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NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG 2001357

MCAS
Tustin, CA
April 2021

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

July 09, 2020

Vista Work Order No. 2001357

Ms. Kimberly Shiroodi
KMEA
2423 Hoover Avenue
National City, CA 91950

Dear Ms. Shiroodi,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on June 25, 2020 under your Project Name 'MCAS El Toro and Tustin, PFAS'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 2001357
Case Narrative

Sample Condition on Receipt:

Two blank water samples and two groundwater samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution/LC-MSMS Method Compliant with Table B-15 of QSM 5.3 (Aqueous)

The samples were extracted and analyzed for a selected list of PFAS using Isotope Dilution and LC-MS/MS compliant with Table B-15 of QSM 5.3. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 of the LOQ concentrations. The LCS/LCSD recoveries were within the acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2001357-01	SB01-20200624	24-Jun-20 15:00	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-02	EB01-20200624	24-Jun-20 15:10	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-03	I006MW06S-20200624	24-Jun-20 16:00	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-04	DUP01-20200624	24-Jun-20 16:05	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Aqueous

Laboratory Data

Lab Sample: B0F0257-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHxA	307-24-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
HFPO-DA	13252-13-6	ND	0.00241	0.00300	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHpA	375-85-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
ADONA	919005-14-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHxS	355-46-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFOA	335-67-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFNA	375-95-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFOS	1763-23-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
9Cl-PF3ONS	756426-58-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFDA	335-76-2	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
MeFOSAA	2355-31-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
EtFOSAA	2991-50-6	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFUnA	2058-94-8	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
11Cl-PF3OUdS	763051-92-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFDoA	307-55-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFTrDA	72629-94-8	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFTeDA	376-06-7	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	78.9	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C3-HFPO-DA	IS	69.4	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFHxA	IS	72.1	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C4-PFHpA	IS	71.7	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C3-PFHxS	IS	76.2	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C5-PFNA	IS	71.3	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFOA	IS	70.0	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C8-PFOS	IS	71.0	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFDA	IS	69.6	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
d3-MeFOSAA	IS	59.6	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFUnA	IS	59.5	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
d5-EtFOSAA	IS	64.3	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFDoA	IS	66.9	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFTeDA	IS	56.8	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: LCSD **PFAS Isotope Dilution Table B-15**

Name:	KMEA	Lab Sample:	B0F0257-BS1/B0F0257-BSD1
Project:	MCAS El Toro and Tustin, PFAS	QC Batch:	B0F0257
Matrix:	Aqueous	Samp Size:	0.250/0.250 L
		Date Extracted:	03-Jul-20
		Column:	BEH C18

Analyte	CAS Number	LCS (ug/L)	LCS Spike	LCS % Rec	LCS Quals	LCSD (ug/L)	LCSD Spike	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	0.0432	0.0400	108		0.0412	0.0400	103	4.63		72-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHxA	307-24-4	0.0434	0.0400	108		0.0395	0.0400	98.8	9.22		72-129	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
HFPO-DA	13252-13-6	0.0395	0.0400	98.7		0.0448	0.0400	112	12.7		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHpA	375-85-9	0.0414	0.0400	104		0.0383	0.0400	95.7	7.88		72-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
ADONA	919005-14-4	0.0404	0.0400	101		0.0350	0.0400	87.4	14.5		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHxS	355-46-4	0.0377	0.0400	94.2		0.0398	0.0400	99.5	5.50		68-131	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFOA	335-67-1	0.0391	0.0400	97.7		0.0393	0.0400	98.2	0.463		71-133	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFNA	375-95-1	0.0400	0.0400	100		0.0400	0.0400	100	0.00915		69-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFOS	1763-23-1	0.0386	0.0400	96.5		0.0384	0.0400	96.1	0.435		65-140	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
9Cl-PF3ONS	756426-58-1	0.0431	0.0400	108		0.0373	0.0400	93.3	14.2		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFDA	335-76-2	0.0437	0.0400	109		0.0428	0.0400	107	1.94		71-129	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
MeFOSAA	2355-31-9	0.0434	0.0400	108		0.0408	0.0400	102	6.11		65-136	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
EtFOSAA	2991-50-6	0.0378	0.0400	94.6		0.0419	0.0400	105	10.1		61-135	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFUnA	2058-94-8	0.0431	0.0400	108		0.0406	0.0400	101	6.07		69-133	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
11Cl-PF3OUdS	763051-92-9	0.0448	0.0400	112		0.0419	0.0400	105	6.76		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFDoA	307-55-1	0.0389	0.0400	97.3		0.0364	0.0400	91.0	6.73		72-134	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFTrDA	72629-94-8	0.0370	0.0400	92.6		0.0357	0.0400	89.1	3.81		65-144	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFTeDA	376-06-7	0.0418	0.0400	105		0.0395	0.0400	98.8	5.62		71-132	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	73.7		87.0		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C3-HFPO-DA	IS	76.0		77.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFHxA	IS	74.6		84.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C4-PFHpA	IS	73.0		87.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C3-PFHxS	IS	74.6		80.5		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C5-PFNA	IS	75.0		82.5		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFOA	IS	76.9		85.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C8-PFOS	IS	73.0		85.7		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFDA	IS	70.8		81.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
d3-MeFOSAA	IS	64.8		75.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFUnA	IS	60.0		71.9		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
d5-EtFOSAA	IS	68.9		78.9		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFDoA	IS	69.0		79.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Sample ID: LCSD **PFAS Isotope Dilution Table B-15**

Name:	KMEA	Lab Sample:	B0F0257-BS1/B0F0257-BSD1	Date Extracted:	03-Jul-20
Project:	MCAS El Toro and Tustin, PFAS	QC Batch:	B0F0257	Column:	BEH C18
Matrix:	Aqueous	Samp Size:	0.250/0.250 L		

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C2-PFTeDA	IS	61.2		70.3		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Sample ID: SB01-20200624

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Blank Water
Date Collected: 24-Jun-20 15:00

Laboratory Data

Lab Sample: 2001357-01
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHxA	307-24-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
HFPO-DA	13252-13-6	ND	0.00244	0.00304	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHpA	375-85-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
ADONA	919005-14-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHxS	355-46-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFOA	335-67-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFNA	375-95-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFOS	1763-23-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
9Cl-PF3ONS	756426-58-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFDA	335-76-2	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
MeFOSAA	2355-31-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
EtFOSAA	2991-50-6	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFUnA	2058-94-8	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
11Cl-PF3OUdS	763051-92-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFDoA	307-55-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFTrDA	72629-94-8	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFTeDA	376-06-7	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	91.4	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C3-HFPO-DA	IS	86.6	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFHxA	IS	87.2	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C4-PFHpA	IS	85.0	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C3-PFHxS	IS	84.9	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C5-PFNA	IS	83.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFOA	IS	85.6	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C8-PFOS	IS	80.0	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFDA	IS	81.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
d3-MeFOSAA	IS	68.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFUnA	IS	76.7	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
d5-EtFOSAA	IS	78.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFDoA	IS	76.2	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFTeDA	IS	64.7	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Vista Analytical Laboratory

Sample ID: EB01-20200624

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Blank Water
Date Collected: 24-Jun-20 15:10

Laboratory Data

Lab Sample: 2001357-02
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHxA	307-24-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
HFPO-DA	13252-13-6	ND	0.00243	0.00302	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHpA	375-85-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
ADONA	919005-14-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHxS	355-46-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFOA	335-67-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFNA	375-95-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFOS	1763-23-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
9Cl-PF3ONS	756426-58-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFDA	335-76-2	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
MeFOSAA	2355-31-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
EtFOSAA	2991-50-6	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFUnA	2058-94-8	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
11Cl-PF3OUdS	763051-92-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFDoA	307-55-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFTrDA	72629-94-8	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFTeDA	376-06-7	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.9	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C3-HFPO-DA	IS	104	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFHxA	IS	102	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C4-PFHpA	IS	96.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C3-PFHxS	IS	101	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C5-PFNA	IS	99.0	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFOA	IS	96.2	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C8-PFOS	IS	96.8	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFDA	IS	96.0	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
d3-MeFOSAA	IS	88.3	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFUnA	IS	82.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
d5-EtFOSAA	IS	87.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFDoA	IS	85.5	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFTeDA	IS	67.2	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: I006MW06S-20200624 **PFAS Isotope Dilution Table B-15**

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Groundwater
Date Collected: 24-Jun-20 16:00

Laboratory Data

Lab Sample: 2001357-03
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0819	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHxA	307-24-4	0.605	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
HFPO-DA	13252-13-6	ND	0.00236	0.00293	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHpA	375-85-9	0.337	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
ADONA	919005-14-4	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHxS	355-46-4	0.515	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFOA	335-67-1	0.268	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFNA	375-95-1	0.00443	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFOS	1763-23-1	0.0906	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
9Cl-PF3ONS	756426-58-1	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFDA	335-76-2	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
MeFOSAA	2355-31-9	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
EtFOSAA	2991-50-6	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFUnA	2058-94-8	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
11Cl-PF3OUdS	763051-92-9	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFDoA	307-55-1	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFTrDA	72629-94-8	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFTeDA	376-06-7	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	91.4	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C3-HFPO-DA	IS	89.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFHxA	IS	84.9	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C4-PFHpA	IS	87.6	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C3-PFHxS	IS	79.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C5-PFNA	IS	86.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFOA	IS	83.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C8-PFOS	IS	85.4	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFDA	IS	78.3	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
d3-MeFOSAA	IS	74.9	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFUnA	IS	72.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
d5-EtFOSAA	IS	82.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFDoA	IS	69.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFTeDA	IS	64.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: DUP01-20200624

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Groundwater
Date Collected: 24-Jun-20 16:05

Laboratory Data

Lab Sample: 2001357-04
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0824	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHxA	307-24-4	0.588	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
HFPO-DA	13252-13-6	ND	0.00237	0.00295	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHpA	375-85-9	0.339	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
ADONA	919005-14-4	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHxS	355-46-4	0.535	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFOA	335-67-1	0.315	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFNA	375-95-1	0.00492	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFOS	1763-23-1	0.106	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
9Cl-PF3ONS	756426-58-1	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFDA	335-76-2	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
MeFOSAA	2355-31-9	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
EtFOSAA	2991-50-6	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFUnA	2058-94-8	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
11Cl-PF3OUdS	763051-92-9	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFDoA	307-55-1	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFTrDA	72629-94-8	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFTeDA	376-06-7	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	76.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C3-HFPO-DA	IS	71.5	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFHxA	IS	72.6	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C4-PFHpA	IS	70.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C3-PFHxS	IS	69.0	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C5-PFNA	IS	71.0	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFOA	IS	70.9	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C8-PFOS	IS	74.5	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFDA	IS	67.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
d3-MeFOSAA	IS	67.1	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFUnA	IS	60.3	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
d5-EtFOSAA	IS	71.9	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFDoA	IS	65.3	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFTeDA	IS	62.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical

1104 Windfield Way
El Dorado Hills, CA 95762
TEL: 916-673-1520

2001357
0.7°c

Vista PM: Jade White-Dobbs

CHAIN OF CUSTODY RECORD

DATE: 6/26/2020

PAGE: 1 OF 1

LABORATORY CLIENT: KMEA	CLIENT PROJECT NAME / NUMBER: MCAS El Toro and Tustin, PFAS	P.O. NO.: TO 008 Mod-46
ADDRESS: 9210 Sky Park Court, Suite 220	PROJECT CONTACT: Kimberly Shiroodi / Brian Johnson	CONTRACT NO.: N62473-16-D-2405
CITY: San Diego, CA 92123	SAMPLER(S): (SIGNATURE) Ulf Rulter	LAB USE ONLY
TEL: (619) 399-5900 / E-Mail: kimberly.shiroodi@woodplc.com / E-MAIL: brian.johnson@woodplc.com		

TURNAROUND TIME

☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 10 DAYS ☒ Standard

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ____ / ____ / ____

SPECIAL INSTRUCTIONS

GW samples potentially contain elevated levels of PFAS, separate SDG (Tustin).

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	QC Level	PFAS by LC/MS-MS
	SB01 - 20200624	6/24/20	15:00	BW	2		X
	EB01 - 20200624	"	15:10	"	2		X
	I006 MW06S - 20200624	"	16:00	GW	2	N	X
	DUP01 - 20200624	"	16:05	"	2		X

ul 6-24-20

Relinquished by: (Signature) Ulf Rulter	Received by: (Signature) / Carrier Tracking Number FedEx	Date: 6/24/20	Time: 17:00
Relinquished by: (Signature) Fedex	Received by: (Signature) Conor Mahr	Date: 06/25/20	Time: 0933
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 2001357 TAT Std

Samples Arrival:	**Date/Time** 06/25/20 0833 ~~1012~~		**Initials:** CM			**Location:** WR-2 **Shelf/Rack:** N/A	
Delivered By:	(FedEx)	UPS	On Trac	GLS	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None
Temp °C: 0.7 (uncorrected) **Temp °C:** 0.7 (corrected)			**Probe used:** Y / (N)			**Thermometer ID:** IR-4	

	YES	NO	NA
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Airbill — Trk # 8142 4183 5158	✓		
Shipping Documentation Present?	✓		
Shipping Container: Vista / (Client) / Retain / (Return) / Dispose			
Chain of Custody / Sample Documentation Present?	✓		
Chain of Custody / Sample Documentation Complete?	✓		
Holding Time Acceptable?	✓		

Logged In:	**Date/Time** 06/25/20 1134	**Initials:** KS	**Location:** R-13 / WR-2 **Shelf/Rack:** A-2 / F-4	
COC Anomaly/Sample Acceptance Form completed?			✓	✓

Comments:

CoC/Label Reconciliation Report WO# 2001357

LabNumber	CoC Sample ID		SampleAlias	Sample Date/Time		Container	BaseMatrix	Sample Comments
2001357-01	A SB01-20200624	☑		24-Jun-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-01	B SB01-20200624	☑		24-Jun-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-02	A EB01-20200624	☑		24-Jun-20 15:10	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-02	B EB01-20200624	☑		24-Jun-20 15:10	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-03	A I006MW065-20200624	☑ Ⓐ		24-Jun-20 16:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-03	B I006MW065-20200624	☑ ↓		24-Jun-20 16:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-04	A DUP01-20200624	☑		24-Jun-20 16:05	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-04	B DUP01-20200624	☑		24-Jun-20 16:05	☑	HDPE Bottle, 250 mL	Aqueous	

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Adequate Sample Volume?	✓		
Container Type Appropriate for Analysis(es)	✓		
Preservation Documented: Na2S2O3 Trizma (None) Other		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

Comments:

Ⓐ Per client ~~email~~ email sample ID updated. RSB 6/29/20
RSB 6/29/20

Verifed by/Date: KS 06/25/20

July 09, 2020

Vista Work Order No. 2001357

Ms. Kimberly Shiroodi
KMEA
2423 Hoover Avenue
National City, CA 91950

Dear Ms. Shiroodi,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on June 25, 2020 under your Project Name 'MCAS El Toro and Tustin, PFAS'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 2001357
Case Narrative

Sample Condition on Receipt:

Two blank water samples and two groundwater samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution/LC-MSMS Method Compliant with Table B-15 of QSM 5.3 (Aqueous)

The samples were extracted and analyzed for a selected list of PFAS using Isotope Dilution and LC-MS/MS compliant with Table B-15 of QSM 5.3. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 of the LOQ concentrations. The LCS/LCSD recoveries were within the acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2001357-01	SB01-20200624	24-Jun-20 15:00	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-02	EB01-20200624	24-Jun-20 15:10	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-03	I006MW06S-20200624	24-Jun-20 16:00	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2001357-04	DUP01-20200624	24-Jun-20 16:05	25-Jun-20 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Aqueous

Laboratory Data

Lab Sample: B0F0257-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHxA	307-24-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
HFPO-DA	13252-13-6	ND	0.00241	0.00300	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHpA	375-85-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
ADONA	919005-14-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFHxS	355-46-4	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFOA	335-67-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFNA	375-95-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFOS	1763-23-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
9Cl-PF3ONS	756426-58-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFDA	335-76-2	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
MeFOSAA	2355-31-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
EtFOSAA	2991-50-6	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFUnA	2058-94-8	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
11Cl-PF3OUdS	763051-92-9	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFDoA	307-55-1	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFTrDA	72629-94-8	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
PFTeDA	376-06-7	ND	0.00137	0.00200	0.00400		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	78.9	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C3-HFPO-DA	IS	69.4	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFHxA	IS	72.1	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C4-PFHpA	IS	71.7	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C3-PFHxS	IS	76.2	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C5-PFNA	IS	71.3	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFOA	IS	70.0	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C8-PFOS	IS	71.0	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFDA	IS	69.6	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
d3-MeFOSAA	IS	59.6	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFUnA	IS	59.5	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
d5-EtFOSAA	IS	64.3	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFDoA	IS	66.9	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1
13C2-PFTeDA	IS	56.8	50 - 150		B0F0257	03-Jul-20	0.250 L	06-Jul-20 19:03	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: LCSD **PFAS Isotope Dilution Table B-15**

Name:	KMEA	Lab Sample:	B0F0257-BS1/B0F0257-BSD1
Project:	MCAS El Toro and Tustin, PFAS	QC Batch:	B0F0257
Matrix:	Aqueous	Samp Size:	0.250/0.250 L
		Date Extracted:	03-Jul-20
		Column:	BEH C18

Analyte	CAS Number	LCS (ug/L)	LCS Spike	LCS % Rec	LCS Quals	LCSD (ug/L)	LCSD Spike	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	0.0432	0.0400	108		0.0412	0.0400	103	4.63		72-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHxA	307-24-4	0.0434	0.0400	108		0.0395	0.0400	98.8	9.22		72-129	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
HFPO-DA	13252-13-6	0.0395	0.0400	98.7		0.0448	0.0400	112	12.7		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHpA	375-85-9	0.0414	0.0400	104		0.0383	0.0400	95.7	7.88		72-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
ADONA	919005-14-4	0.0404	0.0400	101		0.0350	0.0400	87.4	14.5		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFHxS	355-46-4	0.0377	0.0400	94.2		0.0398	0.0400	99.5	5.50		68-131	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFOA	335-67-1	0.0391	0.0400	97.7		0.0393	0.0400	98.2	0.463		71-133	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFNA	375-95-1	0.0400	0.0400	100		0.0400	0.0400	100	0.00915		69-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFOS	1763-23-1	0.0386	0.0400	96.5		0.0384	0.0400	96.1	0.435		65-140	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
9Cl-PF3ONS	756426-58-1	0.0431	0.0400	108		0.0373	0.0400	93.3	14.2		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFDA	335-76-2	0.0437	0.0400	109		0.0428	0.0400	107	1.94		71-129	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
MeFOSAA	2355-31-9	0.0434	0.0400	108		0.0408	0.0400	102	6.11		65-136	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
EtFOSAA	2991-50-6	0.0378	0.0400	94.6		0.0419	0.0400	105	10.1		61-135	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFUnA	2058-94-8	0.0431	0.0400	108		0.0406	0.0400	101	6.07		69-133	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
11Cl-PF3OUdS	763051-92-9	0.0448	0.0400	112		0.0419	0.0400	105	6.76		70-130	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFDoA	307-55-1	0.0389	0.0400	97.3		0.0364	0.0400	91.0	6.73		72-134	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFTrDA	72629-94-8	0.0370	0.0400	92.6		0.0357	0.0400	89.1	3.81		65-144	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1
PFTeDA	376-06-7	0.0418	0.0400	105		0.0395	0.0400	98.8	5.62		71-132	30	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	73.7		87.0		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C3-HFPO-DA	IS	76.0		77.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFHxA	IS	74.6		84.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C4-PFHpA	IS	73.0		87.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C3-PFHxS	IS	74.6		80.5		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C5-PFNA	IS	75.0		82.5		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFOA	IS	76.9		85.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C8-PFOS	IS	73.0		85.7		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFDA	IS	70.8		81.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
d3-MeFOSAA	IS	64.8		75.1		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFUnA	IS	60.0		71.9		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
d5-EtFOSAA	IS	68.9		78.9		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1
13C2-PFDoA	IS	69.0		79.4		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Sample ID: LCSD **PFAS Isotope Dilution Table B-15**

Name:	KMEA	Lab Sample:	B0F0257-BS1/B0F0257-BSD1	Date Extracted:	03-Jul-20
Project:	MCAS El Toro and Tustin, PFAS	QC Batch:	B0F0257	Column:	BEH C18
Matrix:	Aqueous	Samp Size:	0.250/0.250 L		

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C2-PFTeDA	IS	61.2		70.3		50-150	06-Jul-20 19:13	1	06-Jul-20 19:24	1

Sample ID: SB01-20200624 **PFAS Isotope Dilution Table B-15**

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Blank Water
Date Collected: 24-Jun-20 15:00

Laboratory Data

Lab Sample: 2001357-01
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHxA	307-24-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
HFPO-DA	13252-13-6	ND	0.00244	0.00304	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHpA	375-85-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
ADONA	919005-14-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFHxS	355-46-4	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFOA	335-67-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFNA	375-95-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFOS	1763-23-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
9Cl-PF3ONS	756426-58-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFDA	335-76-2	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
MeFOSAA	2355-31-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
EtFOSAA	2991-50-6	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFUnA	2058-94-8	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
11Cl-PF3OUdS	763051-92-9	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFDoA	307-55-1	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFTrDA	72629-94-8	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
PFTeDA	376-06-7	ND	0.00139	0.00202	0.00406		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	91.4	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C3-HFPO-DA	IS	86.6	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFHxA	IS	87.2	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C4-PFHpA	IS	85.0	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C3-PFHxS	IS	84.9	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C5-PFNA	IS	83.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFOA	IS	85.6	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C8-PFOS	IS	80.0	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFDA	IS	81.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
d3-MeFOSAA	IS	68.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFUnA	IS	76.7	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
d5-EtFOSAA	IS	78.1	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFDoA	IS	76.2	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1
13C2-PFTeDA	IS	64.7	50 - 150		B0F0257	03-Jul-20	0.247 L	06-Jul-20 20:16	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: EB01-20200624

PFAS Isotope Dilution Table B-15

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Blank Water
Date Collected: 24-Jun-20 15:10

Laboratory Data

Lab Sample: 2001357-02
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHxA	307-24-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
HFPO-DA	13252-13-6	ND	0.00243	0.00302	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHpA	375-85-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
ADONA	919005-14-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFHxS	355-46-4	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFOA	335-67-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFNA	375-95-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFOS	1763-23-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
9Cl-PF3ONS	756426-58-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFDA	335-76-2	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
MeFOSAA	2355-31-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
EtFOSAA	2991-50-6	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFUnA	2058-94-8	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
11Cl-PF3OUdS	763051-92-9	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFDoA	307-55-1	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFTrDA	72629-94-8	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
PFTeDA	376-06-7	ND	0.00138	0.00202	0.00403		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.9	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C3-HFPO-DA	IS	104	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFHxA	IS	102	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C4-PFHpA	IS	96.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C3-PFHxS	IS	101	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C5-PFNA	IS	99.0	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFOA	IS	96.2	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C8-PFOS	IS	96.8	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFDA	IS	96.0	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
d3-MeFOSAA	IS	88.3	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFUnA	IS	82.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
d5-EtFOSAA	IS	87.7	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFDoA	IS	85.5	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1
13C2-PFTeDA	IS	67.2	50 - 150		B0F0257	03-Jul-20	0.248 L	06-Jul-20 20:27	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: I006MW06S-20200624 **PFAS Isotope Dilution Table B-15**

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Groundwater
Date Collected: 24-Jun-20 16:00

Laboratory Data

Lab Sample: 2001357-03
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0819	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHxA	307-24-4	0.605	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
HFPO-DA	13252-13-6	ND	0.00236	0.00293	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHpA	375-85-9	0.337	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
ADONA	919005-14-4	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFHxS	355-46-4	0.515	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFOA	335-67-1	0.268	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFNA	375-95-1	0.00443	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFOS	1763-23-1	0.0906	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
9Cl-PF3ONS	756426-58-1	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFDA	335-76-2	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
MeFOSAA	2355-31-9	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
EtFOSAA	2991-50-6	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFUnA	2058-94-8	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
11Cl-PF3OUdS	763051-92-9	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFDoA	307-55-1	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFTrDA	72629-94-8	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
PFTeDA	376-06-7	ND	0.00134	0.00195	0.00391		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	91.4	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C3-HFPO-DA	IS	89.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFHxA	IS	84.9	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C4-PFHpA	IS	87.6	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C3-PFHxS	IS	79.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C5-PFNA	IS	86.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFOA	IS	83.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C8-PFOS	IS	85.4	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFDA	IS	78.3	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
d3-MeFOSAA	IS	74.9	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFUnA	IS	72.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
d5-EtFOSAA	IS	82.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFDoA	IS	69.2	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1
13C2-PFTeDA	IS	64.0	50 - 150		B0F0257	03-Jul-20	0.256 L	06-Jul-20 20:37	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: DUP01-20200624 **PFAS Isotope Dilution Table B-15**

Client Data

Name: KMEA
Project: MCAS El Toro and Tustin, PFAS
Matrix: Groundwater
Date Collected: 24-Jun-20 16:05

Laboratory Data

Lab Sample: 2001357-04
Date Received: 25-Jun-20 09:33
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0824	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHxA	307-24-4	0.588	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
HFPO-DA	13252-13-6	ND	0.00237	0.00295	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHpA	375-85-9	0.339	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
ADONA	919005-14-4	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFHxS	355-46-4	0.535	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFOA	335-67-1	0.315	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFNA	375-95-1	0.00492	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFOS	1763-23-1	0.106	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
9Cl-PF3ONS	756426-58-1	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFDA	335-76-2	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
MeFOSAA	2355-31-9	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
EtFOSAA	2991-50-6	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFUnA	2058-94-8	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
11Cl-PF3OUdS	763051-92-9	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFDoA	307-55-1	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFTrDA	72629-94-8	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
PFTeDA	376-06-7	ND	0.00135	0.00197	0.00394		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	76.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C3-HFPO-DA	IS	71.5	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFHxA	IS	72.6	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C4-PFHpA	IS	70.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C3-PFHxS	IS	69.0	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C5-PFNA	IS	71.0	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFOA	IS	70.9	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C8-PFOS	IS	74.5	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFDA	IS	67.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
d3-MeFOSAA	IS	67.1	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFUnA	IS	60.3	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
d5-EtFOSAA	IS	71.9	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFDoA	IS	65.3	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1
13C2-PFTeDA	IS	62.7	50 - 150		B0F0257	03-Jul-20	0.254 L	06-Jul-20 20:58	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical

1104 Windfield Way
El Dorado Hills, CA 95762
TEL: 916-673-1520

2001357
0.7°c

Vista PM: Jade White-Dobbs

CHAIN OF CUSTODY RECORD

DATE: 6/26/2020

PAGE: 1 OF 1

LABORATORY CLIENT: KMEA	CLIENT PROJECT NAME / NUMBER: MCAS El Toro and Tustin, PFAS
ADDRESS: 9210 Sky Park Court, Suite 220	PROJECT CONTACT: Kimberly Shiroodi / Brian Johnson
CITY: San Diego, CA 92123	SAMPLER(S): (SIGNATURE) Ulf Rukter
TEL: (619) 399-5900 / E-Mail: kimberly.shiroodi@woodplc.com / E-MAIL: brian.johnson@woodplc.com	P.O. NO.: TO 008 Mod-46 / CONTRACT NO.: N62473-16-D-2405 / LAB USE ONLY

TURNAROUND TIME

☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 10 DAYS ☒ Standard

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ____/____/____

SPECIAL INSTRUCTIONS

GW samples potentially contain elevated levels of PFAS, separate SOG (Tustin).

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	QC Level	PFAS by LC/MS-MS
	SB01 - 20200624	6/24/20	15:00	BW	2		X
	EB01 - 20200624	"	15:10	"	2		X
	I006 MW06S - 20200624	"	16:00	GW	2	N	X
	DUP01 - 20200624	"	16:05	"	2		X

UM 6-24-20

Relinquished by: (Signature) Ulf Rukter	Received by: (Signature) / Carrier Tracking Number FedEx	Date: 6/24/20	Time: 17:00
Relinquished by: (Signature) Fedex	Received by: (Signature) Conor Mahr	Date: 06/25/20	Time: 0933
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 2001357 TAT Std

Samples Arrival:	**Date/Time** 06/25/20 0833 ~~1012~~			**Initials:** CM		**Location:** WR-2 **Shelf/Rack:** N/A	
Delivered By:	(FedEx)	UPS	On Trac	GLS	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None
Temp °C: 0.7 (uncorrected) / **Temp °C:** 0.7 (corrected)			**Probe used:** Y / (N)			**Thermometer ID:** IR-4	

					YES	NO	NA
Shipping Container(s) Intact?					✓		
Shipping Custody Seals Intact?					✓		
Airbill —	Trk # 8142 4183 5158				✓		
Shipping Documentation Present?					✓		
Shipping Container	Vista	(Client)	Retain	(Return)		Dispose	
Chain of Custody / Sample Documentation Present?					✓		
Chain of Custody / Sample Documentation Complete?					✓		
Holding Time Acceptable?					✓		

Logged In:	**Date/Time** 06/25/20 1134	**Initials:** KS	**Location:** R-13 / WR-2 **Shelf/Rack:** A-2 / F-4	
COC Anomaly/Sample Acceptance Form completed?			✓	✓

Comments:

CoC/Label Reconciliation Report WO# 2001357

LabNumber	CoC Sample ID		SampleAlias	Sample Date/Time		Container	BaseMatrix	Sample Comments
2001357-01	A SB01-20200624	☑		24-Jun-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-01	B SB01-20200624	☑		24-Jun-20 15:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-02	A EB01-20200624	☑		24-Jun-20 15:10	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-02	B EB01-20200624	☑		24-Jun-20 15:10	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-03	A I006MW065-20200624	☑ Ⓐ		24-Jun-20 16:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-03	B I006MW065-20200624	☑ ↓		24-Jun-20 16:00	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-04	A DUP01-20200624	☑		24-Jun-20 16:05	☑	HDPE Bottle, 250 mL	Aqueous	
2001357-04	B DUP01-20200624	☑		24-Jun-20 16:05	☑	HDPE Bottle, 250 mL	Aqueous	

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Adequate Sample Volume?	✓		
Container Type Appropriate for Analysis(es)	✓		
Preservation Documented: Na2S2O3 Trizma (None) Other		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

Comments:

Ⓐ Per client ~~email~~ email sample ID updated. RSB 6/29/20
RSB 6/29/20

Verifed by/Date: KS 06/25/20

EXTRACTION INFORMATION

Process Sheet

Workorder: 2001357

Prep Expiration: 2020-07-08
Client: KMEA

Workorder Due: 16-Jul-20 00:00

TAT: 21

Method: **537M PFAS DOD QSM 5.3 (LOQ as mRL)**
Matrix: **Aqueous**

Prep Batch: B0F0257

Prep Data Entered: ME 07/06/2020
Date and Initials

Version: 537.1 List of 18-EIS
DoD: DoD QSM 5.3

Initial Sequence: SOG0013

LabSampID	A/B	Prep Rec	Spike Rec	ClientSampleID	Comments	Location	Container
2001357-01	A	☑	☑	SB01-20200624		R-13 A-2	HDPE Bottle, 250 mL
2001357-02		☑	☑	EB01-20200624		R-13 A-2	HDPE Bottle, 250 mL
2001357-03		☑	☑	I006MW065-20200624		R-13 A-2	HDPE Bottle, 250 mL
2001357-04		☑	☑	DUP01-20200624		R-13 A-2	HDPE Bottle, 250 mL

WO Comments: **May have elevated PFAS levels - isolate samples.** ME 07/03/2020
Instrument - begin w/ dils.
Report to DL

Pre-Prep Check Out: CHT 06/26/20
Pre-Prep Check In: CHT 06/26/20

Prep Check Out: HP 07/03/20
Prep Check In: N/A

Prep Reconciled Initals/Date: CHT 06/26/20
Spike Reconciled Initals/Date: HP 07/03/20
VialBoxID: Viper

Matrix: Aqueous

Method: 537M PFAS DOD QSM 5.3 (LOQ as mRL)

Vista Internal Chain-of-Custody

B0F0257

Vista Analytical Laboratory

	Location		L2	R13	L2	R12	L2	R12	L4		
	Reason		Prep	R9	R4	R9	R6	R9	R8		
	Initials		CHT	CHT	HP	ME	TL	TC	[illegible]		
	Date/Time		06/26/20 0855	06/26/20 0930	07/03/20 7:22	07/08/20 17:10	07/06/20 08:51	07/06/20 15:11	7/6/2020 1700		
Initial Storage	LabNumber	Cont									
R-13 A-2	2001356-01	A	O	O	O	E	F	B	C		
R-13 A-2	2001357-01										
R-13 A-2	2001357-02										
R-13 A-2	2001357-03										
R-13 A-2	2001357-04										
R-13 A-2	2001358-01										
R-13 A-2	2001358-02										
R-13 A-2	2001358-03										
R-13 A-2	2001358-04										
R-13 A-2	2001358-05										
R-13 A-2	2001358-06	ABC									
R-13 A-2	2001358-07	A									

Location Key:
L1 = Prep Lab 1
L2 = Prep Lab 2
L3 = HRMS Diox
L4 = Instrument
Other = _____

Reason Key:
R1 = Percent Solids
R2 = Eluate Preservation
R3 = Sub-Sample
R4 = Extraction
R6 = Concentration
R7 = Filtering
R8 = Analysis
R9 = Storage
Other = _____

Type Key:
O = Original Sample
E = Extract of Sample

Matrix: Aqueous

Method: 537M PFAS DOD QSM 5.3 (LOQ as mRL)

PREPARATION BENCH SHEET

B0F0257

Chemist: Hp

Prep Date: 07/03/20

Prep Time: 07:52

Hood#: 5

Prepared using: ☐ Sonication Shaker ☑ SPE Extraction ☑ Centrifuge ID: 05

Hp 07/03/20 Hp 07/03/20

Rec Date/Initals: TC 07/06/20 Date/Initals: CHT 06/26/20 BalanceID: HRMS-9

Cen	VISTA Sample ID	Rec Vial1	Rec Vial2	pH	Chlorine (Cl)	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE and Reconciliation	ENVI-Carb and Reconciliation
☐	B0F0257-BLK1	☑	☑	5	0	NA	NA	(0.250)	Hp ME 07/03/20	Hp 07/03/20	Hp 07/03/20
☐	B0F0257-BS1	☑	☑	5	0	↓	↓	(0.250)	↓	↓	↓
☐	B0F0257-BSD1	☑	☑	5	0	↓	↓	(0.250)	↓	↓	↓
☐	B0F0257-MS1 2001358-06	☑	☑	6	0	27679	25.69	0.25110	↓	↓	↓
☐	B0F0257-MSD1 2001358-06	☑	☑	6	0	268.36	26.25	0.24211	↓	↓	↓
☐	2001356-01	☑	☑	5	0	283.55	25.73	0.25782	↓	↓	↓
☐	2001357-01	☑	☑	4	0	272.54	26.00	0.24654	↓	↓	↓
☐	2001357-02	☑	☑	4	0	273.91	25.87	0.24804	↓	↓	↓
☐	2001357-03	☑	☑	6	0	282.11	26.48	0.25563	↓	↓	↓
☐	2001357-04	☑	☑	6	0	279.78	25.75	0.26403	↓	↓	↓
☐	2001358-01	☑	☑	4	0	267.04	25.76	0.24128	↓	↓	↓
☐	2001358-02	☑	☑	6	0	290.23	26.34	0.26389	↓	↓	↓
☐	2001358-03	☑	☑	6	0	289.29	26.28	0.26301	↓	↓	↓
☐	2001358-04	☑	☑	6	0	285.12	25.94	0.25918	↓	↓	↓

IS: 200720 10uL (12)

IS SUP: N/A

NS: 200202 10uL (8)

NS SUP: N/A

SPE Chem: Strata XL-AW 100um 200mg/6mL

SPE Lot#: 618-006986B3

ENVI-Carb Lot#: B021C1

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s) 1 mL

Notes:

Comments: Assume 1 g = 1 mL
Cen = Centrifuged
Rec = Reconcile final vial transfer

1 = Sample centrifuged twice
2 = Sample deeply colored after centrifuge
3 = Cartridge sorbent discolored after SPE
4 = Sample clogged cartridge, additional cartridge(s) used
5 = Sample recombined at final volume
6 = Sample took longer to SPE, required stronger vacuum
7 = Required Nitrogen line to finish SPE
8 = Required Nitrogen line to finish elution
9 = Sample arrived with low volume
10 = Trizma added to QC (5g/L)

Matrix: Aqueous

Method: 537M PFAS DOD QSM 5.3 (LOQ as mRL)

PREPARATION BENCH SHEET

B0F0257

Chemist: Hp

Prep Date: 07/03/20

Prep Time: 07:52

Hood#: 5

Prepared using: ☐ Sonication Shaker ☑ SPE Extraction ☑ Centrifuge ID: ~~C5~~ Hp 07/03/20 Hp 07/03/20

Rec Date/Initals:

Date/Initals: CHT 06/26/20

BalanceID: HRMS-9

Cen	VISTA Sample ID	Rec Vial1	Rec Vial2	pH	Chlorine (Cl)	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE and Reconciliation	ENVI-Carb and Reconciliation
☐	2001358-05	☑	☑	6	0	281.96	26.06	0.25590	Hp ME 07/03/20	Hp 07/03/20	Hp 07/03/20
☐	2001358-06	☑	☑	6	0	281.20	26.23	0.25497	↓	↓	↓
☐	2001358-07	☑	☑	6	0	280.11	25.67	0.25444	↓	↓	↓

IS: 20E1207 10mL (V12)

IS SUP: N/A

NS: 20E1202 10mL (V8)

NS SUP: N/A

SPE Chem: Strata XL-Aw 200mg/6mL

SPE Lot#: S18-006863

ENVI-Carb Lot#: B02161

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s) 1 mL

Notes:

Comments: Assume 1 g = 1 mL
Cen = Centrifuged
Rec = Reconcile final vial transfer

1 = Sample centrifuged twice
2 = Sample deeply colored after centrifuge
3 = Cartridge sorbent discolored after SPE
4 = Sample clogged cartridge, additional cartridge(s) used
5 = Sample recombined at final volume
6 = Sample took longer to SPE, required stronger vacuum
7 = Required Nitrogen line to finish SPE
8 = Required Nitrogen line to finish elution
9 = Sample arrived with low volume
10 = Trizma added to QC (5g/L)

Batch: B0F0257

Matrix: Aqueous

LabNumber	WetWeight (Initial)	% Solids (Extraction Solids)	DryWeight	Final	Extracted	Ext By	Spike	SpikeAmount	ClientMatrix	Analysis
2001356-01	0.25782 ✓	N/A	N/A	1000	03-Jul-20 07:52 ✓	HRP ✓			Wastewater	537M PFAS DOD QSM 5.3
2001357-01	0.24654 ✓			1000	03-Jul-20 07:52	HRP			Blank Water	537M PFAS DOD QSM 5.3
2001357-02	0.24804 ✓			1000	03-Jul-20 07:52	HRP			Blank Water	537M PFAS DOD QSM 5.3
2001357-03	0.25563 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001357-04	0.25403 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-01	0.24128 ✓			1000	03-Jul-20 07:52	HRP			Blank Water	537M PFAS DOD QSM 5.3
2001358-02	0.26389 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-03	0.26301 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-04	0.25918 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-05	0.2559 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-06	0.25497 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
2001358-07	0.25444 ✓			1000	03-Jul-20 07:52	HRP			Groundwater	537M PFAS DOD QSM 5.3
B0F0257-BLK1	0.25 ✓			1000	03-Jul-20 07:52	HRP				QC
B0F0257-BS1	0.25 ✓			1000	03-Jul-20 07:52	HRP	20E1202 ✓	10 ✓		QC
B0F0257-BSD1	0.25 ✓			1000	03-Jul-20 07:52	HRP	20E1202 ✓	10 ✓		QC
B0F0257-MS1	0.2511 ✓			1000	03-Jul-20 07:52	HRP	20E1202 ✓	10 ✓		QC
B0F0257-MSD1	0.24211 ✓			1000	03-Jul-20 07:52 ✓	HRP ✓	20E1202 ✓	10 ✓		QC

All bolded data on report verified against written benchsheet by (initial/date) ME 07/06/2020

Printed: 7/6/2020 8:41:24AM
Page 1 of 1

Sample Data – PFAS Isotope Dilution Table B-15

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-50.qld

Last Altered: Wednesday, July 08, 2020 17:49:14 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 17:49:30 Pacific Daylight Time

Name: 200706P1-50, Date: 06-Jul-2020, Time: 19:03:20, ID: B0F0257-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80		1.026e3	0.250		2.86						YES
2	7	PFHxA	313.0 > 269.0		9.832e3	0.250		3.38						YES
3	9	HFPO-DA	285.1 > 168.9		1.981e3	0.250		3.58						YES
4	11	PFHpA	363.0 > 319		8.811e3	0.250		3.97						YES
5	12	ADONA	376.8 > 250.9		8.811e3	0.250		4.07						YES
6	51	13C3-PFBS-EIS	302.0 > 98.9	1.026e3		0.250	104.004	2.87	2.86	1030	39.465	78.9		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	9.832e3		0.250	1090.353	3.38	3.38	9830	36.069	72.1		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	1.981e3		0.250	228.261	3.59	3.58	1980	34.716	69.4		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	8.811e3		0.250	983.154	3.98	3.97	8810	35.848	71.7		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	8.811e3		0.250	983.154	3.98	3.97	8810	35.848	71.7		
11	-1													
12	13	L-PFHxS	399 > 79.9		2.097e3	0.250		4.11						YES
13	1...	Total PFHxS	399 > 79.9	0.000e0	2.097e3	0.250		3.93		0.000				
14	16	L-PFOA	413 > 369		1.010e4	0.250		4.49						YES
15	1...	Total PFOA	413 > 369	0.000e0	1.010e4	0.250		4.60		0.000				
16	21	PFNA	463.0 > 418.8		1.082e4	0.250		4.93						YES
17	61	13C3-PFHxS-EIS	402 > 80	2.097e3		0.250	220.112	4.13	4.11	2100	38.107	76.2		
18	61	13C3-PFHxS-EIS	402 > 80	2.097e3		0.250	220.112	4.13	4.11	2100	38.107	76.2		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.010e4		0.250	1154.443	4.67	4.49	10100	34.985	70.0		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.010e4		0.250	1154.443	4.67	4.49	10100	34.985	70.0		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.082e4		0.250	1213.140	5.13	4.93	10800	35.671	71.3		
22	-1													
23	23	L-PFOS	499 > 80		2.001e3	0.250		5.00						YES
24	1...	Total PFOS	499> 80	0.000e0	2.001e3	0.250		4.60		0.000				
25	25	9Cl-PF30NS	531 > 351		2.001e3	0.250		5.22						YES
26	26	PFDA	513 > 469		1.298e4	0.250		5.30						YES
27	33	PFUdA	563.0 > 519		1.176e4	0.250		5.62						YES
28	71	13C8-PFOS-EIS	507.1 > 80	2.001e3		0.250	225.510	5.02	5.00	2000	35.496	71.0		
29	71	13C8-PFOS-EIS	507.1 > 80	2.001e3		0.250	225.510	5.02	5.00	2000	35.496	71.0		
30	71	13C8-PFOS-EIS	507.1 > 80	2.001e3		0.250	225.510	5.02	5.00	2000	35.496	71.0		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.298e4		0.250	1491.471	5.31	5.30	13000	34.805	69.6		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.176e4		0.250	1581.335	5.54	5.62	11800	29.738	59.5		
33	-1													
34	29	L-MeFOSAA	570 > 419		2.469e3	0.250		5.44						YES
35	1...	Total N-MeFOSAA	570. > 419	0.000e0	2.469e3	0.250		5.19		0.000				
36	31	L-EtFOSAA	583.9 > 419		2.524e3	0.250		5.59						YES

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-50.qld

Last Altered: Wednesday, July 08, 2020 17:49:14 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 17:49:30 Pacific Daylight Time

Name: 200706P1-50, Date: 06-Jul-2020, Time: 19:03:20, ID: B0F0257-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	0.000e0	2.524e3	0.250		5.37		0.000				
38	35	11Cl-PF30UdS	631 > 451		1.563e4	0.250		5.82						YES
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.469e3		0.250	331.163	5.46	5.44	2470	29.822	59.6		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.469e3		0.250	331.163	5.46	5.44	2470	29.822	59.6		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.524e3		0.250	313.941	5.61	5.59	2520	32.163	64.3		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.524e3		0.250	313.941	5.61	5.59	2520	32.163	64.3		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.563e4		0.250	1868.510	6.13	5.89	15600	33.463	66.9		
44	-1													
45	37	PFDoA	612.9 > 569.0		1.563e4	0.250		5.89						YES
46	39	PFTrDA	662.9 > 618.9		1.563e4	0.250		6.15						YES
47	41	PFTeDA	713.0 > 669.0		1.354e4	0.250		6.32						YES
48	1...	TDCA	498.3>106.9			0.250	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.001e3		0.250	225.510	5.02	5.00	2000	35.496	71.0		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.563e4		0.250	1868.510	6.13	5.89	15600	33.463	66.9		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.563e4		0.250	1868.510	6.13	5.89	15600	33.463	66.9		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.354e4		0.250	1905.823	6.34	6.32	13500	28.413	56.8		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-50.qld

Last Altered: Wednesday, July 08, 2020 17:49:14 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 17:49:30 Pacific Daylight Time

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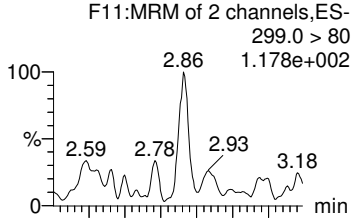
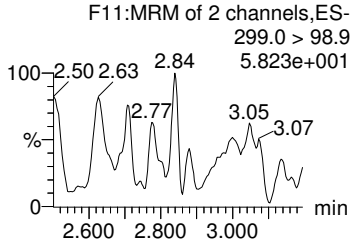
Calibration: P:\PFAS5.pro\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

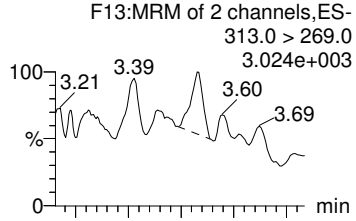
Name: 200706P1-50, Date: 06-Jul-2020, Time: 19:03:20, ID: B0F0257-BLK1 Method Blank 0.25, Description: Method Blank

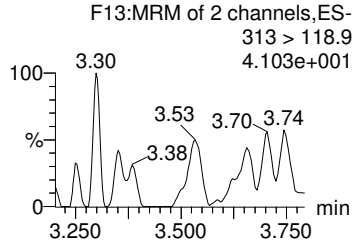
PFBS



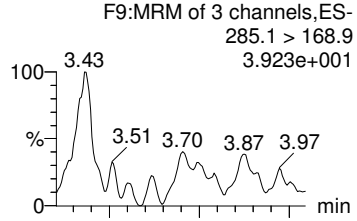


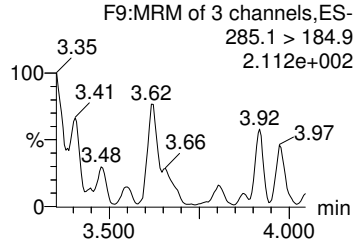
PFHxA



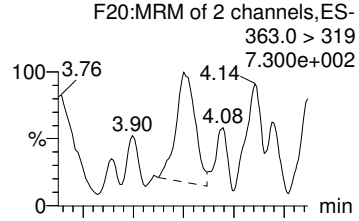


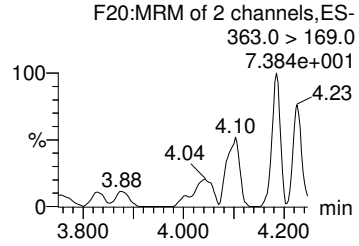
HFPO-DA





PFHpA





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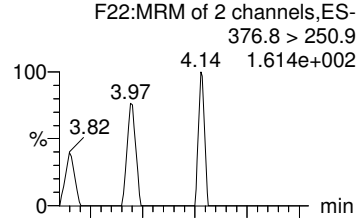
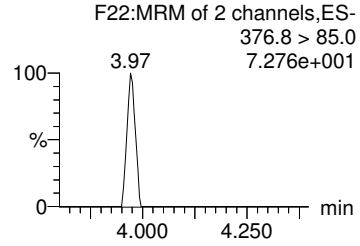
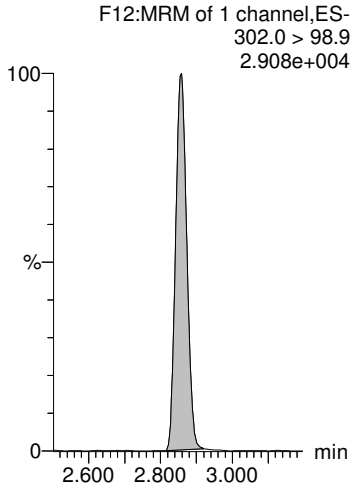
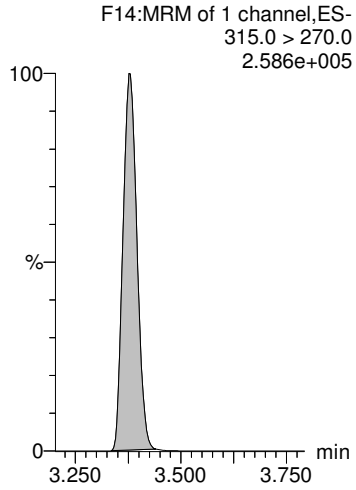




13C3-PFBS-EIS



13C2-PFHxA-EIS



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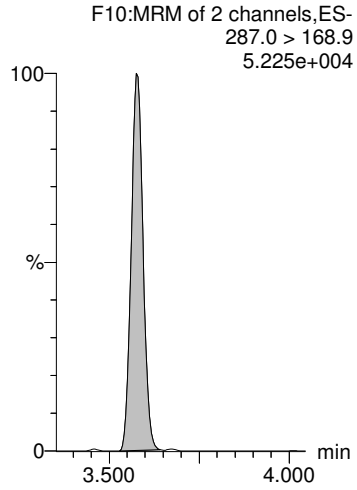

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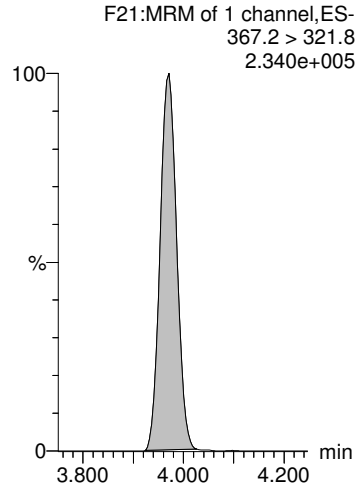

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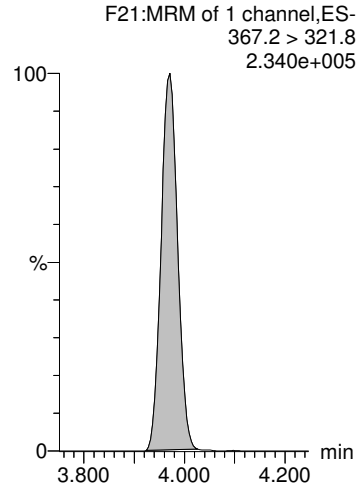

RK 7/8/2020

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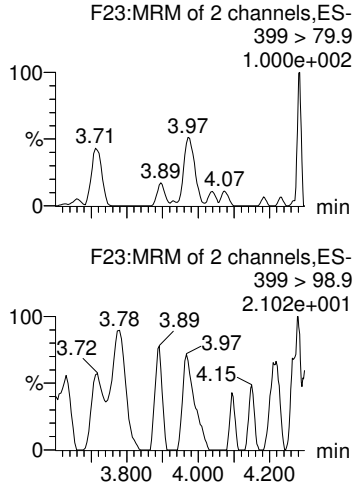

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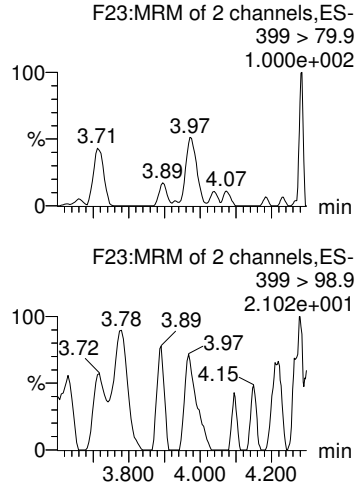
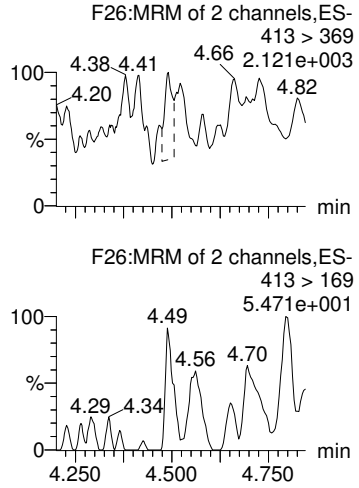


L-PFOA



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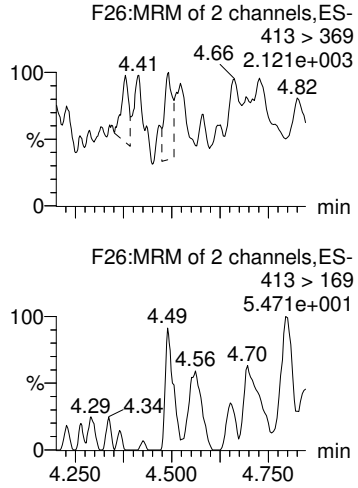

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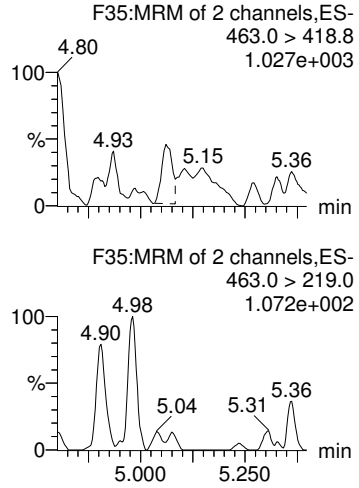
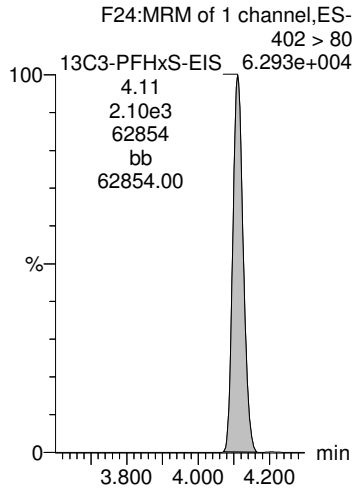


13C3-PFHxS-EIS



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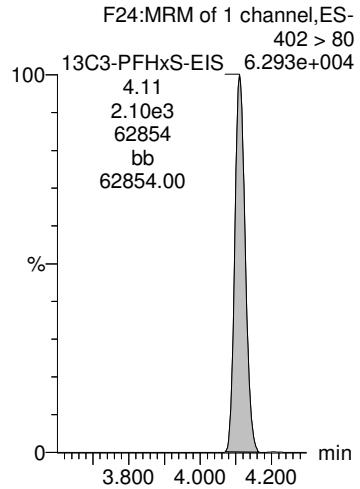

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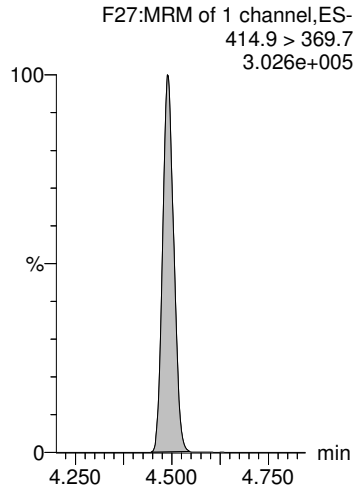

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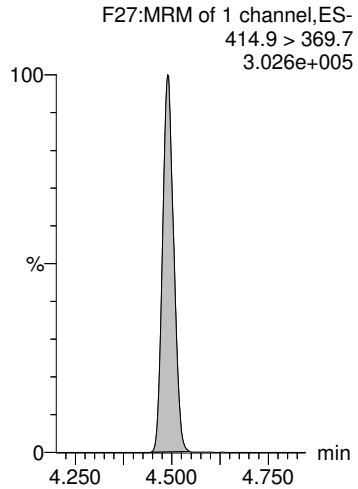
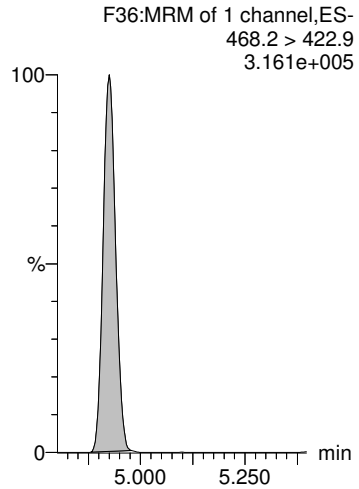


13C5-PFNA-EIS



RK 7/8/2020

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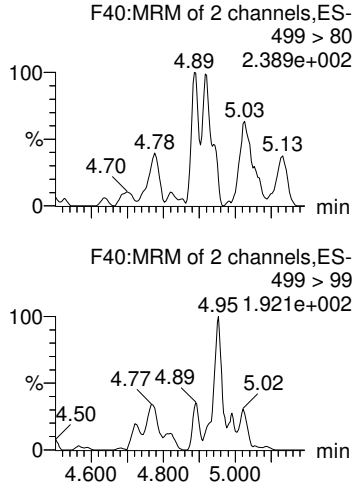

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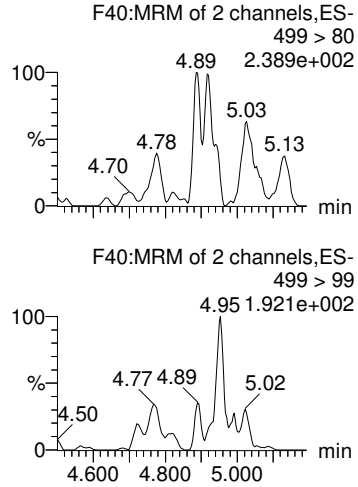

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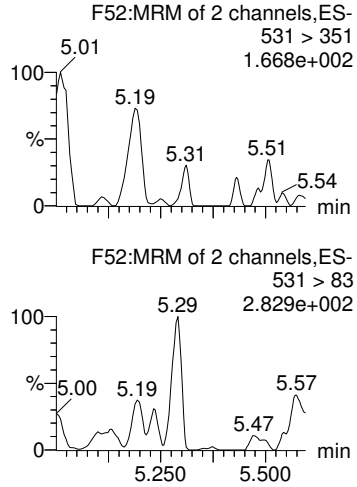

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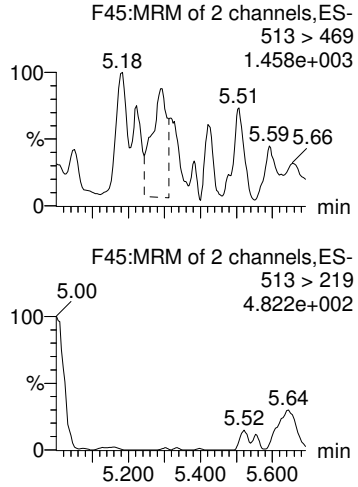
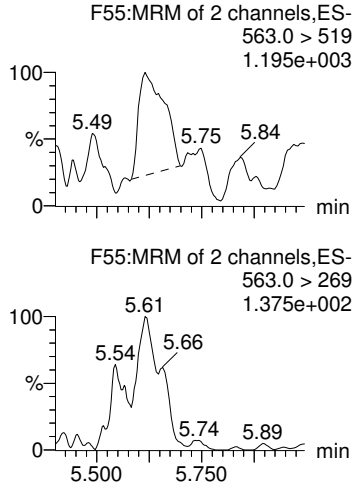


PFUdA



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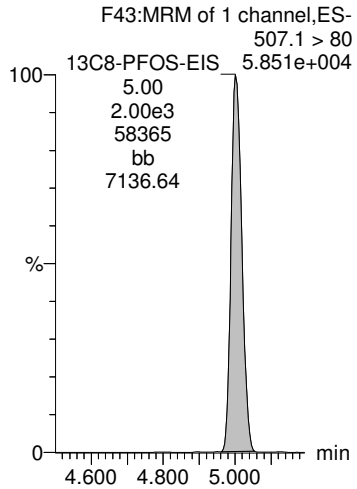

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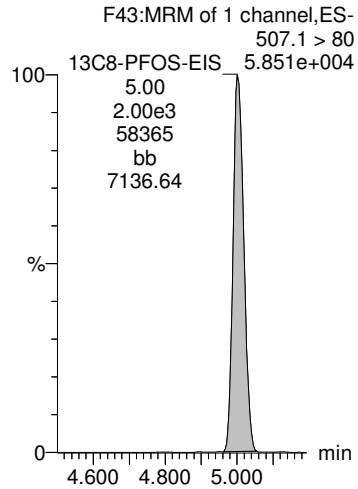

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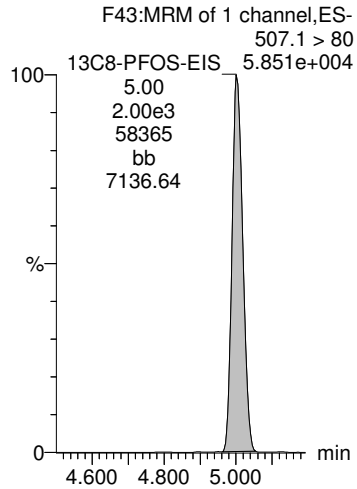
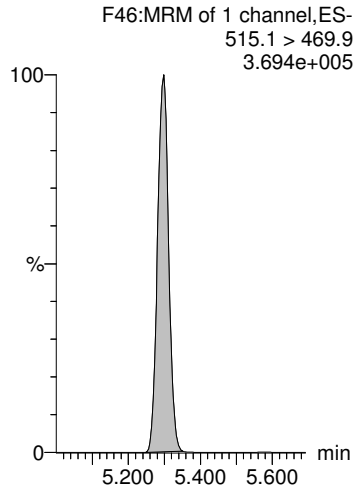


13C2-PFDA-EIS



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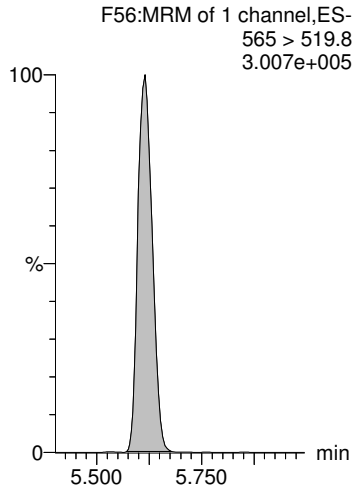

RK 7/8/2020

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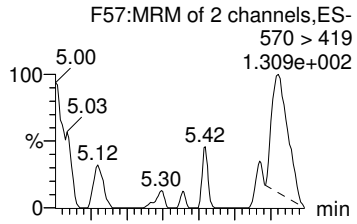

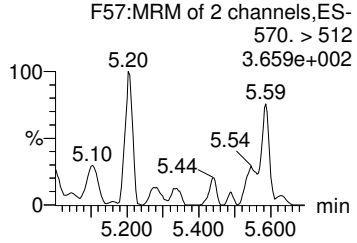

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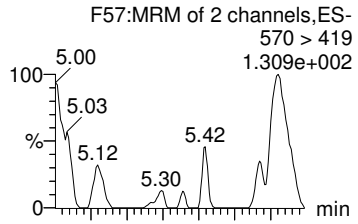
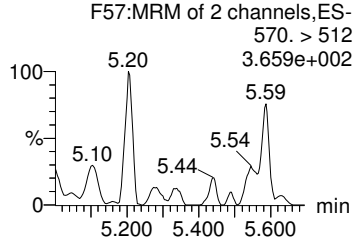
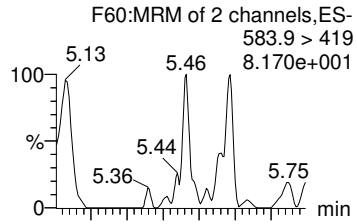
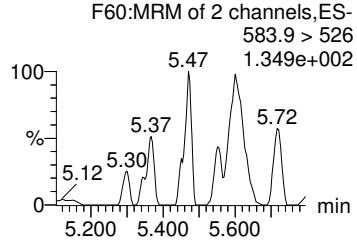




L-EtFOSAA





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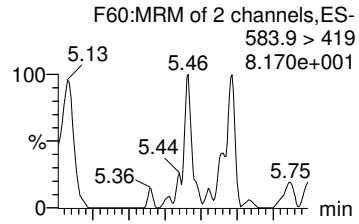
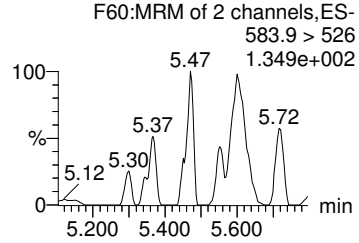
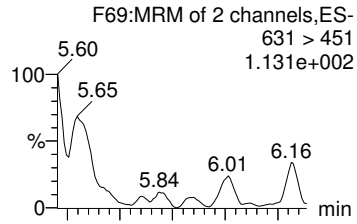
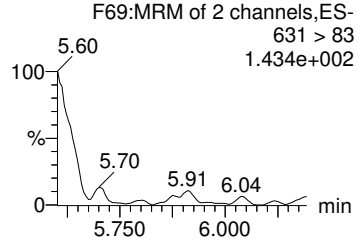




11Cl-PF30UdS





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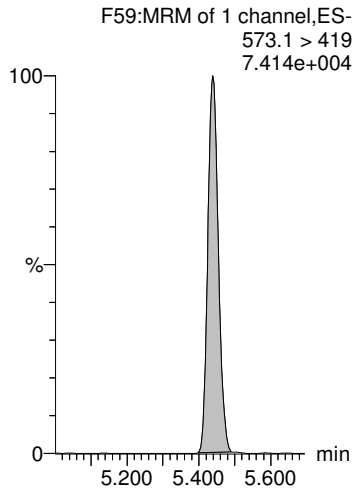

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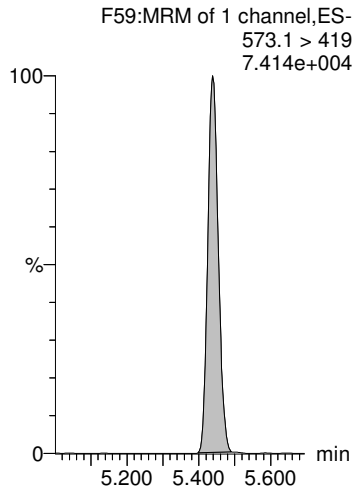
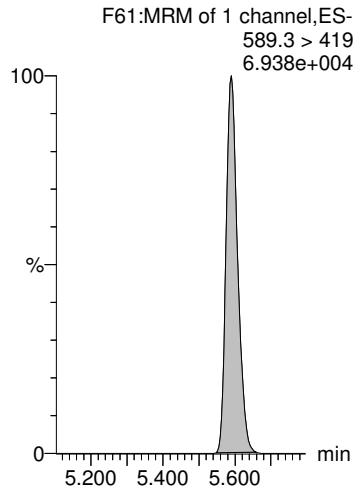


d5-N-EtFOSAA-EIS



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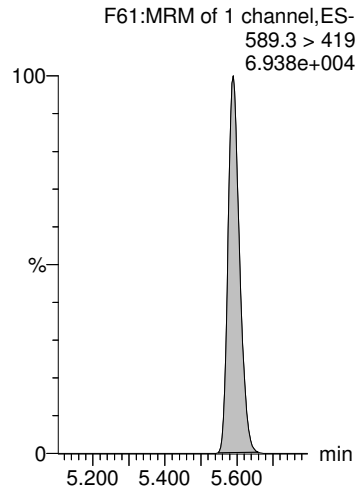

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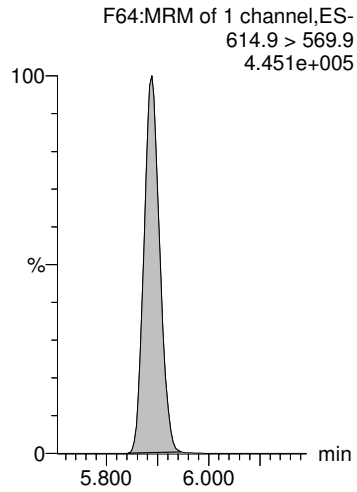

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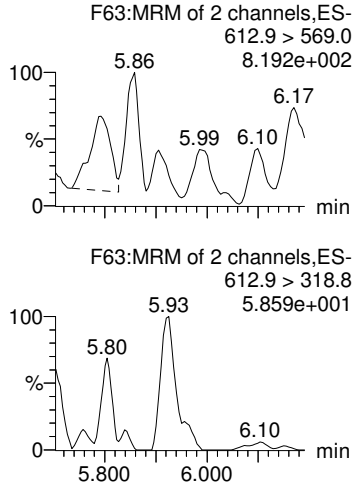

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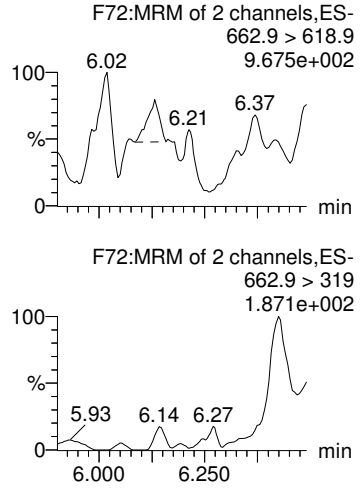
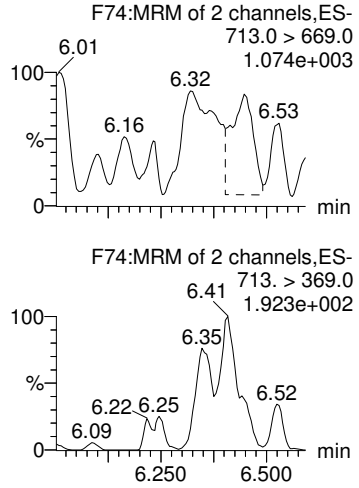
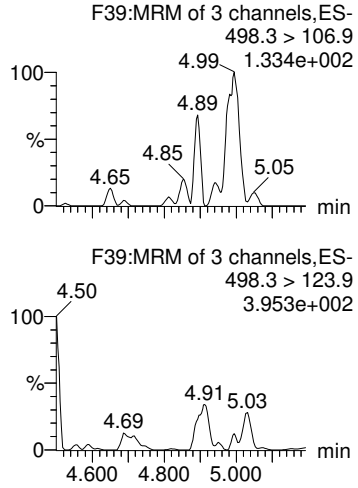


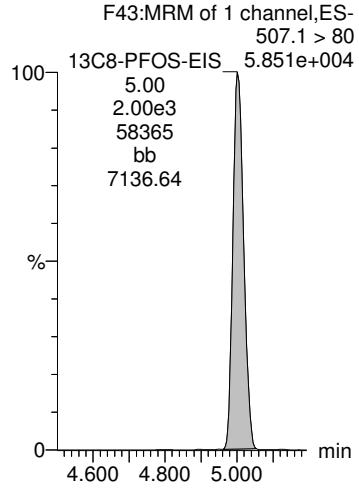
PFTeDA



TDCA



13C8-PFOS-EIS



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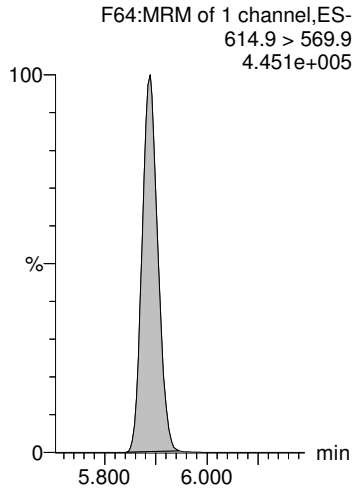

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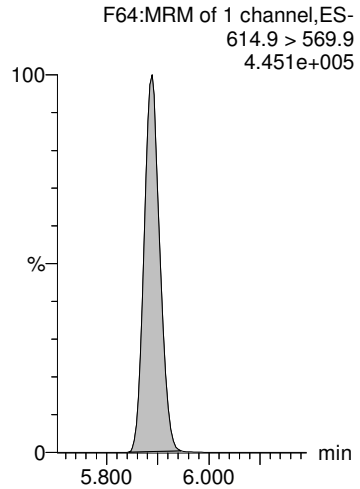

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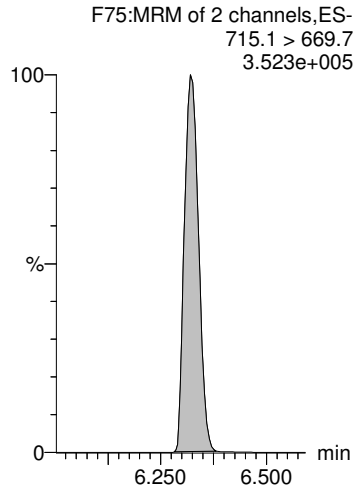

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Last Altered: Wednesday, July 08, 2020 17:59:59 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:00:50 Pacific Daylight Time

Name: 200706P1-51, Date: 06-Jul-2020, Time: 19:13:50, ID: B0F0257-BS1 OPR 0.25, Description: OPR

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80	2.117e3	9.581e2	0.250		2.86	2.86	27.6	43.186	108.0	2.411	NO
2	7	PFHxA	313.0 > 269.0	9.197e3	1.017e4	0.250		3.38	3.38	11.3	43.361	108.4	15.746	NO
3	9	HFPO-DA	285.1 > 168.9	1.723e3	2.169e3	0.250		3.58	3.58	9.93	39.492	98.7	2.405	NO
4	11	PFHpA	363.0 > 319	9.683e3	8.977e3	0.250		3.97	3.97	13.5	41.430	103.6	65.168	NO
5	12	ADONA	376.8 > 250.9	1.579e4	8.977e3	0.250		4.07	4.08	22.0	40.449	101.1	3.953	NO
6	51	13C3-PFBS-EIS	302.0 > 98.9	9.581e2		0.250	104.004	2.87	2.86	958	36.848	73.7		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	1.017e4		0.250	1090.353	3.38	3.38	10200	37.321	74.6		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.169e3		0.250	228.261	3.59	3.58	2170	38.002	76.0		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	8.977e3		0.250	983.154	3.98	3.97	8980	36.522	73.0		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	8.977e3		0.250	983.154	3.98	3.97	8980	36.522	73.0		
11	-1													
12	13	L-PFHxS	399 > 79.9	1.703e3	2.053e3	0.250		4.11	4.11	10.4	37.682	94.2	3.870	NO
13	1...	Total PFHxS	399 > 79.9	1.703e3	2.053e3	0.250		3.93		10.4	37.682			
14	16	L-PFOA	413 > 369	9.841e3	1.110e4	0.250		4.49	4.49	11.1	39.095	97.7	3.192	NO
15	1...	Total PFOA	413 > 369	9.841e3	1.110e4	0.250		4.60		11.1	39.095			
16	21	PFNA	463.0 > 418.8	1.017e4	1.137e4	0.250		4.93	4.92	11.2	39.989	100.0	13.373	NO
17	61	13C3-PFHxS-EIS	402 > 80	2.053e3		0.250	220.112	4.13	4.11	2050	37.308	74.6		
18	61	13C3-PFHxS-EIS	402 > 80	2.053e3		0.250	220.112	4.13	4.11	2050	37.308	74.6		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.110e4		0.250	1154.443	4.67	4.49	11100	38.464	76.9		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.110e4		0.250	1154.443	4.67	4.49	11100	38.464	76.9		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.137e4		0.250	1213.140	5.13	4.93	11400	37.492	75.0		
22	-1													
23	23	L-PFOS	499 > 80	2.015e3	2.059e3	0.250		5.00	5.00	12.2	38.612	96.5	2.236	NO
24	1...	Total PFOS	499> 80	2.015e3	2.059e3	0.250		4.60		12.2	38.612			
25	25	9Cl-PF30NS	531 > 351	5.047e3	2.059e3	0.250		5.22	5.22	30.6	43.052	107.6	40.084	NO
26	26	PFDA	513 > 469	9.783e3	1.319e4	0.250		5.30	5.30	9.27	43.660	109.2	5.671	NO
27	33	PFUdA	563.0 > 519	1.124e4	1.186e4	0.250		5.61	5.61	11.8	43.092	107.7	20.120	NO
28	71	13C8-PFOS-EIS	507.1 > 80	2.059e3		0.250	225.510	5.02	5.00	2060	36.520	73.0		
29	71	13C8-PFOS-EIS	507.1 > 80	2.059e3		0.250	225.510	5.02	5.00	2060	36.520	73.0		
30	71	13C8-PFOS-EIS	507.1 > 80	2.059e3		0.250	225.510	5.02	5.00	2060	36.520	73.0		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.319e4		0.250	1491.471	5.31	5.30	13200	35.385	70.8		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.186e4		0.250	1581.335	5.54	5.61	11900	30.010	60.0		
33	-1													
34	29	L-MeFOSAA	570 > 419	2.832e3	2.684e3	0.250		5.44	5.44	13.2	43.382	108.5	2.029	NO
35	1...	Total N-MeFOSAA	570. > 419	2.832e3	2.684e3	0.250		5.19		13.2	43.382			
36	31	L-EtFOSAA	583.9 > 419	2.837e3	2.702e3	0.250		5.59	5.60	13.1	37.845	94.6	1.284	NO

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-51.qld

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Name: 200706P1-51, Date: 06-Jul-2020, Time: 19:13:50, ID: B0F0257-BS1 OPR 0.25, Description: OPR

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	2.837e3	2.702e3	0.250		5.37		13.1	37.845			
38	35	11Cl-PF30UdS	631 > 451	3.727e3	1.611e4	0.250		5.81	5.81	2.89	44.805	112.0	15.128	NO
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.684e3		0.250	331.163	5.46	5.44	2680	32.417	64.8		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.684e3		0.250	331.163	5.46	5.44	2680	32.417	64.8		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.702e3		0.250	313.941	5.61	5.59	2700	34.431	68.9		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.702e3		0.250	313.941	5.61	5.59	2700	34.431	68.9		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.611e4		0.250	1868.510	6.13	5.88	16100	34.477	69.0		
44	-1													
45	37	PFDoA	612.9 > 569.0	1.230e4	1.611e4	0.250		5.88	5.89	9.54	38.922	97.3	12.014	NO
46	39	PFTrDA	662.9 > 618.9	1.241e4	1.611e4	0.250		6.15	6.13	9.64	37.041	92.6	123.274	NO
47	41	PFTeDA	713.0 > 669.0	8.099e3	1.458e4	0.250		6.32	6.32	6.95	41.808	104.5	14.033	NO
48	1...	TDCA	498.3>106.9			0.250	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.059e3		0.250	225.510	5.02	5.00	2060	36.520	73.0		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.611e4		0.250	1868.510	6.13	5.88	16100	34.477	69.0		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.611e4		0.250	1868.510	6.13	5.88	16100	34.477	69.0		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.458e4		0.250	1905.823	6.34	6.32	14600	30.595	61.2		

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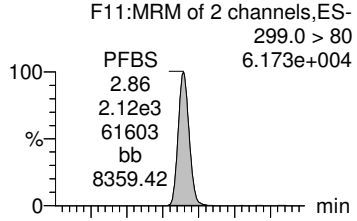
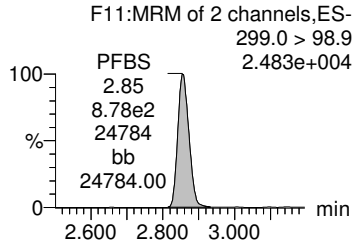
Name: 200706P1-51, Date: 06-Jul-2020, Time: 19:13:50, ID: B0F0257-BS1 OPR 0.25, Description: OPR

PFBS





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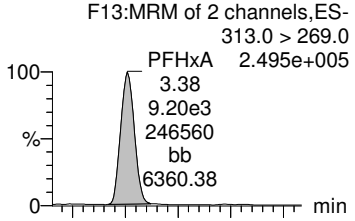
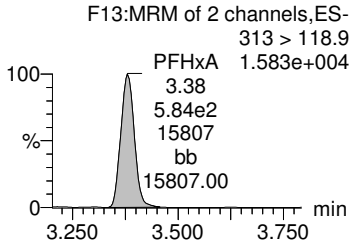
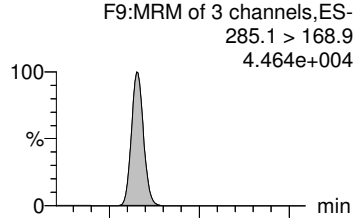
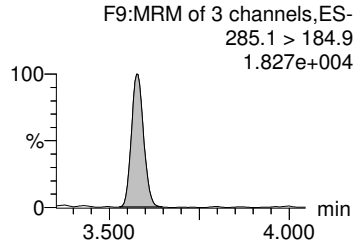




HFPO-DA





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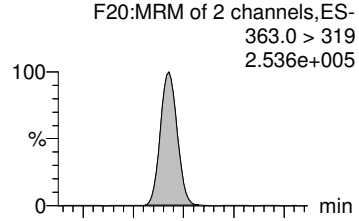

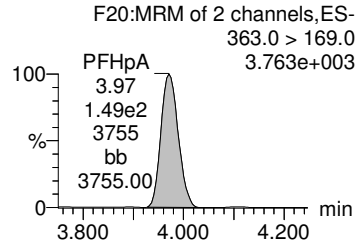

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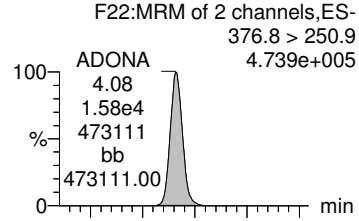

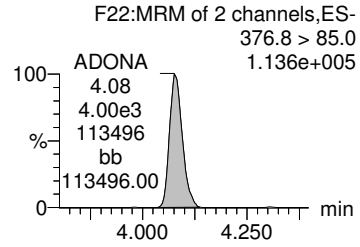

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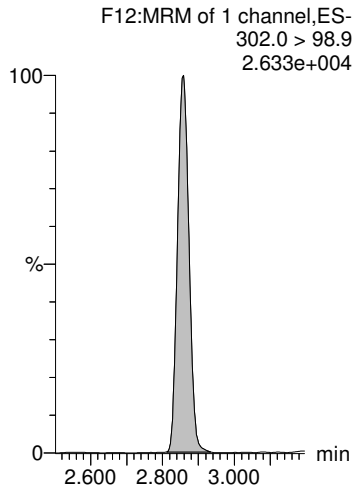

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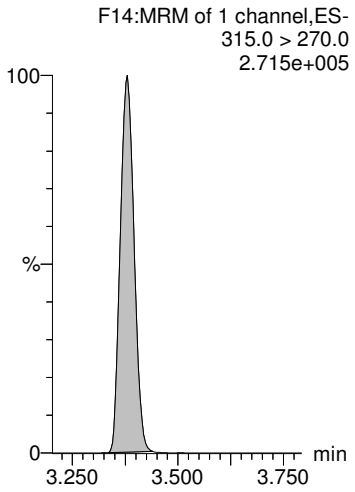

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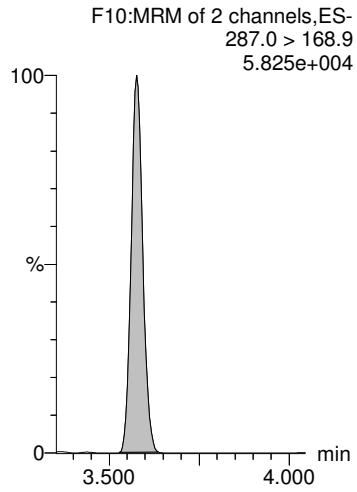

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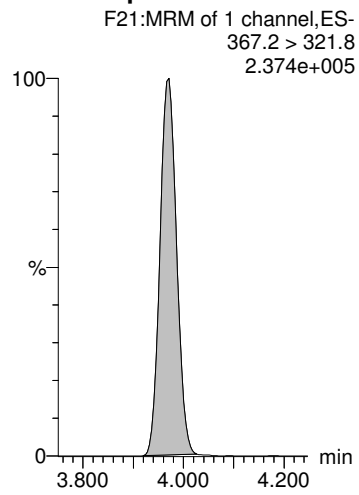

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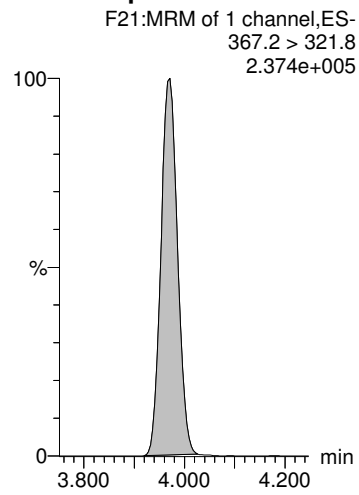

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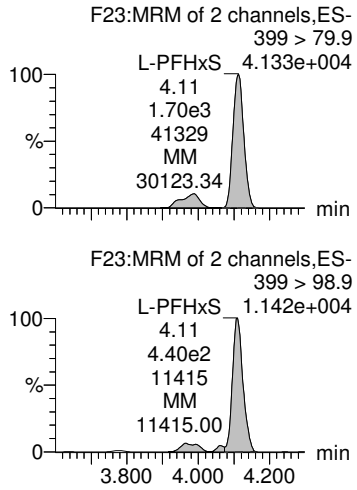
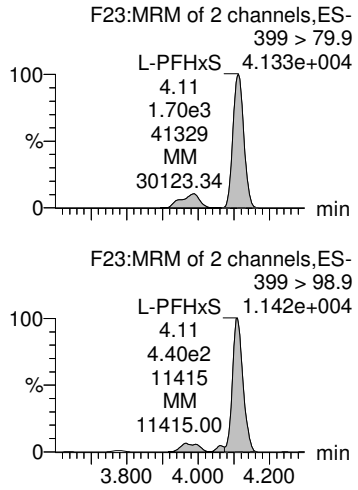
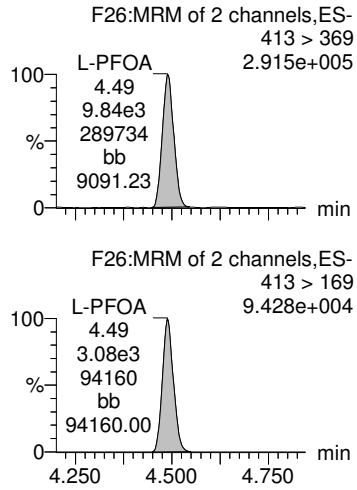
L-PFHxS



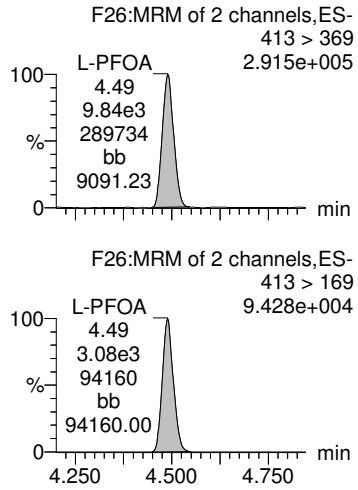
Total PFHxS



L-PFOA



Total PFOA



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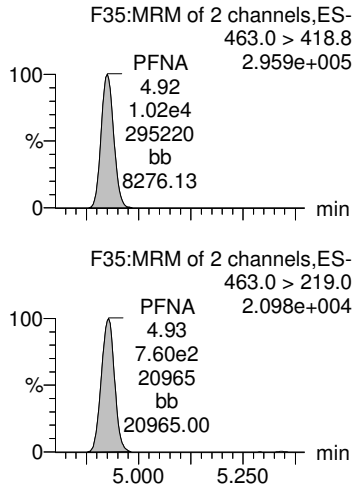

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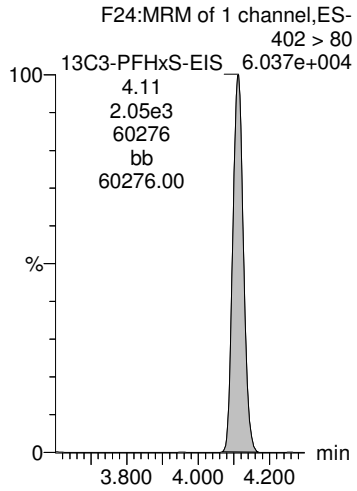

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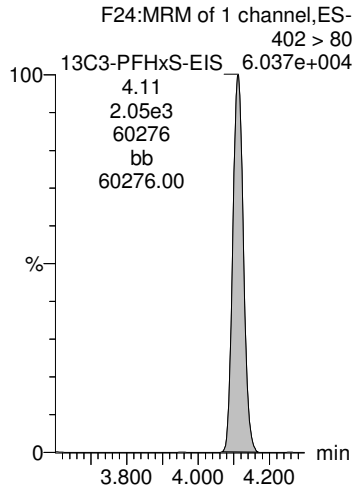

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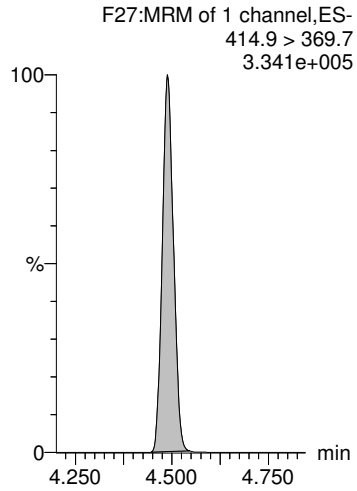

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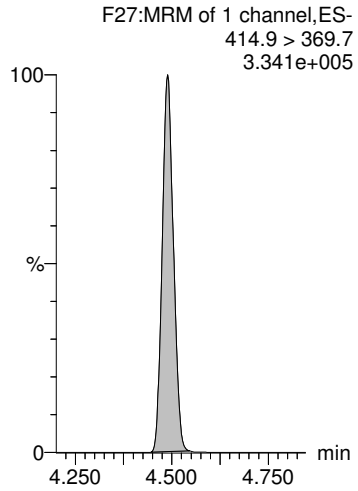

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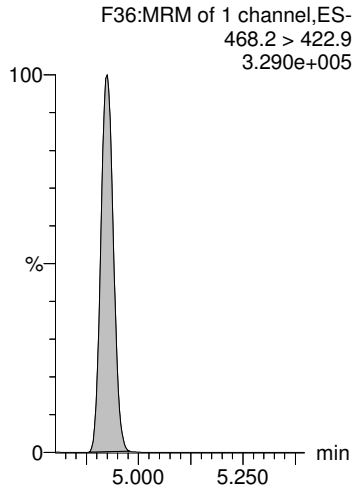

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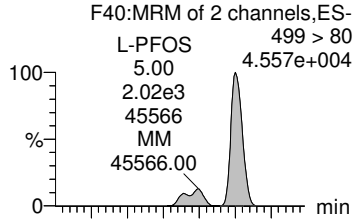
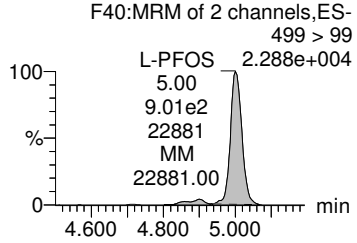
L-PFOS





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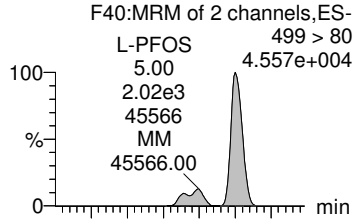

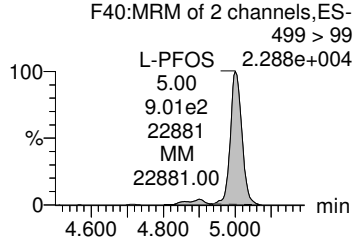

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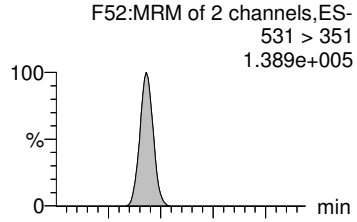

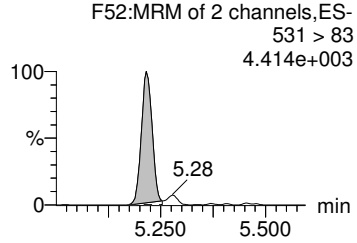

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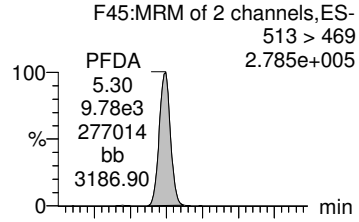
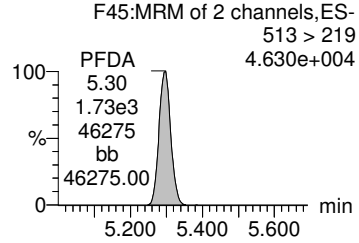
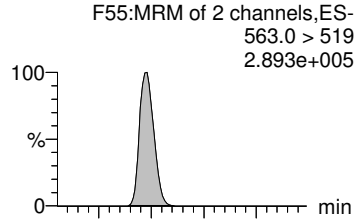
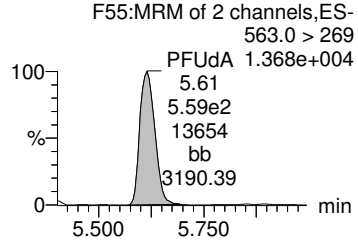


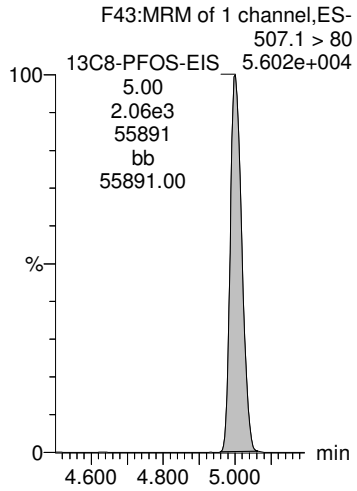


PFUdA





13C8-PFOS-EIS



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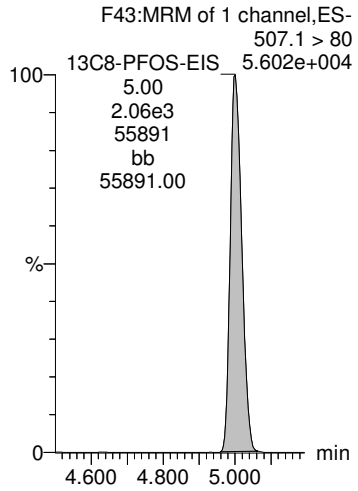

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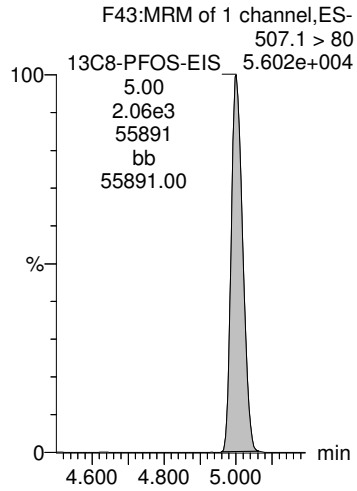

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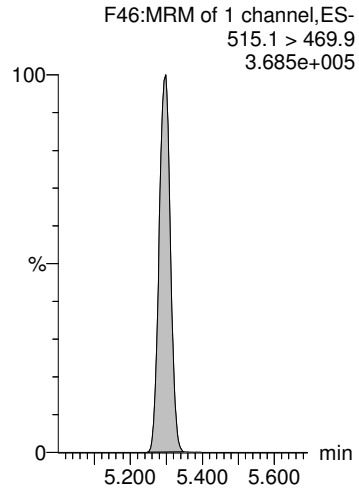

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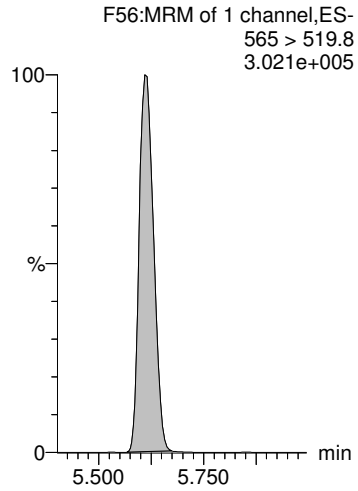


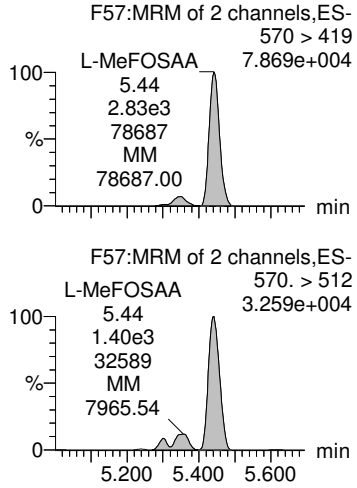
RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-51.qld

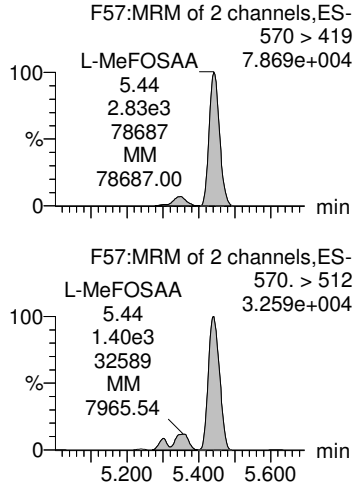
Last Altered: Wednesday, July 08, 2020 17:59:59 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:00:50 Pacific Daylight Time

Name: 200706P1-51, Date: 06-Jul-2020, Time: 19:13:50, ID: B0F0257-BS1 OPR 0.25, Description: OPR

L-MeFOSAA



Total N-MeFOSAA



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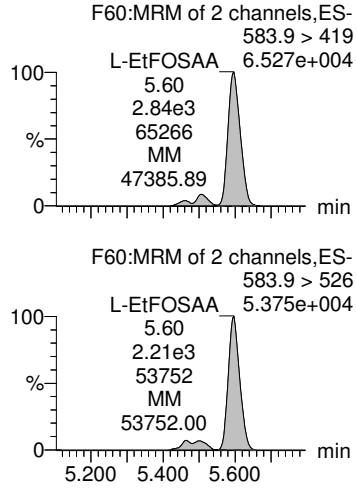
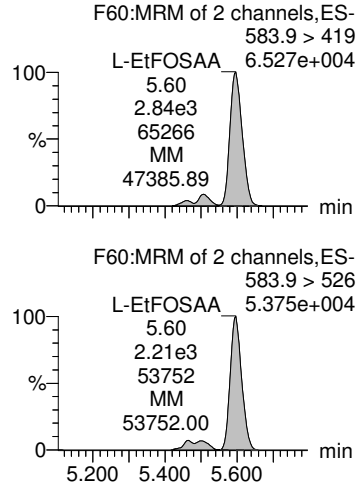
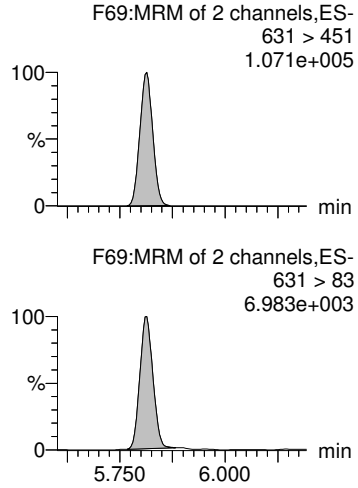


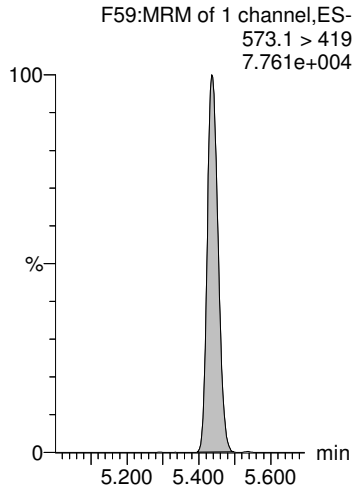
Total N-EtFOSAA



11Cl-PF30UdS



d3-N-MeFOSAA-EIS



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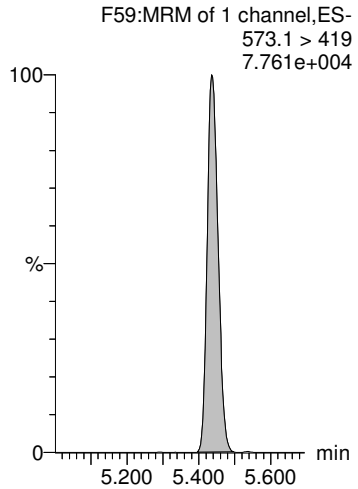
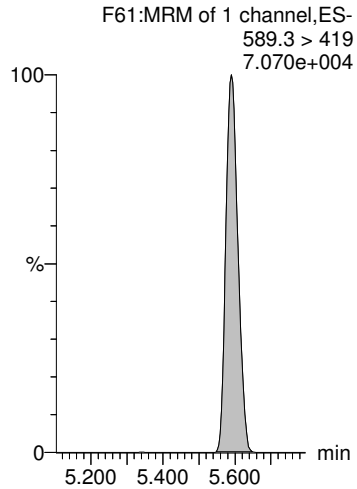


d5-N-EtFOSAA-EIS



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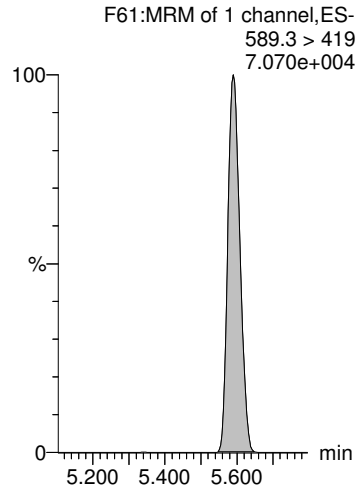
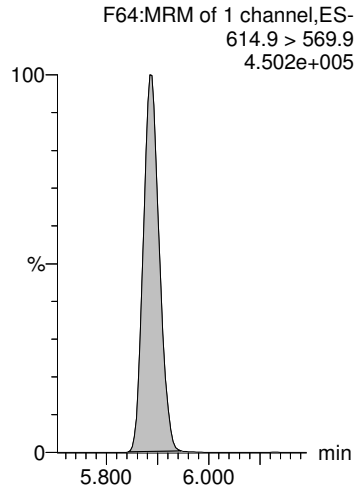


13C2-PFDoA-EIS

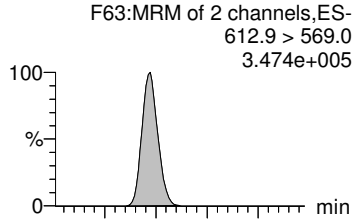


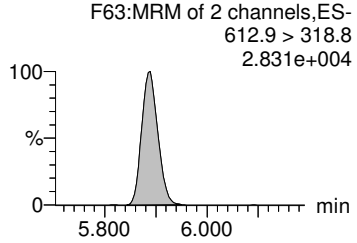
Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-51.qld

Last Altered: Wednesday, July 08, 2020 17:59:59 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:00:50 Pacific Daylight Time

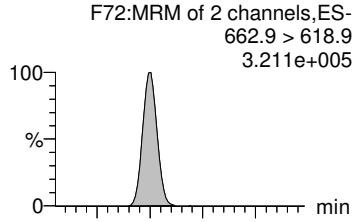
Name: 200706P1-51, Date: 06-Jul-2020, Time: 19:13:50, ID: B0F0257-BS1 OPR 0.25, Description: OPR

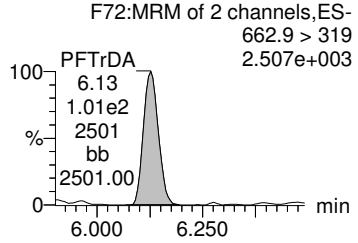
PFDoA



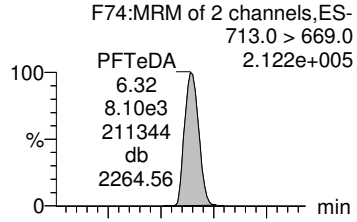


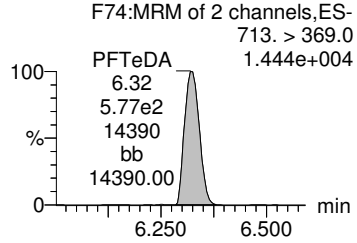
PFTrDA



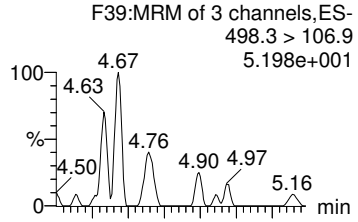


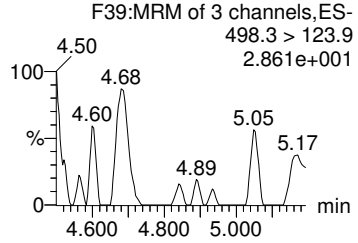
PFTeDA



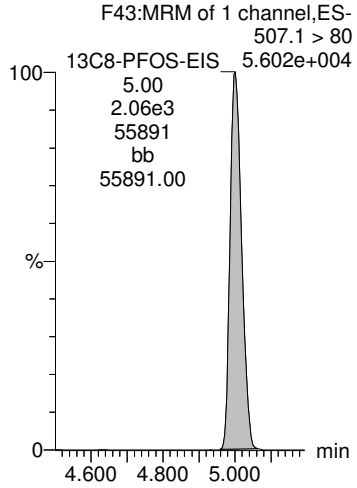


TDCA

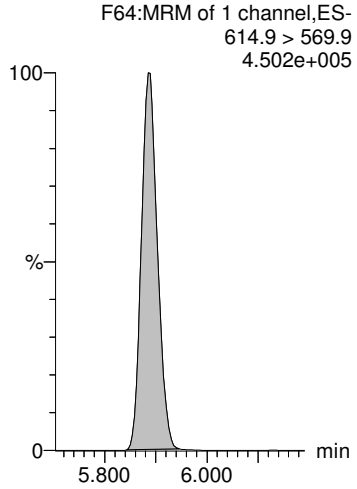




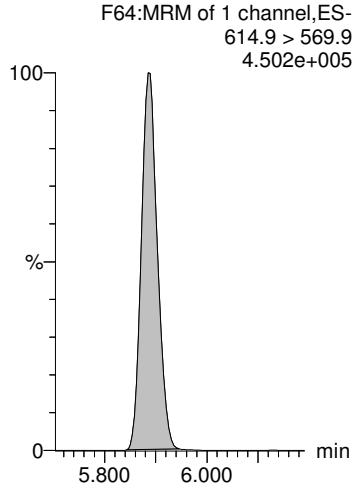
13C8-PFOS-EIS



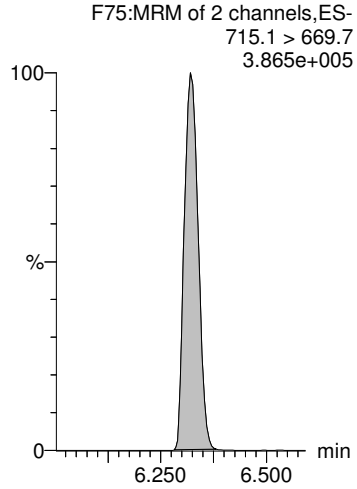
13C2-PFDoA-EIS



13C2-PFDoA-EIS



13C2-PFTeDA-EIS



RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-52.qld

Last Altered: Wednesday, July 08, 2020 18:04:33 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80	2.386e3	1.131e3	0.250		2.85	2.85	26.4	41.232	103.1	2.510	NO
2	7	PFHxA	313.0 > 269.0	9.485e3	1.150e4	0.250		3.38	3.38	10.3	39.539	98.8	13.854	NO
3	9	HFPO-DA	285.1 > 168.9	1.983e3	2.199e3	0.250		3.58	3.58	11.3	44.849	112.1	2.429	NO
4	11	PFHpA	363.0 > 319	1.067e4	1.070e4	0.250		3.97	3.97	12.5	38.290	95.7	45.208	NO
5	12	ADONA	376.8 > 250.9	1.628e4	1.070e4	0.250		4.07	4.08	19.0	34.973	87.4	3.819	NO
6	51	13C3-PFBS-EIS	302.0 > 98.9	1.131e3		0.250	104.004	2.87	2.85	1130	43.490	87.0		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	1.150e4		0.250	1090.353	3.38	3.38	11500	42.182	84.4		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.199e3		0.250	228.261	3.59	3.58	2200	38.528	77.1		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	1.070e4		0.250	983.154	3.98	3.97	10700	43.526	87.1		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	1.070e4		0.250	983.154	3.98	3.97	10700	43.526	87.1		
11	-1													
12	13	L-PFHxS	399 > 79.9	1.941e3	2.215e3	0.250		4.11	4.11	11.0	39.812	99.5	3.618	NO
13	1...	Total PFHxS	399 > 79.9	1.941e3	2.215e3	0.250		3.93		11.0	39.812			
14	16	L-PFOA	413 > 369	1.097e4	1.232e4	0.250		4.49	4.49	11.1	39.277	98.2	3.129	NO
15	1...	Total PFOA	413 > 369	1.097e4	1.232e4	0.250		4.60		11.1	39.277			
16	21	PFNA	463.0 > 418.8	1.118e4	1.251e4	0.250		4.92	4.93	11.2	39.985	100.0	12.450	NO
17	61	13C3-PFHxS-EIS	402 > 80	2.215e3		0.250	220.112	4.13	4.11	2220	40.255	80.5		
18	61	13C3-PFHxS-EIS	402 > 80	2.215e3		0.250	220.112	4.13	4.11	2220	40.255	80.5		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.232e4		0.250	1154.443	4.67	4.49	12300	42.689	85.4		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.232e4		0.250	1154.443	4.67	4.49	12300	42.689	85.4		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.251e4		0.250	1213.140	5.13	4.92	12500	41.247	82.5		
22	-1													
23	23	L-PFOS	499 > 80	2.356e3	2.417e3	0.250		5.00	5.00	12.2	38.444	96.1	2.445	NO
24	1...	Total PFOS	499> 80	2.356e3	2.417e3	0.250		4.60		12.2	38.444			
25	25	9Cl-PF30NS	531 > 351	5.139e3	2.417e3	0.250		5.22	5.22	26.6	37.332	93.3	32.912	NO
26	26	PFDA	513 > 469	1.100e4	1.512e4	0.250		5.29	5.30	9.09	42.822	107.1	5.297	NO
27	33	PFUdA	563.0 > 519	1.267e4	1.420e4	0.250		5.61	5.61	11.1	40.554	101.4	18.627	NO
28	71	13C8-PFOS-EIS	507.1 > 80	2.417e3		0.250	225.510	5.02	5.00	2420	42.875	85.7		
29	71	13C8-PFOS-EIS	507.1 > 80	2.417e3		0.250	225.510	5.02	5.00	2420	42.875	85.7		
30	71	13C8-PFOS-EIS	507.1 > 80	2.417e3		0.250	225.510	5.02	5.00	2420	42.875	85.7		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.512e4		0.250	1491.471	5.31	5.29	15100	40.547	81.1		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.420e4		0.250	1581.335	5.54	5.61	14200	35.928	71.9		
33	-1													
34	29	L-MeFOSAA	570 > 419	3.085e3	3.108e3	0.250		5.44	5.44	12.4	40.811	102.0	1.825	NO
35	1...	Total N-MeFOSAA	570. > 419	3.085e3	3.108e3	0.250		5.19		12.4	40.811			
36	31	L-EtFOSAA	583.9 > 419	3.596e3	3.096e3	0.250		5.59	5.59	14.5	41.871	104.7	1.447	NO

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-52.qld

Last Altered: Wednesday, July 08, 2020 18:04:33 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	3.596e3	3.096e3	0.250		5.37		14.5	41.871			
38	35	11Cl-PF30UdS	631 > 451	4.011e3	1.854e4	0.250		5.82	5.81	2.70	41.876	104.7	17.080	NO
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.108e3		0.250	331.163	5.46	5.44	3110	37.540	75.1		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.108e3		0.250	331.163	5.46	5.44	3110	37.540	75.1		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.096e3		0.250	313.941	5.61	5.59	3100	39.441	78.9		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.096e3		0.250	313.941	5.61	5.59	3100	39.441	78.9		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.854e4		0.250	1868.510	6.13	5.89	18500	39.682	79.4		
44	-1													
45	37	PFDoA	612.9 > 569.0	1.324e4	1.854e4	0.250		5.89	5.88	8.93	36.389	91.0	13.412	NO
46	39	PFTrDA	662.9 > 618.9	1.376e4	1.854e4	0.250		6.15	6.13	9.28	35.657	89.1	124.616	NO
47	41	PFTeDA	713.0 > 669.0	8.804e3	1.675e4	0.250		6.32	6.32	6.57	39.523	98.8	14.213	NO
48	1...	TDCA	498.3>106.9			0.250	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.417e3		0.250	225.510	5.02	5.00	2420	42.875	85.7		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.854e4		0.250	1868.510	6.13	5.89	18500	39.682	79.4		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.854e4		0.250	1868.510	6.13	5.89	18500	39.682	79.4		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.675e4		0.250	1905.823	6.34	6.32	16800	35.158	70.3		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-52.qld

Last Altered: Wednesday, July 08, 2020 18:04:33 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

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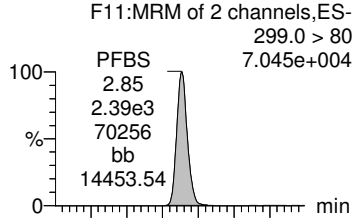
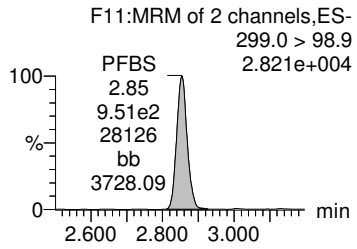
Calibration: P:\PFAS5.pro\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

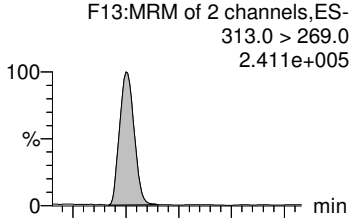
Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

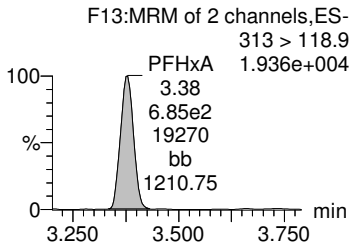
PFBS





PFHxA





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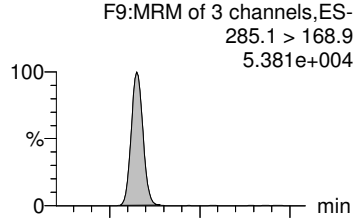

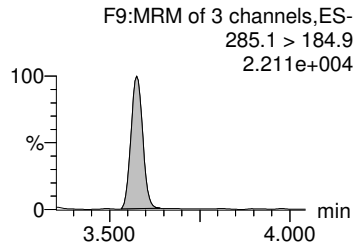

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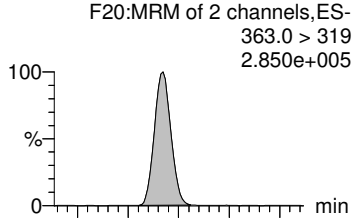
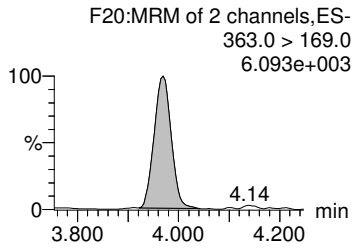
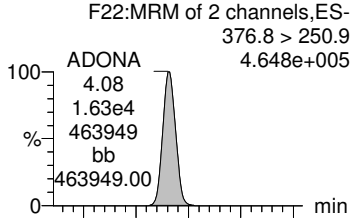
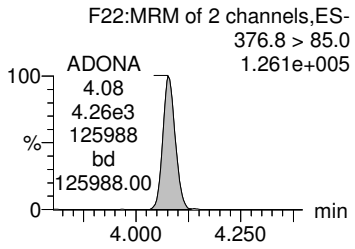


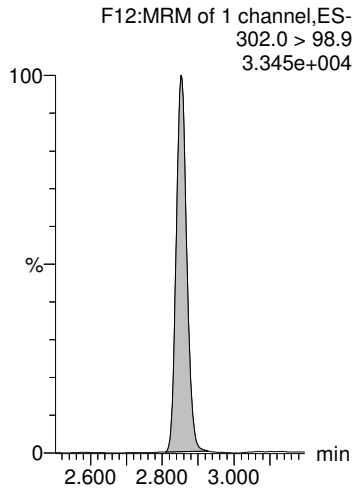


ADONA

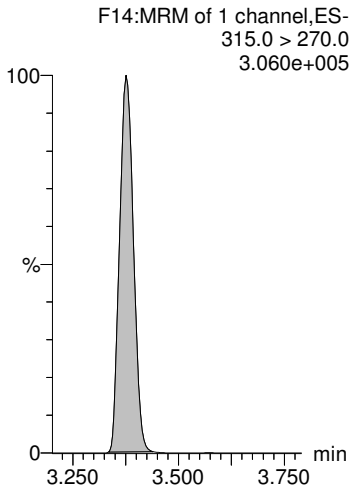




13C3-PFBS-EIS



13C2-PFHxA-EIS



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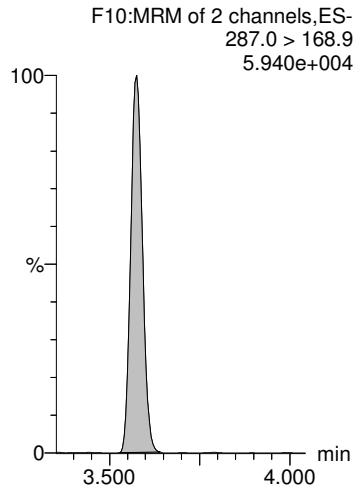

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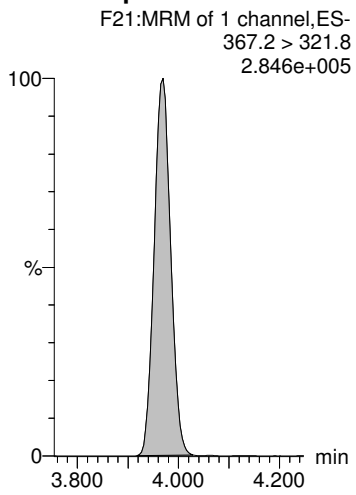

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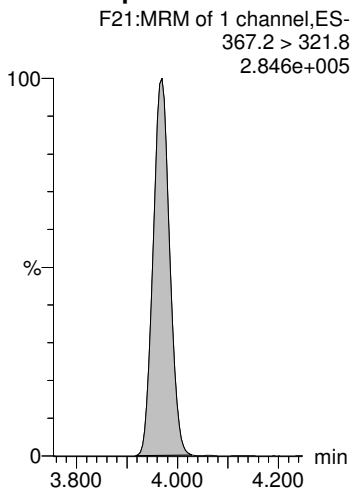

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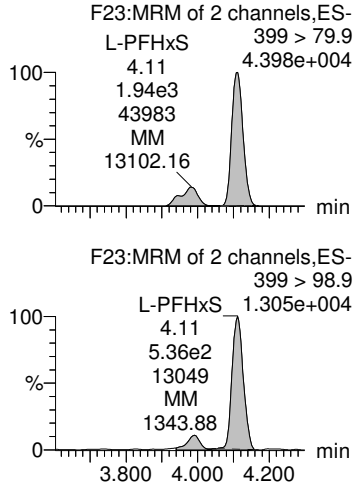
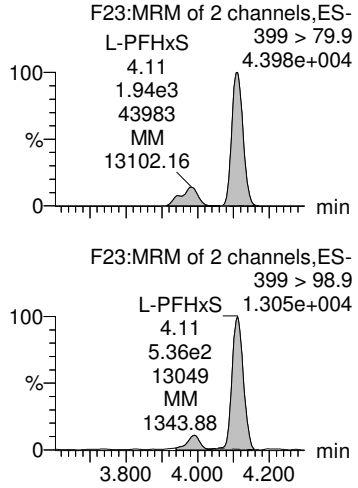
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

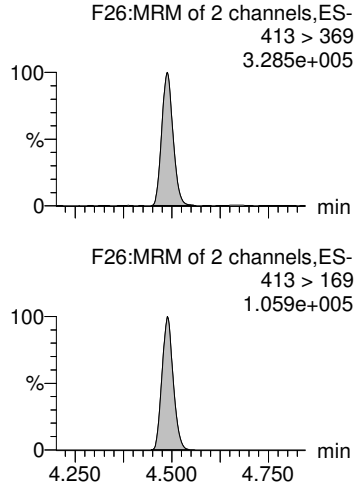
L-PFHxS



Total PFHxS



L-PFOA



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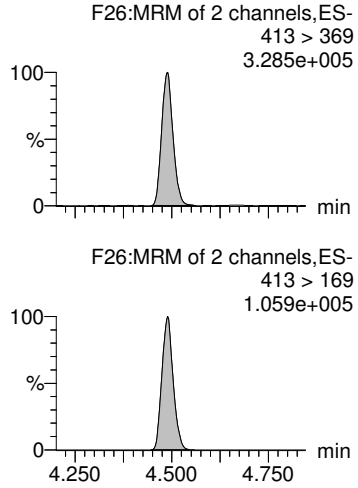

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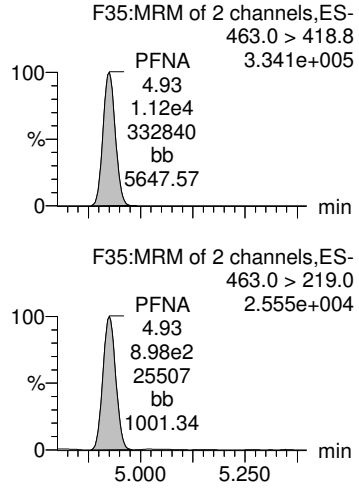
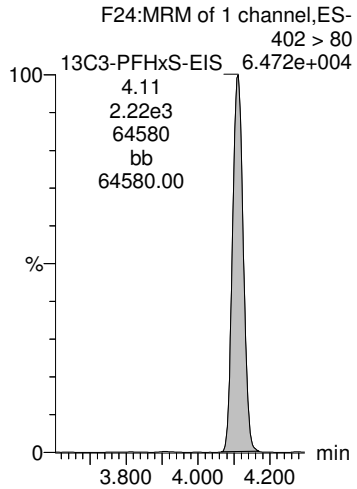


13C3-PFHxS-EIS



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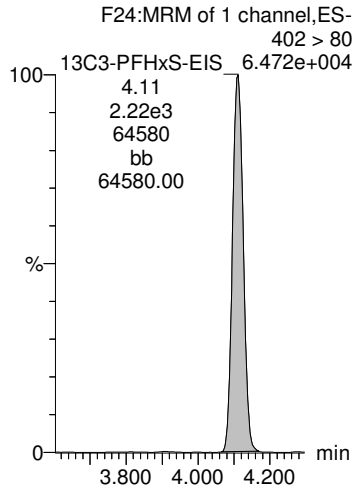
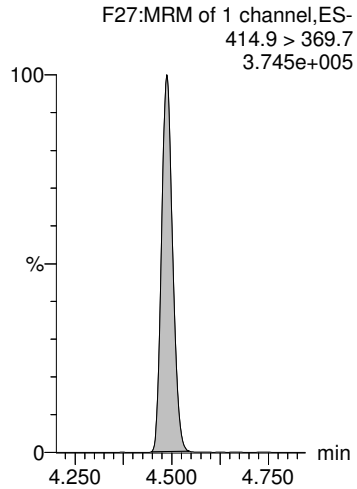
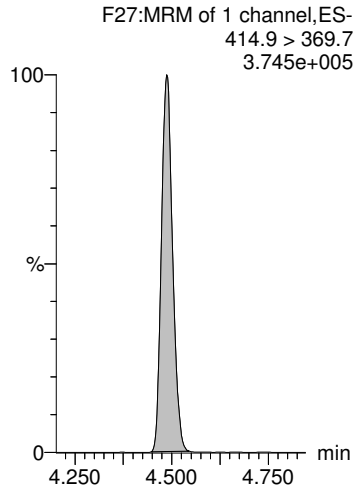


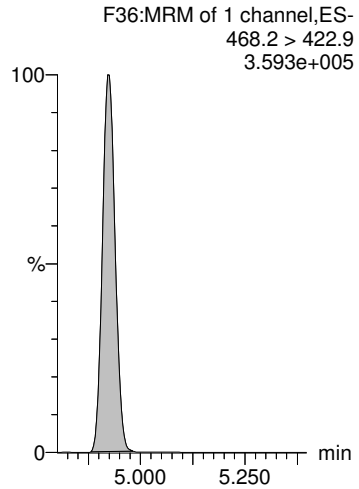
13C2-PFOA-EIS



13C2-PFOA-EIS



13C5-PFNA-EIS



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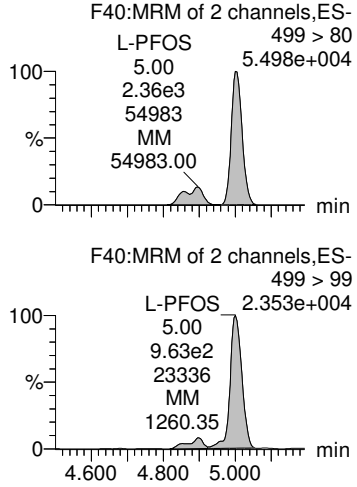
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

L-PFOS



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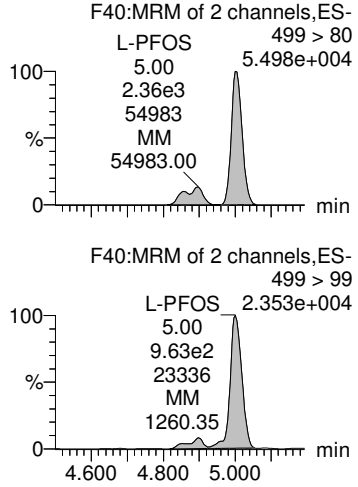
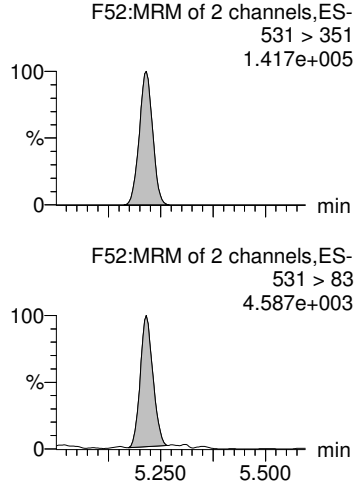


9Cl-PF30NS



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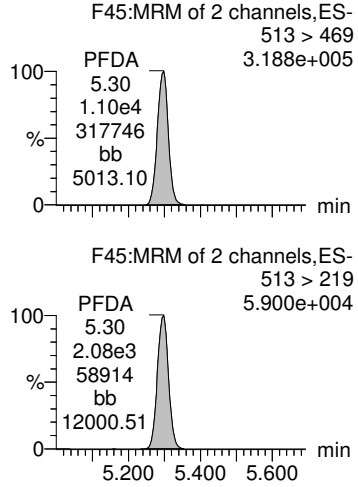
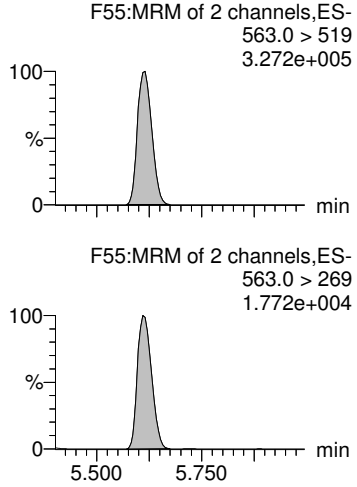
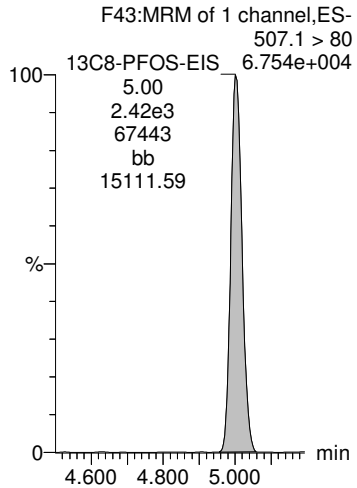


PFUdA



13C8-PFOS-EIS



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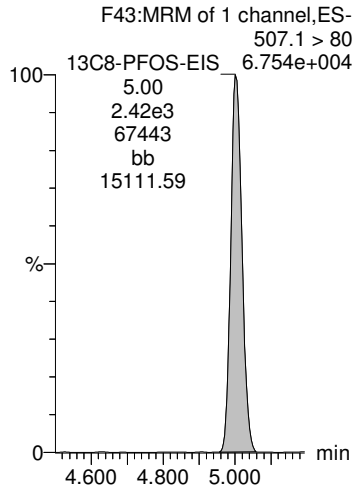

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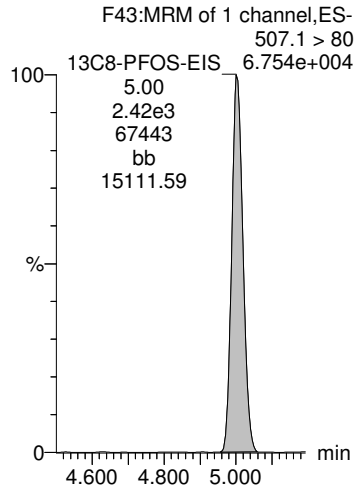
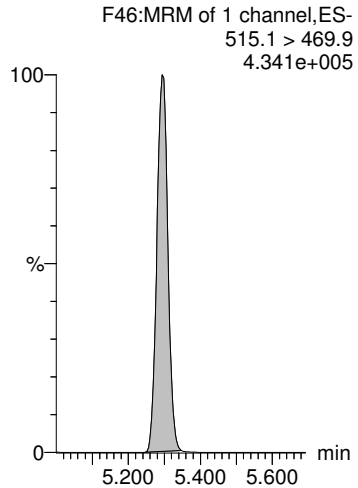
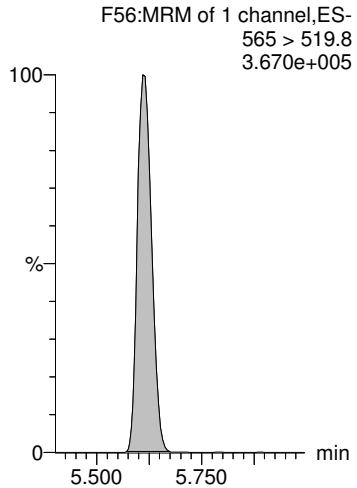


13C2-PFDA-EIS



13C2-PFUdA-EIS



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Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

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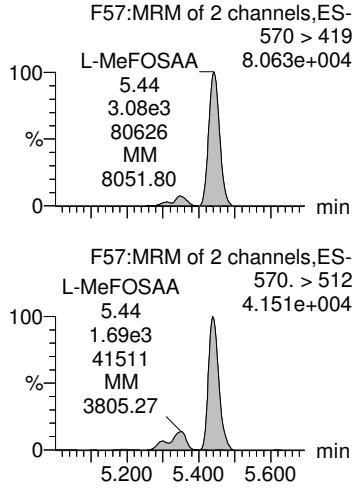
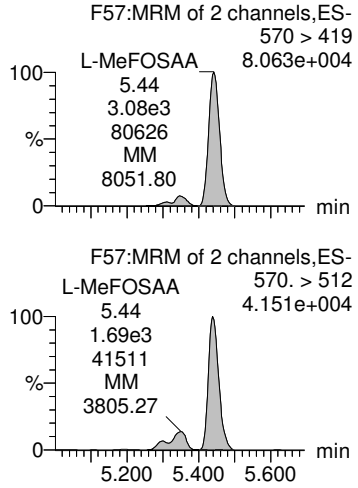
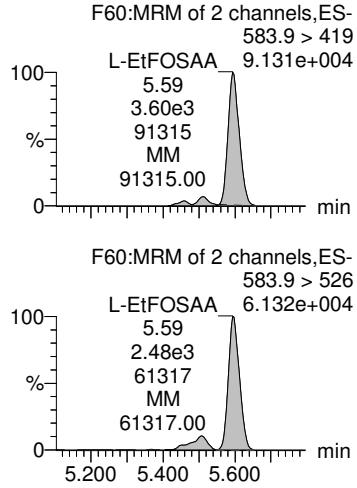


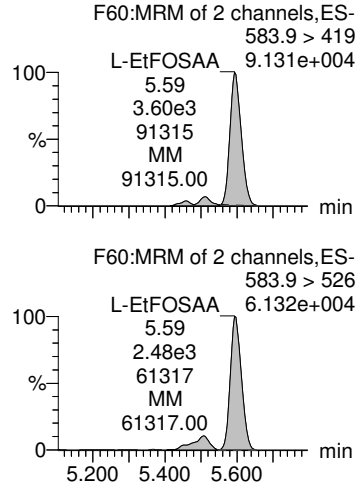
Total N-MeFOSAA



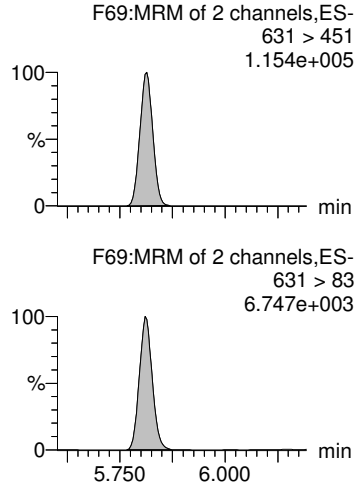
L-EtFOSAA



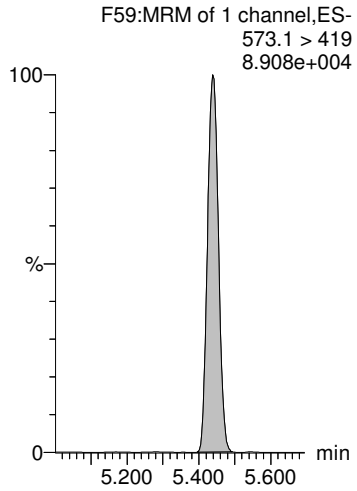
Total N-EtFOSAA



11Cl-PF30UdS



d3-N-MeFOSAA-EIS



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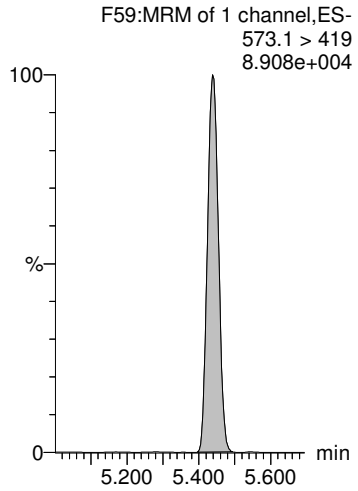
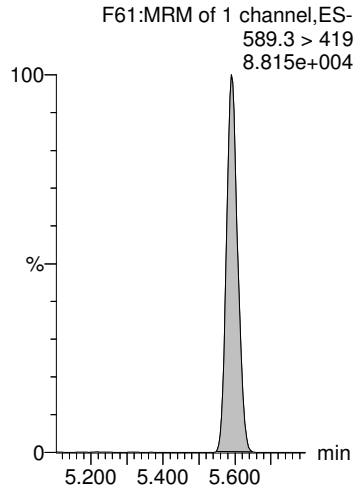


d5-N-EtFOSAA-EIS



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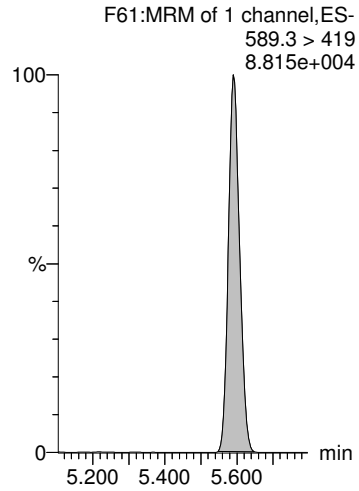
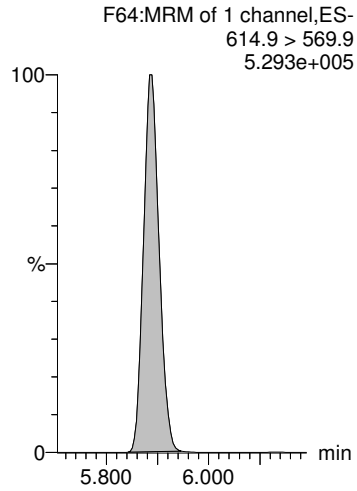


13C2-PFDoA-EIS



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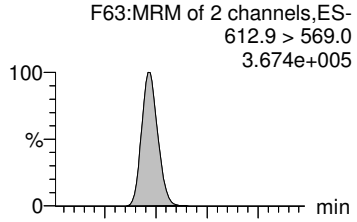
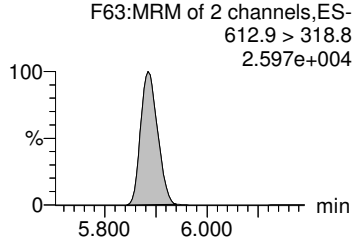
Printed: Wednesday, July 08, 2020 18:05:34 Pacific Daylight Time

Name: 200706P1-52, Date: 06-Jul-2020, Time: 19:24:18, ID: B0F0257-BSD1 LCSD 0.25, Description: LCSD

PFDoA





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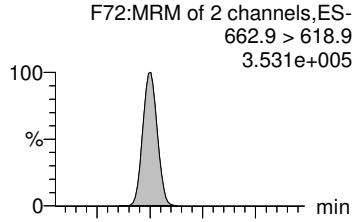

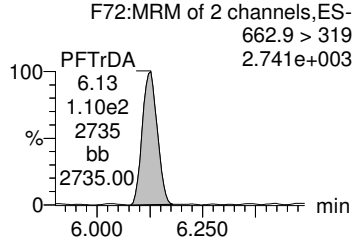

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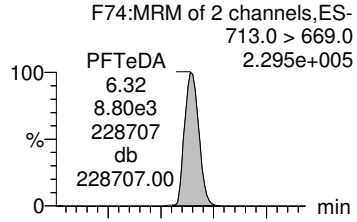

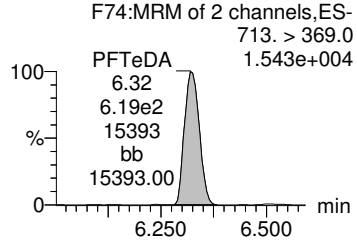

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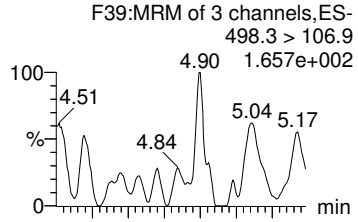

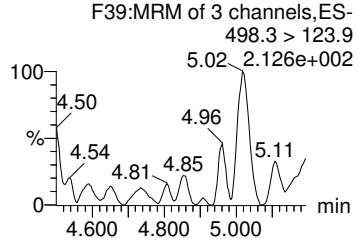

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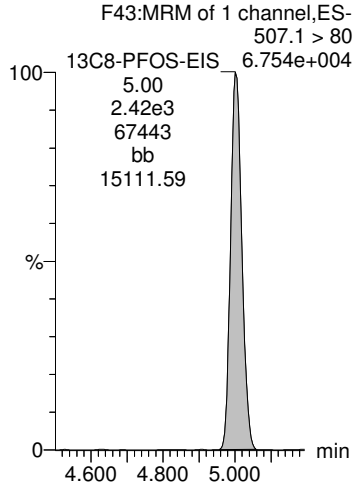

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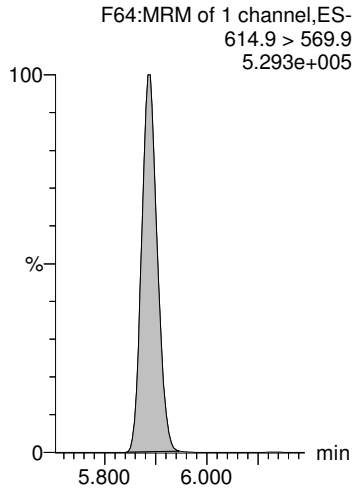

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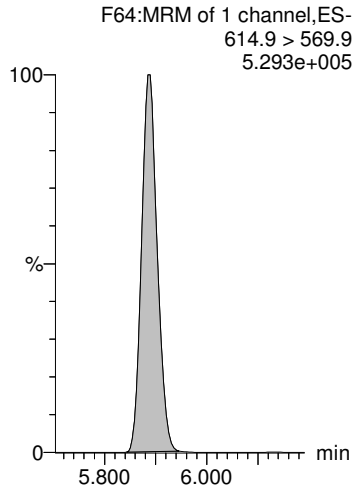

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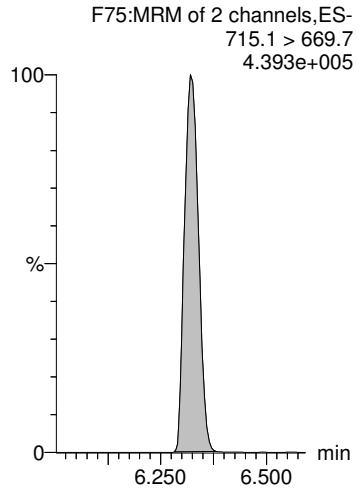

RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

Last Altered: Wednesday, July 08, 2020 18:22:32 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:23:11 Pacific Daylight Time

Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80		1.189e3	0.247		2.85						YES
2	7	PFHxA	313.0 > 269.0		1.189e4	0.247		3.38						YES
3	9	HFPO-DA	285.1 > 168.9		2.471e3	0.247		3.58						YES
4	11	PFHpA	363.0 > 319		1.045e4	0.247		3.97						YES
5	12	ADONA	376.8 > 250.9		1.045e4	0.247		4.07						YES
6	51	13C3-PFBS-EIS	302.0 > 98.9	1.189e3		0.247	104.004	2.87	2.85	1190	46.356	91.4		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	1.189e4		0.247	1090.353	3.38	3.38	11900	44.233	87.2		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.471e3		0.247	228.261	3.59	3.58	2470	43.906	86.6		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	1.045e4		0.247	983.154	3.98	3.97	10400	43.110	85.0		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	1.045e4		0.247	983.154	3.98	3.97	10400	43.110	85.0		
11	-1													
12	13	L-PFHxS	399 > 79.9		2.335e3	0.247		4.11						YES
13	1...	Total PFHxS	399 > 79.9	0.000e0	2.335e3	0.247		3.93		0.000				
14	16	L-PFOA	413 > 369		1.236e4	0.247		4.49						YES
15	1...	Total PFOA	413 > 369	0.000e0	1.236e4	0.247		4.60		0.000				
16	21	PFNA	463.0 > 418.8		1.261e4	0.247		4.92						YES
17	61	13C3-PFHxS-EIS	402 > 80	2.335e3		0.247	220.112	4.13	4.11	2340	43.032	84.9		
18	61	13C3-PFHxS-EIS	402 > 80	2.335e3		0.247	220.112	4.13	4.11	2340	43.032	84.9		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.236e4		0.247	1154.443	4.67	4.49	12400	43.412	85.6		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.236e4		0.247	1154.443	4.67	4.49	12400	43.412	85.6		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.261e4		0.247	1213.140	5.13	4.92	12600	42.150	83.1		
22	-1													
23	23	L-PFOS	499 > 80		2.254e3	0.247		5.00						YES
24	1...	Total PFOS	499> 80	0.000e0	2.254e3	0.247		4.60		0.000				
25	25	9Cl-PF30NS	531 > 351		2.254e3	0.247		5.22						YES
26	26	PFDA	513 > 469		1.513e4	0.247		5.29						YES
27	33	PFUdA	563.0 > 519		1.517e4	0.247		5.61						YES
28	71	13C8-PFOS-EIS	507.1 > 80	2.254e3		0.247	225.510	5.02	5.00	2250	40.542	80.0		
29	71	13C8-PFOS-EIS	507.1 > 80	2.254e3		0.247	225.510	5.02	5.00	2250	40.542	80.0		
30	71	13C8-PFOS-EIS	507.1 > 80	2.254e3		0.247	225.510	5.02	5.00	2250	40.542	80.0		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.513e4		0.247	1491.471	5.31	5.29	15100	41.138	81.1		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.517e4		0.247	1581.335	5.54	5.61	15200	38.913	76.7		
33	-1													
34	29	L-MeFOSAA	570 > 419		2.818e3	0.247		5.44						YES
35	1...	Total N-MeFOSAA	570. > 419	0.000e0	2.818e3	0.247		5.19		0.000				
36	31	L-EtFOSAA	583.9 > 419		3.064e3	0.247		5.59						YES

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

Last Altered: Wednesday, July 08, 2020 18:22:32 Pacific Daylight Time
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Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	0.000e0	3.064e3	0.247		5.37		0.000				
38	35	11Cl-PF30UdS	631 > 451		1.780e4	0.247		5.81						YES
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.818e3		0.247	331.163	5.46	5.44	2820	34.518	68.1		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.818e3		0.247	331.163	5.46	5.44	2820	34.518	68.1		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.064e3		0.247	313.941	5.61	5.59	3060	39.584	78.1		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.064e3		0.247	313.941	5.61	5.59	3060	39.584	78.1		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.780e4		0.247	1868.510	6.13	5.89	17800	38.643	76.2		
44	-1													
45	37	PFDoA	612.9 > 569.0		1.780e4	0.247		5.89						YES
46	39	PFTrDA	662.9 > 618.9		1.780e4	0.247		6.15						YES
47	41	PFTeDA	713.0 > 669.0		1.543e4	0.247		6.32						YES
48	1...	TDCA	498.3>106.9			0.247	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.254e3		0.247	225.510	5.02	5.00	2250	40.542	80.0		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.780e4		0.247	1868.510	6.13	5.89	17800	38.643	76.2		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.780e4		0.247	1868.510	6.13	5.89	17800	38.643	76.2		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.543e4		0.247	1905.823	6.34	6.32	15400	32.829	64.7		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

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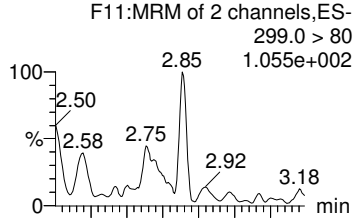
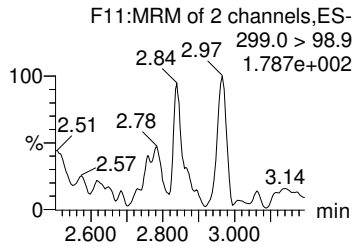
Calibration: P:\PFAS5.pro\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

PFBS





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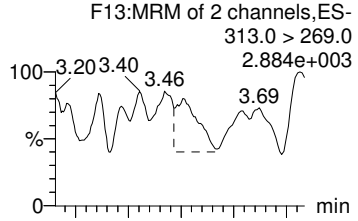

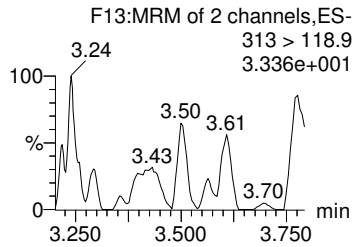

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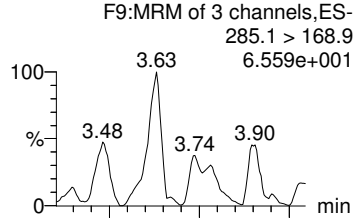

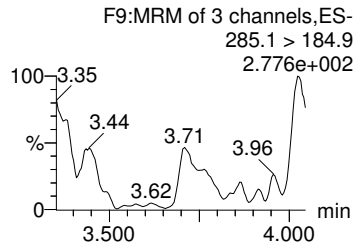

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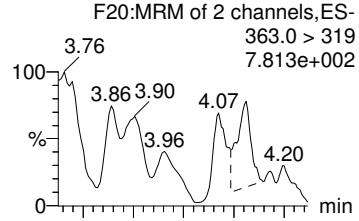

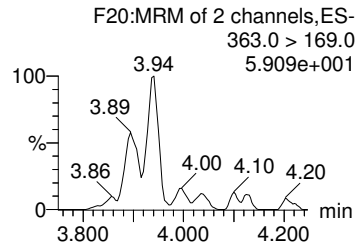

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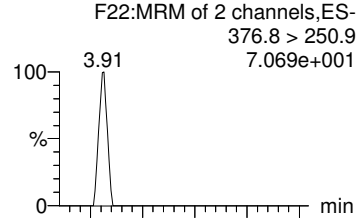

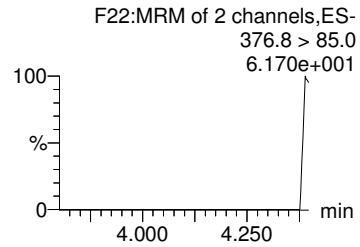

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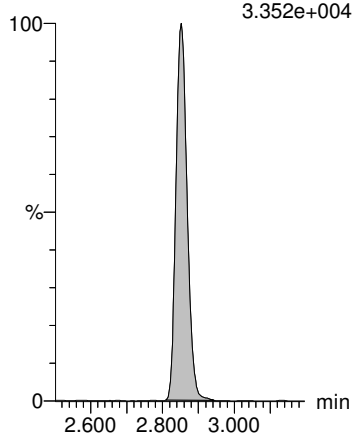

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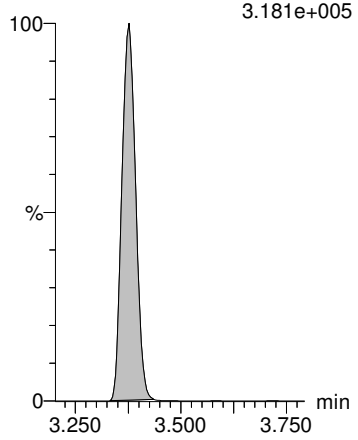

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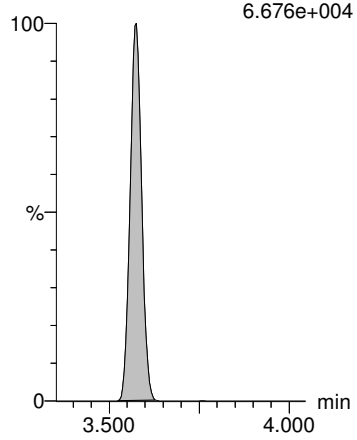

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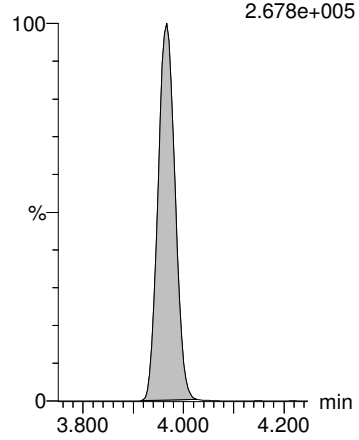

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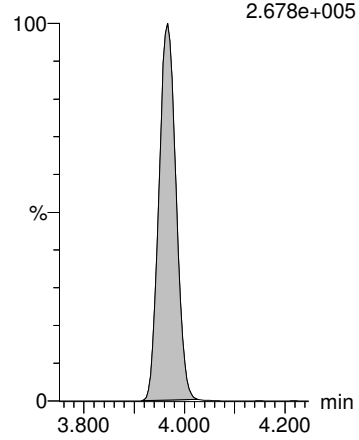

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Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

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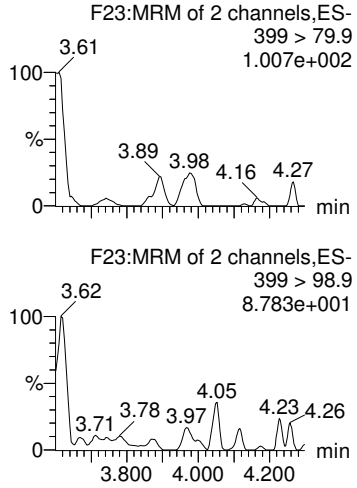
Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

L-PFHxS



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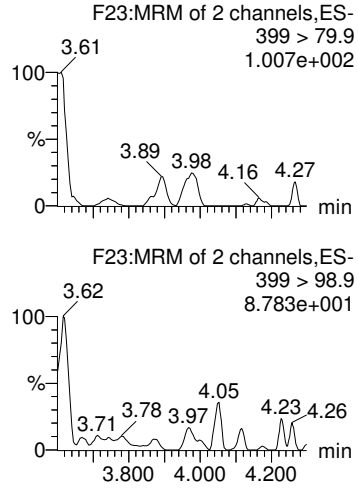
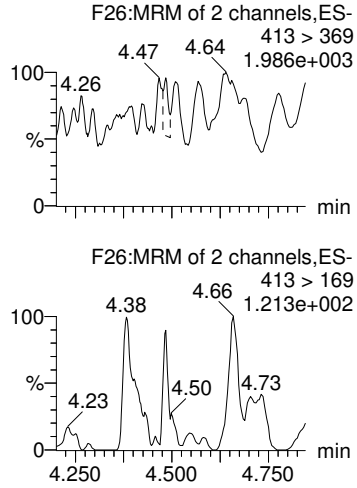
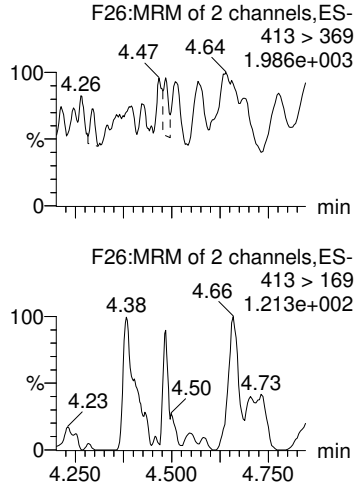


L-PFOA



Total PFOA



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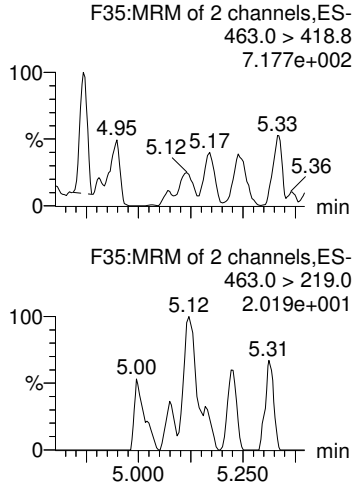

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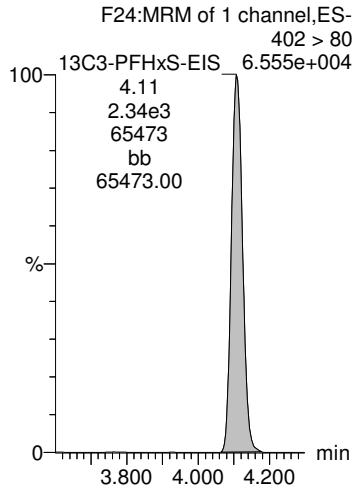

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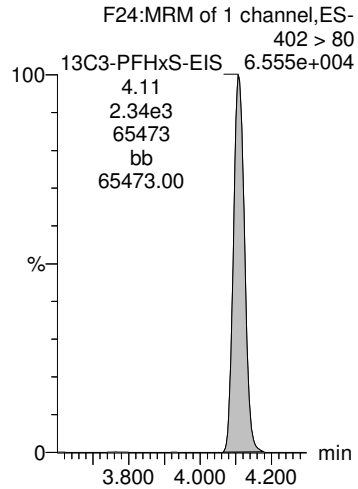

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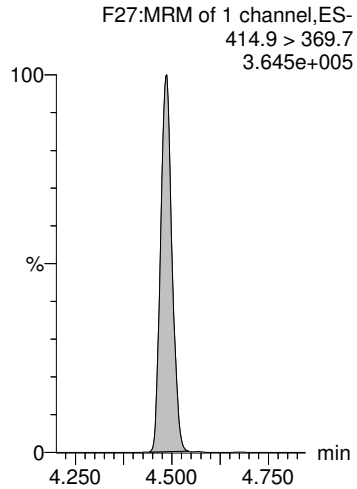

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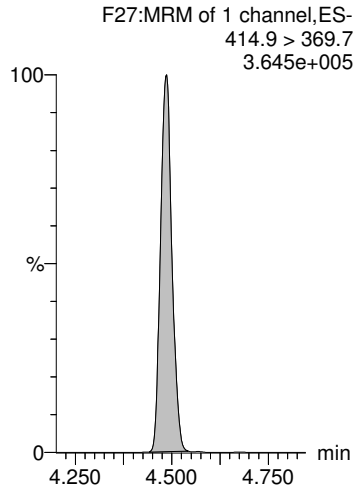

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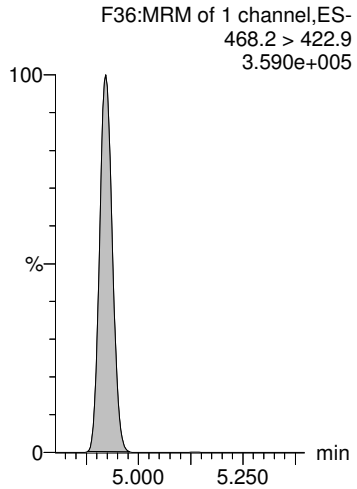

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Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

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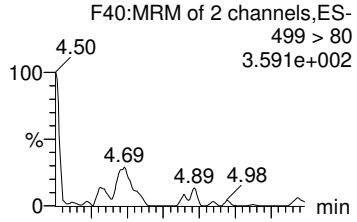
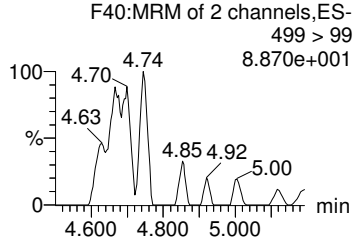
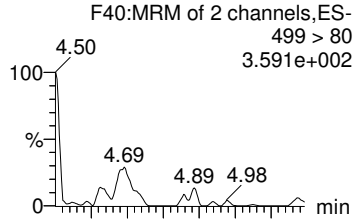
Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

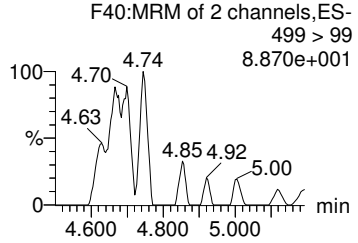
L-PFOS



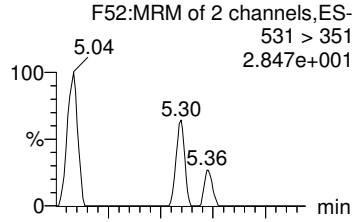


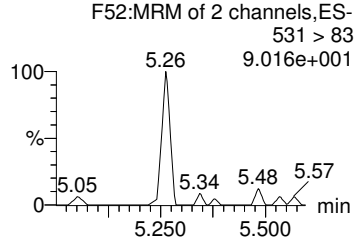
Total PFOS



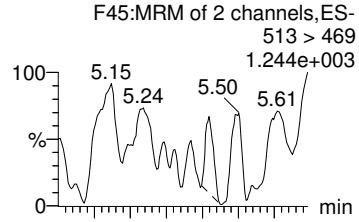


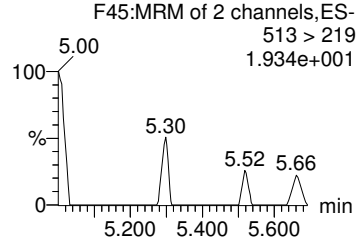
9Cl-PF30NS



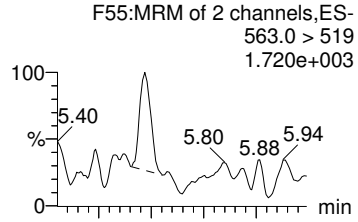


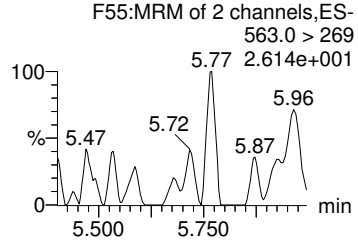
PFDA



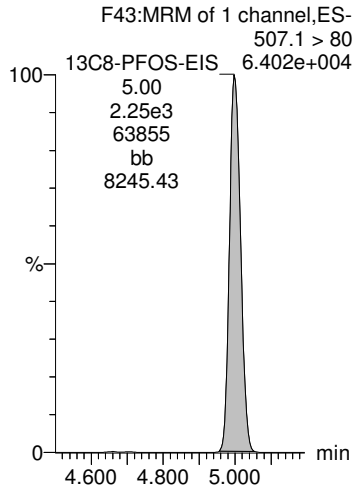


PFUdA





13C8-PFOS-EIS



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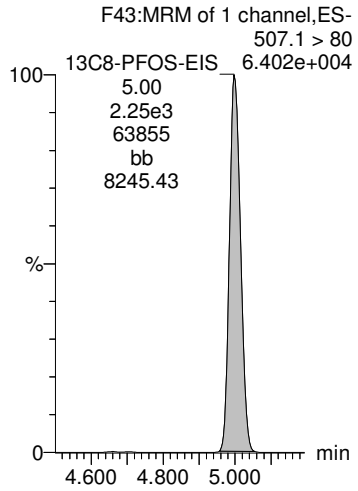

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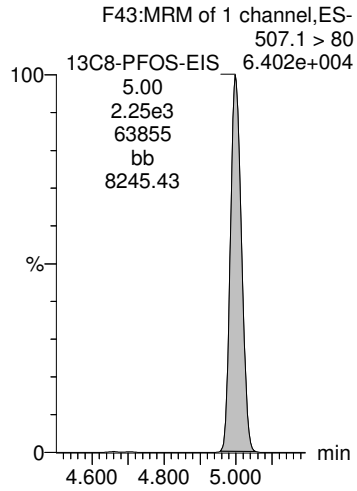

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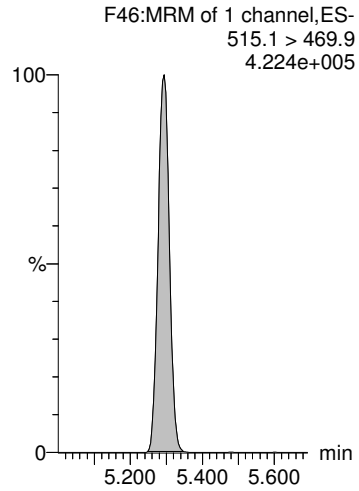

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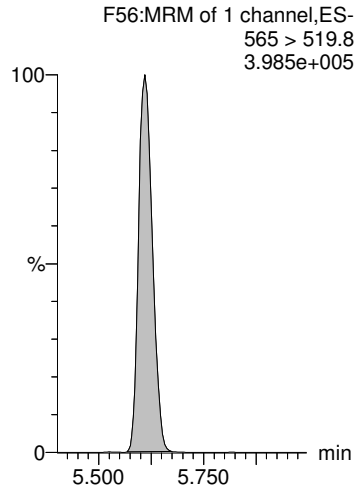

RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

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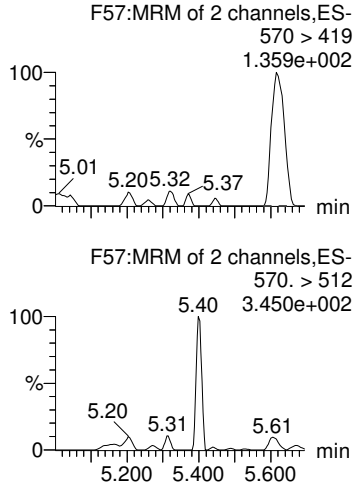
Printed: Wednesday, July 08, 2020 18:23:11 Pacific Daylight Time

Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

L-MeFOSAA



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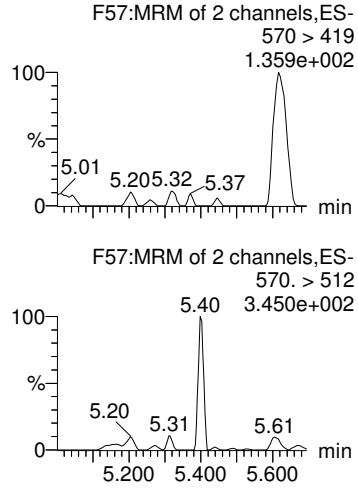

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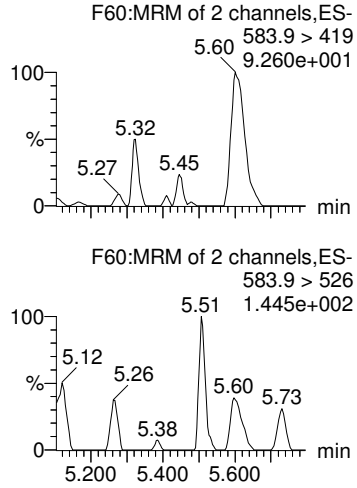
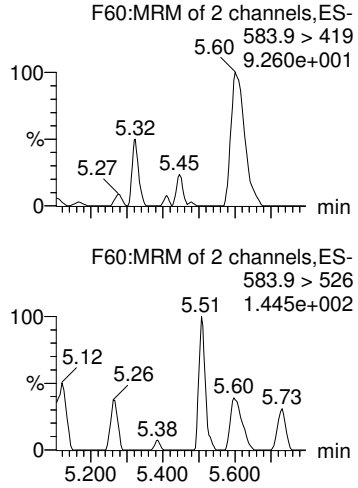
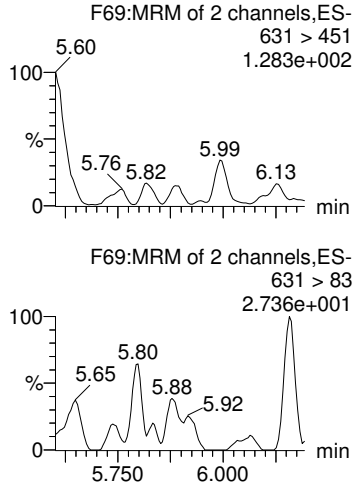


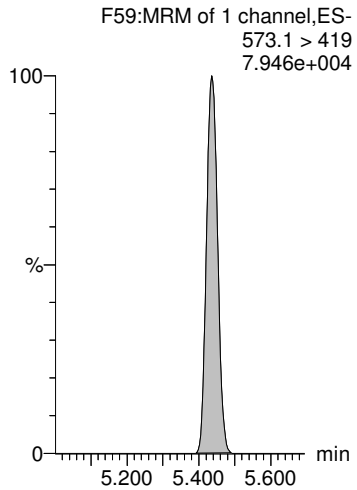
Total N-EtFOSAA



11Cl-PF30UdS



d3-N-MeFOSAA-EIS



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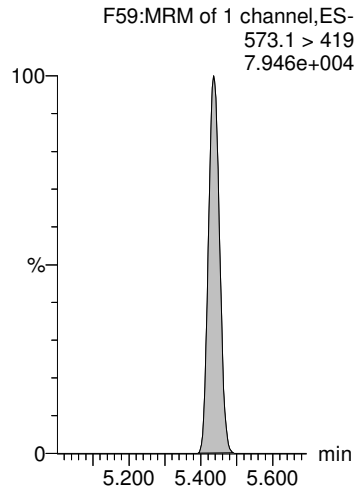

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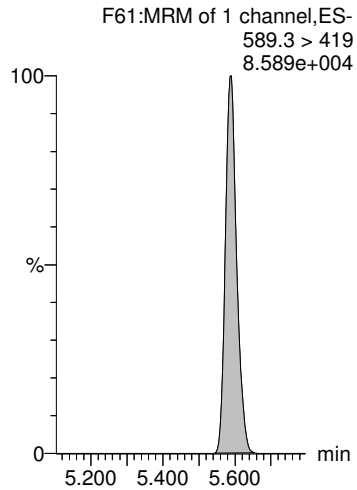
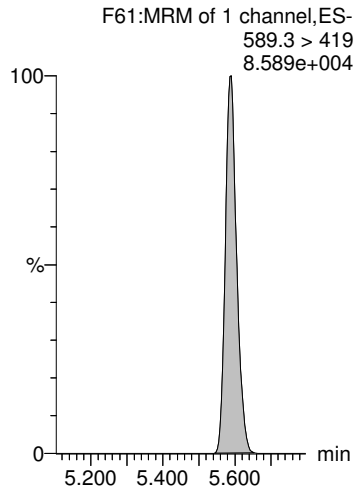
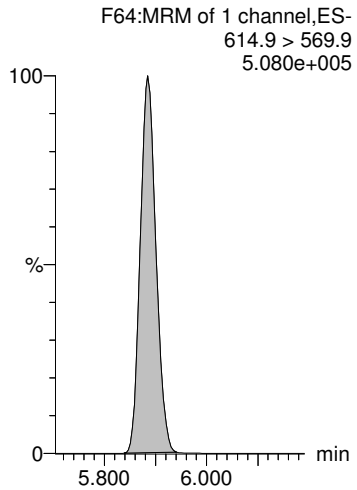


d5-N-EtFOSAA-EIS



13C2-PFDoA-EIS



Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-57.qld

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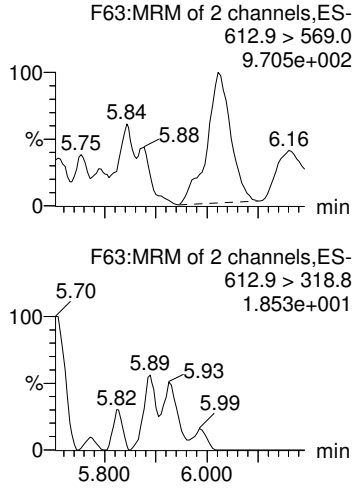
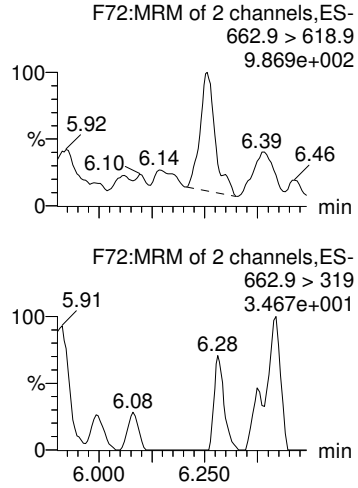
Printed: Wednesday, July 08, 2020 18:23:11 Pacific Daylight Time

Name: 200706P1-57, Date: 06-Jul-2020, Time: 20:16:52, ID: 2001357-01 SB01-20200624 0.24654, Description: SB01-20200624

PFDoA



PFTrDA



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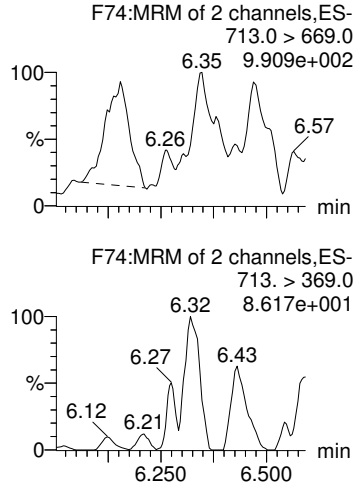
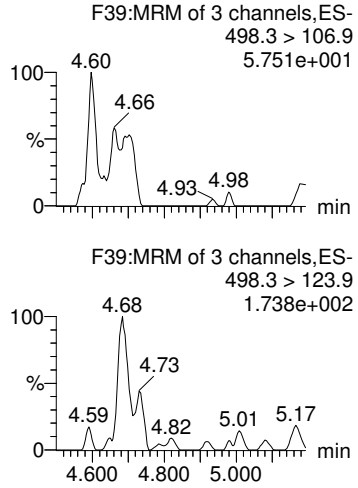
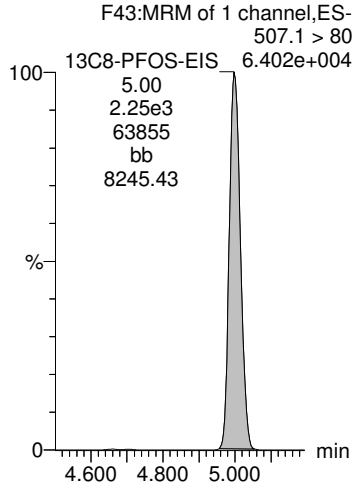


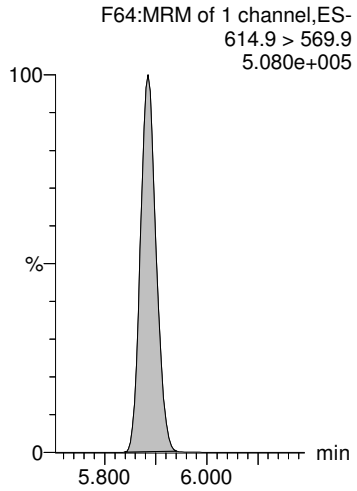
TDCA



13C8-PFOS-EIS



13C2-PFDoA-EIS



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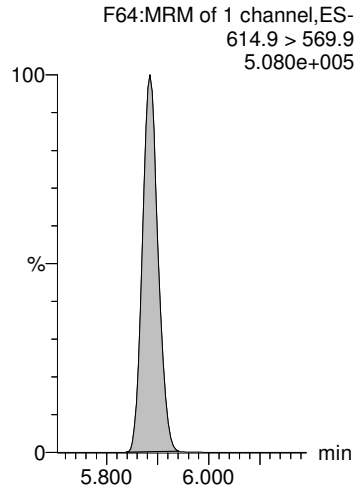

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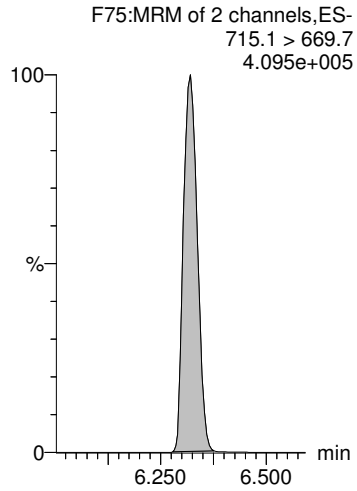

RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-58.qld

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Printed: Wednesday, July 08, 2020 18:28:24 Pacific Daylight Time

Name: 200706P1-58, Date: 06-Jul-2020, Time: 20:27:21, ID: 2001357-02 EB01-20200624 0.24804, Description: EB01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80		1.298e3	0.248		2.85						YES
2	7	PFHxA	313.0 > 269.0		1.390e4	0.248		3.38						YES
3	9	HFPO-DA	285.1 > 168.9		2.964e3	0.248		3.57						YES
4	11	PFHpA	363.0 > 319		1.189e4	0.248		3.97						YES
5	12	ADONA	376.8 > 250.9		1.189e4	0.248		4.07						YES
6	51	13C3-PFBS-EIS	302.0 > 98.9	1.298e3		0.248	104.004	2.87	2.85	1300	50.320	99.9		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	1.390e4		0.248	1090.353	3.38	3.38	13900	51.402	102.0		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.964e3		0.248	228.261	3.59	3.57	2960	52.355	103.9		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	1.189e4		0.248	983.154	3.98	3.97	11900	48.750	96.7		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	1.189e4		0.248	983.154	3.98	3.97	11900	48.750	96.7		
11	-1													
12	13	L-PFHxS	399 > 79.9		2.768e3	0.248		4.11						YES
13	1...	Total PFHxS	399 > 79.9	0.000e0	2.768e3	0.248		3.93		0.000				
14	16	L-PFOA	413 > 369		1.388e4	0.248		4.49						YES
15	1...	Total PFOA	413 > 369	0.000e0	1.388e4	0.248		4.60		0.000				
16	21	PFNA	463.0 > 418.8		1.502e4	0.248		4.92						YES
17	61	13C3-PFHxS-EIS	402 > 80	2.768e3		0.248	220.112	4.13	4.11	2770	50.702	100.6		
18	61	13C3-PFHxS-EIS	402 > 80	2.768e3		0.248	220.112	4.13	4.11	2770	50.702	100.6		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.388e4		0.248	1154.443	4.67	4.49	13900	48.471	96.2		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.388e4		0.248	1154.443	4.67	4.49	13900	48.471	96.2		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.502e4		0.248	1213.140	5.13	4.92	15000	49.904	99.0		
22	-1													
23	23	L-PFOS	499 > 80		2.729e3	0.248		5.00						YES
24	1...	Total PFOS	499> 80	0.000e0	2.729e3	0.248		4.60		0.000				
25	25	9Cl-PF30NS	531 > 351		2.729e3	0.248		5.22						YES
26	26	PFDA	513 > 469		1.789e4	0.248		5.29						YES
27	33	PFUdA	563.0 > 519		1.635e4	0.248		5.61						YES
28	71	13C8-PFOS-EIS	507.1 > 80	2.729e3		0.248	225.510	5.02	5.00	2730	48.785	96.8		
29	71	13C8-PFOS-EIS	507.1 > 80	2.729e3		0.248	225.510	5.02	5.00	2730	48.785	96.8		
30	71	13C8-PFOS-EIS	507.1 > 80	2.729e3		0.248	225.510	5.02	5.00	2730	48.785	96.8		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.789e4		0.248	1491.471	5.31	5.29	17900	48.371	96.0		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.635e4		0.248	1581.335	5.54	5.61	16400	41.690	82.7		
33	-1													
34	29	L-MeFOSAA	570 > 419		3.655e3	0.248		5.44						YES
35	1...	Total N-MeFOSAA	570. > 419	0.000e0	3.655e3	0.248		5.19		0.000				
36	31	L-EtFOSAA	583.9 > 419		3.443e3	0.248		5.59						YES

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-58.qld

Last Altered: Wednesday, July 08, 2020 18:28:12 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:28:24 Pacific Daylight Time

Name: 200706P1-58, Date: 06-Jul-2020, Time: 20:27:21, ID: 2001357-02 EB01-20200624 0.24804, Description: EB01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	0.000e0	3.443e3	0.248		5.37		0.000				
38	35	11Cl-PF30UdS	631 > 451		1.996e4	0.248		5.81						YES
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.655e3		0.248	331.163	5.46	5.44	3650	44.494	88.3		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.655e3		0.248	331.163	5.46	5.44	3650	44.494	88.3		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.443e3		0.248	313.941	5.61	5.59	3440	44.213	87.7		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.443e3		0.248	313.941	5.61	5.59	3440	44.213	87.7		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.996e4		0.248	1868.510	6.13	5.88	20000	43.065	85.5		
44	-1													
45	37	PFDoA	612.9 > 569.0		1.996e4	0.248		5.88						YES
46	39	PFTrDA	662.9 > 618.9		1.996e4	0.248		6.15						YES
47	41	PFTeDA	713.0 > 669.0		1.601e4	0.248		6.32						YES
48	1...	TDCA	498.3>106.9			0.248	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.729e3		0.248	225.510	5.02	5.00	2730	48.785	96.8		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.996e4		0.248	1868.510	6.13	5.88	20000	43.065	85.5		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.996e4		0.248	1868.510	6.13	5.88	20000	43.065	85.5		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.601e4		0.248	1905.823	6.34	6.32	16000	33.874	67.2		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-58.qld

Last Altered: Wednesday, July 08, 2020 18:28:12 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:28:24 Pacific Daylight Time

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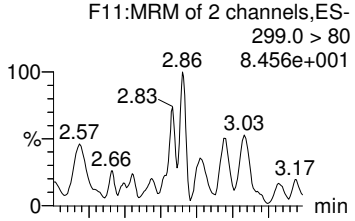
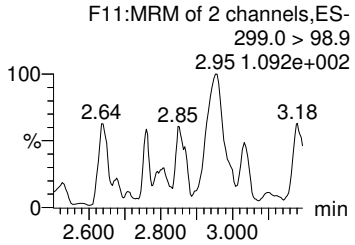
Calibration: P:\PFAS5.pro\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

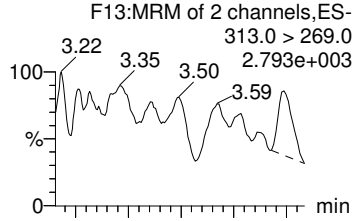
Name: 200706P1-58, Date: 06-Jul-2020, Time: 20:27:21, ID: 2001357-02 EB01-20200624 0.24804, Description: EB01-20200624

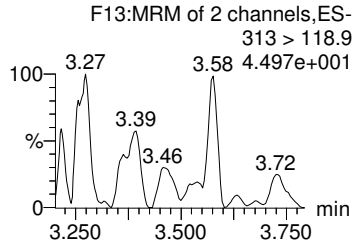
PFBS



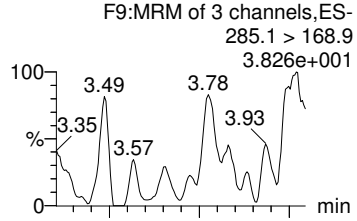


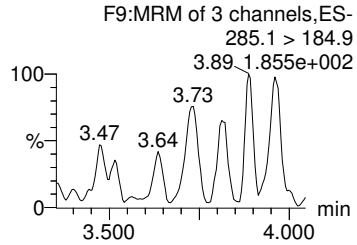
PFHxA



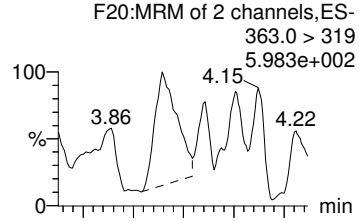


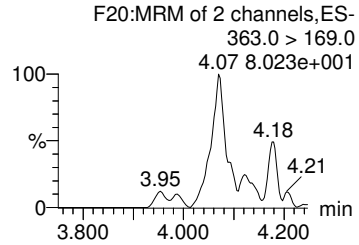
HFPO-DA



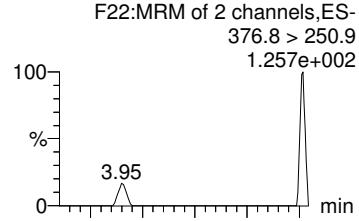


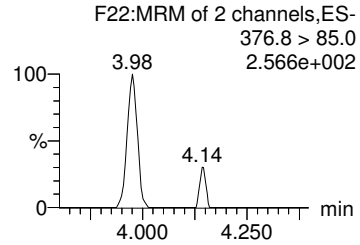
PFHpA



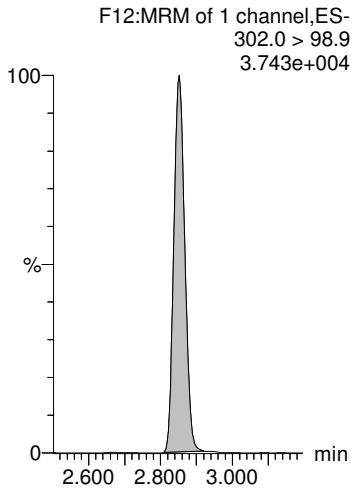


ADONA

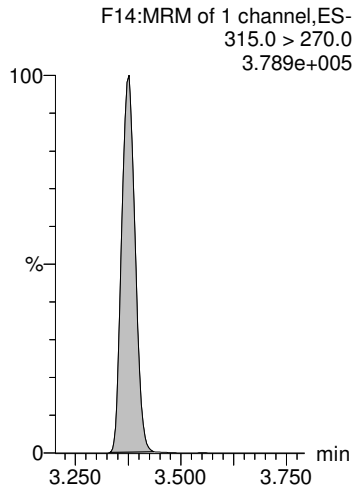




13C3-PFBS-EIS



13C2-PFHxA-EIS



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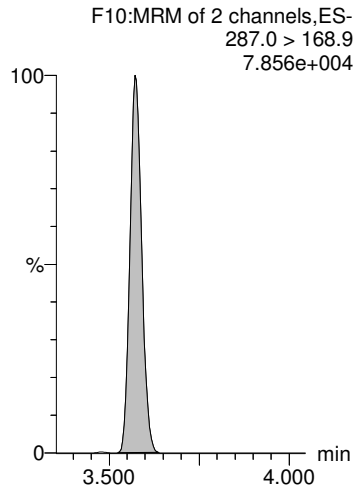

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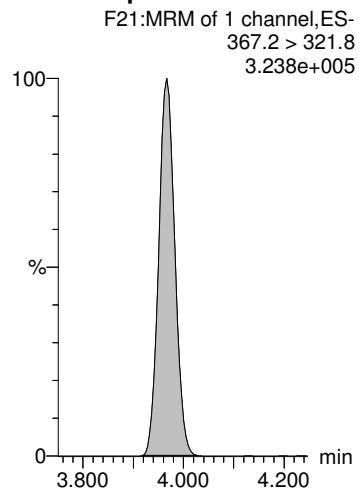

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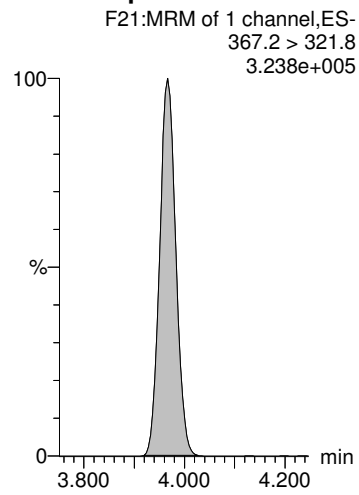

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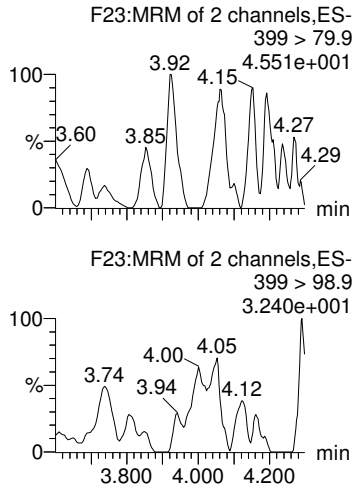
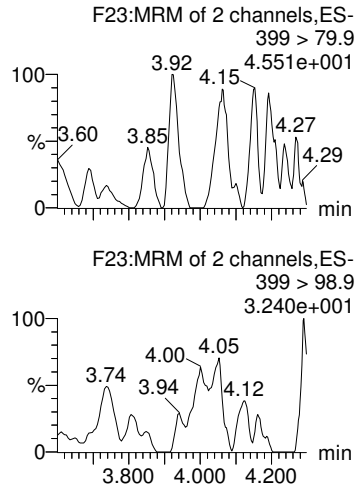
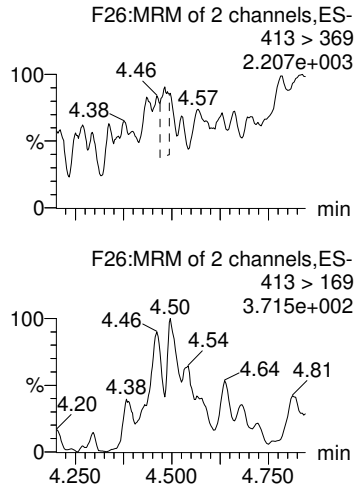


Total PFHxS



L-PFOA



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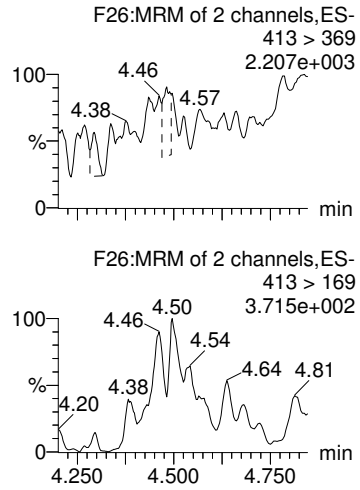

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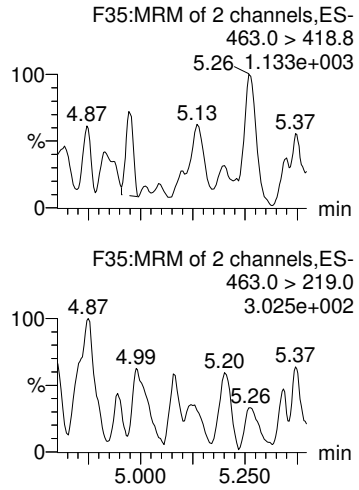

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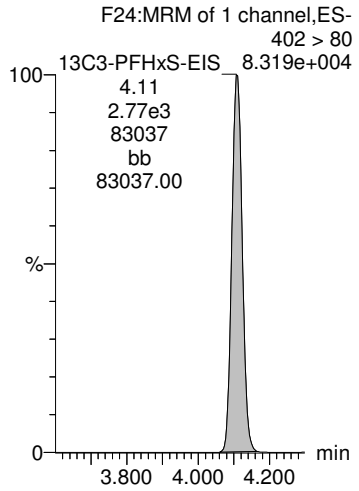

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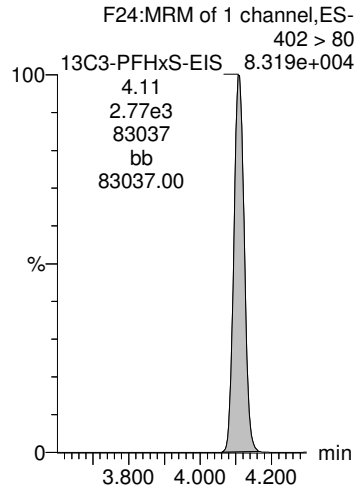

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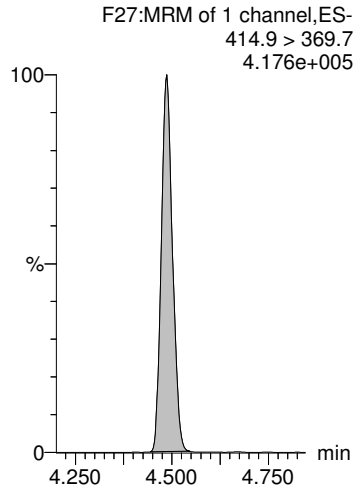

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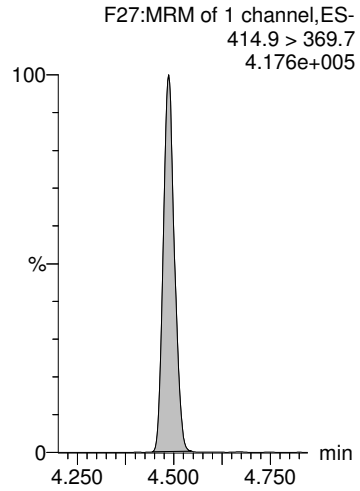

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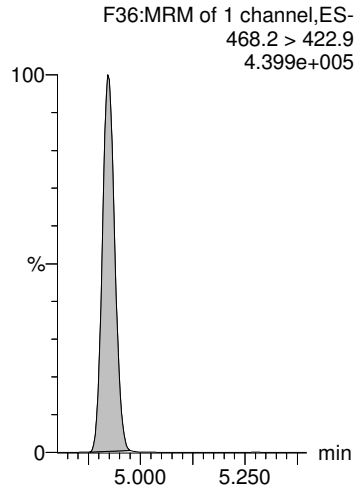

RK 7/8/2020

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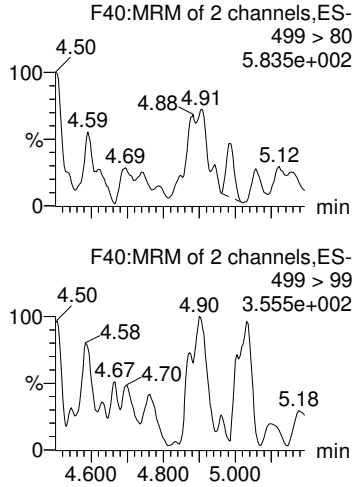
Name: 200706P1-58, Date: 06-Jul-2020, Time: 20:27:21, ID: 2001357-02 EB01-20200624 0.24804, Description: EB01-20200624

L-PFOS



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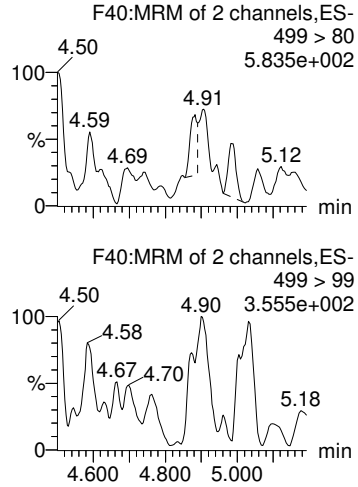
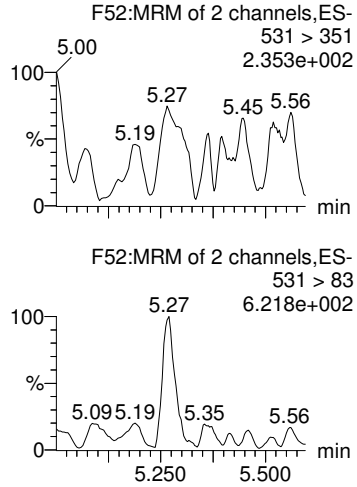


9Cl-PF30NS



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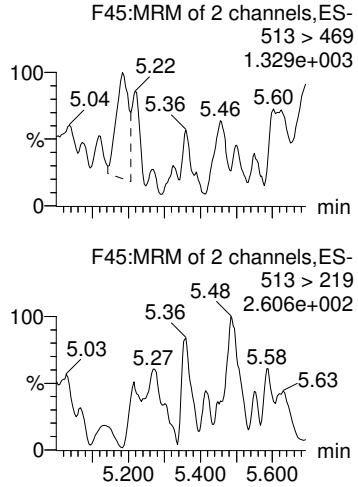

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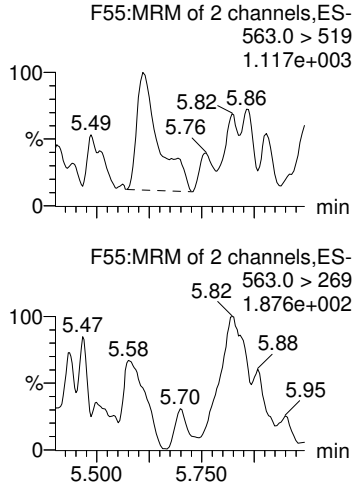
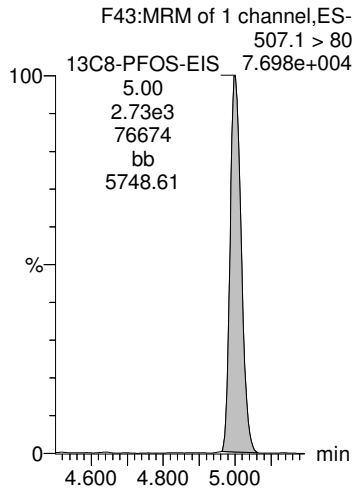


13C8-PFOS-EIS



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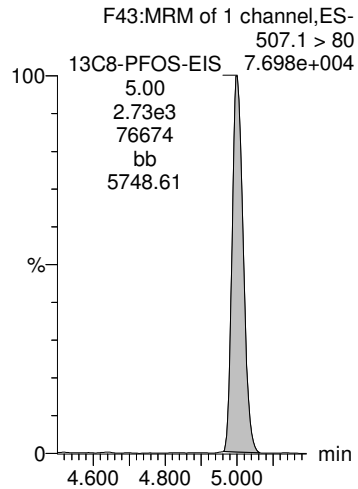

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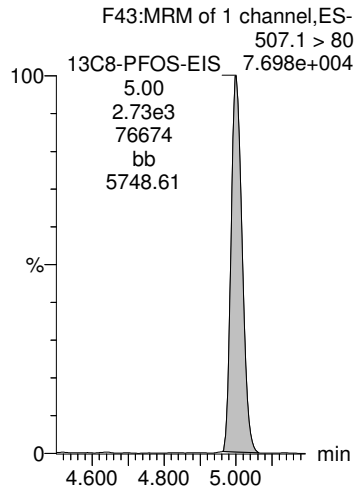

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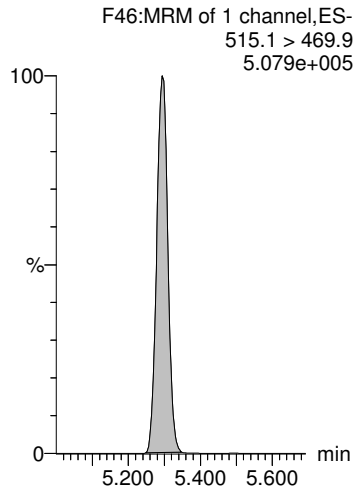

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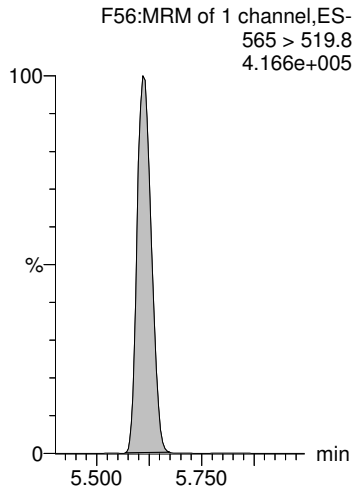

RK 7/8/2020

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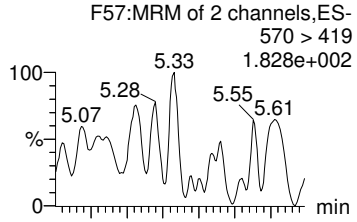

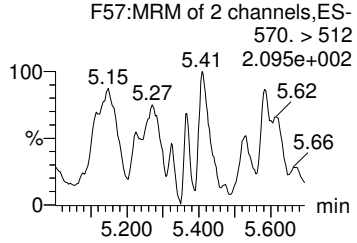

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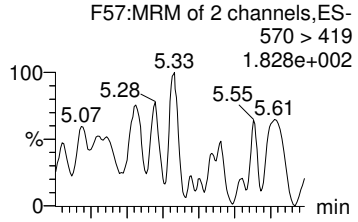
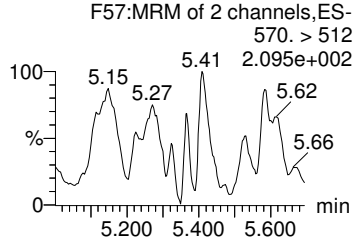
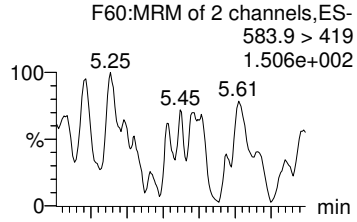
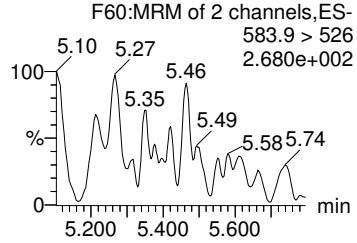




L-EtFOSAA





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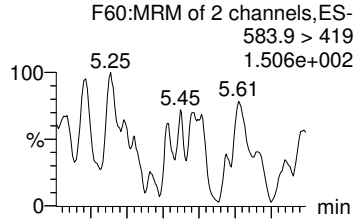
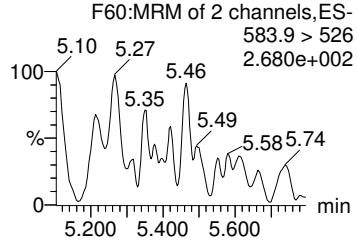
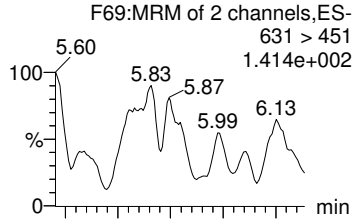
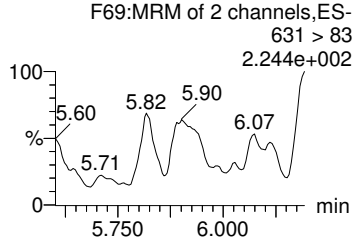


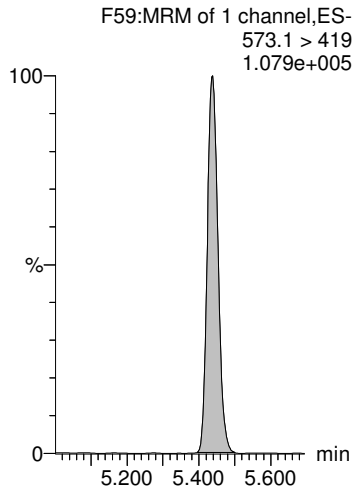


11Cl-PF30UdS





d3-N-MeFOSAA-EIS



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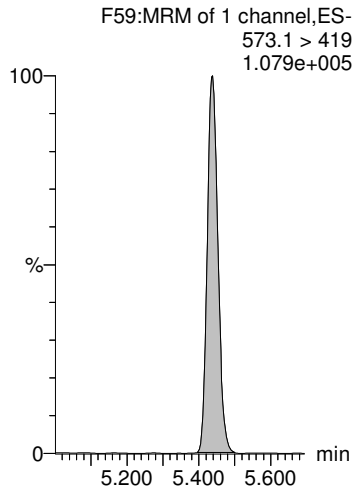
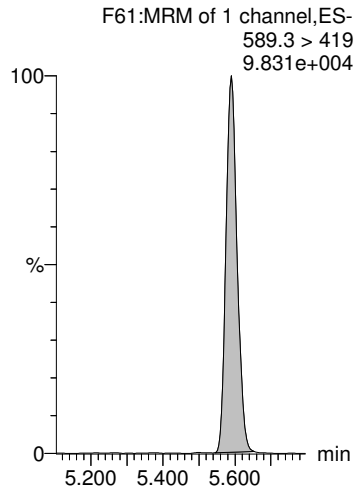
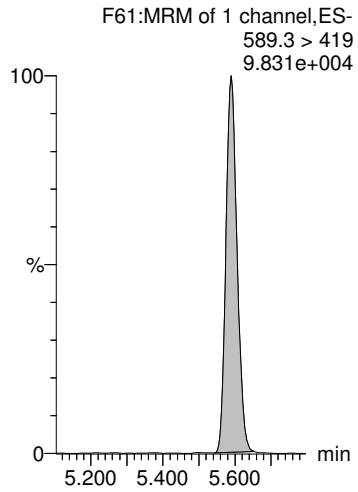


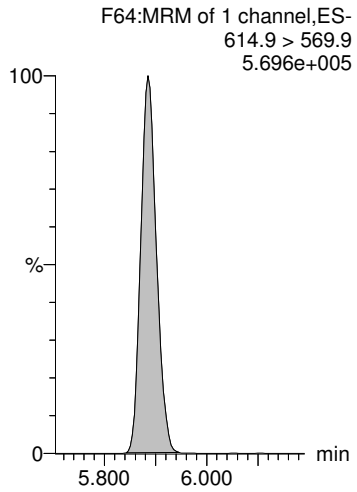
d5-N-EtFOSAA-EIS



d5-N-EtFOSAA-EIS



13C2-PFDoA-EIS



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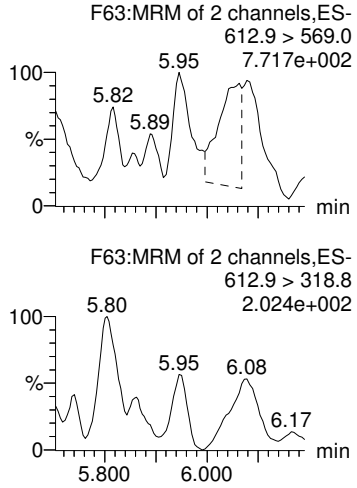
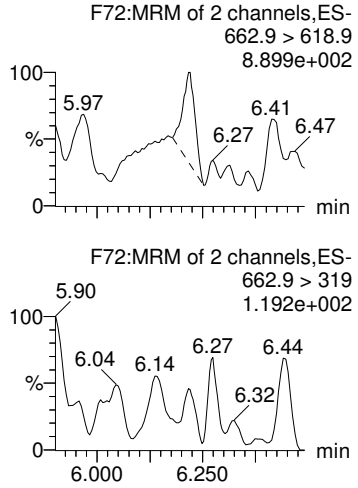
PFDoA



PFTrDA



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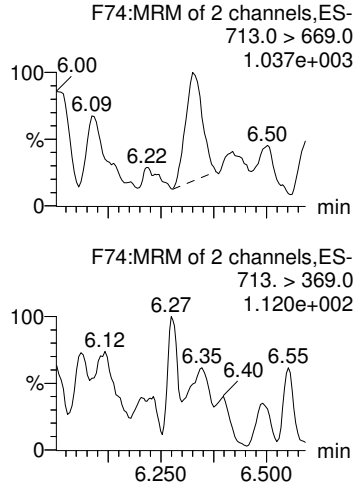

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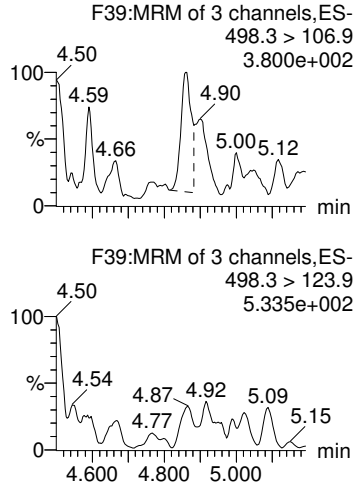
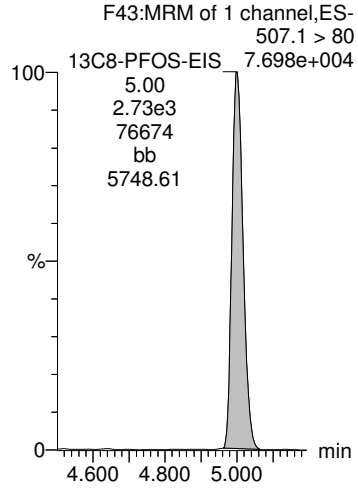


13C8-PFOS-EIS



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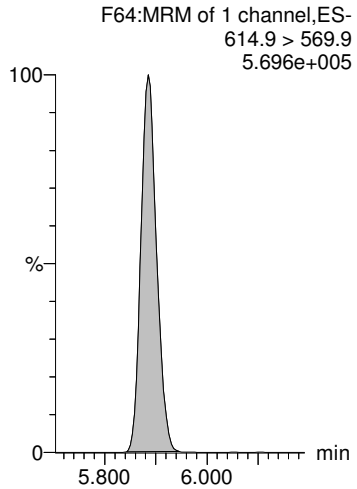

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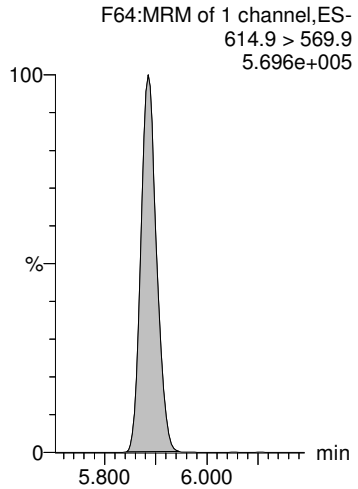

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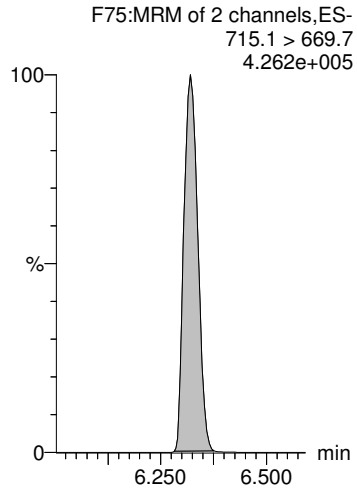

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-59.qld

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Printed: Wednesday, July 08, 2020 18:34:33 Pacific Daylight Time

Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80	5.087e3	1.188e3	0.256		2.85	2.85	53.5	81.893		2.500	NO
2	7	PFHxA	313.0 > 269.0	1.483e5	1.157e4	0.256		3.37	3.38	160	604.943		15.970	NO
3	9	HFPO-DA	285.1 > 168.9		2.539e3	0.256		3.57						YES
4	11	PFHpA	363.0 > 319	9.524e4	1.077e4	0.256		3.97	3.97	111	336.649		50.731	NO
5	12	ADONA	376.8 > 250.9		1.077e4	0.256		4.07						YES
6	51	13C3-PFBS-EIS	302.0 > 98.9	1.188e3		0.256	104.004	2.87	2.85	1190	44.692	91.4		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	1.157e4		0.256	1090.353	3.38	3.37	11600	41.515	84.9		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.539e3		0.256	228.261	3.59	3.57	2540	43.509	89.0		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	1.077e4		0.256	983.154	3.98	3.97	10800	42.838	87.6		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	1.077e4		0.256	983.154	3.98	3.97	10800	42.838	87.6		
11	-1													
12	13	L-PFHxS	399 > 79.9	2.506e4	2.180e3	0.256		4.11	4.11	144	515.359		4.125	NO
13	1...	Total PFHxS	399 > 79.9	2.506e4	2.180e3	0.256		3.93		144	515.359			
14	16	L-PFOA	413 > 369	7.347e4	1.200e4	0.256		4.48	4.48	76.5	267.994		2.958	NO
15	1...	Total PFOA	413 > 369	7.347e4	1.200e4	0.256		4.60		76.5	267.994			
16	21	PFNA	463.0 > 418.8	1.343e3	1.307e4	0.256		4.92	4.92	1.29	4.432		17.211	NO
17	61	13C3-PFHxS-EIS	402 > 80	2.180e3		0.256	220.112	4.13	4.11	2180	38.739	79.2		
18	61	13C3-PFHxS-EIS	402 > 80	2.180e3		0.256	220.112	4.13	4.11	2180	38.739	79.2		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.200e4		0.256	1154.443	4.67	4.48	12000	40.666	83.2		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.200e4		0.256	1154.443	4.67	4.48	12000	40.666	83.2		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.307e4		0.256	1213.140	5.13	4.92	13100	42.141	86.2		
22	-1													
23	23	L-PFOS	499 > 80	5.670e3	2.408e3	0.256		5.00	5.00	29.4	90.629		2.626	NO
24	1...	Total PFOS	499> 80	5.670e3	2.408e3	0.256		4.60		29.4	90.629			
25	25	9Cl-PF30NS	531 > 351		2.408e3	0.256		5.22						YES
26	26	PFDA	513 > 469		1.459e4	0.256		5.29						YES
27	33	PFUdA	563.0 > 519		1.428e4	0.256		5.61						YES
28	71	13C8-PFOS-EIS	507.1 > 80	2.408e3		0.256	225.510	5.02	5.00	2410	41.764	85.4		
29	71	13C8-PFOS-EIS	507.1 > 80	2.408e3		0.256	225.510	5.02	5.00	2410	41.764	85.4		
30	71	13C8-PFOS-EIS	507.1 > 80	2.408e3		0.256	225.510	5.02	5.00	2410	41.764	85.4		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.459e4		0.256	1491.471	5.31	5.29	14600	38.269	78.3		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.428e4		0.256	1581.335	5.54	5.61	14300	35.324	72.2		
33	-1													
34	29	L-MeFOSAA	570 > 419		3.100e3	0.256		5.44						YES
35	1...	Total N-MeFOSAA	570. > 419	0.000e0	3.100e3	0.256		5.19		0.000				
36	31	L-EtFOSAA	583.9 > 419		3.218e3	0.256		5.59						YES

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-59.qld

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Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	0.000e0	3.218e3	0.256		5.37		0.000				
38	35	11Cl-PF30UdS	631 > 451		1.615e4	0.256		5.81						YES
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.100e3		0.256	331.163	5.46	5.44	3100	36.624	74.9		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	3.100e3		0.256	331.163	5.46	5.44	3100	36.624	74.9		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.218e3		0.256	313.941	5.61	5.59	3220	40.093	82.0		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	3.218e3		0.256	313.941	5.61	5.59	3220	40.093	82.0		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.615e4		0.256	1868.510	6.13	5.88	16200	33.815	69.2		
44	-1													
45	37	PFDoA	612.9 > 569.0		1.615e4	0.256		5.88						YES
46	39	PFTrDA	662.9 > 618.9		1.615e4	0.256		6.15						YES
47	41	PFTeDA	713.0 > 669.0		1.524e4	0.256		6.32						YES
48	1...	TDCA	498.3>106.9			0.256	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.408e3		0.256	225.510	5.02	5.00	2410	41.764	85.4		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.615e4		0.256	1868.510	6.13	5.88	16200	33.815	69.2		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.615e4		0.256	1868.510	6.13	5.88	16200	33.815	69.2		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.524e4		0.256	1905.823	6.34	6.32	15200	31.287	64.0		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-59.qld

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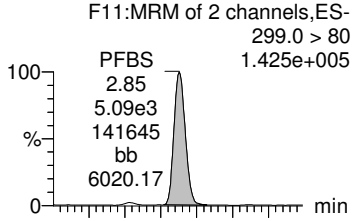
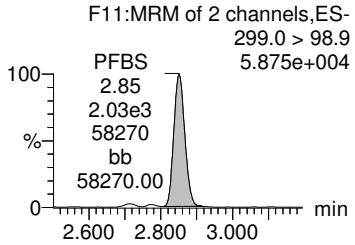
Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

PFBS





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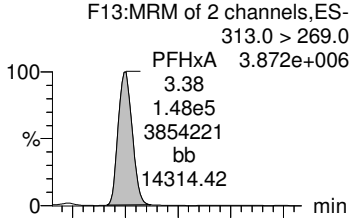
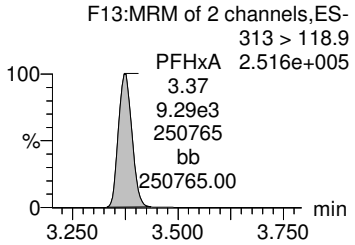
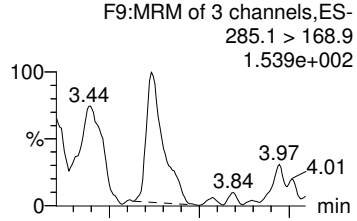
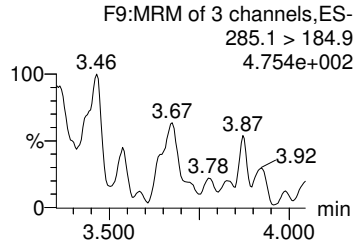




HFPO-DA





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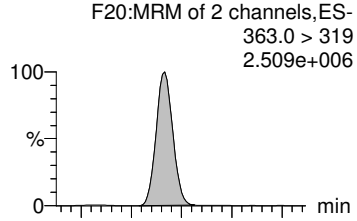

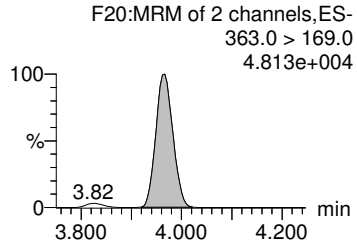

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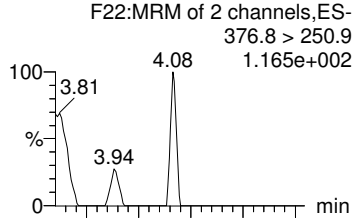

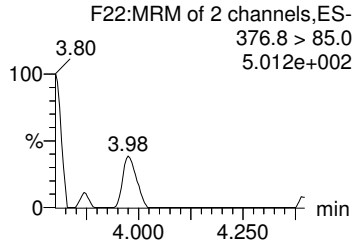

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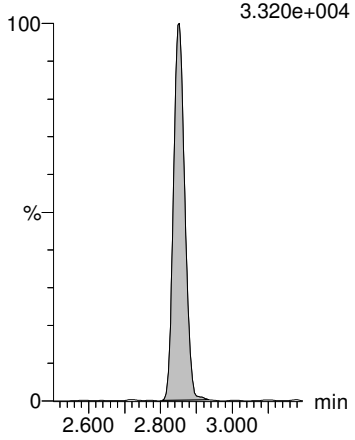

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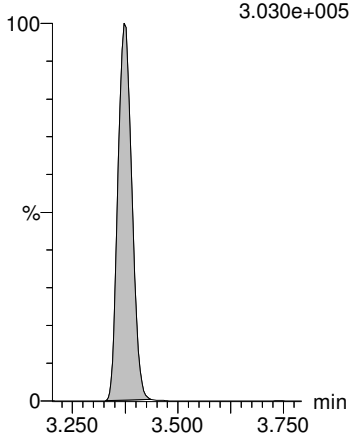

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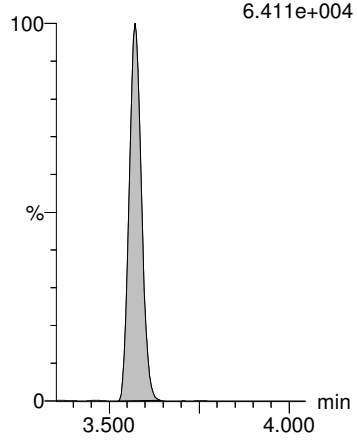

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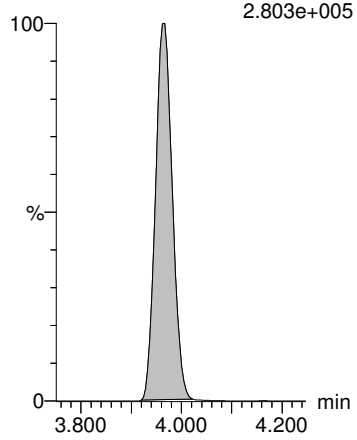

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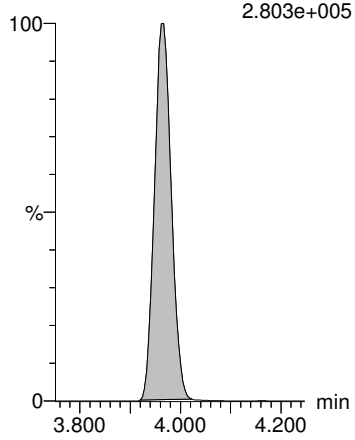

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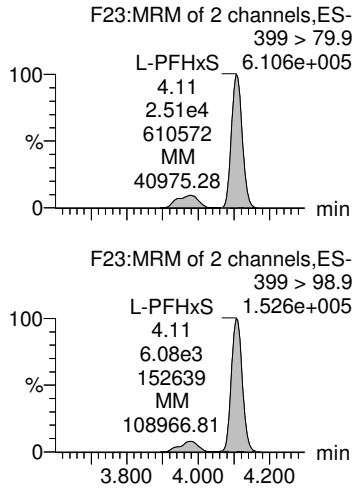
Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

L-PFHxS



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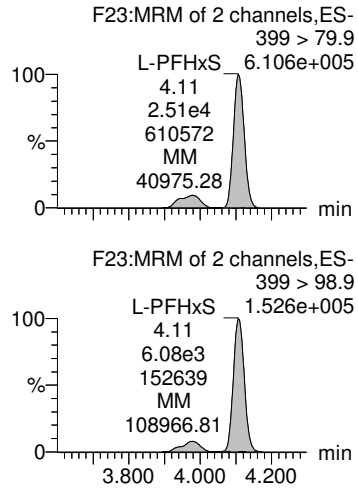
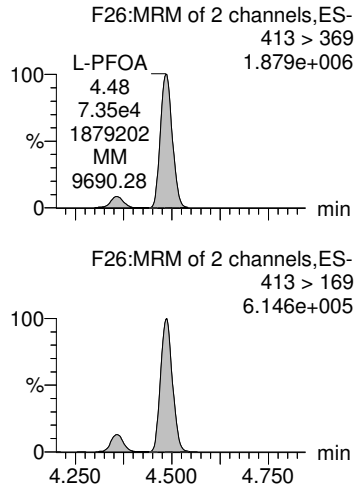


L-PFOA



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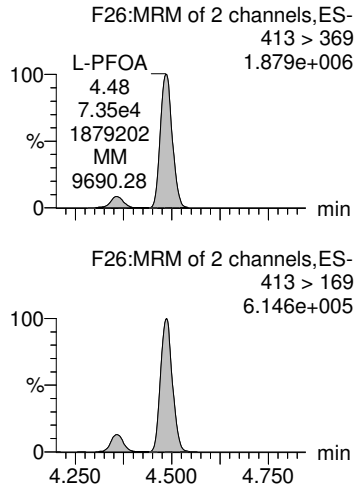

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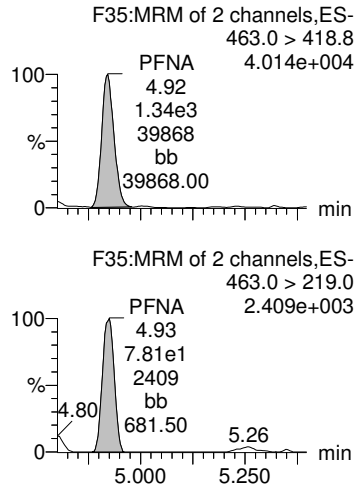

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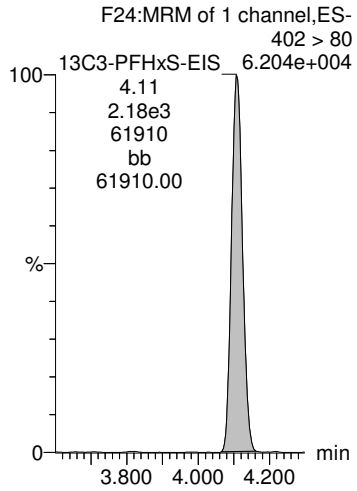

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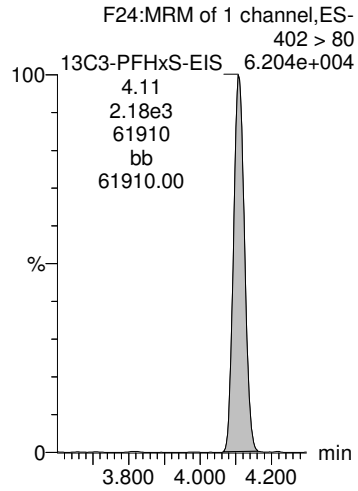

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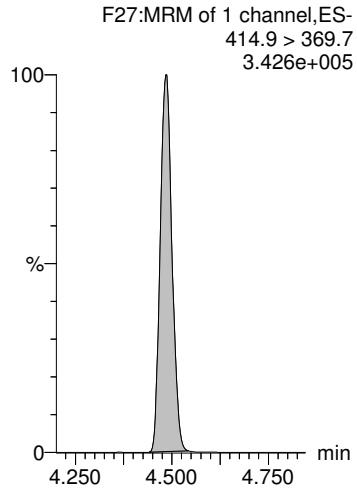

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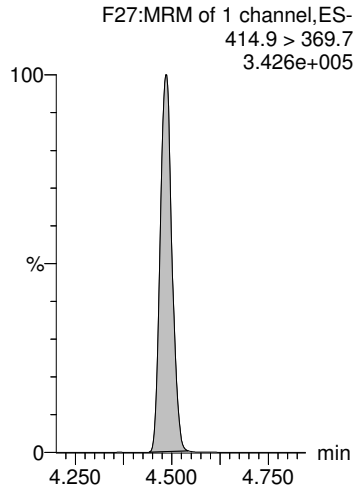

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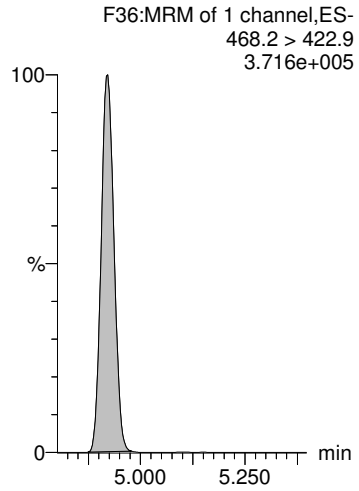

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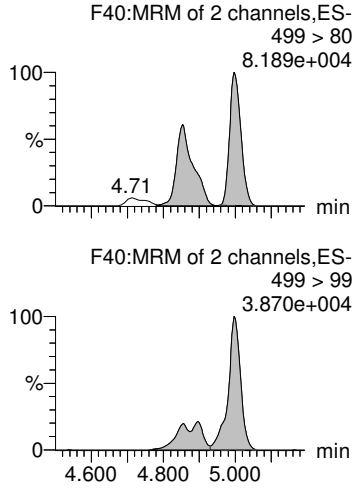
Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

L-PFOS



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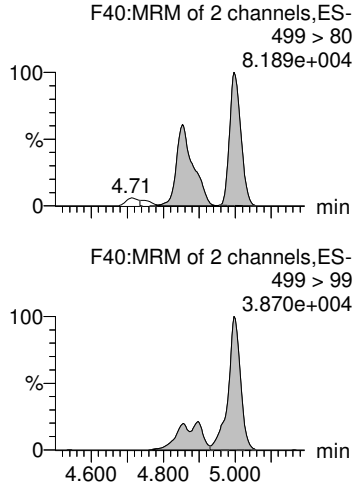

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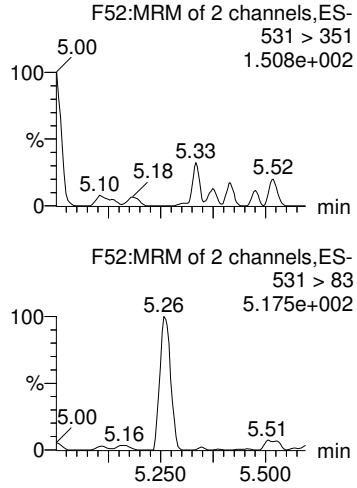
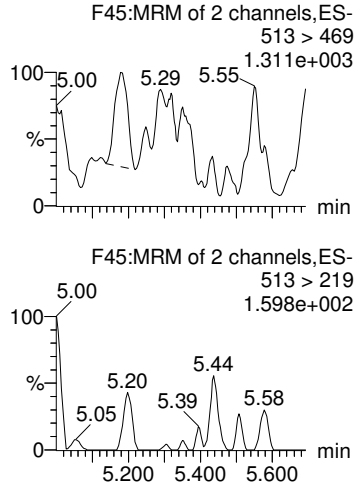
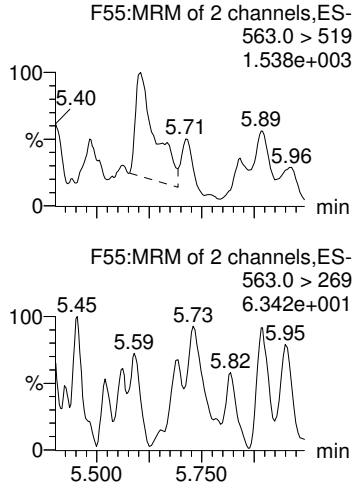


PFDA



PFUdA



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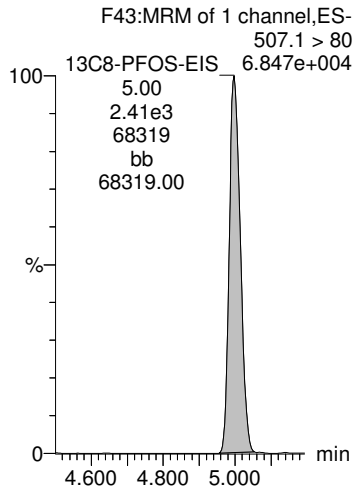

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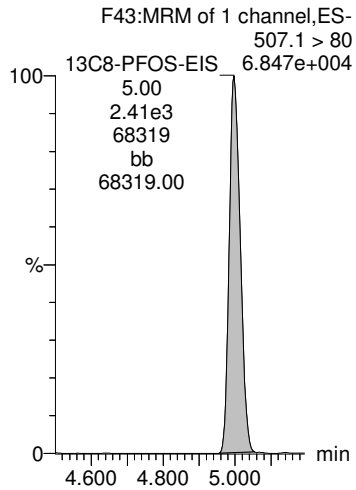

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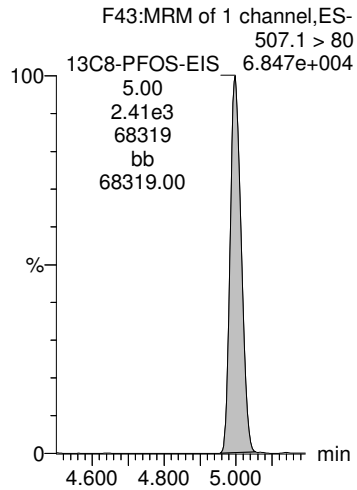

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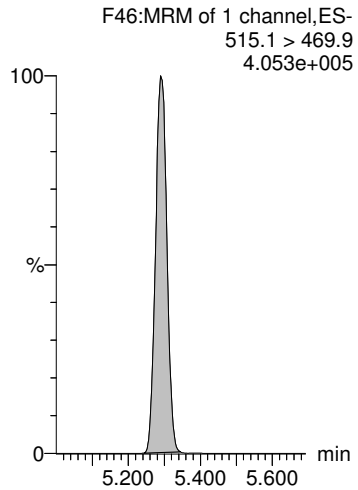

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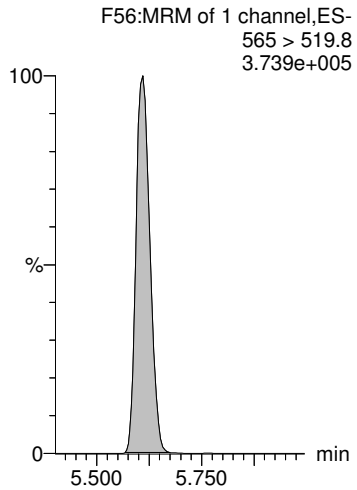

RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-59.qld

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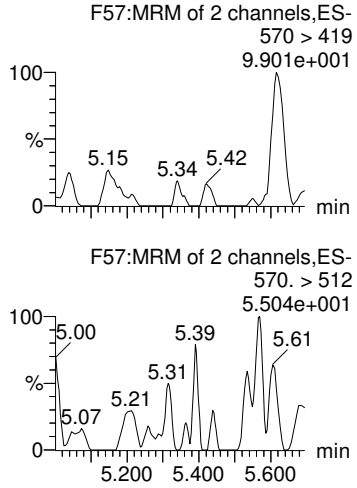
Printed: Wednesday, July 08, 2020 18:34:33 Pacific Daylight Time

Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

L-MeFOSAA



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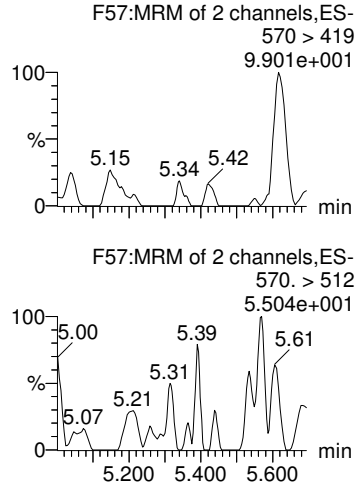

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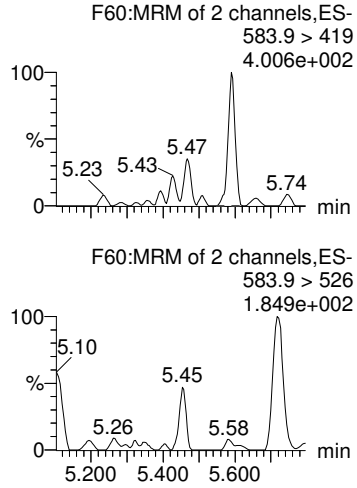

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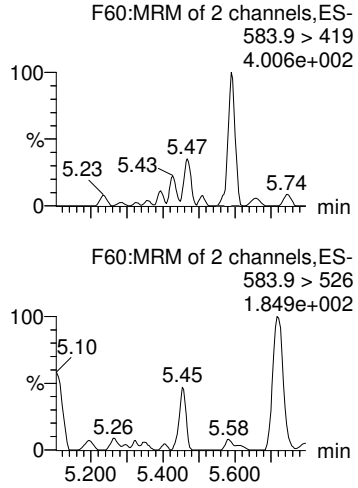

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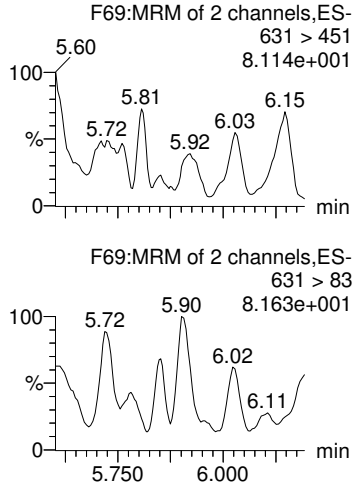

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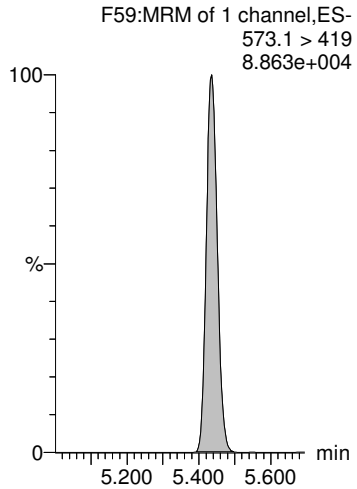
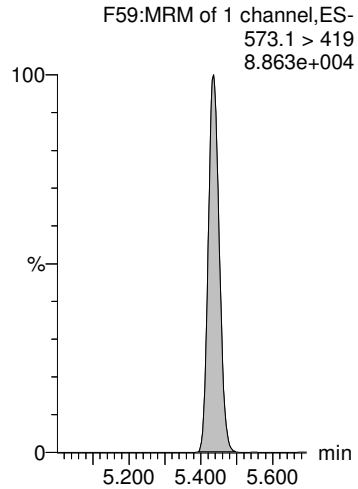


d3-N-MeFOSAA-EIS



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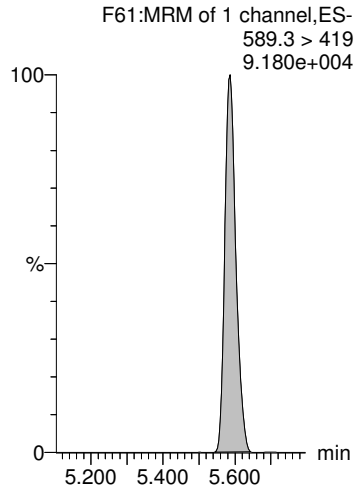

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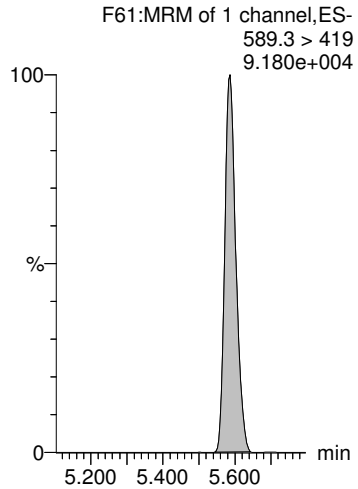

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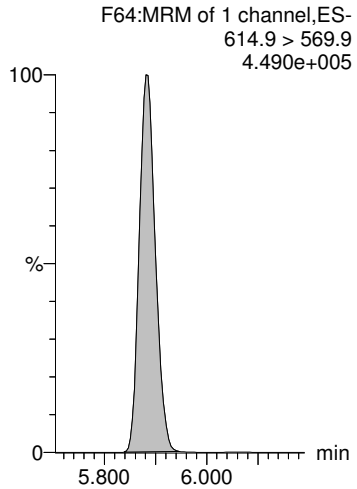

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Printed: Wednesday, July 08, 2020 18:34:33 Pacific Daylight Time

Name: 200706P1-59, Date: 06-Jul-2020, Time: 20:37:52, ID: 2001357-03 I006MW065-20200624 0.25563, Description: I006MW065-20200624

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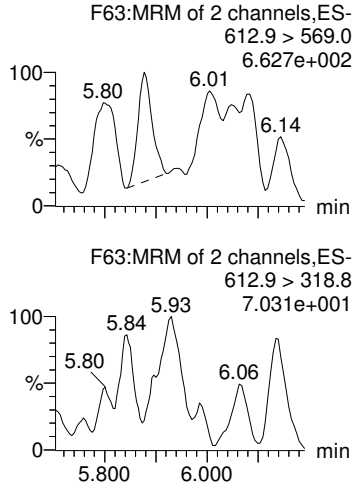

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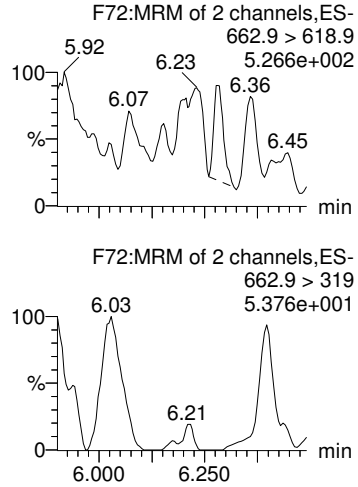

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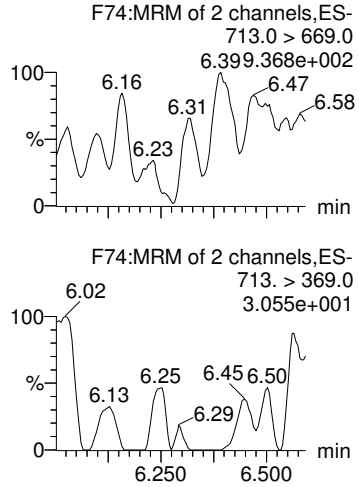

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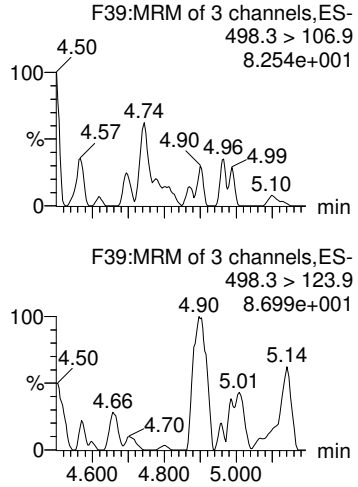

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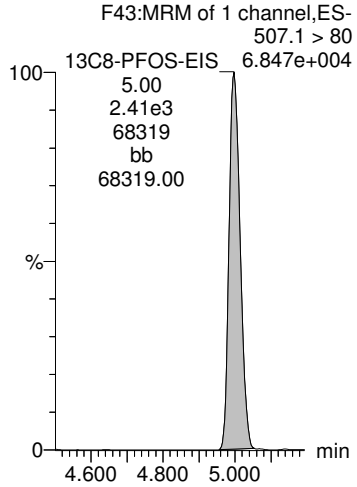

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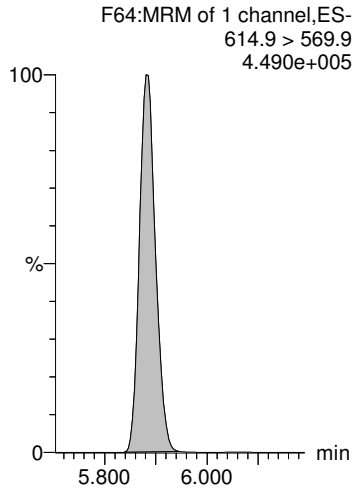

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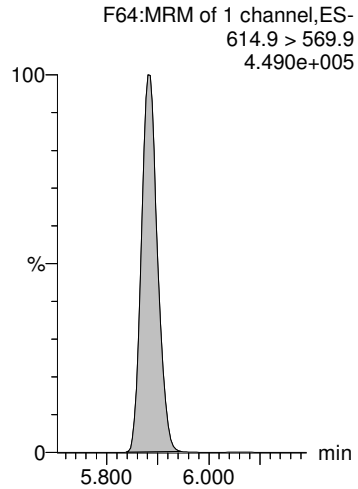
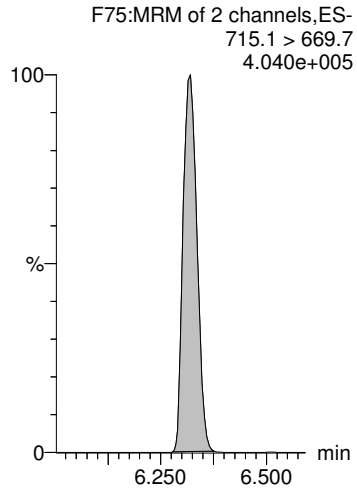


13C2-PFTeDA-EIS



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Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 80	4.268e3	9.972e2	0.254		2.85	2.85	53.5	82.393		2.615	NO
2	7	PFHxA	313.0 > 269.0	1.225e5	9.900e3	0.254		3.37	3.37	155	587.792		16.173	NO
3	9	HFPO-DA	285.1 > 168.9		2.041e3	0.254		3.57						YES
4	11	PFHpA	363.0 > 319	7.698e4	8.686e3	0.254		3.96	3.96	111	339.420		44.800	NO
5	12	ADONA	376.8 > 250.9	7.378e0	8.686e3	0.254		4.06	3.97	0.0106			1.657	NO
6	51	13C3-PFBS-EIS	302.0 > 98.9	9.972e2		0.254	104.004	2.87	2.85	997	37.745	76.7		
7	57	13C2-PFHxA-EIS	315.0 > 270.0	9.900e3		0.254	1090.353	3.38	3.37	9900	35.743	72.6		
8	53	13C3-HFPO-DA-EIS	287.0 > 168.9	2.041e3		0.254	228.261	3.59	3.57	2040	35.196	71.5		
9	59	13C4-PFHpA-EIS	367.2 > 321.8	8.686e3		0.254	983.154	3.98	3.96	8690	34.778	70.7		
10	59	13C4-PFHpA-EIS	367.2 > 321.8	8.686e3		0.254	983.154	3.98	3.96	8690	34.778	70.7		
11	-1													
12	13	L-PFHxS	399 > 79.9	2.253e4	1.898e3	0.254		4.10	4.10	148	535.466		4.280	NO
13	1...	Total PFHxS	399 > 79.9	2.253e4	1.898e3	0.254		3.93		148	535.466			
14	16	L-PFOA	413 > 369	7.307e4	1.023e4	0.254		4.48	4.48	89.3	315.327		3.035	NO
15	1...	Total PFOA	413 > 369	7.307e4	1.023e4	0.254		4.60		89.3	315.327			
16	21	PFNA	463.0 > 418.8	1.218e3	1.076e4	0.254		4.92	4.92	1.41	4.916		11.983	NO
17	61	13C3-PFHxS-EIS	402 > 80	1.898e3		0.254	220.112	4.13	4.10	1900	33.945	69.0		
18	61	13C3-PFHxS-EIS	402 > 80	1.898e3		0.254	220.112	4.13	4.10	1900	33.945	69.0		
19	69	13C2-PFOA-EIS	414.9 > 369.7	1.023e4		0.254	1154.443	4.67	4.48	10200	34.884	70.9		
20	69	13C2-PFOA-EIS	414.9 > 369.7	1.023e4		0.254	1154.443	4.67	4.48	10200	34.884	70.9		
21	65	13C5-PFNA-EIS	468.2 > 422.9	1.076e4		0.254	1213.140	5.13	4.92	10800	34.921	71.0		
22	-1													
23	23	L-PFOS	499 > 80	5.760e3	2.099e3	0.254		4.99	5.00	34.3	106.274		2.861	NO
24	1...	Total PFOS	499> 80	5.760e3	2.099e3	0.254		4.60		34.3	106.274			
25	25	9Cl-PF30NS	531 > 351		2.099e3	0.254		5.21						YES
26	26	PFDA	513 > 469		1.263e4	0.254		5.29						YES
27	33	PFUdA	563.0 > 519		1.191e4	0.254		5.60						YES
28	71	13C8-PFOS-EIS	507.1 > 80	2.099e3		0.254	225.510	5.02	4.99	2100	36.641	74.5		
29	71	13C8-PFOS-EIS	507.1 > 80	2.099e3		0.254	225.510	5.02	4.99	2100	36.641	74.5		
30	71	13C8-PFOS-EIS	507.1 > 80	2.099e3		0.254	225.510	5.02	4.99	2100	36.641	74.5		
31	73	13C2-PFDA-EIS	515.1 > 469.9	1.263e4		0.254	1491.471	5.31	5.29	12600	33.322	67.7		
32	79	13C2-PFUdA-EIS	565 > 519.8	1.191e4		0.254	1581.335	5.54	5.60	11900	29.659	60.3		
33	-1													
34	29	L-MeFOSAA	570 > 419		2.776e3	0.254		5.43						YES
35	1...	Total N-MeFOSAA	570. > 419	0.000e0	2.776e3	0.254		5.19		0.000				
36	31	L-EtFOSAA	583.9 > 419	4.200e1	2.823e3	0.254		5.59	5.59	0.186	0.703		3.640	NO

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Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-61.qld

Last Altered: Wednesday, July 08, 2020 18:39:54 Pacific Daylight Time
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Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	1...	Total N-EtFOSAA	583.9 > 419	4.200e1	2.823e3	0.254		5.37		0.186	0.703			
38	35	11Cl-PF30UdS	631 > 451		1.525e4	0.254		5.81						YES
39	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.776e3		0.254	331.163	5.46	5.43	2780	32.998	67.1		
40	77	d3-N-MeFOSAA-EIS	573.1 > 419	2.776e3		0.254	331.163	5.46	5.43	2780	32.998	67.1		
41	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.823e3		0.254	313.941	5.61	5.59	2820	35.393	71.9		
42	81	d5-N-EtFOSAA-EIS	589.3 > 419	2.823e3		0.254	313.941	5.61	5.59	2820	35.393	71.9		
43	83	13C2-PFDoA-EIS	614.9 > 569.9	1.525e4		0.254	1868.510	6.13	5.88	15300	32.130	65.3		
44	-1													
45	37	PFDoA	612.9 > 569.0		1.525e4	0.254		5.88						YES
46	39	PFTrDA	662.9 > 618.9		1.525e4	0.254		6.15						YES
47	41	PFTeDA	713.0 > 669.0		1.495e4	0.254		6.31						YES
48	1...	TDCA	498.3>106.9			0.254	0.022	4.47						YES
49	71	13C8-PFOS-EIS	507.1 > 80	2.099e3		0.254	225.510	5.02	4.99	2100	36.641	74.5		
50	83	13C2-PFDoA-EIS	614.9 > 569.9	1.525e4		0.254	1868.510	6.13	5.88	15300	32.130	65.3		
51	83	13C2-PFDoA-EIS	614.9 > 569.9	1.525e4		0.254	1868.510	6.13	5.88	15300	32.130	65.3		
52	89	13C2-PFTeDA-EIS	715.1 > 669.7	1.495e4		0.254	1905.823	6.34	6.31	14900	30.875	62.7		

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-61.qld

Last Altered: Wednesday, July 08, 2020 18:39:54 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:40:04 Pacific Daylight Time

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Calibration: P:\PFAS5.pro\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

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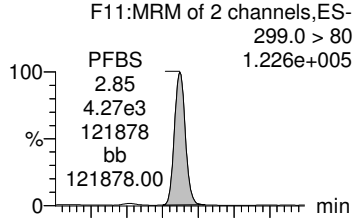

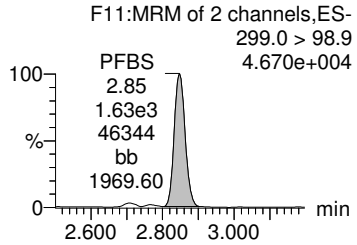

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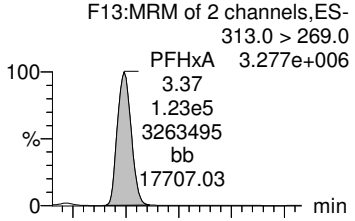

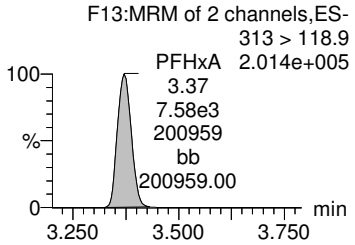

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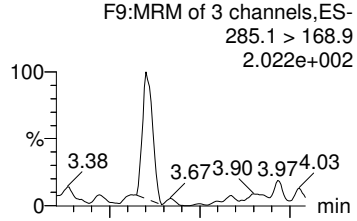

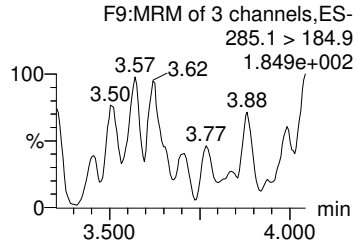

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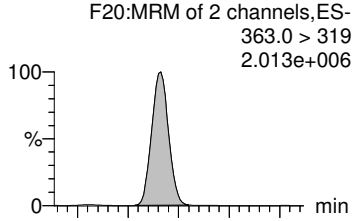

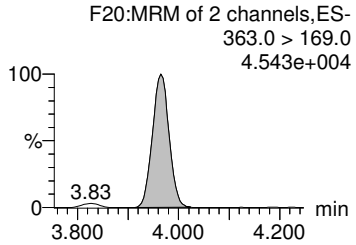

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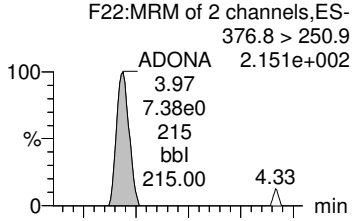
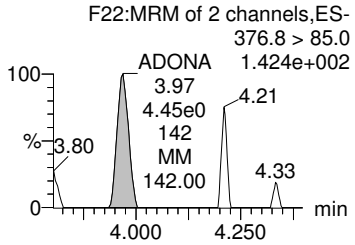
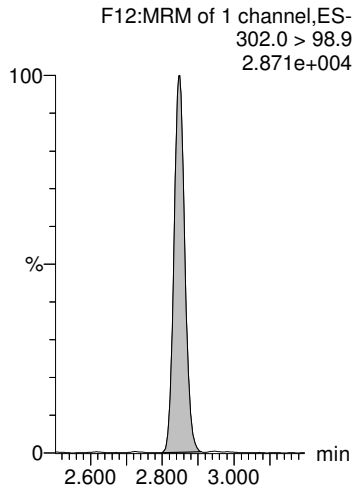




13C3-PFBS-EIS



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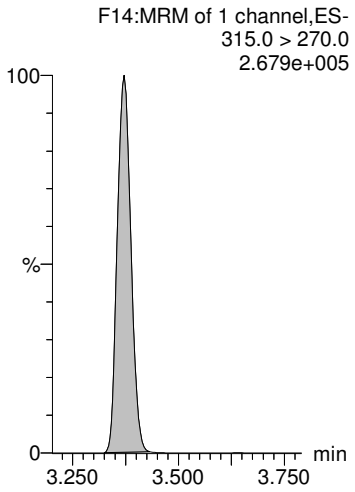

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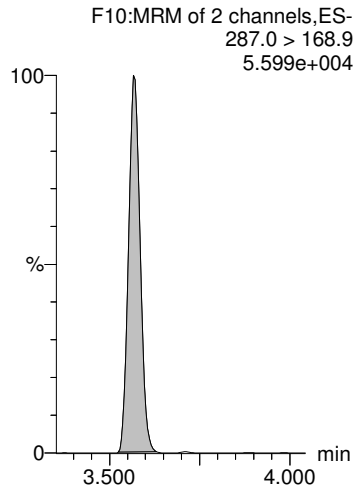

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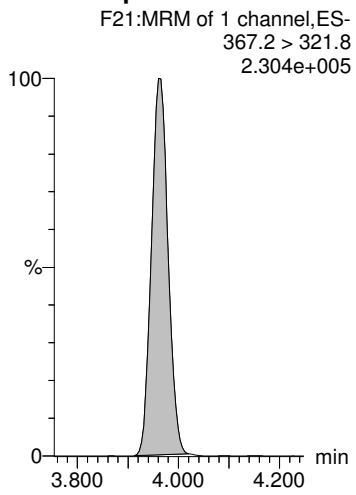

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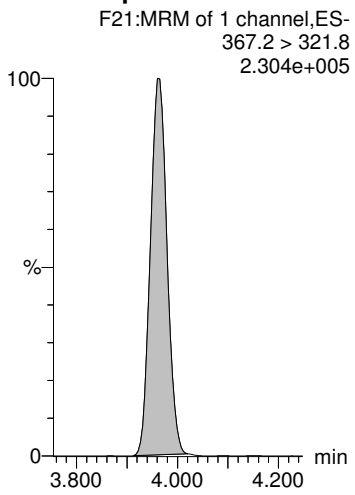

RK 7/8/2020

Dataset: P:\PFAS5.PRO\RESULTS\200706P1\200706P1-61.qld

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Printed: Wednesday, July 08, 2020 18:40:04 Pacific Daylight Time

Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

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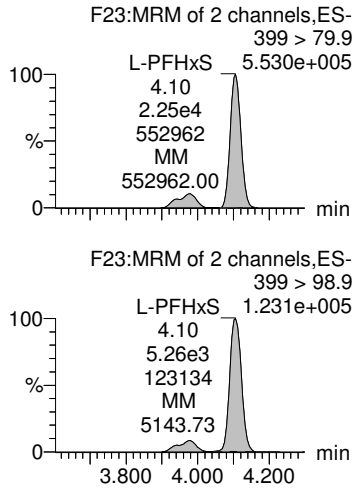

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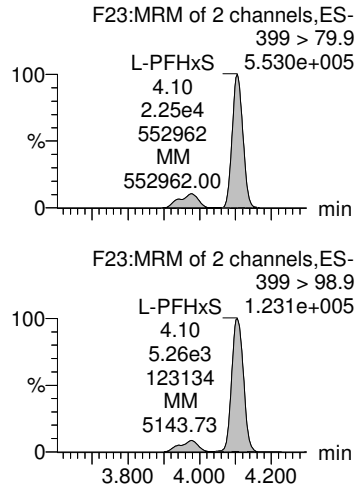
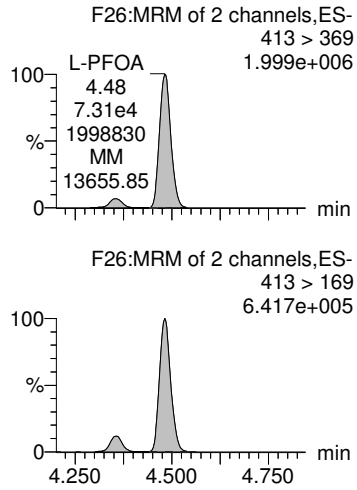


L-PFOA



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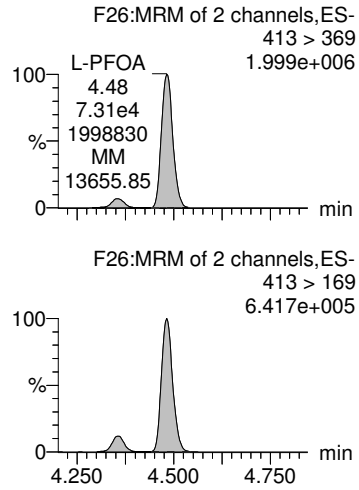

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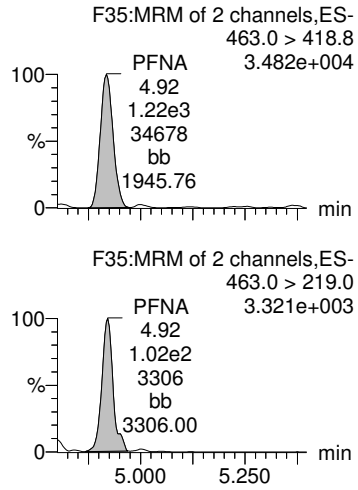

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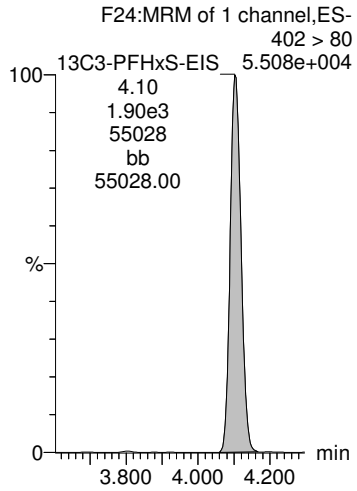

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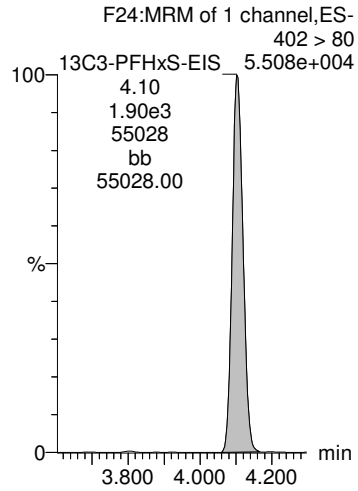

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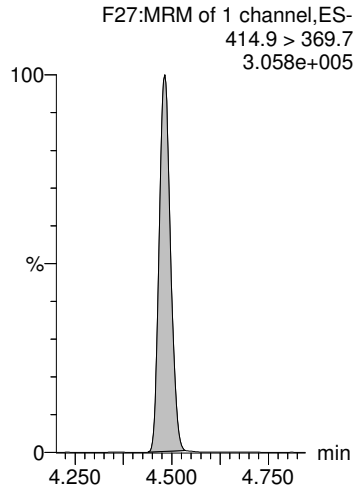

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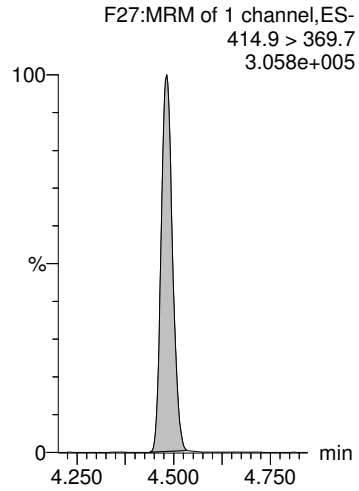

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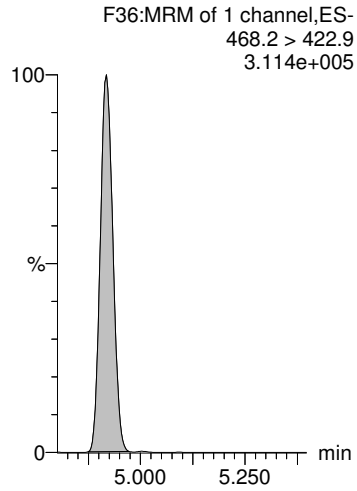

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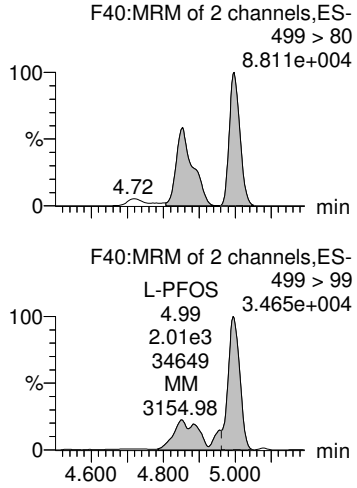
Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

L-PFOS



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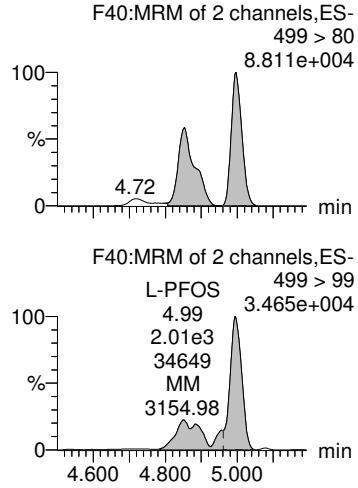
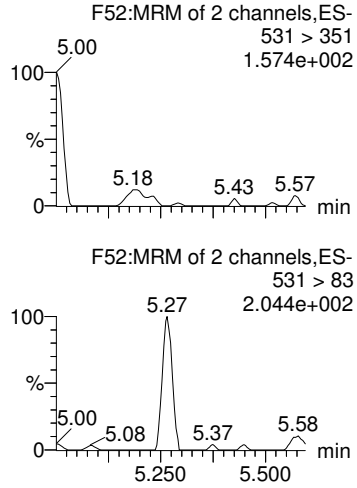


9Cl-PF30NS



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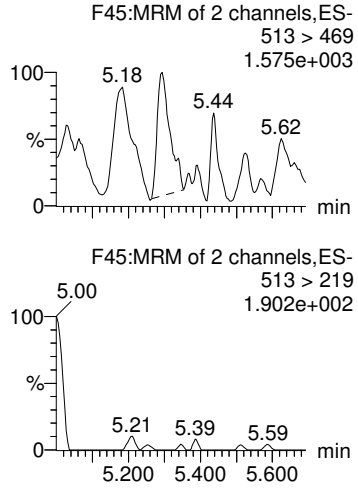

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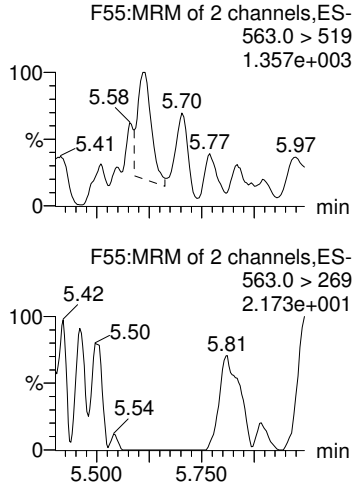

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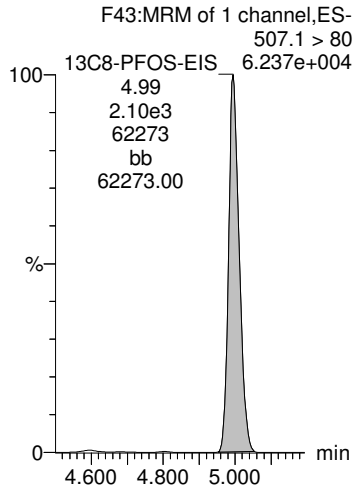

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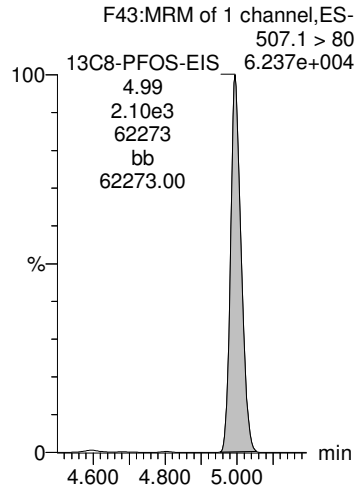

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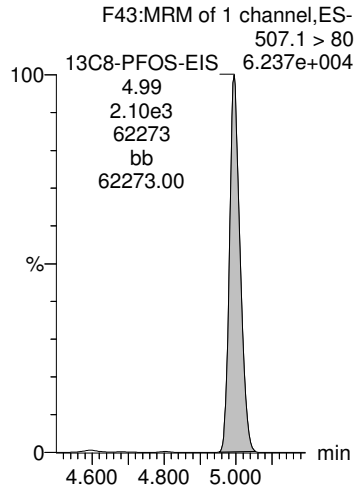

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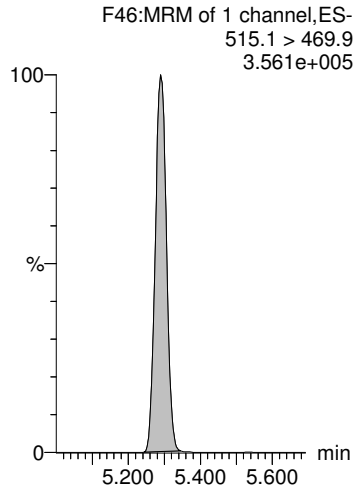

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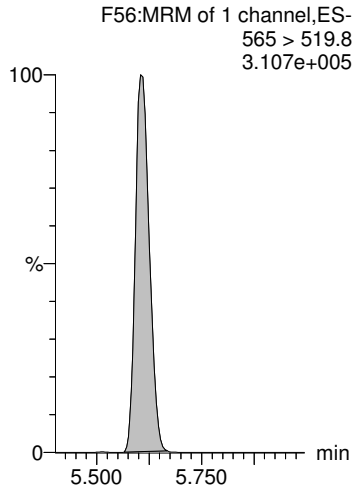

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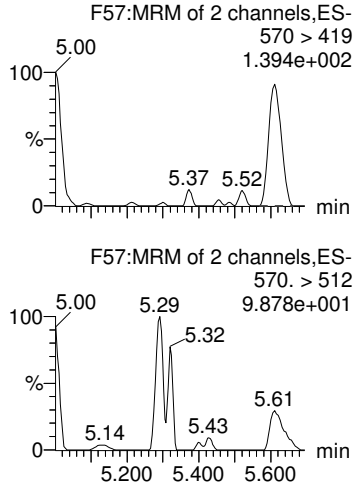
Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

L-MeFOSAA



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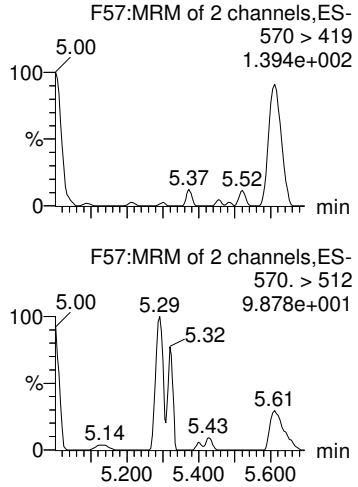

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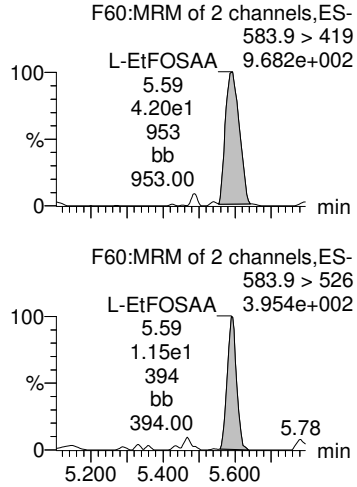

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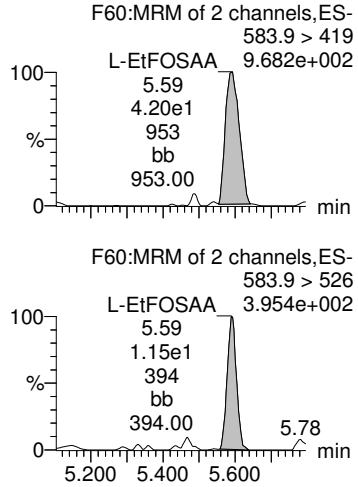
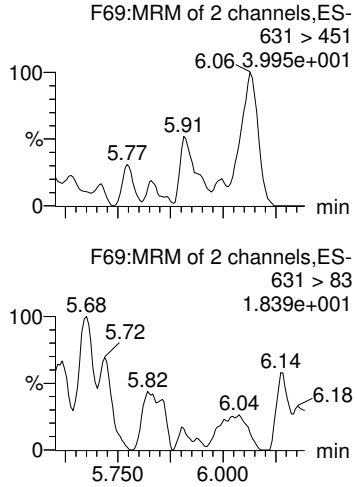


11Cl-PF30UdS



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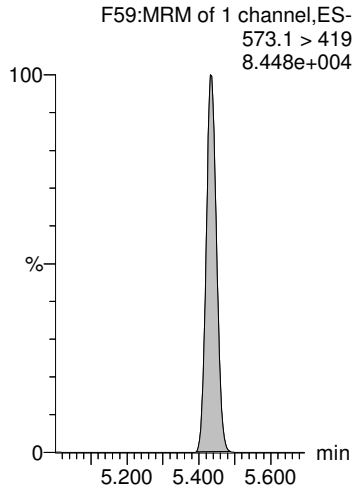

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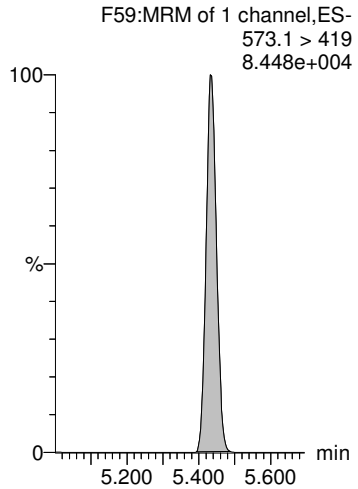

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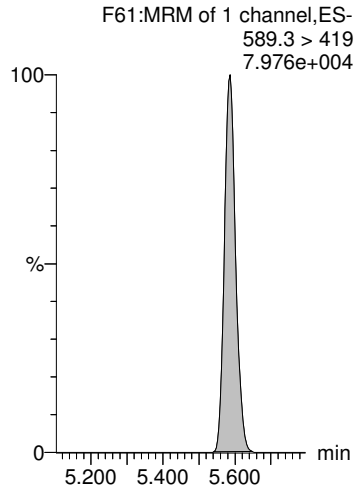

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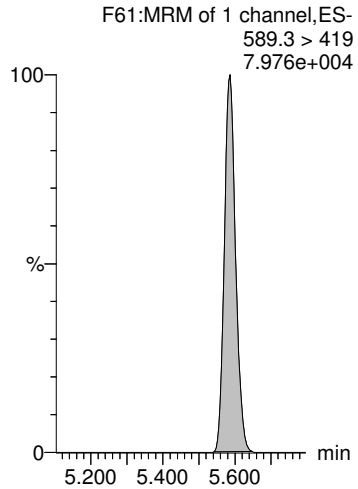

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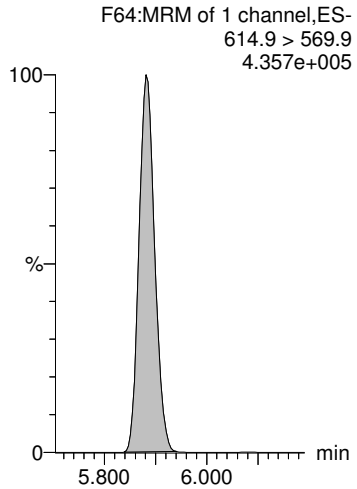

RK 7/8/2020

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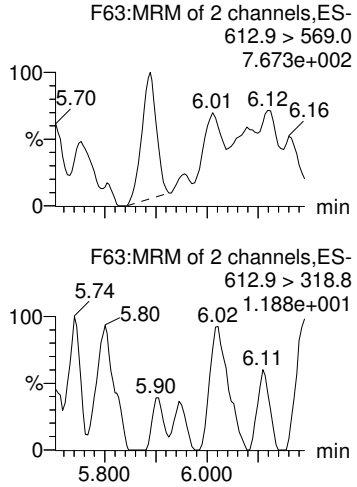
Last Altered: Wednesday, July 08, 2020 18:39:54 Pacific Daylight Time
Printed: Wednesday, July 08, 2020 18:40:04 Pacific Daylight Time

Name: 200706P1-61, Date: 06-Jul-2020, Time: 20:58:53, ID: 2001357-04 DUP01-20200624 0.25403, Description: DUP01-20200624

PFDoA



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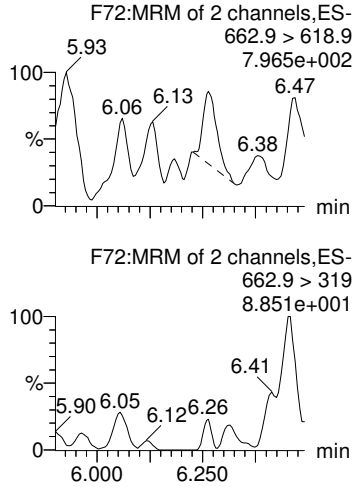

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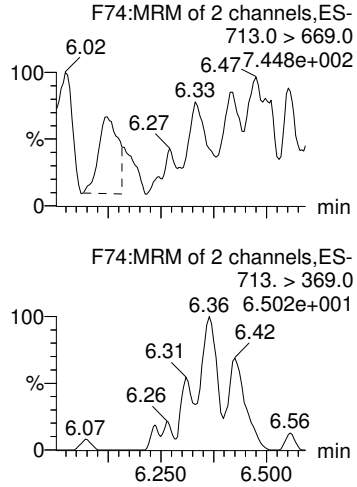

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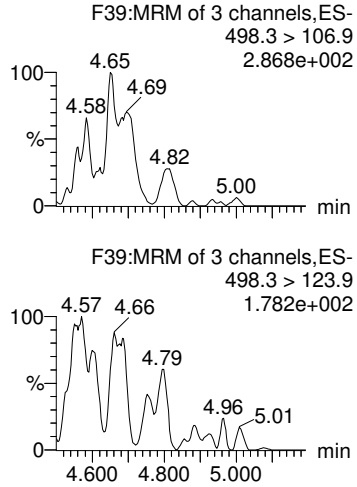

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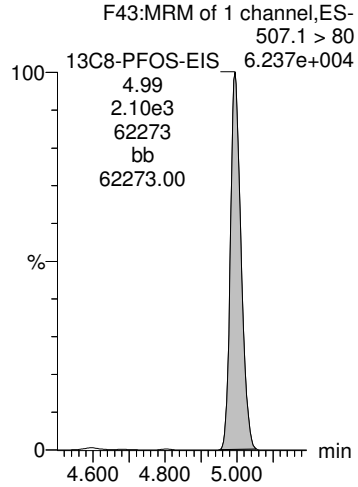

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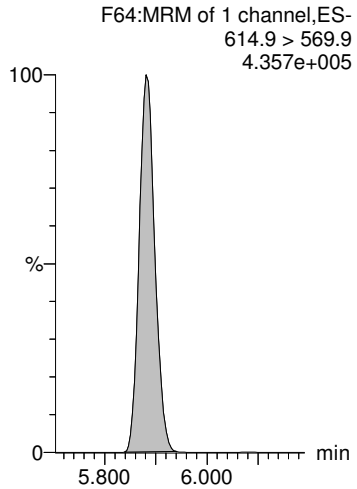

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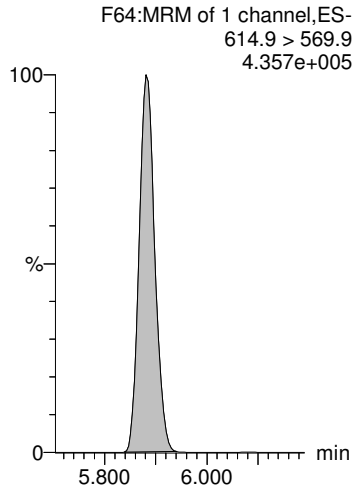

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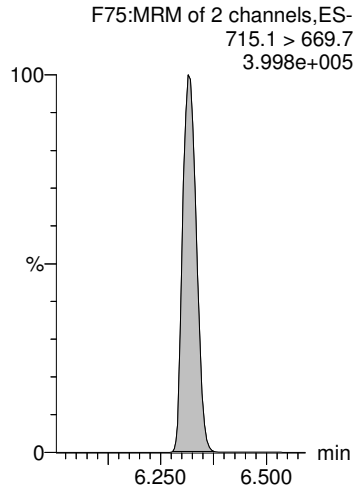

INSTRUMENT BLANKS (IB)

AND

CONTINUTING CALIBRATION VERIFICATIONS (CCV)

Vista Analytical Laboratory

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Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

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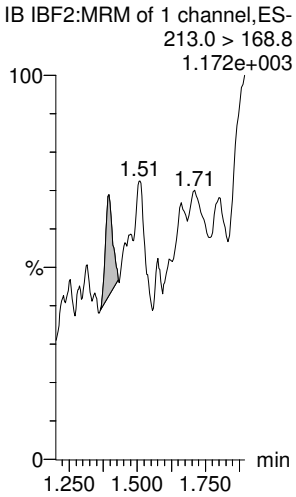

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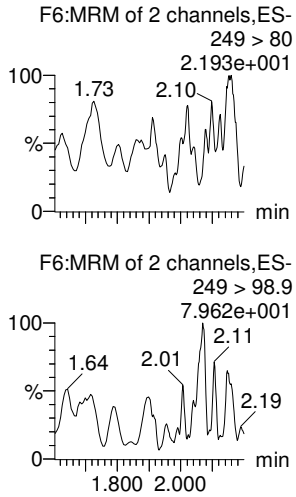

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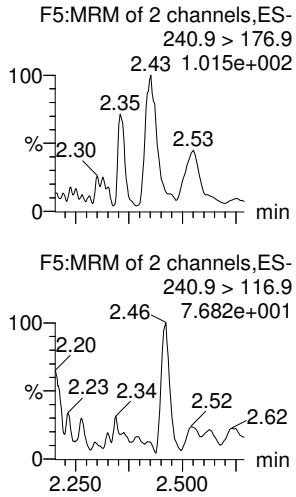
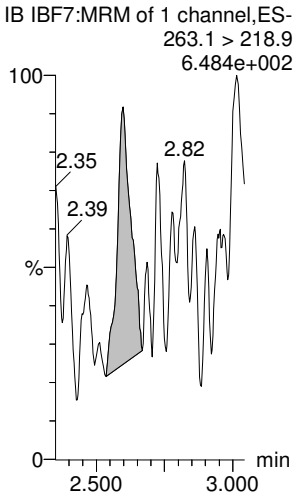


PFPeA



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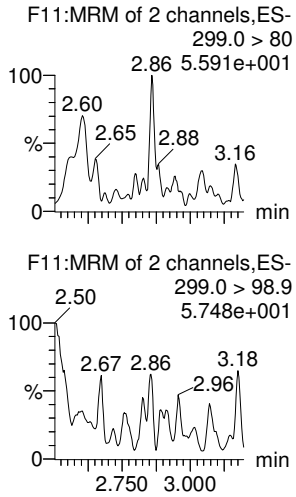

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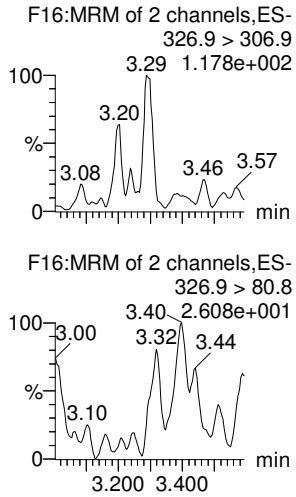
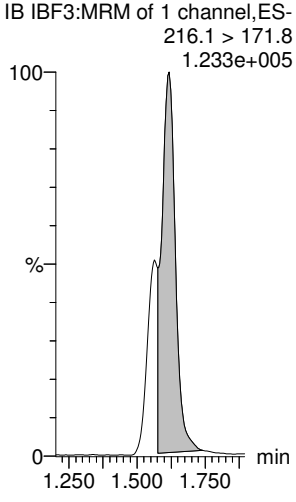


13C3-PFBA-EIS



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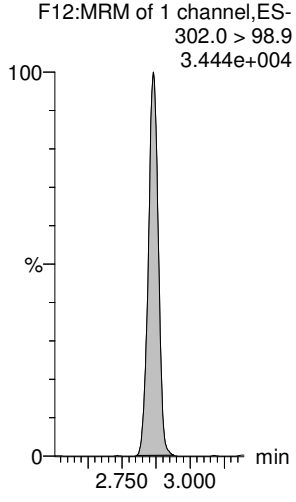

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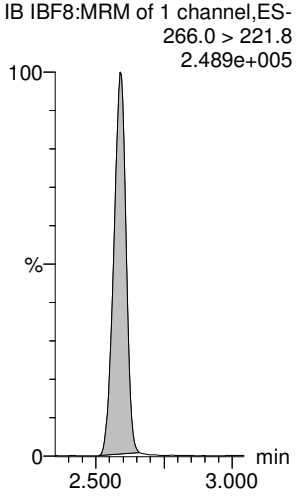

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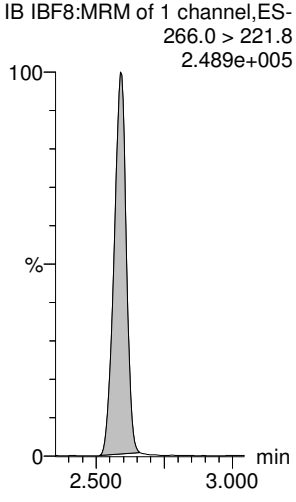

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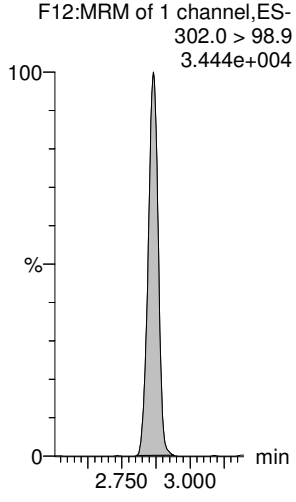

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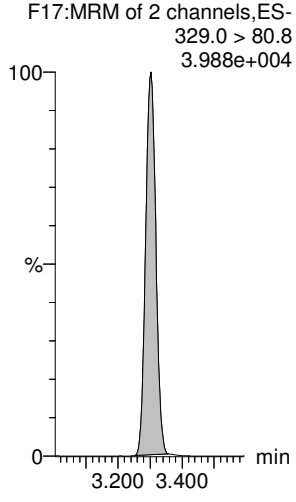

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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

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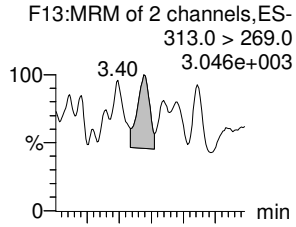

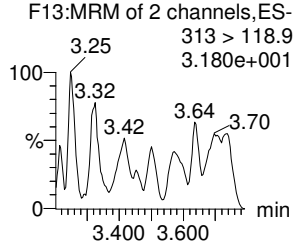

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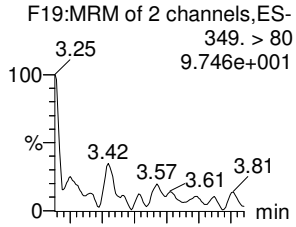
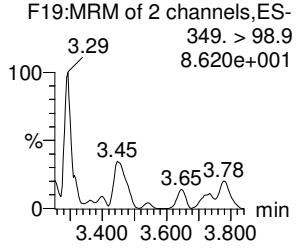
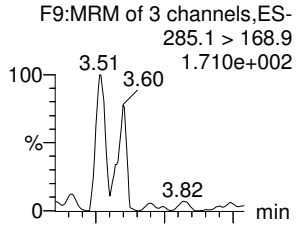
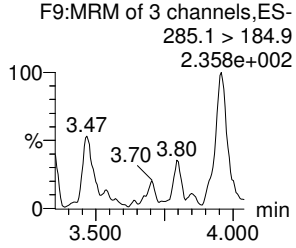


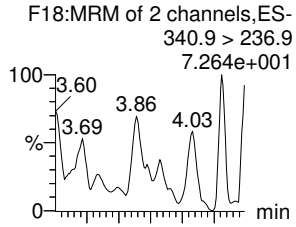


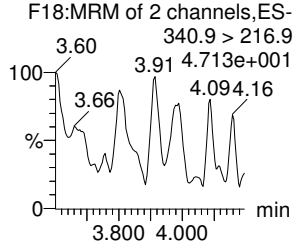
HFPO-DA





5:3 FTCA





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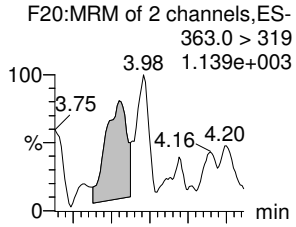

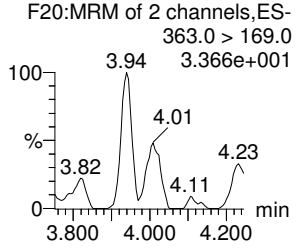

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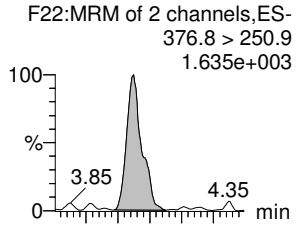

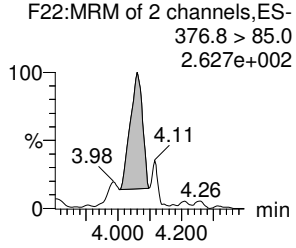

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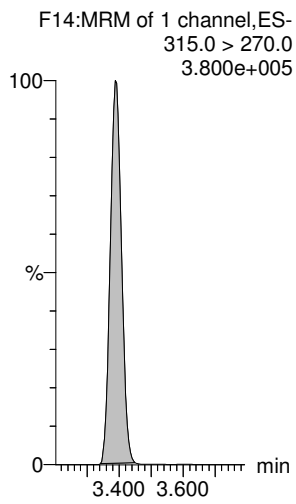

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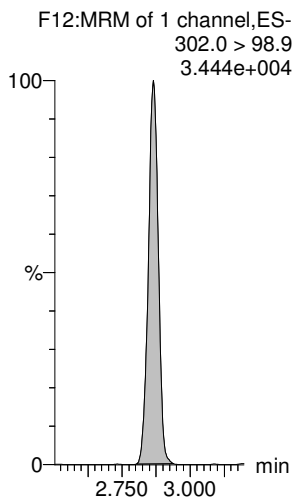

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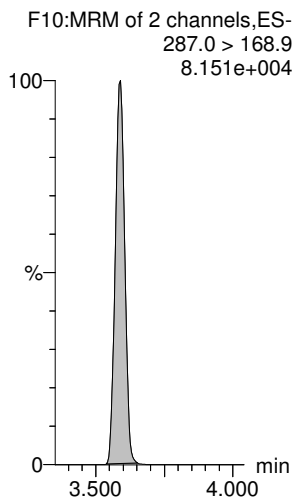
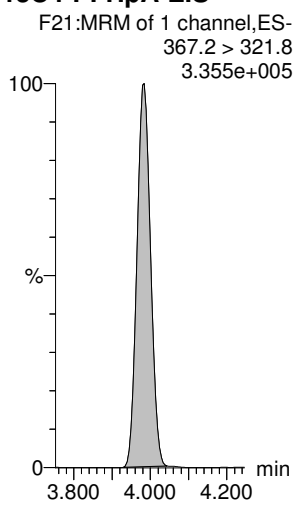


13C4-PFHpA-EIS



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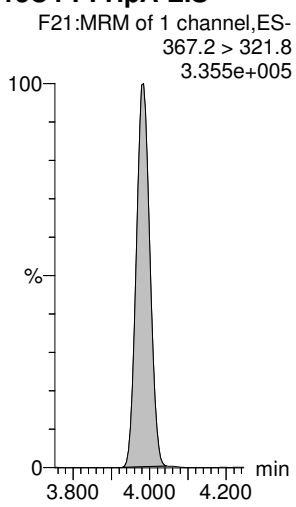

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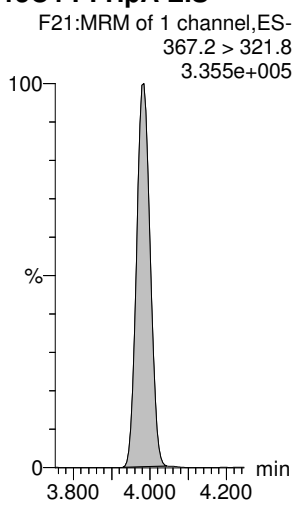

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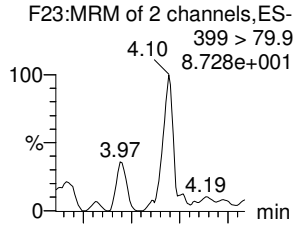
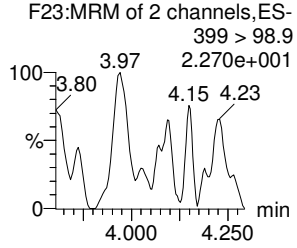
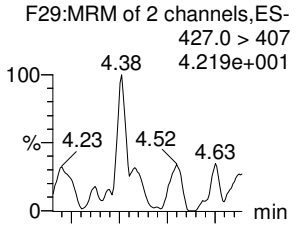
Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

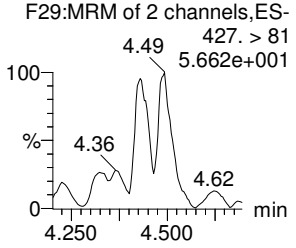
L-PFHxS





6:2 FTS





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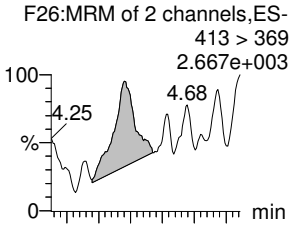

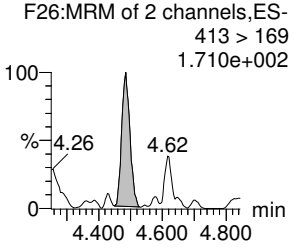

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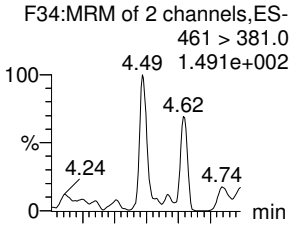

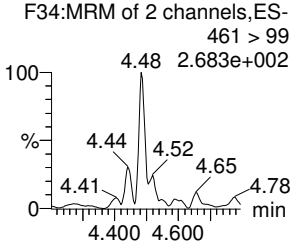

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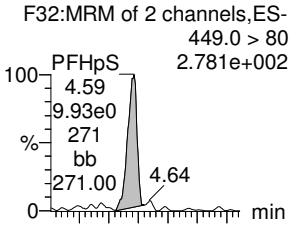

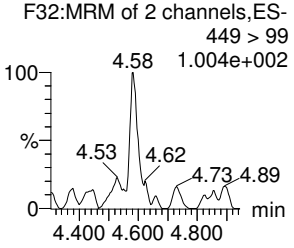

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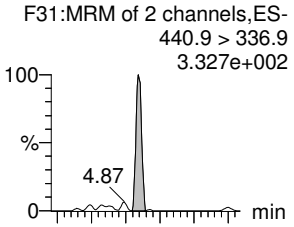
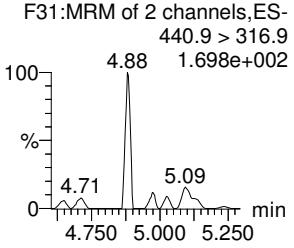
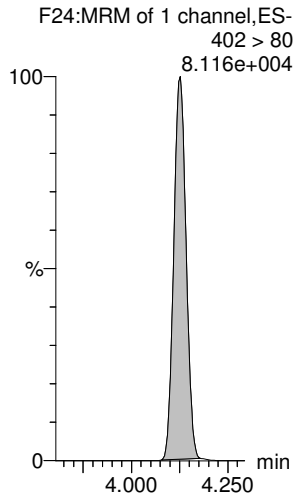




13C3-PFHxS-EIS



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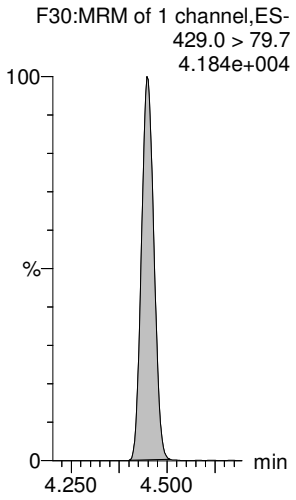

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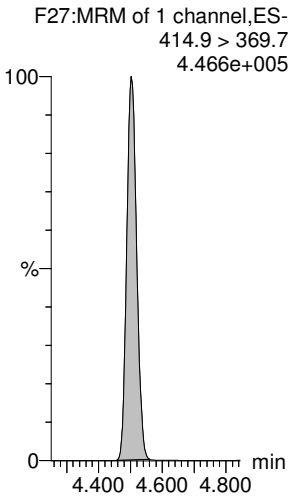

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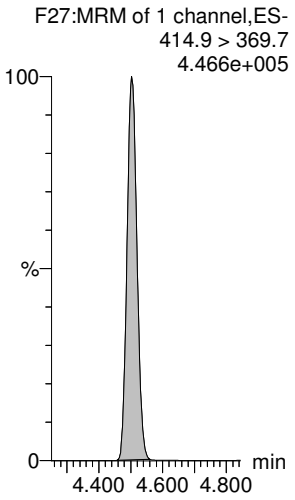

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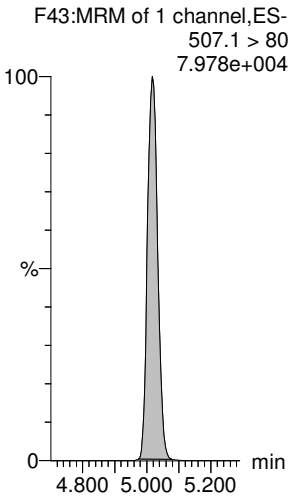

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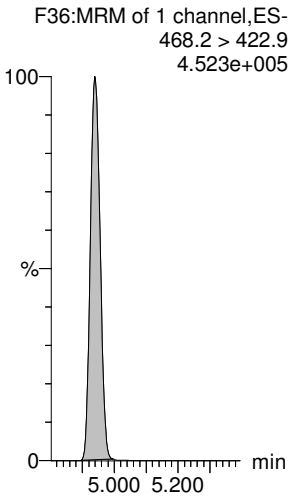

Vista Analytical Laboratory

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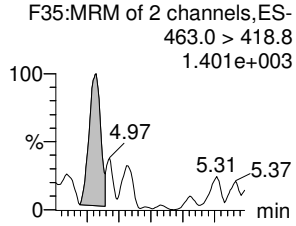

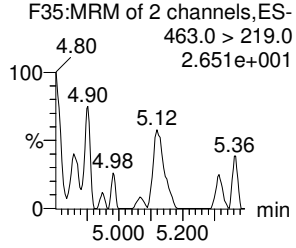

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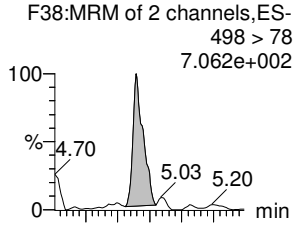
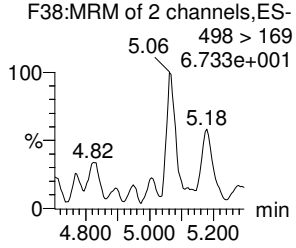
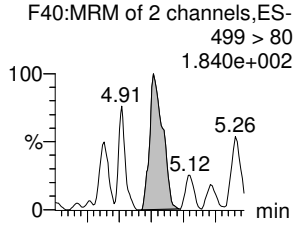
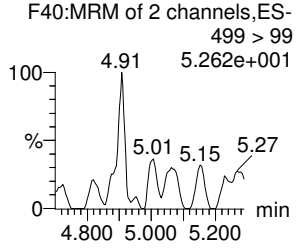




L-PFOS





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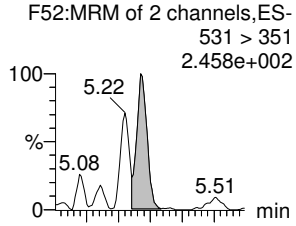

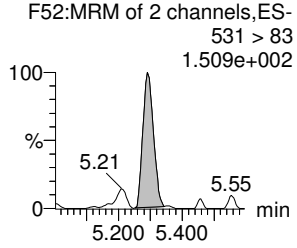

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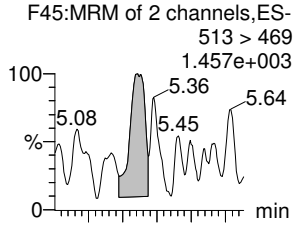
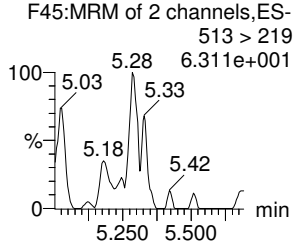
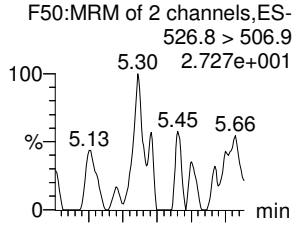
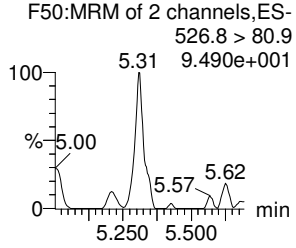


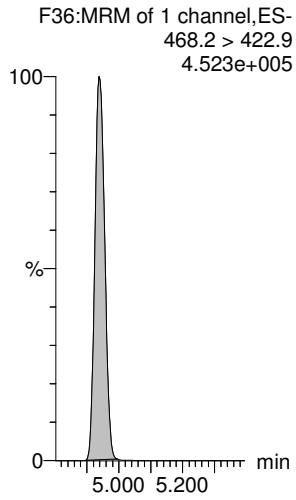


8:2 FTS

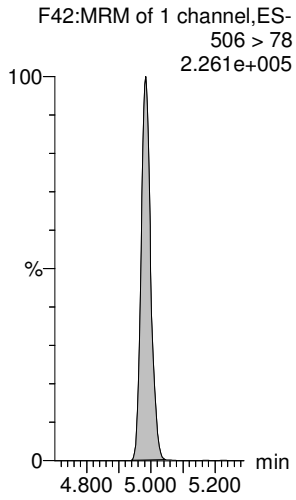




13C5-PFNA-EIS



13C8-PFOSA-EIS



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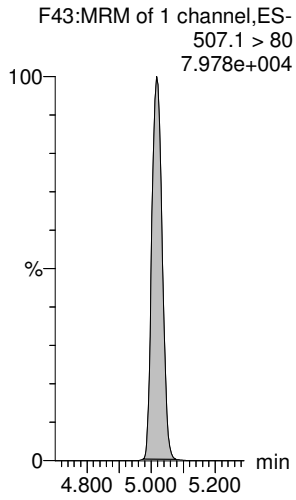

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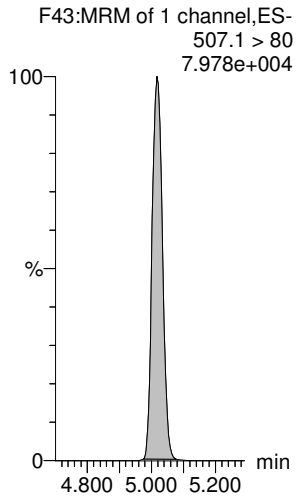

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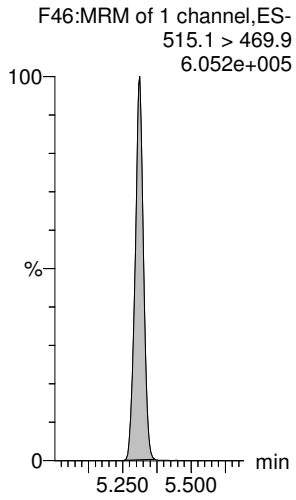
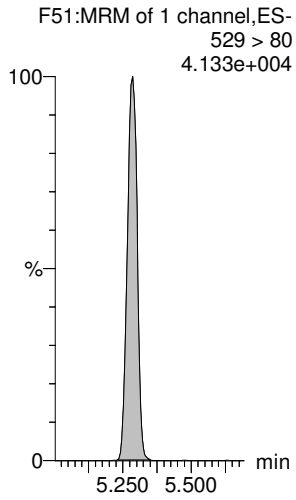


13C2-8:2 FTS-EIS



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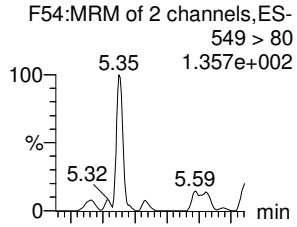
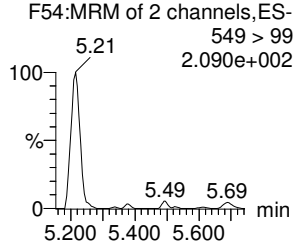
Printed: Tuesday, July 07, 2020 10:17:38 Pacific Daylight Time

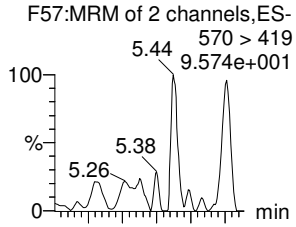
Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

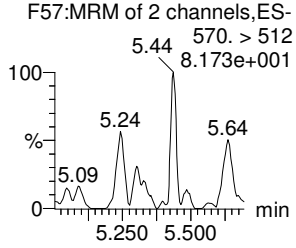
PFNS





L-MeFOSAA





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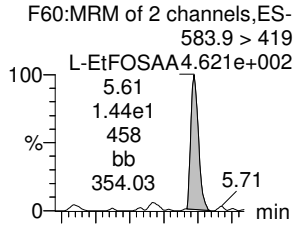

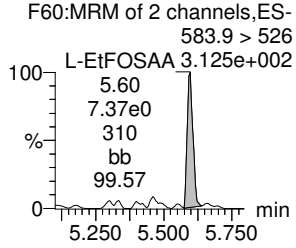

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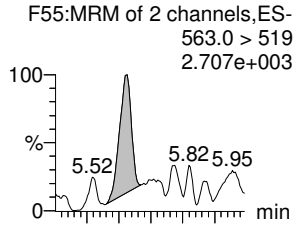

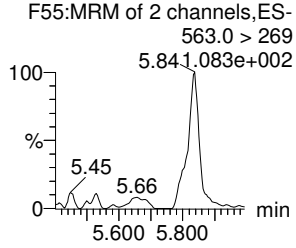

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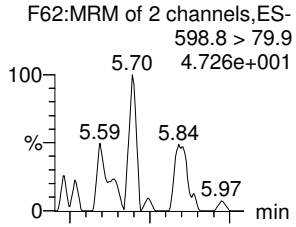

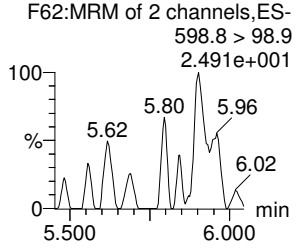

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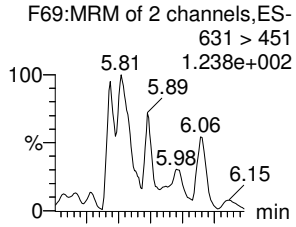
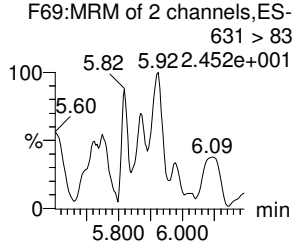
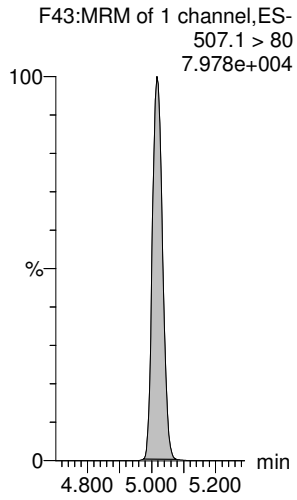
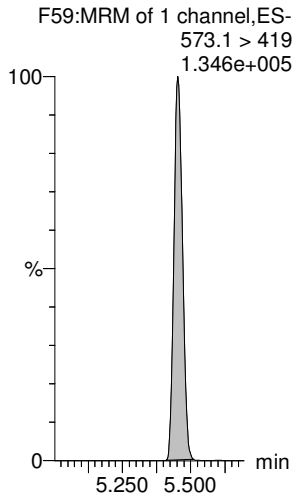




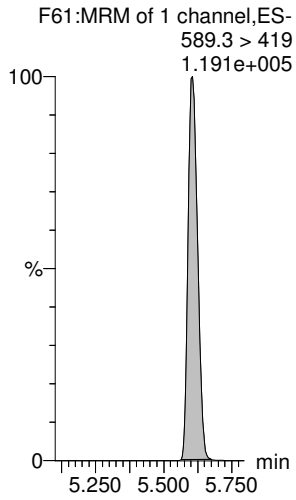
13C8-PFOS-EIS



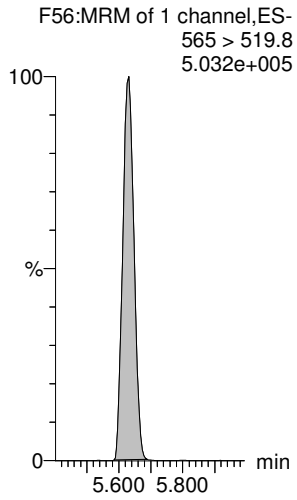
d3-N-MeFOSAA-EIS



d5-N-EtFOSAA-EIS



13C2-PFUdA-EIS



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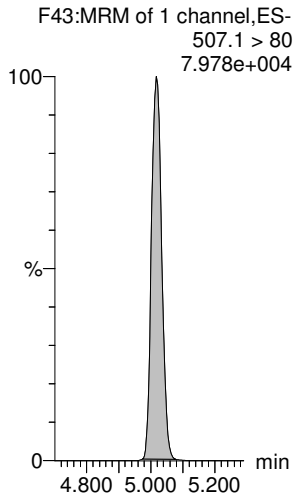

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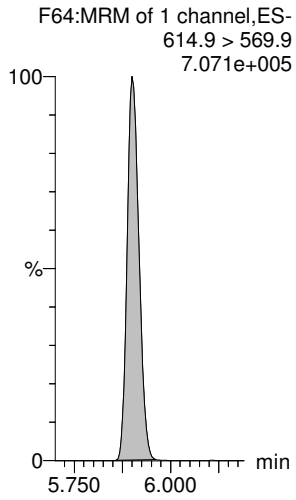

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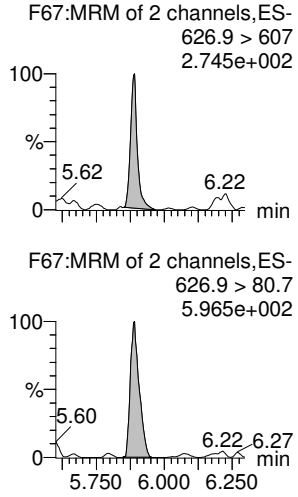
10:2 FTS



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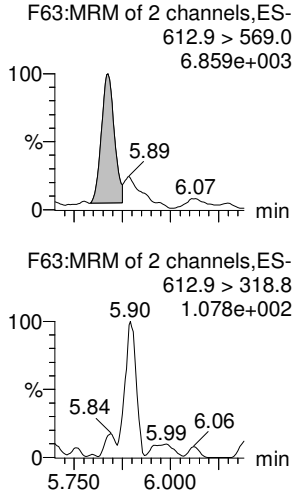

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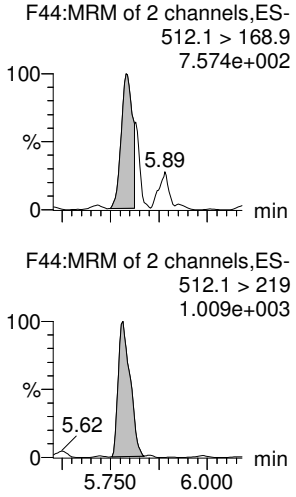

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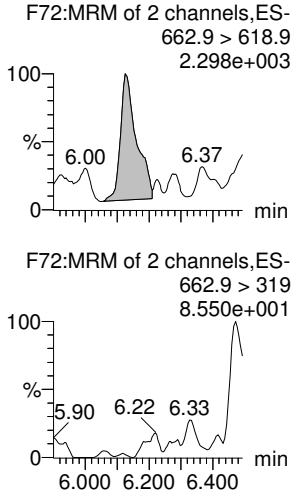

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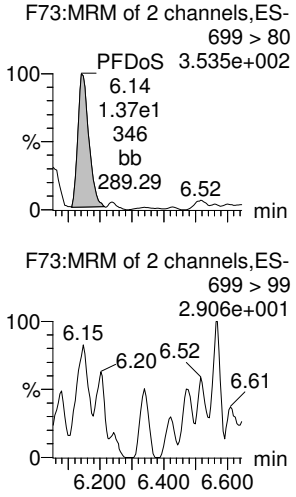

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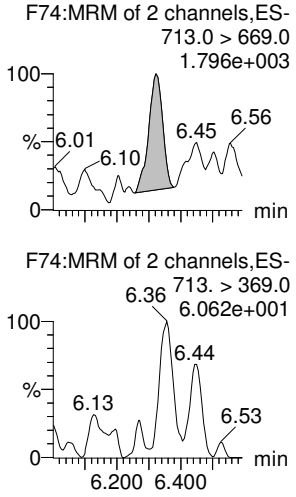
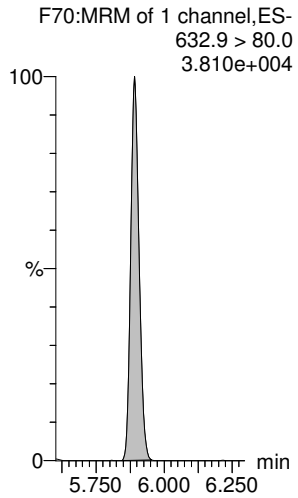
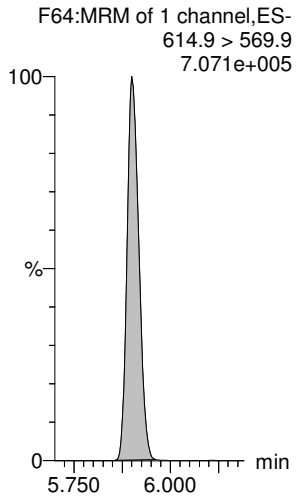


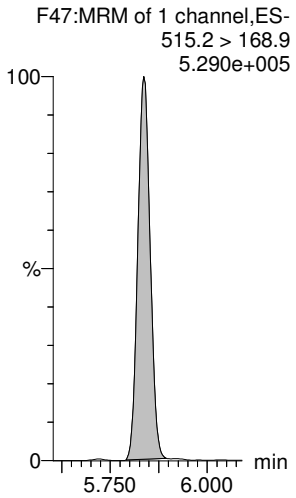
13C2-10:2 FTS-EIS



13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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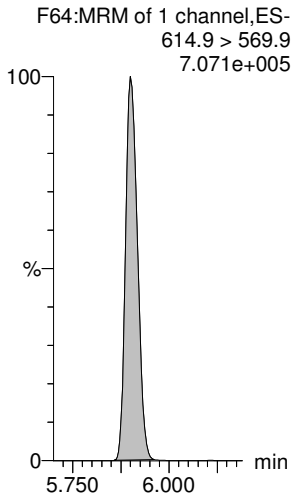

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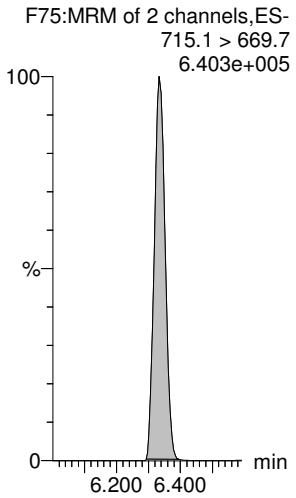

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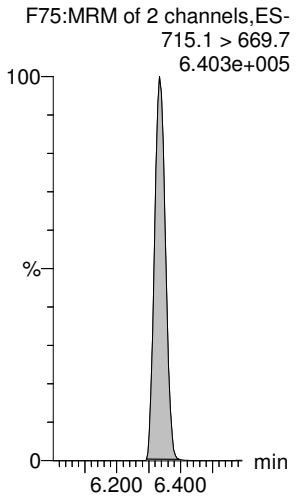

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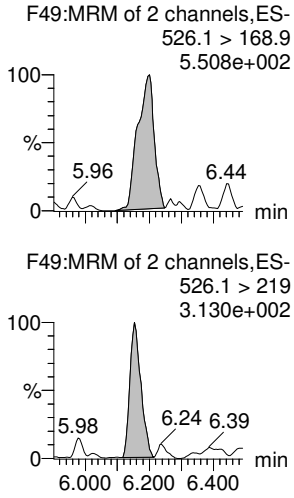
N-EtFOSA



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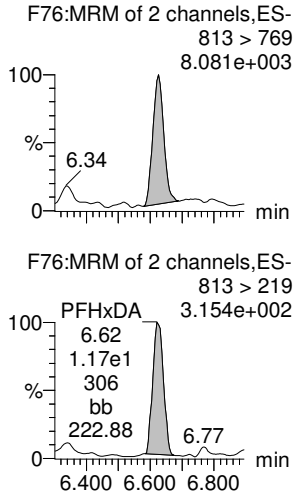

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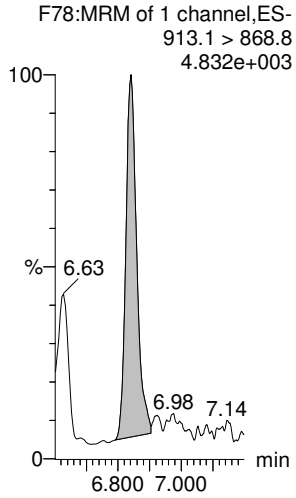
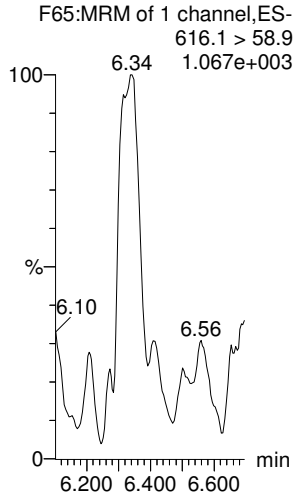


N-MeFOSE



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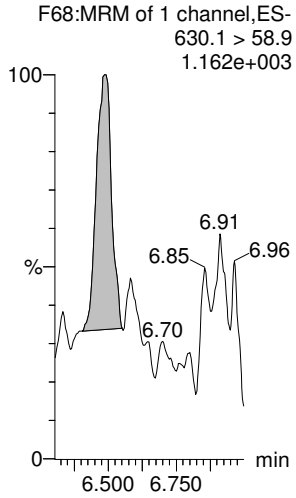

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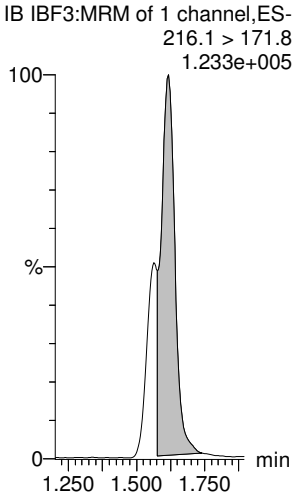
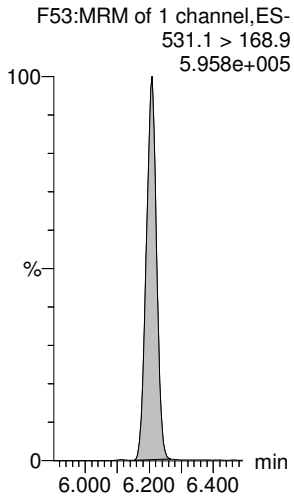


d5-N-ETFOSA-EIS



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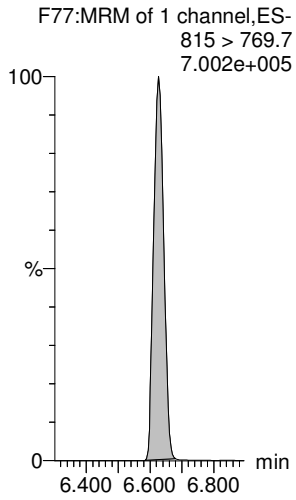

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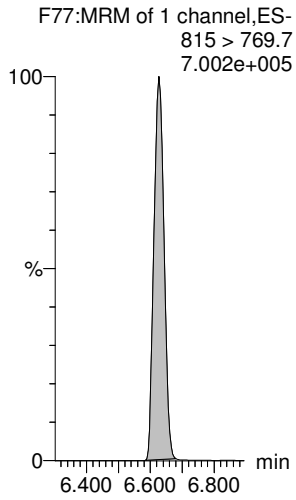
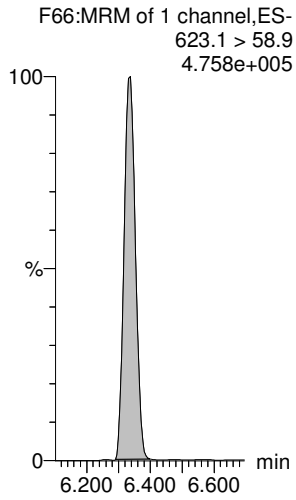
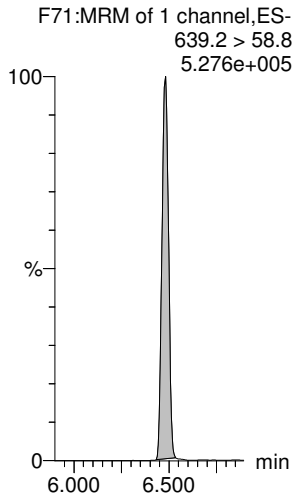


d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



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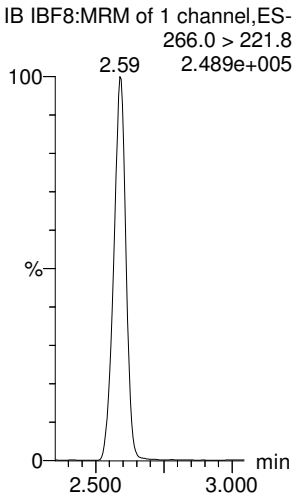

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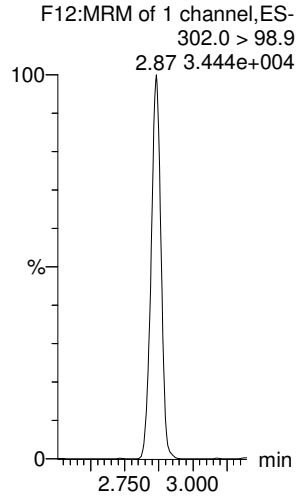
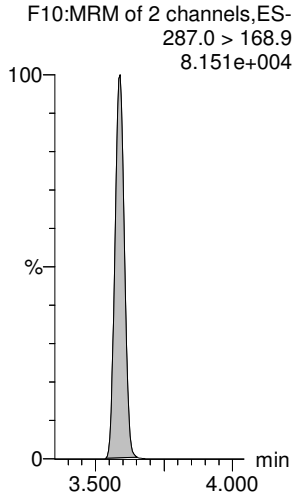
Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

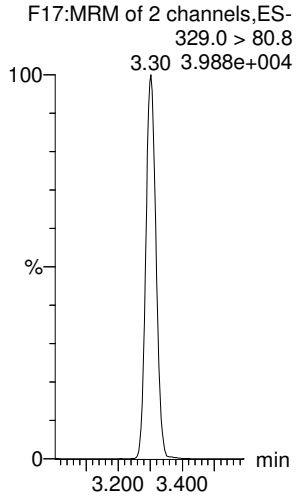
13C3-PFBS-RSD



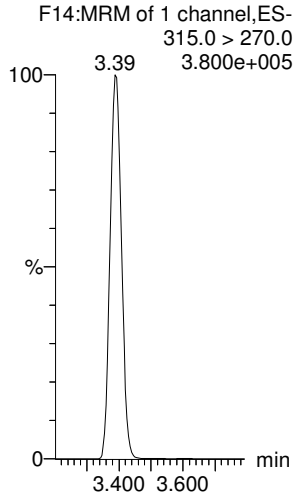
13C3-HFPO-DA-RSD



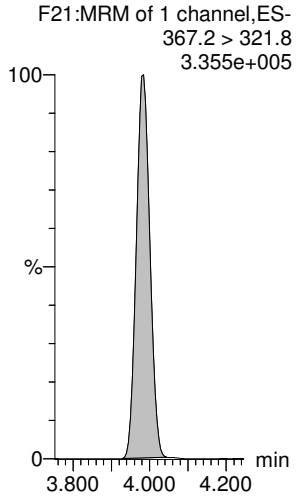
13C2-4:2 FTS-RSD



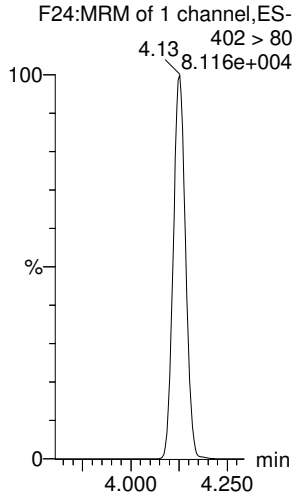
13C2-PFHxA-RSD



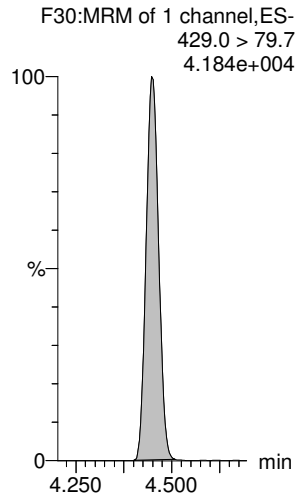
13C4-PFHpA-RSD



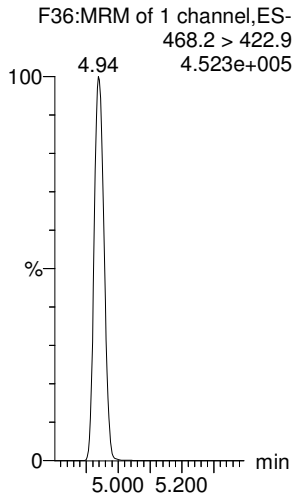
13C3-PFHxS-RSD



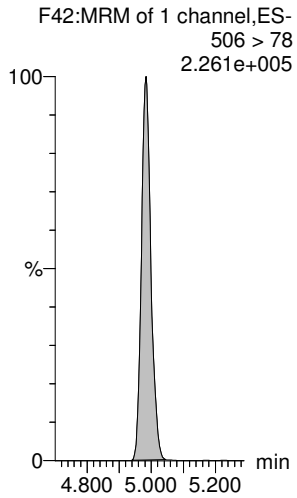
13C2-6:2 FTS-RSD



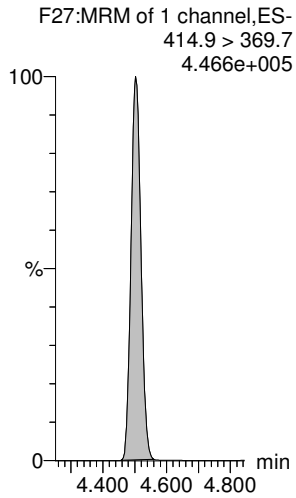
13C5-PFNA-RSD



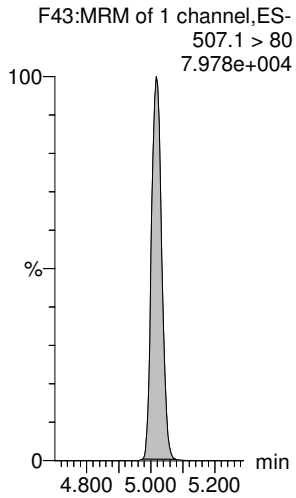
13C8-PFOSA-RSD



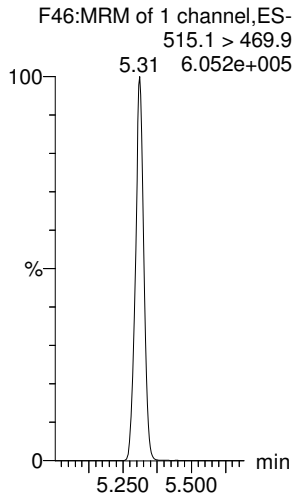
13C2-PFOA-RSD



13C8-PFOS-RSD



13C2-PFDA-RSD



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Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
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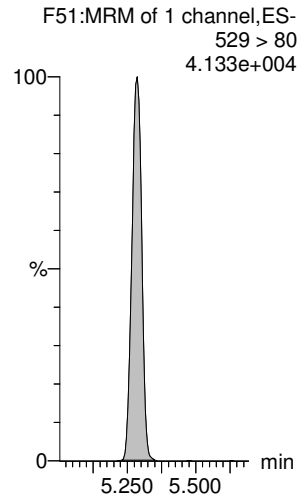
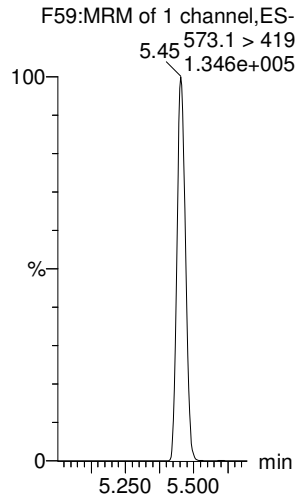
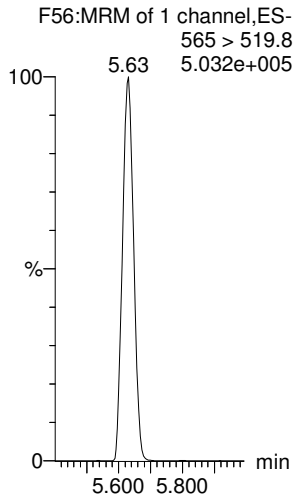
13C2-8:2 FTS-RSD



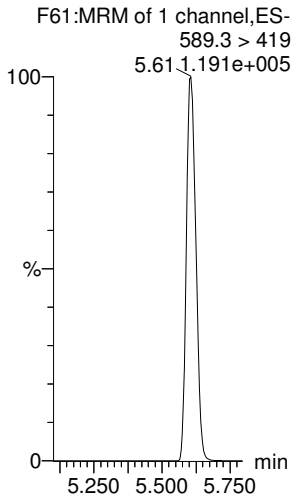
d3-N-MeFOSAA-RSD



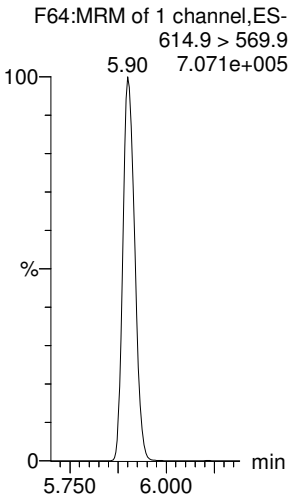
13C2-PFUdA-RSD



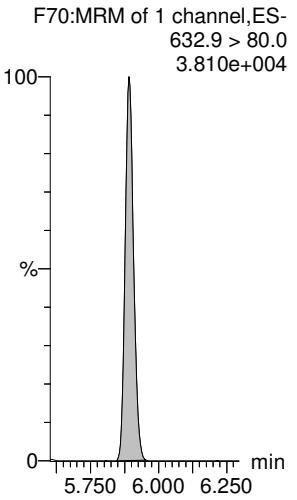
d5-N-EtFOSAA-RSD



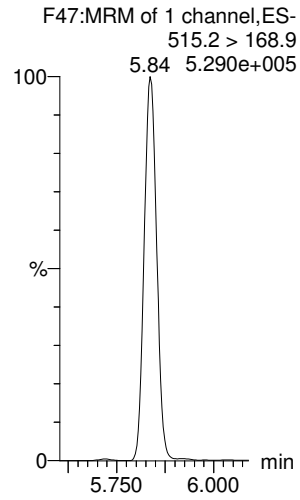
13C2-PFDoA-RSD



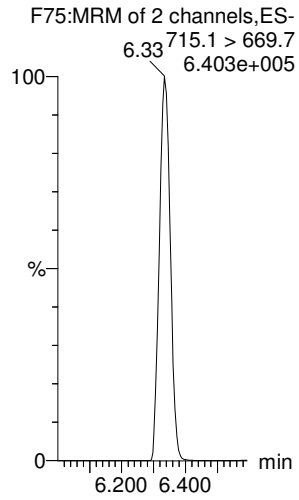
13C2-10:2 FTS-RSD



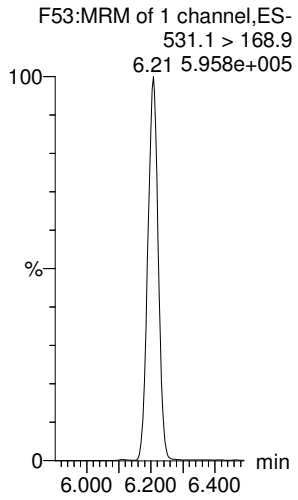
d3-N-MeFOSA-RSD



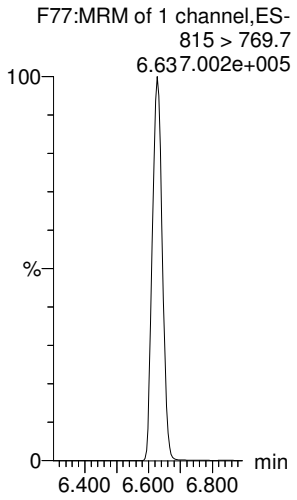
13C2-PFTeDA-RSD



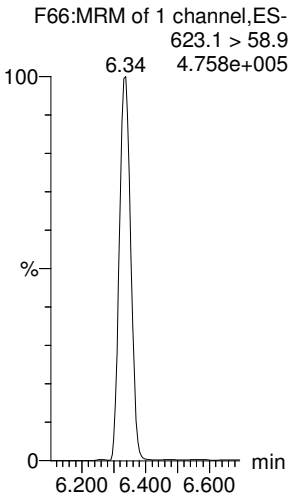
d5-N-ETFOSA-RSD



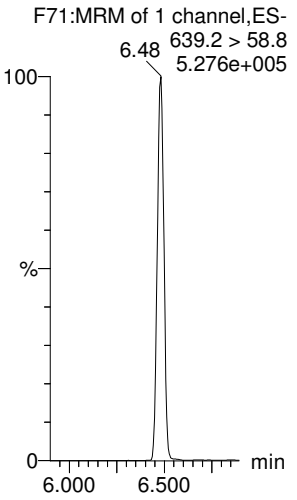
13C2-PFHxDA-RSD



d7-N-MeFOSE-RSD



d9-N-EtFOSE-RSD



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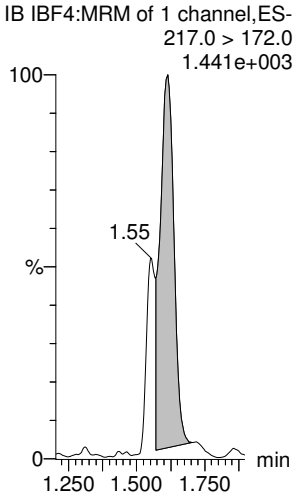
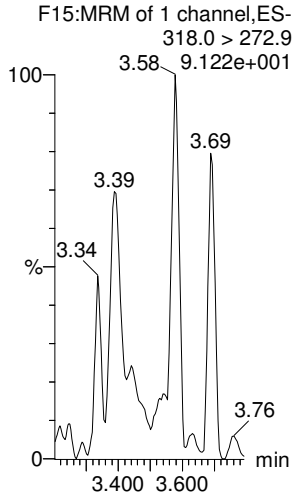
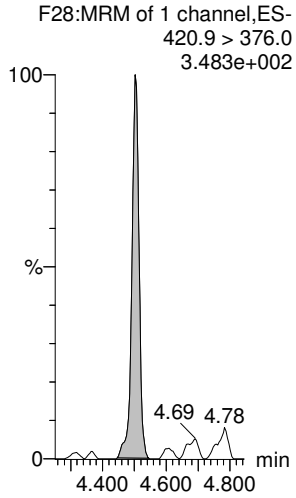
13C4-PFBA



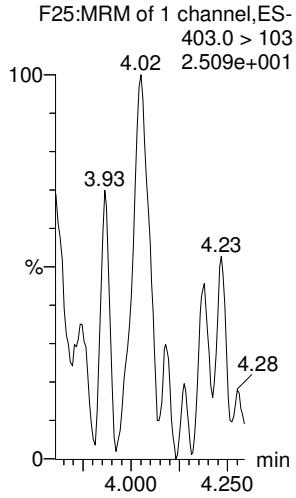
13C5-PFHxA



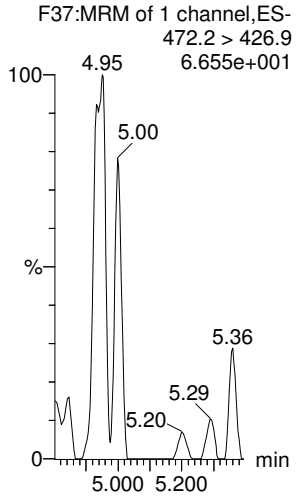
13C8-PFOA



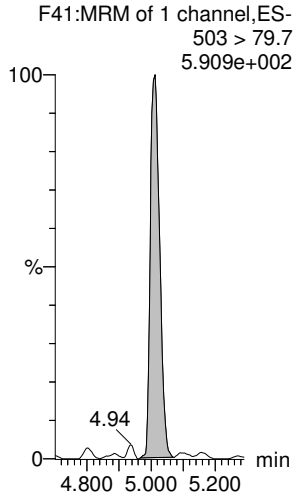
18O2-PFHxS



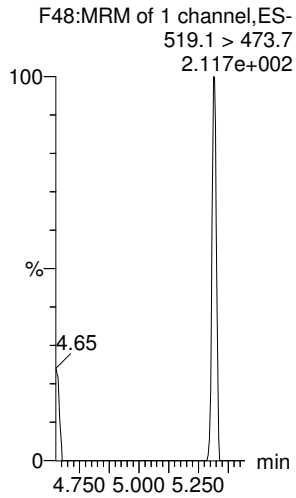
13C9-PFNA



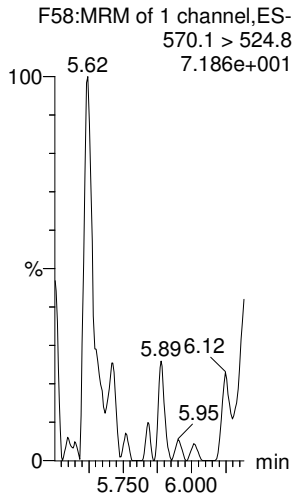
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	9.237	7031.754	1.00	1.40	0.016				NO		
2	2	PFPrS	249 > 80		1445.272	1.00						NO		YES
3	3	3:3 FTCA	240.9 > 176.9		12721.932	1.00						NO		YES
4	4	PFPeA	263.1 > 218.9	25.230	12721.932	1.00	2.60	0.025		0.0220		NO		
5	5	PFBS	299.0 > 80		1445.272	1.00						NO		YES
6	6	4:2 FTS	326.9 > 306.9		1446.075	1.00						NO		YES
7	47	13C3-PFBA-EIS	216.1 > 171.8	7031.754		1.00	1.62	7031.754	12.500	10.2	81.6	NO		
8	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
9	49	13C3-PFPeA-EIS	266.0 > 221.8	12721.932		1.00	2.59	12721.932	12.500	13.2	105.8	NO		
10	49	13C3-PFPeA-EIS	266.0 > 221.8	12721.932		1.00	2.59	12721.932	12.500	13.2	105.8	NO		
11	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
12	55	13C2-4:2 FTS-EIS	329.0 >80.8	1446.075		1.00	3.30	1446.075	12.500	14.3	114.6	NO		
13	-1													
14	7	PFHxA	313.0 > 269.0	72.555	15300.678	1.00	3.48	0.059				NO		YES
15	8	PFPeS	349.>80		1445.272	1.00						NO		YES
16	9	HFPO-DA	285.1 > 168.9		3189.258	1.00						NO		YES
17	10	5:3 FTCA	340.9 > 236.9		13649.274	1.00						NO		YES
18	11	PFHpA	363.0 > 319	52.108	13649.274	1.00	3.92	0.048		0.00883		NO		YES
19	12	ADONA	376.8 > 250.9	88.752	13649.274	1.00	4.05	0.081		0.00188		NO	8.841	YES
20	57	13C2-PFHxA-EIS	315.0 > 270.0	15300.678		1.00	3.39	15300.678	12.500	14.0	112.3	NO		
21	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
22	53	13C3-HFPO-DA-EIS	287.0 > 168.9	3189.258		1.00	3.59	3189.258	12.500	14.0	111.8	NO		
23	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
24	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
25	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
26	-1													
27	13	L-PFHxS	399 > 79.9		2956.690	1.00						NO		YES
28	15	6:2 FTS	427.0 > 407		1567.986	1.00						NO		YES
29	16	L-PFOA	413 > 369	129.786	15770.835	1.00	4.48	0.103		0.0430		NO	25.854	YES
30	18	PFecHS	461 > 381.0		15770.835	1.00						NO		YES
31	19	PFHpS	449.0 > 80	9.934	2919.588	1.00	4.59	0.043		0.0384		NO		YES
32	20	7:3 FTCA	440.9 > 336.9	7.772	16049.925	1.00	4.92	0.006		0.0180		NO		YES
33	61	13C3-PFHxS-EIS	402 > 80	2956.690		1.00	4.13	2956.690	12.500	13.4	107.5	NO		
34	63	13C2-6:2 FTS-EIS	429.0 >79.7	1567.986		1.00	4.45	1567.986	12.500	12.2	97.4	NO		
35	69	13C2-PFOA-EIS	414.9 > 369.7	15770.835		1.00	4.50	15770.835	12.500	13.7	109.3	NO		
36	69	13C2-PFOA-EIS	414.9 > 369.7	15770.835		1.00	4.50	15770.835	12.500	13.7	109.3	NO		

Dataset: Untitled

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	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
38	65	13C5-PFNA-EIS	468.2 > 422.9	16049.925		1.00	4.94	16049.925	12.500	13.2	105.8	NO		
39	-1													
40	21	PFNA	463.0 > 418.8	57.165	16049.925	1.00	4.93	0.045		0.0224		NO		YES
41	22	PFOSA	498 > 78	25.110	7728.135	1.00	4.96	0.041		0.0514		NO		YES
42	23	L-PFOS	499 > 80	8.560	2919.588	1.00	5.01	0.037		0.103		NO		YES
43	25	9Cl-PF30NS	531 > 351	9.123	2919.588	1.00	5.27	0.039		0.00792		NO	1.599	YES
44	26	PFDA	513 > 469	85.108	21328.793	1.00	5.30	0.050		0.00680		NO		YES
45	27	8:2 FTS	526.8 > 506.9		1698.056	1.00						NO		YES
46	65	13C5-PFNA-EIS	468.2 > 422.9	16049.925		1.00	4.94	16049.925	12.500	13.2	105.8	NO		
47	67	13C8-PFOSA-EIS	506 > 78	7728.135		1.00	4.98	7728.135	12.500	13.5	108.2	NO		
48	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
49	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
50	73	13C2-PFDA-EIS	515.1 > 469.9	21328.793		1.00	5.31	21328.793	12.500	14.3	114.4	NO		
51	75	13C2-8:2 FTS-EIS	529 > 80	1698.056		1.00	5.29	1698.056	12.500	15.4	123.1	NO		
52	-1													
53	28	PFNS	549 > 80		2919.588	1.00						NO		YES
54	29	L-MeFOSAA	570 > 419		4765.928	1.00						NO		YES
55	31	L-EtFOSAA	583.9 > 419	14.370	4706.535	1.00	5.61	0.038		0.0729		NO	1.950	NO
56	33	PFUdA	563.0 > 519	100.840	20308.568	1.00	5.63	0.062		0.0393		NO		YES
57	34	PFDS	598.8 >79.9		2919.588	1.00						NO		YES
58	35	11Cl-PF30UdS	631 > 451		24925.619	1.00						NO		YES
59	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
60	77	d3-N-MeFOSAA-EIS	573.1 > 419	4765.928		1.00	5.45	4765.928	12.500	14.4	115.1	NO		
61	81	d5-N-EtFOSAA-EIS	589.3 > 419	4706.535		1.00	5.61	4706.535	12.500	15.0	119.9	NO		
62	79	13C2-PFUdA-EIS	565 > 519.8	20308.568		1.00	5.63	20308.568	12.500	12.8	102.7	NO		
63	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
64	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
65	-1													
66	36	10:2 FTS	626.9 > 607	7.920	1352.273	1.00	5.89	0.073				NO	0.352	NO
67	37	PFDoA	612.9 > 569.0	251.215	24925.619	1.00	5.84	0.126		0.123		NO		YES
68	38	N-MeFOSA	512.1 > 168.9	24.563	19283.832	1.00	5.79	0.190		0.115		NO	0.693	YES
69	39	PFTrDA	662.9 > 618.9	124.413	24925.619	1.00	6.13	0.062		0.0581		NO		YES
70	40	PFDoS	699 > 80	13.725	24932.619	1.00	6.14	0.007		0.0634		NO		YES
71	41	PFTeDA	713.0 > 669.0	77.320	24932.619	1.00	6.32	0.039				NO		YES
72	85	13C2-10:2 FTS-EIS	632.9 > 80.0	1352.273		1.00	5.89	1352.273	12.500	12.4	99.6	NO		

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
74	87	d3-N-MeFOSA-EIS	515.2 > 168.9	19283.832		1.00	5.84	19283.832	149.200	139	93.4	NO		
75	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
76	89	13C2-PFTeDA-EIS	715.1 > 669.7	24932.619		1.00	6.33	24932.619	12.500	13.1	104.7	NO		
77	89	13C2-PFTeDA-EIS	715.1 > 669.7	24932.619		1.00	6.33	24932.619	12.500	13.1	104.7	NO		
78	-1													
79	42	N-EtFOSA	526.1 > 168.9	32.074	22029.455	1.00	6.20	0.217		0.279		NO	2.593	NO
80	43	PFHxDA	813 > 769	298.843	25212.395	1.00	6.63	0.148				NO	25.568	NO
81	44	PFODA	913.1 > 868.8	179.740	25212.395	1.00	6.84	0.089		0.0930		NO		
82	45	N-MeFOSE	616.1 > 58.9		19306.602	1.00						NO		
83	46	N-EtFOSE	630.1 > 58.9	49.654	20422.244	1.00	6.49	0.363		0.0274		NO		
84	48	13C3-PFBA-RSD	216.1 > 171.8	7031.754	81.232	1.00	1.62	1082.048	12.500	1270	10132.7	YES		
85	91	d5-N-ETFOSA-EIS	531.1 > 168.9	22029.455		1.00	6.21	22029.455	149.200	142	95.1	NO		
86	93	13C2-PFHxDA-EIS	815 > 769.7	25212.395		1.00	6.63	25212.395	12.500	12.0	95.6	NO		
87	93	13C2-PFHxDA-EIS	815 > 769.7	25212.395		1.00	6.63	25212.395	12.500	12.0	95.6	NO		
88	95	d7-N-MeFOSE-EIS	623.1 > 58.9	19306.602		1.00	6.34	19306.602	149.200	143	96.0	NO		
89	97	d9-N-EtFOSE-EIS	639.2 > 58.8	20422.244		1.00	6.48	20422.244	149.200	137	92.0	NO		
90	50	13C3-PFPeA-RSD	266.0 > 221.8			1.00			12.500			NO		
91	-1													
92	52	13C3-PFBS-RSD	302.0 > 98.9			1.00			12.500			NO		
93	54	13C3-HFPO-DA-RSD	287.0 > 168.9	3189.258		1.00	3.59		12.500			NO		
94	56	13C2-4:2 FTS-RSD	329.0 >80.8			1.00			12.500			NO		
95	58	13C2-PFHxA-RSD	315.0 > 270.0			1.00			12.500			NO		
96	60	13C4-PFHpA-RSD	367.2 > 321.8	13649.274		1.00	3.98		12.500			NO		
97	62	13C3-PFHxS-RSD	402 > 80			1.00			12.500			NO		
98	64	13C2-6:2 FTS-RSD	429.0 >79.7	1567.986	19.889	1.00	4.45	985.461	12.500	2080	16676.0	YES		
99	66	13C5-PFNA-RSD	468.2 > 422.9			1.00			12.500			NO		
100	68	13C8-PFOSA-RSD	506 > 78	7728.135		1.00	4.98		12.500			NO		
101	70	13C2-PFOA-RSD	414.9 > 369.7	15770.835	8.783	1.00	4.50	22445.114	12.500	20500	16418...	YES		
102	72	13C8-PFOS-RSD	507.1 > 80	2919.588	19.889	1.00	5.02	1834.926	12.500	2100	16783.2	YES		
103	74	13C2-PFDA-RSD	515.1 > 469.9			1.00			12.500			NO		
104	-1													
105	76	13C2-8:2 FTS-RSD	529 > 80	1698.056	19.889	1.00	5.29	1067.208	12.500	2340	18699.8	YES		
106	78	d3-N-MeFOSAA-RSD	573.1 > 419			1.00			12.500			NO		
107	80	13C2-PFUdA-RSD	565 > 519.8			1.00			12.500			NO		
108	82	d5-N-EtFOSAA-RSD	589.3 > 419			1.00			12.500			NO		

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
109	84	13C2-PFDoA-RSD	614.9 > 569.9			1.00			12.500			NO		
110	86	13C2-10:2 FTS-RSD	632.9 > 80.0	1352.273	19.889	1.00	5.89	849.888	12.500	2210	17709.6	YES		
111	88	d3-N-MeFOSA-RSD	515.2 > 168.9			1.00			149.200			NO		
112	90	13C2-PFTeDA-RSD	715.1 > 669.7			1.00			12.500			NO		
113	92	d5-N-ETFOSA-RSD	531.1 > 168.9			1.00			149.200			NO		
114	94	13C2-PFHxDA-RSD	815 > 769.7			1.00			12.500			NO		
115	96	d7-N-MeFOSE-RSD	623.1 > 58.9			1.00			149.200			NO		
116	98	d9-N-EtFOSE-RSD	639.2 > 58.8			1.00			149.200			NO		
117	-1													
118	99	13C4-PFBA	217.0 > 172.0	81.232	81.232	1.00	1.61	12.500	12.500	12.5	100.0	NO		
119	1...	13C5-PFHxA	318.0 > 272.9			1.00			12.500			NO		
120	1...	13C8-PFOA	420.9 > 376.0	8.783	8.783	1.00	4.50	12.500	12.500	12.5	100.0	NO		
121	1...	18O2-PFHxS	403.0 > 103			1.00			12.500			NO		
122	1...	13C9-PFNA	472.2 > 426.9			1.00			12.500			NO		
123	1...	13C4-PFOS	503 > 79.7	19.889	19.889	1.00	5.01	12.500	12.500	12.5	100.0	NO		
124	1...	13C6-PFDA	519.1 > 473.7			1.00			12.500			NO		
125	1...	13C7-PFUdA	570.1 > 524.8			1.00			12.500			NO		

LC Calibration Standards Review Checklist Q5

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manual Integrations	NM
Calibration ID:	ST20070601-11	L (M) H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:	-12	L (M) H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:	-13	L (M) H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:	-14	L (M) H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:	-15	L (M) H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:	-16	L M H	☒	☒	☒	☒	☒	☒	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐

NM OK 07/07/20

Full Mass Cal. Date: 06-22-20

Run Log Present: ☒

# of Samples per Sequence Checked: ☒

Instrument Blank Saved ☒

All Branches in Acquisition Window ☒

IIS Area Saved ~~☒~~

Reviewed By: JR 07/07/2020
Initials/Date

Comments:

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-48.qld

Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
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✓ 7R 07/07/2020

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

1	PFBA	213.0 > 168.8	7874.219	9536.798	1.00	1.61	10.321	10.000	9.97	99.7	NO		
2	PFPrS	249 > 80	1603.595	1379.378	1.00	1.95	14.532	10.000	10.9	108.9	NO	2.885	NO
3	3:3 FTCA	240.9 > 176.9	787.836	12698.616	1.00	2.43	0.776	10.000	9.39	93.9	NO	3.568	NO
4	PFPeA	263.1 > 218.9	9577.079	12698.616	1.00	2.58	9.427	10.000	10.2	101.8	NO		
5	PFBS	299.0 > 80	2939.529	1379.378	1.00	2.85	26.638	10.000	10.4	104.1	NO	2.563	NO
6	4:2 FTS	326.9 > 306.9	2884.368	1268.590	1.00	3.29	28.421	10.000	9.98	99.8	NO	12.212	NO
47	13C3-PFBA-EIS	216.1 > 171.8	9536.798		1.00	1.61	9536.798	12.500	13.8	110.6	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1379.378		1.00	2.85	1379.378	12.500	13.3	106.1	NO		
49	13C3-PFPeA-EIS	266.0 > 221.8	12698.616		1.00	2.58	12698.616	12.500	13.2	105.6	NO		
49	13C3-PFPeA-EIS	266.0 > 221.8	12698.616		1.00	2.58	12698.616	12.500	13.2	105.6	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1379.378		1.00	2.85	1379.378	12.500	13.3	106.1	NO		
55	13C2-4:2 FTS-EIS	329.0 >80.8	1268.590		1.00	3.29	1268.590	12.500	12.6	100.6	NO		
-1													
7	PFHxA	313.0 > 269.0	12637.913	14639.554	1.00	3.38	10.791	10.000	10.3	103.5	NO	16.642	NO
8	PFPeS	349.>80	2371.695	1379.378	1.00	3.55	21.492	10.000	10.3	103.0	NO	2.548	NO
9	HFPO-DA	285.1 > 168.9	2447.118	3140.680	1.00	3.58	9.740	10.000	9.68	96.8	NO	2.367	NO
10	5:3 FTCA	340.9 > 236.9	1698.485	13493.209	1.00	3.91	1.573	10.000	8.91	89.1	NO	1.735	NO
11	PFHpA	363.0 > 319	13770.608	13493.209	1.00	3.97	12.757	10.000	9.80	98.0	NO	49.800	NO
12	ADONA	376.8 > 250.9	22669.070	13493.209	1.00	4.08	21.000	10.000	9.65	96.5	NO	4.104	NO
57	13C2-PFHxA-EIS	315.0 > 270.0	14639.554		1.00	3.38	14639.554	12.500	13.4	107.4	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1379.378		1.00	2.85	1379.378	12.500	13.3	106.1	NO		
53	13C3-HFPO-DA-EIS	287.0 > 168.9	3140.680		1.00	3.58	3140.680	12.500	13.8	110.1	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	13493.209		1.00	3.97	13493.209	12.500	13.7	109.8	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	13493.209		1.00	3.97	13493.209	12.500	13.7	109.8	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	13493.209		1.00	3.97	13493.209	12.500	13.7	109.8	NO		
-1													
13	L-PFHxS	399 > 79.9	2369.503	2816.630	1.00	4.11	10.516	10.000	9.55	95.5	NO	3.828	NO
15	6:2 FTS	427.0 > 407	1483.914	1483.901	1.00	4.44	12.500	10.000	10.9	109.3	NO	0.755	NO
16	L-PFOA	413 > 369	13964.295	15274.092	1.00	4.49	11.428	10.000	10.1	100.8	NO	3.251	NO
18	PFecHS	461 > 381.0	2537.762	15274.092	1.00	4.50	2.077	10.000	9.21	92.1	NO	0.526	NO
19	PFHpS	449.0 > 80	2314.510	2809.042	1.00	4.60	10.299	10.000	10.6	105.8	NO	1.771	NO
20	7:3 FTCA	440.9 > 336.9	3588.461	15371.896	1.00	4.92	2.918	10.000	9.44	94.4	NO	1.217	NO
61	13C3-PFHxS-EIS	402 > 80	2816.630		1.00	4.11	2816.630	12.500	12.8	102.4	NO		
63	13C2-6:2 FTS-EIS	429.0 >79.7	1483.901		1.00	4.44	1483.901	12.500	11.5	92.2	NO		
69	13C2-PFOA-EIS	414.9 > 369.7	15274.092		1.00	4.49	15274.092	12.500	13.2	105.8	NO		
69	13C2-PFOA-EIS	414.9 > 369.7	15274.092		1.00	4.49	15274.092	12.500	13.2	105.8	NO		

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Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

71	13C8-PFOS-EIS	507.1 > 80	2809.042		1.00	5.00	2809.042	12.500	12.5	99.7	NO		
65	13C5-PFNA-EIS	468.2 > 422.9	15371.896		1.00	4.93	15371.896	12.500	12.7	101.4	NO		
-1													
21	PFNA	463.0 > 418.8	14387.799	15371.896	1.00	4.93	11.700	10.000	10.5	104.7	NO	13.296	NO
22	PFOSA	498 > 78	3948.826	7335.037	1.00	4.97	6.729	10.000	9.75	97.5	NO	22.785	NO
23	L-PFOS	499 > 80	2822.769	2809.042	1.00	5.00	12.561	10.000	9.91	99.1	NO	2.674	NO
25	9Cl-PF30NS	531 > 351	6474.327	2809.042	1.00	5.22	28.810	10.000	10.1	101.2	NO	36.430	NO
26	PFDA	513 > 469	13442.274	19905.363	1.00	5.30	8.441	10.000	9.94	99.4	NO	4.946	NO
27	8:2 FTS	526.8 > 506.9	1390.938	1581.411	1.00	5.27	10.994	10.000	8.13	81.3	NO	0.663	NO
65	13C5-PFNA-EIS	468.2 > 422.9	15371.896		1.00	4.93	15371.896	12.500	12.7	101.4	NO		
67	13C8-PFOSA-EIS	506 > 78	7335.037		1.00	4.97	7335.037	12.500	12.8	102.7	NO		
71	13C8-PFOS-EIS	507.1 > 80	2809.042		1.00	5.00	2809.042	12.500	12.5	99.7	NO		
71	13C8-PFOS-EIS	507.1 > 80	2809.042		1.00	5.00	2809.042	12.500	12.5	99.7	NO		
73	13C2-PFDA-EIS	515.1 > 469.9	19905.363		1.00	5.30	19905.363	12.500	13.3	106.8	NO		
75	13C2-8:2 FTS-EIS	529 > 80	1581.411		1.00	5.27	1581.411	12.500	14.3	114.6	NO		
-1													
28	PFNS	549 > 80	2958.070	2809.042	1.00	5.36	13.163	10.000	9.94	99.4	NO	2.475	NO
29	L-MeFOSAA	570 > 419	4402.238	4350.112	1.00	5.44	12.650	10.000	10.4	104.0	NO	1.777	NO
31	L-EtFOSAA	583.9 > 419	4806.518	4658.295	1.00	5.60	12.898	10.000	9.30	93.0	NO	1.406	NO
33	PFUdA	563.0 > 519	15835.691	19243.490	1.00	5.62	10.286	10.000	9.35	93.5	NO	17.115	NO
34	PFDS	598.8 >79.9	2976.634	2809.042	1.00	5.66	13.246	10.000	10.4	103.7	NO	2.406	NO
35	11Cl-PF30UdS	631 > 451	5303.702	24612.705	1.00	5.81	2.694	10.000	10.4	104.3	NO	19.668	NO
71	13C8-PFOS-EIS	507.1 > 80	2809.042		1.00	5.00	2809.042	12.500	12.5	99.7	NO		
77	d3-N-MeFOSAA-EIS	573.1 > 419	4350.112		1.00	5.44	4350.112	12.500	13.1	105.1	NO		
81	d5-N-EtFOSAA-EIS	589.3 > 419	4658.295		1.00	5.59	4658.295	12.500	14.8	118.7	NO		
79	13C2-PFUdA-EIS	565 > 519.8	19243.490		1.00	5.62	19243.490	12.500	12.2	97.4	NO		
71	13C8-PFOS-EIS	507.1 > 80	2809.042		1.00	5.00	2809.042	12.500	12.5	99.7	NO		
83	13C2-PFDoA-EIS	614.9 > 569.9	24612.705		1.00	5.89	24612.705	12.500	13.2	105.4	NO		
-1													
36	10:2 FTS	626.9 > 607	2053.163	1239.527	1.00	5.88	20.705	10.000	11.3	113.2	NO	1.036	NO
37	PFDoA	612.9 > 569.0	18605.541	24612.705	1.00	5.89	9.449	10.000	9.63	96.3	NO	12.492	NO
38	N-MeFOSA	512.1 > 168.9	7966.409	20646.926	1.00	5.81	57.567	50.000	51.5	102.9	NO	1.918	NO
39	PFTrDA	662.9 > 618.9	20404.146	24612.705	1.00	6.13	10.363	10.000	9.96	99.6	NO	86.475	NO
40	PFDoS	699 > 80	3484.474	24741.564	1.00	6.15	1.760	10.000	10.4	103.8	NO	2.123	NO
41	PFTeDA	713.0 > 669.0	12995.239	24741.564	1.00	6.33	6.565	10.000	9.87	98.7	NO	14.437	NO
85	13C2-10:2 FTS-EIS	632.9 > 80.0	1239.527		1.00	5.88	1239.527	12.500	11.4	91.3	NO		

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Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

83	13C2-PFDoA-EIS	614.9 > 569.9	24612.705		1.00	5.89	24612.705	12.500	13.2	105.4	NO		
87	d3-N-MeFOSA-EIS	515.2 > 168.9	20646.926		1.00	5.83	20646.926	149.200	149	100.0	NO		
83	13C2-PFDoA-EIS	614.9 > 569.9	24612.705		1.00	5.89	24612.705	12.500	13.2	105.4	NO		
89	13C2-PFTeDA-EIS	715.1 > 669.7	24741.564		1.00	6.33	24741.564	12.500	13.0	103.9	NO		
89	13C2-PFTeDA-EIS -1	715.1 > 669.7	24741.564		1.00	6.33	24741.564	12.500	13.0	103.9	NO		
42	N-EtFOSA	526.1 > 168.9	9452.549	23806.791	1.00	6.19	59.240	50.000	51.2	102.4	NO	1.936	NO
43	PFHxDA	813 > 769	22556.393	27070.467	1.00	6.62	10.416	10.000	9.95	99.5	NO	32.558	NO
44	PFODA	913.1 > 868.8	18473.520	27070.467	1.00	6.83	8.530	10.000	10.3	102.9	NO		
45	N-MeFOSE	616.1 > 58.9	8003.121	22491.145	1.00	6.34	53.090	50.000	47.9	95.8	NO		
46	N-EtFOSE	630.1 > 58.9	8566.042	23170.283	1.00	6.49	55.159	50.000	54.6	109.1	NO		
48	13C3-PFBA-RSD	216.1 > 171.8	9538.545	10884.140	1.00	1.61	10.955	12.500	12.8	102.6	NO		
91	d5-N-ETFOSA-EIS	531.1 > 168.9	23806.791		1.00	6.20	23806.791	149.200	153	102.8	NO		
93	13C2-PFHxDA-EIS	815 > 769.7	27070.467		1.00	6.62	27070.467	12.500	12.8	102.7	NO		
93	13C2-PFHxDA-EIS	815 > 769.7	27070.467		1.00	6.62	27070.467	12.500	12.8	102.7	NO		
95	d7-N-MeFOSE-EIS	623.1 > 58.9	22491.145		1.00	6.33	22491.145	149.200	167	111.9	NO		
97	d9-N-EtFOSE-EIS	639.2 > 58.8	23170.283		1.00	6.48	23170.283	149.200	156	104.4	NO		
50	13C3-PFPeA-RSD -1	266.0 > 221.8	12698.616	16866.539	1.00	2.58	9.411	12.500	12.5	100.2	NO		
52	13C3-PFBS-RSD	302.0 > 98.9	1379.378	1056.683	1.00	2.85	16.317	12.500	13.3	106.5	NO		
54	13C3-HFPO-DA-RSD	287.0 > 168.9	3140.680	16866.539	1.00	3.58	2.328	12.500	12.3	98.4	NO		
56	13C2-4:2 FTS-RSD	329.0 >80.8	1268.590	1056.683	1.00	3.29	15.007	12.500	13.3	106.1	NO		
58	13C2-PFHxA-RSD	315.0 > 270.0	14639.554	16866.539	1.00	3.38	10.850	12.500	12.3	98.7	NO		
60	13C4-PFHpA-RSD	367.2 > 321.8	13493.209	16866.539	1.00	3.97	10.000	12.500	13.2	105.4	NO		
62	13C3-PFHxS-RSD	402 > 80	2816.630	1056.683	1.00	4.11	33.319	12.500	13.5	108.2	NO		
64	13C2-6:2 FTS-RSD	429.0 >79.7	1483.901	3316.298	1.00	4.44	5.593	12.500	11.8	94.6	NO		
66	13C5-PFNA-RSD	468.2 > 422.9	15371.896	17627.199	1.00	4.93	10.901	12.500	11.6	92.7	NO		
68	13C8-PFOSA-RSD	506 > 78	7335.037	14754.097	1.00	4.97	6.214	12.500	12.8	102.2	NO		
70	13C2-PFOA-RSD	414.9 > 369.7	15274.092	14290.067	1.00	4.49	13.361	12.500	12.2	97.7	NO		
72	13C8-PFOS-RSD	507.1 > 80	2809.042	3316.298	1.00	5.00	10.588	12.500	12.1	96.8	NO		
74	13C2-PFDA-RSD -1	515.1 > 469.9	19905.363	16237.306	1.00	5.30	15.324	12.500	12.2	97.8	NO		
76	13C2-8:2 FTS-RSD	529 > 80	1581.411	3316.298	1.00	5.27	5.961	12.500	13.1	104.4	NO		
78	d3-N-MeFOSAA-RSD	573.1 > 419	4350.112	14754.097	1.00	5.44	3.686	12.500	12.6	100.6	NO		
80	13C2-PFUdA-RSD	565 > 519.8	19243.490	14754.097	1.00	5.62	16.304	12.500	12.6	100.7	NO		
82	d5-N-EtFOSAA-RSD	589.3 > 419	4658.295	14754.097	1.00	5.59	3.947	12.500	14.0	111.6	NO		

OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-48.qld

Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
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Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

84	13C2-PFDoA-RSD	614.9 > 569.9	24612.705	16237.306	1.00	5.89	18.948	12.500	12.2	97.8	NO
86	13C2-10:2 FTS-RSD	632.9 > 80.0	1239.527	3316.298	1.00	5.88	4.672	12.500	12.2	97.4	NO
88	d3-N-MeFOSA-RSD	515.2 > 168.9	20646.926	14754.097	1.00	5.83	17.493	149.200	151	101.3	NO
90	13C2-PFTeDA-RSD	715.1 > 669.7	24741.564	14754.097	1.00	6.33	20.962	12.500	12.8	102.7	NO
92	d5-N-ETFOSA-RSD	531.1 > 168.9	23806.791	14754.097	1.00	6.20	20.170	149.200	155	103.7	NO
94	13C2-PFHxDA-RSD	815 > 769.7	27070.467	14754.097	1.00	6.62	22.935	12.500	12.9	103.3	NO
96	d7-N-MeFOSE-RSD	623.1 > 58.9	22617.865	14754.097	1.00	6.33	19.162	149.200	161	108.0	NO
98	d9-N-EtFOSE-RSD	639.2 > 58.8	23431.799	14754.097	1.00	6.48	19.852	149.200	151	101.0	NO
-1											
99	13C4-PFBA	217.0 > 172.0	10884.140	10884.140	1.00	1.60	12.500	12.500	12.5	100.0	NO
1...	13C5-PFHxA	318.0 > 272.9	16866.539	16866.539	1.00	3.38	12.500	12.500	12.5	100.0	NO
1...	13C8-PFOA	420.9 > 376.0	14290.067	14290.067	1.00	4.49	12.500	12.500	12.5	100.0	NO
1...	18O2-PFHxS	403.0 > 103	1056.683	1056.683	1.00	4.11	12.500	12.500	12.5	100.0	NO
1...	13C9-PFNA	472.2 > 426.9	17627.199	17627.199	1.00	4.93	12.500	12.500	12.5	100.0	NO
1...	13C4-PFOS	503 > 79.7	3316.298	3316.298	1.00	5.00	12.500	12.500	12.5	100.0	NO
1...	13C6-PFDA	519.1 > 473.7	16237.306	16237.306	1.00	5.30	12.500	12.500	12.5	100.0	NO
1...	13C7-PFUdA	570.1 > 524.8	14754.097	14754.097	1.00	5.62	12.500	12.500	12.5	100.0	NO

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Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 12:16:39 Pacific Daylight Time
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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: PFBA

1	200706P1-19	ST200706P1-1 PFC CS-2 20F1901	06-Jul-20	13:13:57
2	200706P1-20	ST200706P1-2 PFC CS-1 20F1902	06-Jul-20	13:24:27
3	200706P1-21	ST200706P1-3 PFC CS0 20F1903	06-Jul-20	13:34:57
4	200706P1-22	ST200706P1-4 PFC CS1 20F1904	06-Jul-20	13:45:26
5	200706P1-23	ST200706P1-5 PFC CS2 20F1905	06-Jul-20	13:55:58
6	200706P1-24	ST200706P1-6 PFC CS3 20F1906	06-Jul-20	14:06:27
7	200706P1-25	ST200706P1-7 PFC CS4 20F1907	06-Jul-20	14:16:59
8	200706P1-26	ST200706P1-8 PFC CS5 20F1908	06-Jul-20	14:27:27
9	200706P1-27	ST200706P1-9 PFC CS6 20F1909	06-Jul-20	14:37:59
10	200706P1-28	ST200706P1-10 PFC CS7 20F1910	06-Jul-20	14:48:28
11	200706P1-29	IB	06-Jul-20	14:58:58
12	200706P1-30	ICV200706P1-1 PFC ICV 20F1911	06-Jul-20	15:09:30
13	200706P1-31	IB	06-Jul-20	15:19:59
14	200706P1-32	B0F0205-BS1 OPR 0.25	06-Jul-20	15:30:30
15	200706P1-33	2001315-06 24-GW-24NEW4-20200618 0.25948	06-Jul-20	15:41:01
16	200706P1-34	2001315-08 24-GW-08DGMW73-20200618 0.25501	06-Jul-20	15:51:31
17	200706P1-35	2001345-06@5X Septic Receiving 0.11338	06-Jul-20	16:02:00
18	200706P1-36	IB	06-Jul-20	16:12:35
19	200706P1-37	2001315-06 24-GW-24NEW4-20200618 0.25948	06-Jul-20	16:46:41
20	200706P1-38	2001315-08 24-GW-08DGMW73-20200618 0.25501	06-Jul-20	16:57:15
21	200706P1-39	2001326-01 REEPEF2658FS 0.11212	06-Jul-20	17:07:46
22	200706P1-40	B0G0023-BLK1 Method Blank 0.01	06-Jul-20	17:18:14
23	200706P1-41	B0G0023-BS1 OPR 0.01	06-Jul-20	17:28:46
24	200706P1-42	B0G0023-BSD1 LCSD 0.01	06-Jul-20	17:39:17
25	200706P1-43	2001353-01RE1 CAVERLY 0.01	06-Jul-20	17:49:46
26	200706P1-44	2001353-02RE1 SOMERSET FARMS 0.01	06-Jul-20	18:00:17
27	200706P1-45	2001353-03 TOZIER 0.01	06-Jul-20	18:10:46
28	200706P1-46	2001353-04RE1 TOZIER (2 vials-same) 0.01	06-Jul-20	18:21:18
29	200706P1-47	IB	06-Jul-20	18:31:47
30	200706P1-48	ST200706P1-11 PFC CS3 20F1906	06-Jul-20	18:42:17
31	200706P1-49	IB	06-Jul-20	18:52:49
32	200706P1-50	B0F0257-BLK1 Method Blank 0.25	06-Jul-20	19:03:20

Dataset: Untitled

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Compound name: PFBA

33	200706P1-51	B0F0257-BS1 OPR 0.25	06-Jul-20	19:13:50
34	200706P1-52	B0F0257-BSD1 LCSD 0.25	06-Jul-20	19:24:18
35	200706P1-53	B0F0257-MS1 Matrix Spike 0.2511	06-Jul-20	19:34:50
36	200706P1-54	B0F0257-MSD1 Matrix Spike Dup 0.24211	06-Jul-20	19:45:19
37	200706P1-55	2001356-01 ET-LW02-2020 0.25782	06-Jul-20	19:55:51
38	200706P1-56	IB	06-Jul-20	20:06:19
39	200706P1-57	2001357-01 SB01-20200624 0.24654	06-Jul-20	20:16:52
40	200706P1-58	2001357-02 EB01-20200624 0.24804	06-Jul-20	20:27:21
41	200706P1-59	2001357-03 I006MW065-20200624 0.25563	06-Jul-20	20:37:52
42	200706P1-60	IB	06-Jul-20	20:48:23
43	200706P1-61	2001357-04 DUP01-20200624 0.25403	06-Jul-20	20:58:53
44	200706P1-62	IB	06-Jul-20	21:09:22
45	200706P1-63	2001358-01 EB02-20200624 0.24128	06-Jul-20	21:19:52
46	200706P1-64	2001358-02 24-GW-24MW06-20200624 0.26389	06-Jul-20	21:30:23
47	200706P1-65	2001358-03 DUP01-20200624 0.26301	06-Jul-20	21:40:52
48	200706P1-66	2001358-04 24-GW-24MW10D-20200624 0.25918	06-Jul-20	21:51:24
49	200706P1-67	2001358-05 DUP02-20200624 0.2559	06-Jul-20	22:01:54
50	200706P1-68	2001358-06 24-GW-24MW10C-20200624 0.25497	06-Jul-20	22:12:25
51	200706P1-69	2001358-07 24-GW-24MW07R-20200624 0.25444	06-Jul-20	22:22:53
52	200706P1-70	B0F0172-BLK1 Method Blank 0.25	06-Jul-20	22:33:25
53	200706P1-71	B0F0172-BS1 OPR 0.25	06-Jul-20	22:43:54
54	200706P1-72	2001276-01 Equipment Blank-1 0.22934	06-Jul-20	22:54:26
55	200706P1-73	ST200706P1-12 PFC CS3 20F1906	06-Jul-20	23:04:55
56	200706P1-74	IB	06-Jul-20	23:15:27
57	200706P1-75	2001276-02 MW-20-01 0.25109	06-Jul-20	23:25:56
58	200706P1-76	2001276-03 Field Blank 0.24862	06-Jul-20	23:36:27
59	200706P1-77	2001276-04 MW-20-02 0.26126	06-Jul-20	23:46:56
60	200706P1-78	2001276-05 MW-20-03 0.24623	06-Jul-20	23:57:28
61	200706P1-79	2001276-06 Equipment Blank-2 0.24081	07-Jul-20	00:07:57
62	200706P1-80	2001276-07 Duplicate-1 0.24702	07-Jul-20	00:18:27
63	200706P1-81	B0F0088-BLK1 Method Blank 5	07-Jul-20	00:28:59
64	200706P1-82	B0F0088-BS1 OPR 5	07-Jul-20	00:39:27
65	200706P1-83	B0F0088-BSD1 LCSD 5	07-Jul-20	00:50:00
66	200706P1-84	2001248-01 05082020 B 5	07-Jul-20	01:00:28
67	200706P1-85	2001250-01 05082020 A 5	07-Jul-20	01:10:58
68	200706P1-86	ST200706P1-13 PFC CS3 20F1906	07-Jul-20	01:21:30

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 12:16:39 Pacific Daylight Time
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Compound name: PFBA

69	200706P1-87	IB	07-Jul-20	01:31:59
70	200706P1-88	2001251-01 05082020 C 5	07-Jul-20	01:42:31
71	200706P1-89	2001252-01 05082020 E 2.5	07-Jul-20	01:53:00
72	200706P1-90	2001351-01 05082020AY 2.5	07-Jul-20	02:03:30
73	200706P1-91	2001375-01 05082020AF 3	07-Jul-20	02:14:01
74	200706P1-92	2001376-01 05082020T 2.5	07-Jul-20	02:24:33
75	200706P1-93	2001383-01 05082020AO 3	07-Jul-20	02:35:01
76	200706P1-94	2001384-01 05082020AG 2.5	07-Jul-20	02:45:33
77	200706P1-95	2001391-01 05082020J 2.5	07-Jul-20	02:56:03
78	200706P1-96	2001392-01 05082020R 3	07-Jul-20	03:06:32
79	200706P1-97	2001393-01 05082020G 2.5	07-Jul-20	03:17:04
80	200706P1-98	ST200706P1-14 PFC CS3 20F1906	07-Jul-20	03:27:34
81	200706P1-99	IB	07-Jul-20	03:38:03
82	200706P1-100	2001402-01 06122020A 5	07-Jul-20	03:48:35
83	200706P1-101	2001403-01 05082020AN 2.5	07-Jul-20	03:59:04
84	200706P1-102	2001302-01@5X OP-1 0.03392	07-Jul-20	04:09:35
85	200706P1-103	2001302-02@5X OP-2 0.03359	07-Jul-20	04:20:04
86	200706P1-104	2001302-03@5X OP-3 0.0336	07-Jul-20	04:30:36
87	200706P1-105	2001302-04@5X OP-4 0.03354	07-Jul-20	04:41:05
88	200706P1-106	2001302-05@5X OP-5 0.03336	07-Jul-20	04:51:36
89	200706P1-107	2001302-06@5X OP-6 0.03266	07-Jul-20	05:02:06
90	200706P1-108	2001302-07@5X OP-7 0.03389	07-Jul-20	05:12:35
91	200706P1-109	2001302-08@5X OP-8 0.03326	07-Jul-20	05:23:07
92	200706P1-110	ST200706P1-15 PFC CS3 20F1906	07-Jul-20	05:33:36
93	200706P1-111	IB	07-Jul-20	05:44:07
94	200706P1-112	2001302-09@5X OP-9 0.03376	07-Jul-20	05:54:38
95	200706P1-113	2001302-10@5X OP-10 0.03297	07-Jul-20	06:05:07
96	200706P1-114	2001302-11@5X OP-11 0.03382	07-Jul-20	06:15:39
97	200706P1-115	2001302-12@5X OP-12 0.03372	07-Jul-20	06:26:08
98	200706P1-116	2001302-13@5X OP-13 0.03255	07-Jul-20	06:36:39
99	200706P1-117	2001302-14@5X OP-14 0.03286	07-Jul-20	06:47:10
100	200706P1-118	2001302-15@5X OP-15 0.03232	07-Jul-20	06:57:39
101	200706P1-119	2001302-16@5X OP-16 0.03366	07-Jul-20	07:08:11
102	200706P1-120	2001302-17@5X OP-17 0.03283	07-Jul-20	07:18:40
103	200706P1-121	2001302-18@5X OP-18 0.03296	07-Jul-20	07:29:10
104	200706P1-122	ST200706P1-16 PFC CS3 20F1906	07-Jul-20	07:39:40

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Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-48.qld

Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

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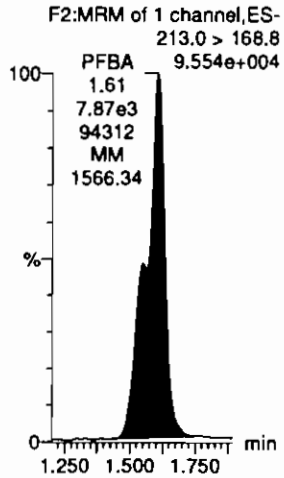
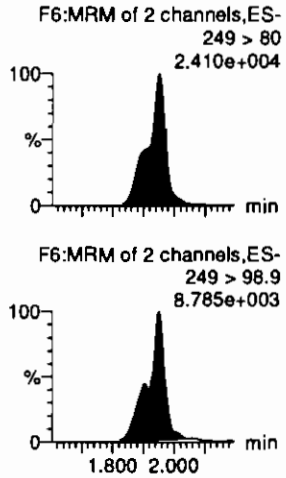
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

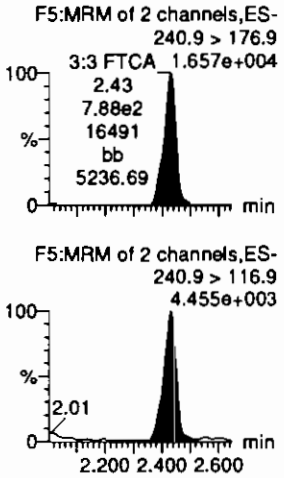
PFBA



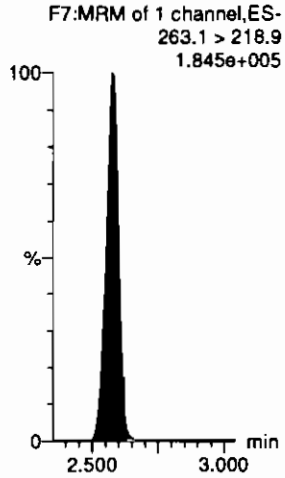
PFPrS



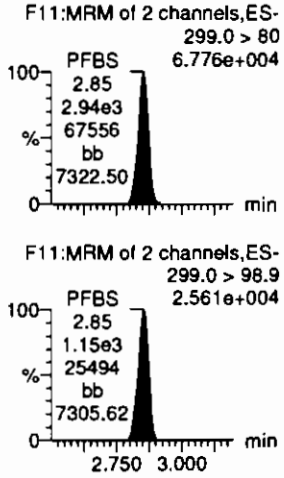
3:3 FTCA



PFPeA



PFBS



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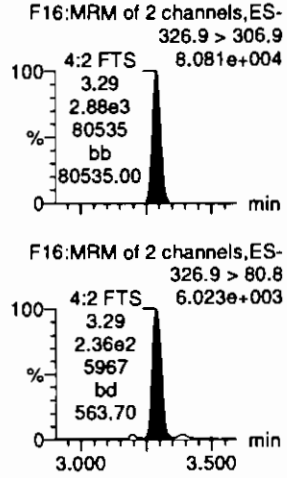
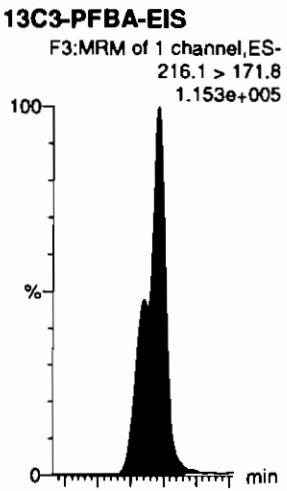


13C3-PFBA-EIS



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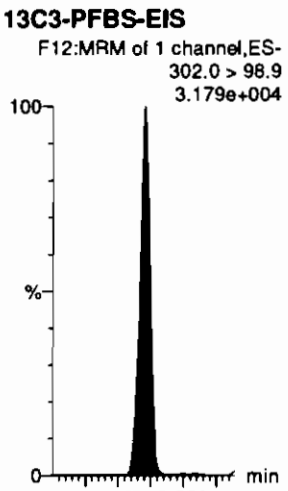

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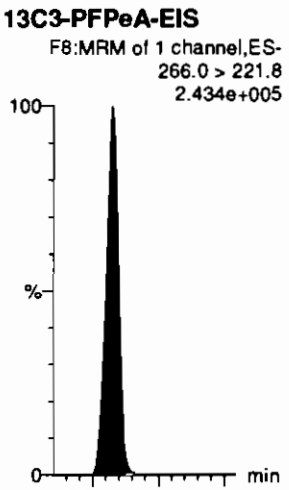
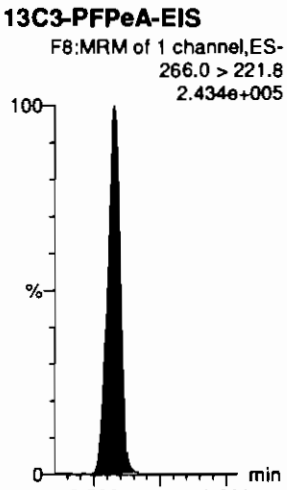


13C3-PFPeA-EIS



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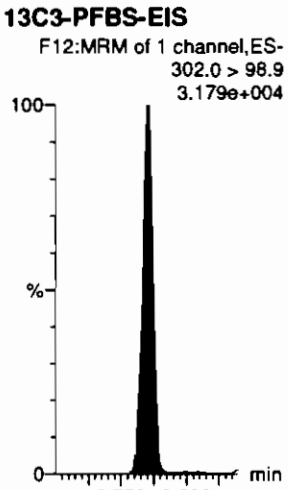

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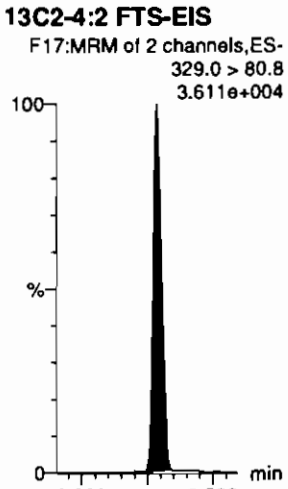

OPV 7/7/2020

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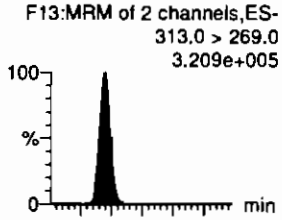
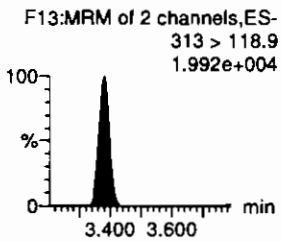
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

PFHxA





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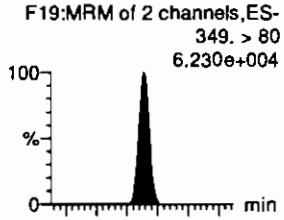

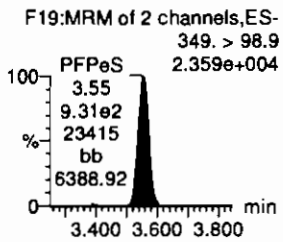

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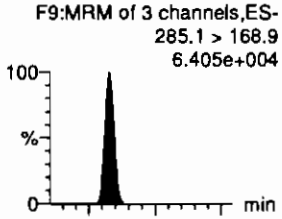

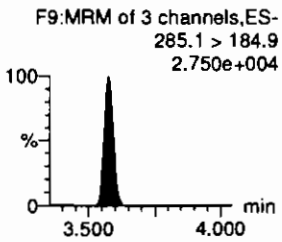

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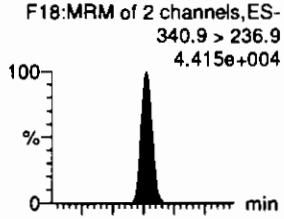

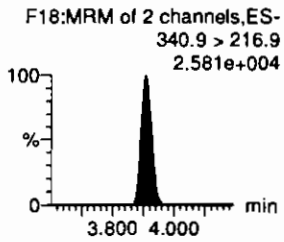

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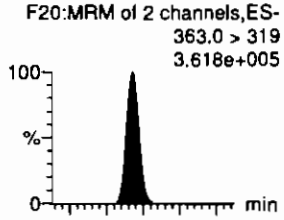

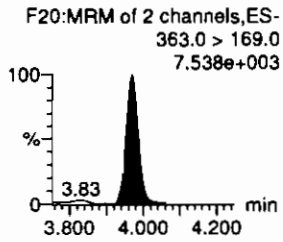

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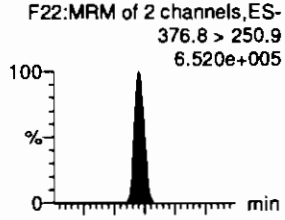

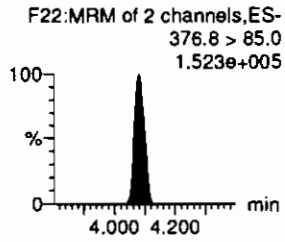

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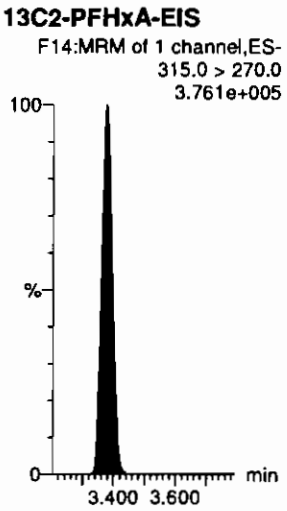

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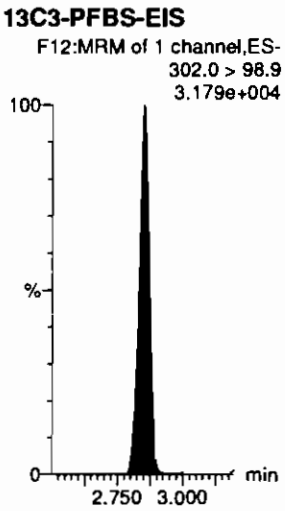

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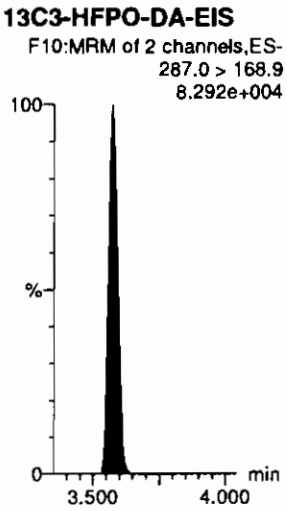

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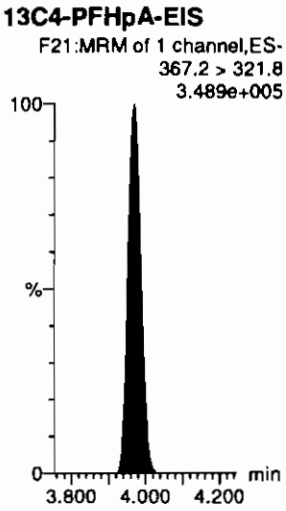

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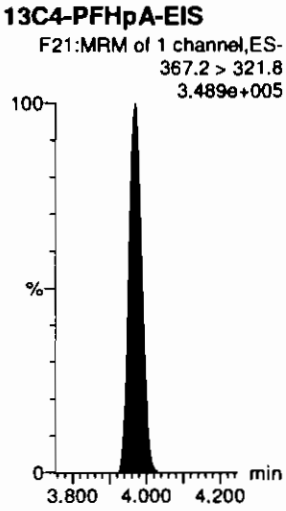

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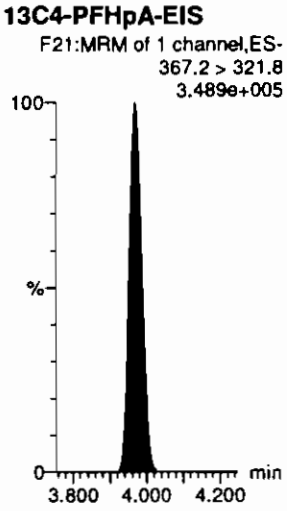

OPV 7/7/2020

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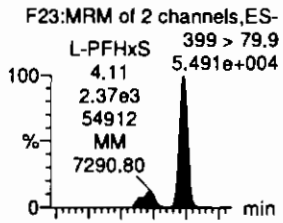
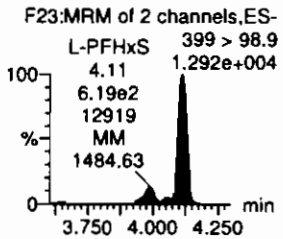
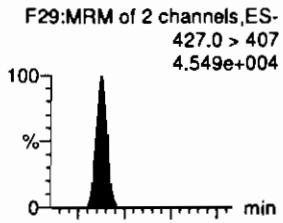
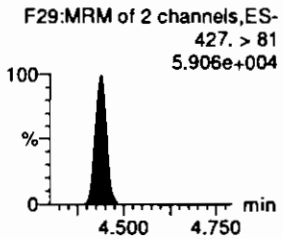




6:2 FTS





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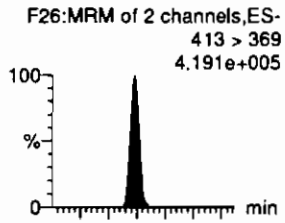

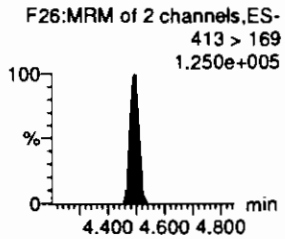

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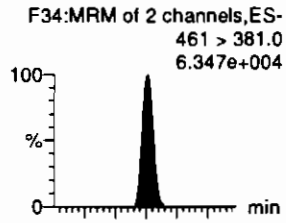

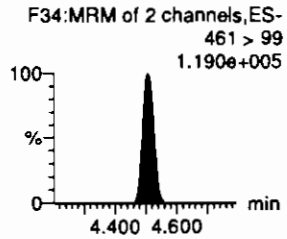

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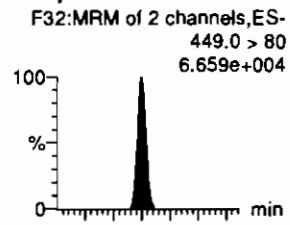

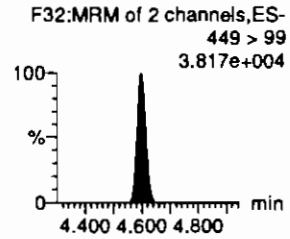

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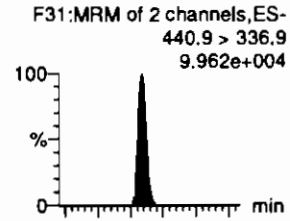

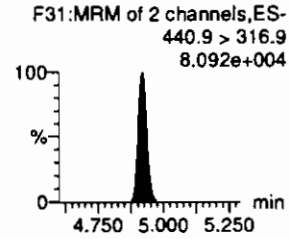

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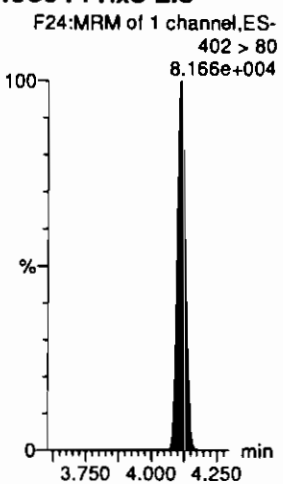

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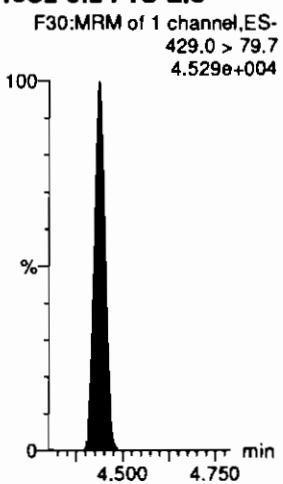

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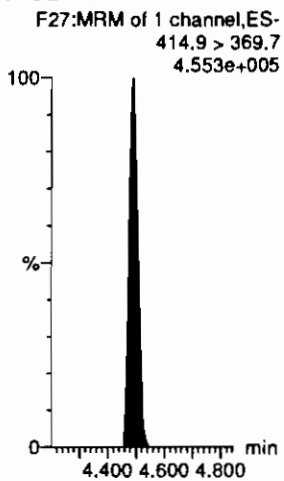

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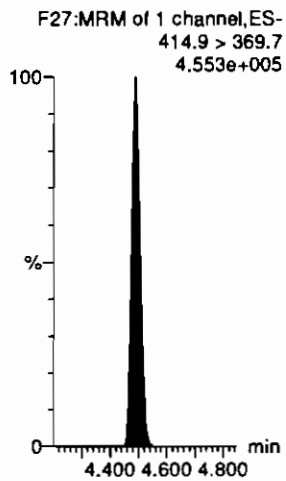
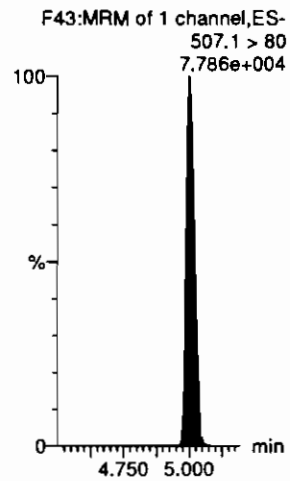
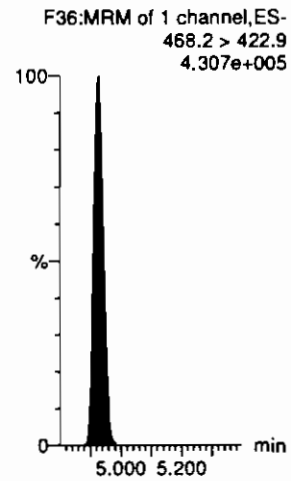


13C8-PFOS-EIS



13C5-PFNA-EIS



OPV 7/7/2020

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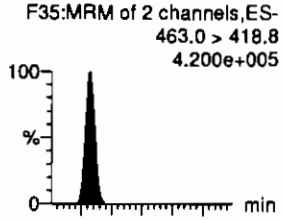

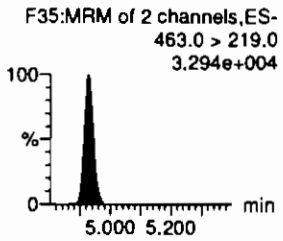

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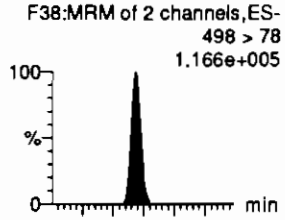
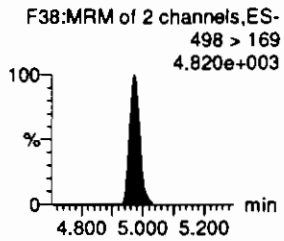
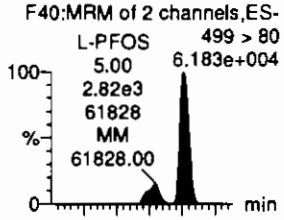
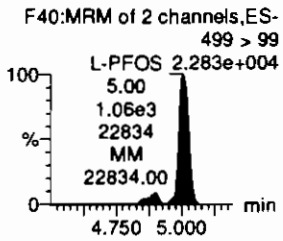




L-PFOS





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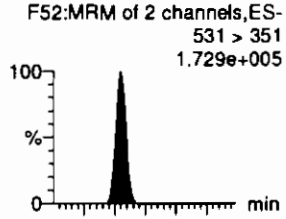

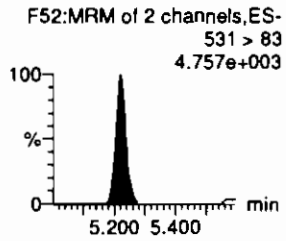

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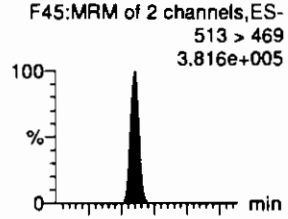

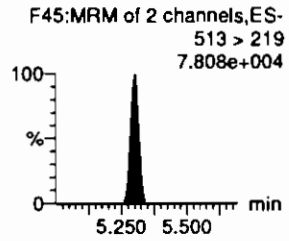

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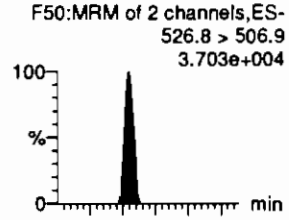

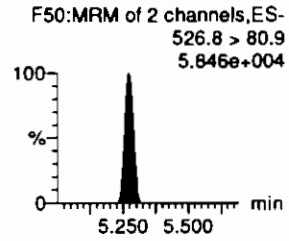

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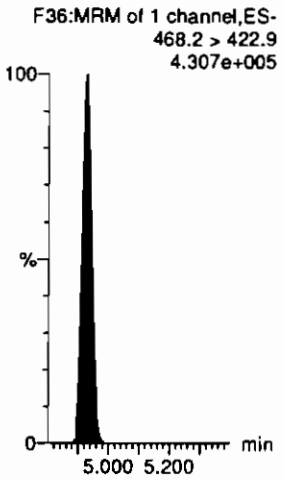

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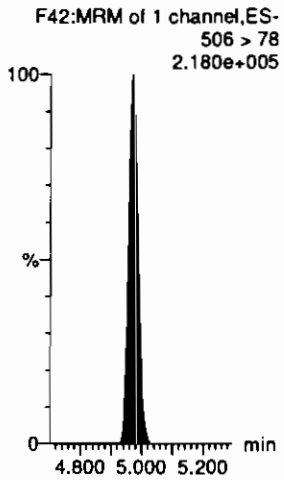
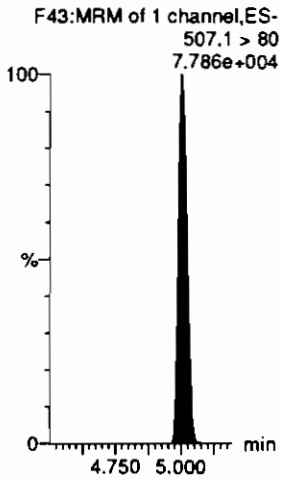


13C8-PFOS-EIS



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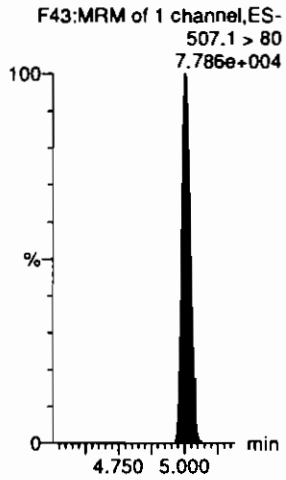

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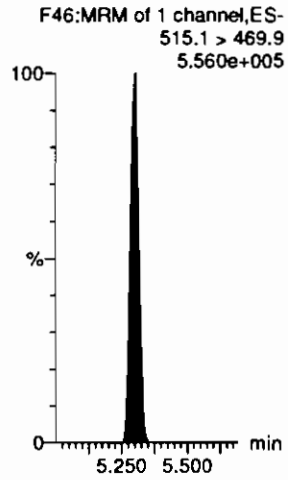

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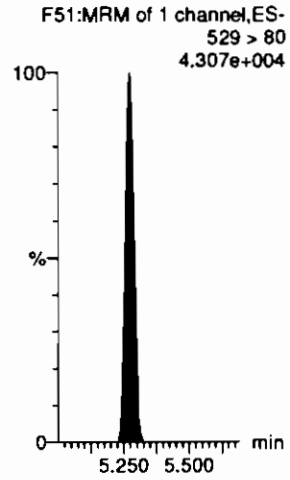

OPV 7/7/2020

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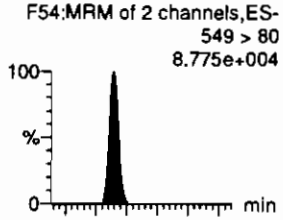
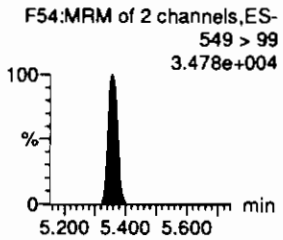
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

PFNS





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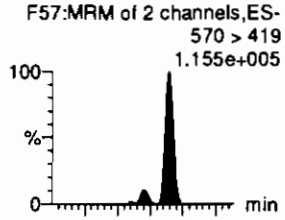

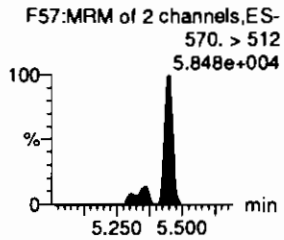

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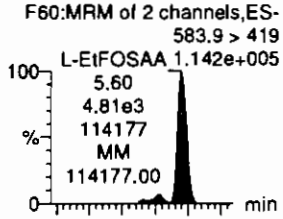

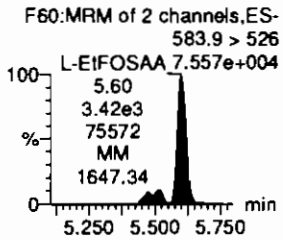

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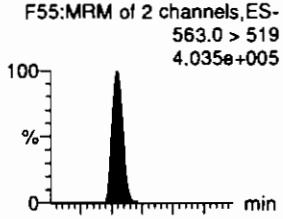

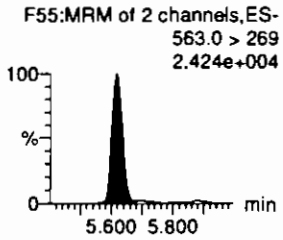

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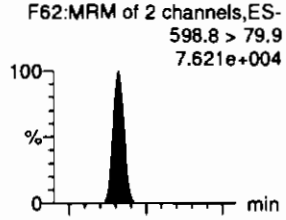

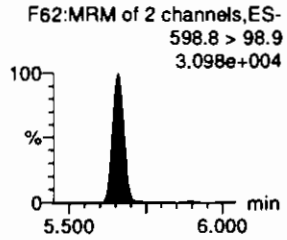

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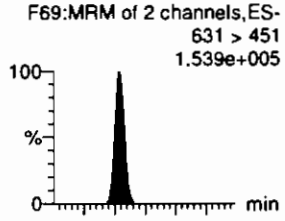

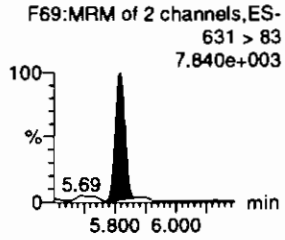

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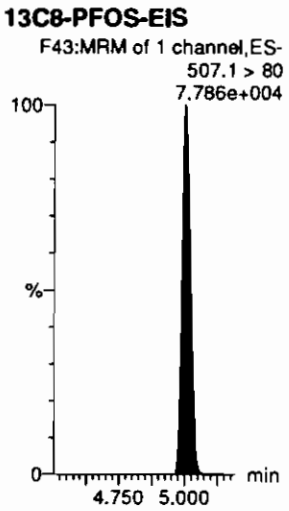

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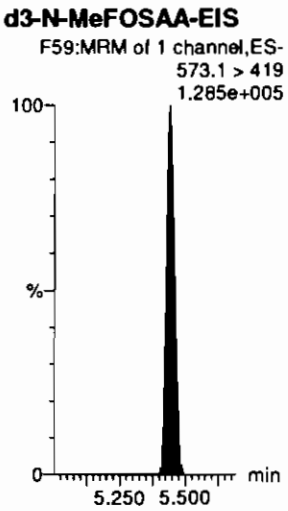

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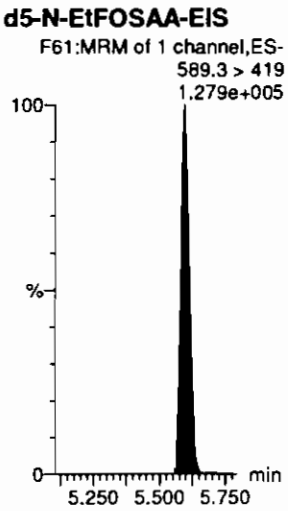

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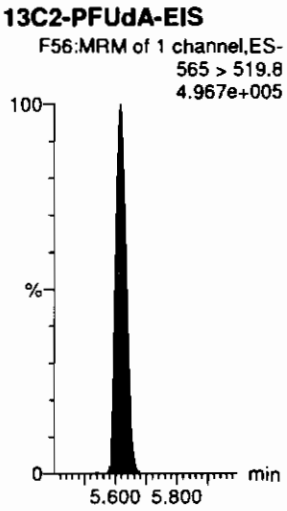

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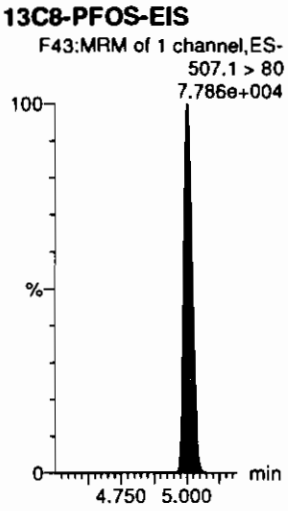

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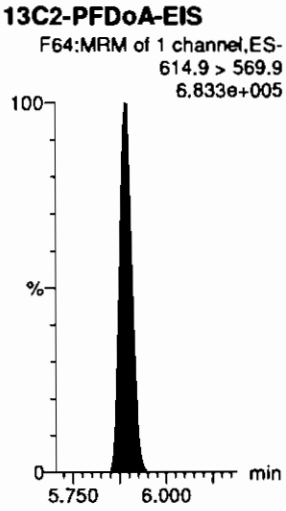

OPV 7/7/2020

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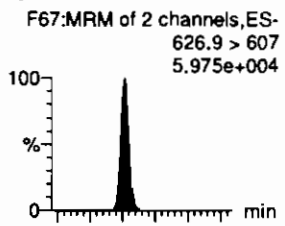
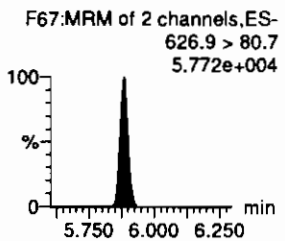
10:2 FTS





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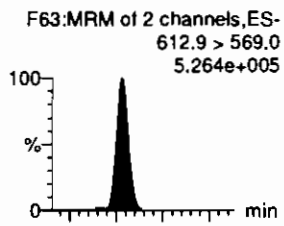

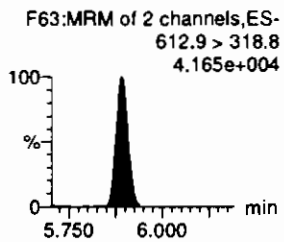

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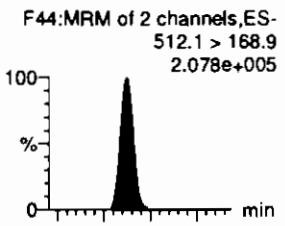

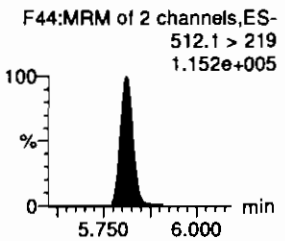

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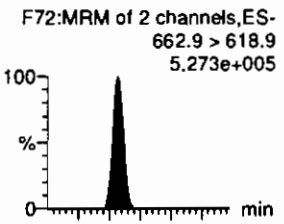

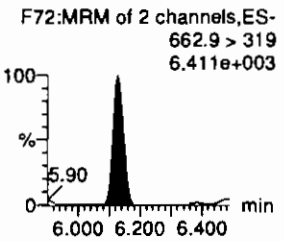

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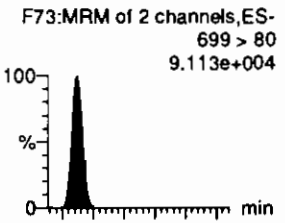

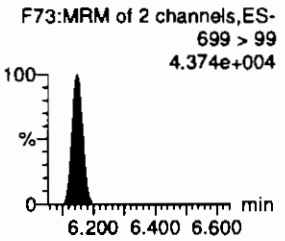

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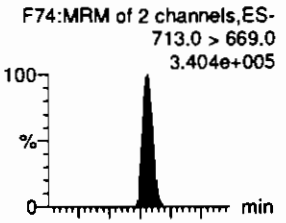

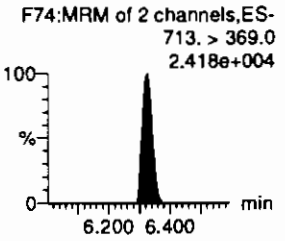

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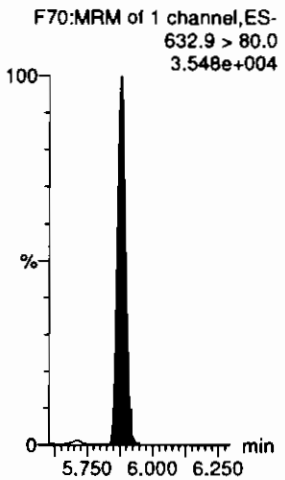

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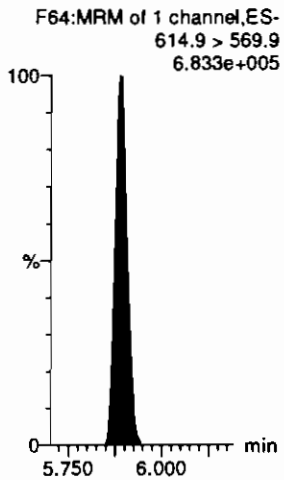

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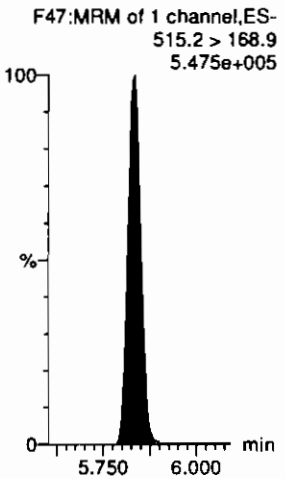

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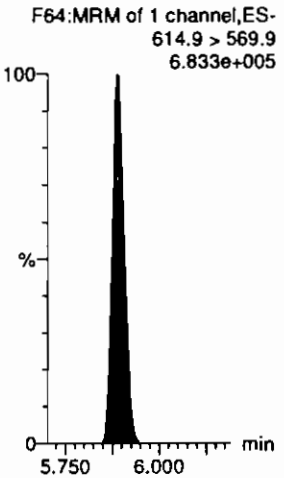

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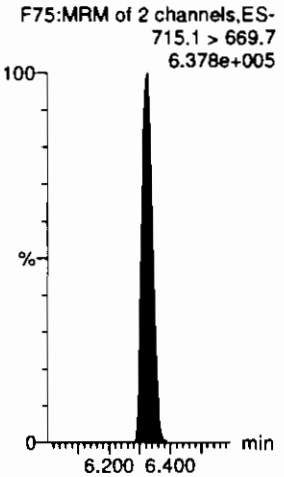

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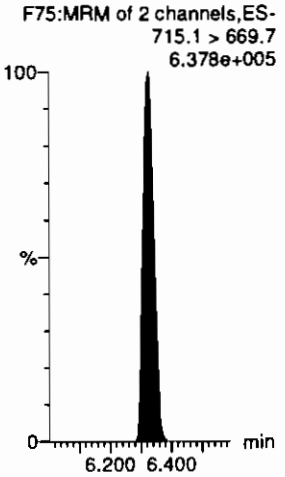

OPV 7/7/2020

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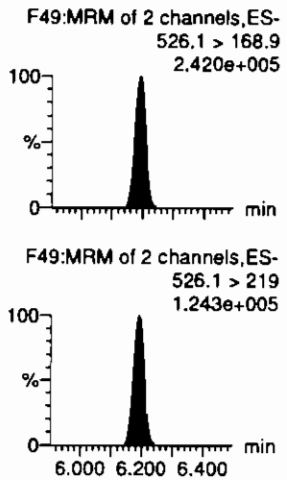
N-EtFOSA



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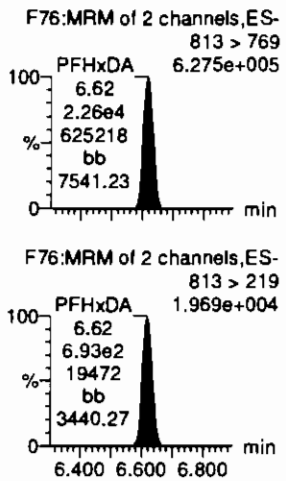

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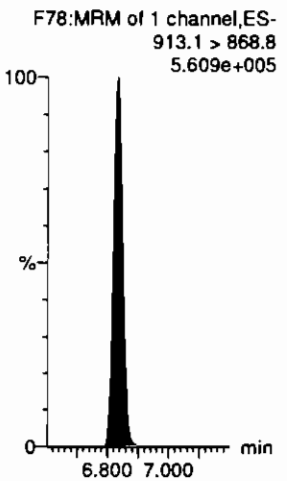

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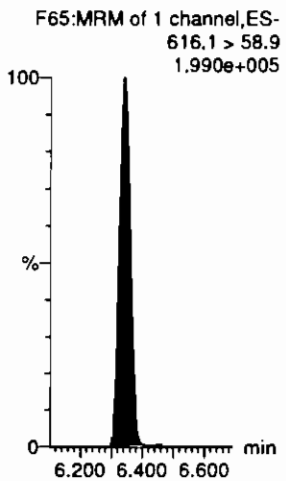

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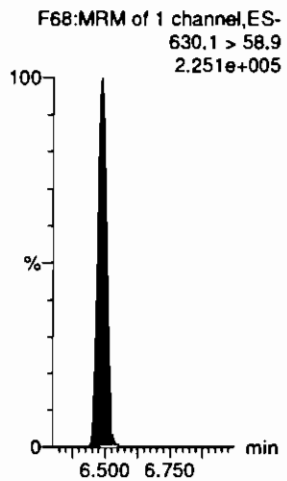

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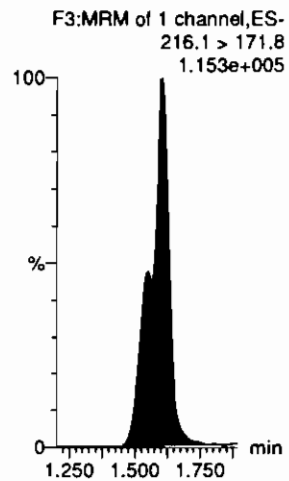
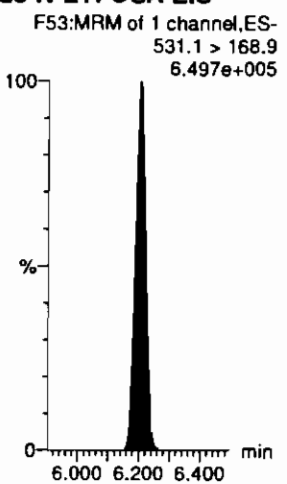


d5-N-ETFOSA-EIS



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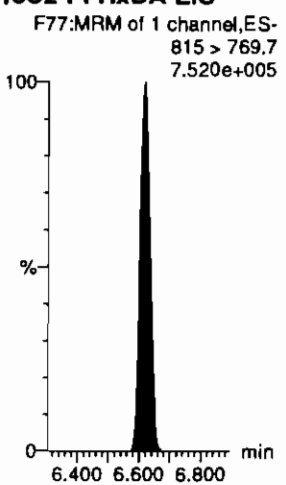

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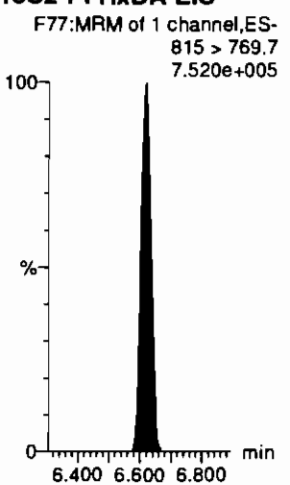

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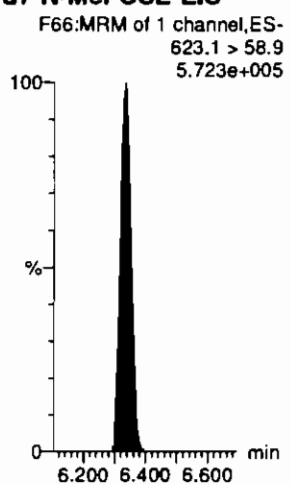

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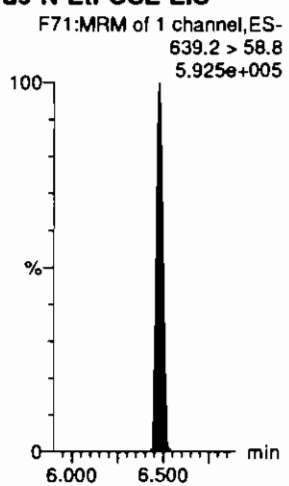

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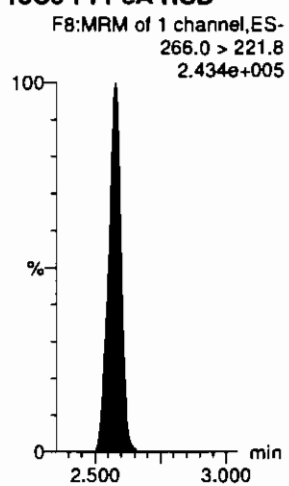

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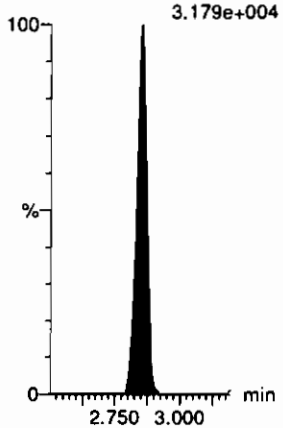
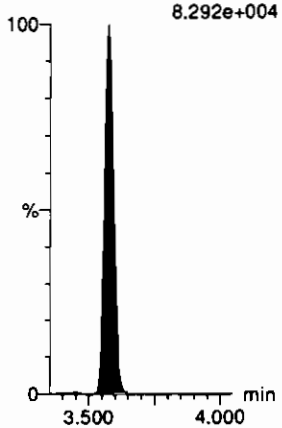
Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

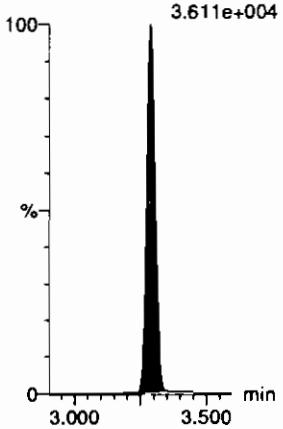
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.179e+004



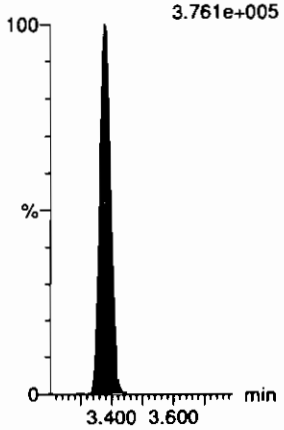
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.292e+004



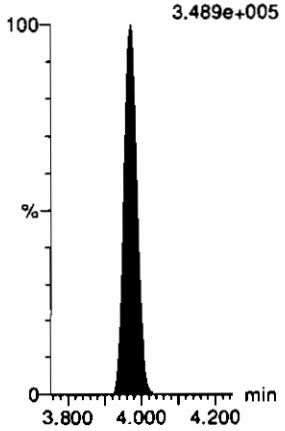
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.611e+004



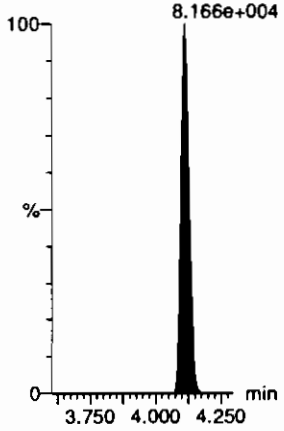
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.761e+005



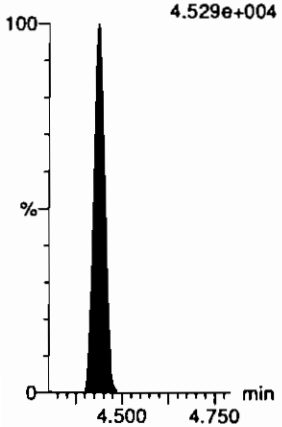
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.489e+005



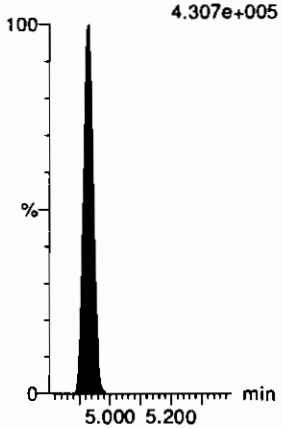
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
8.166e+004



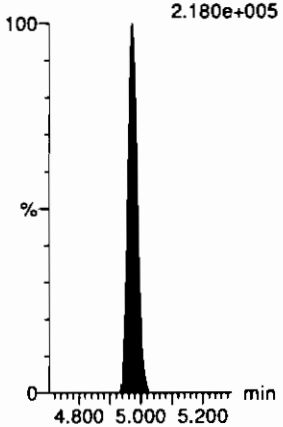
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.529e+004



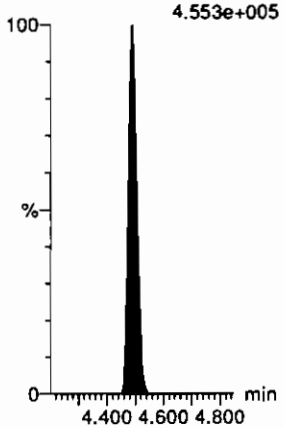
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.307e+005



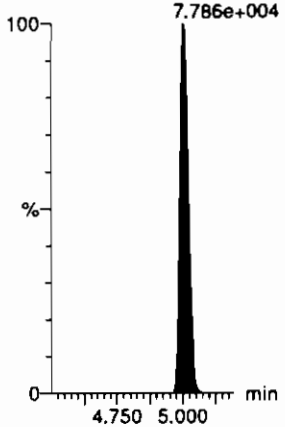
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.180e+005



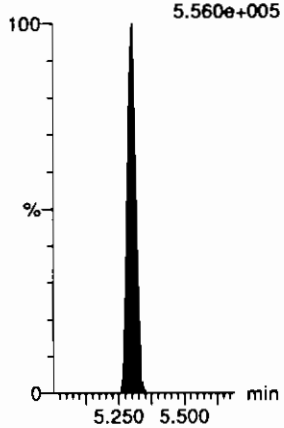
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
4.553e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.786e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.560e+005



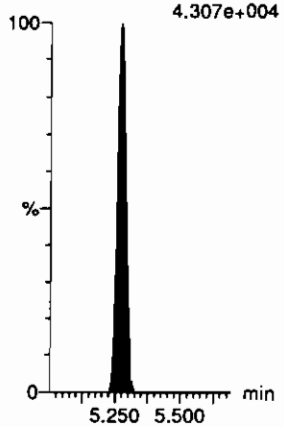
OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-48.qld

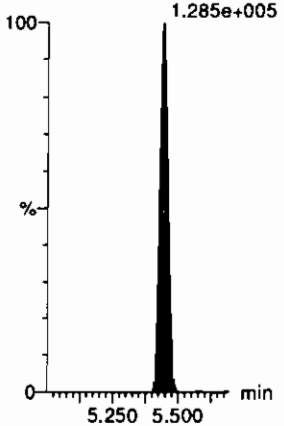
Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

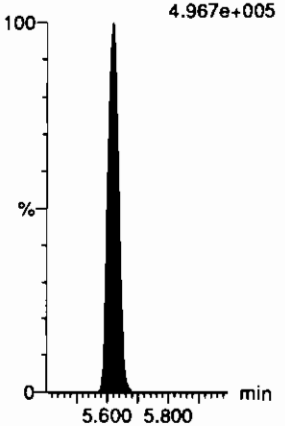
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
4.307e+004



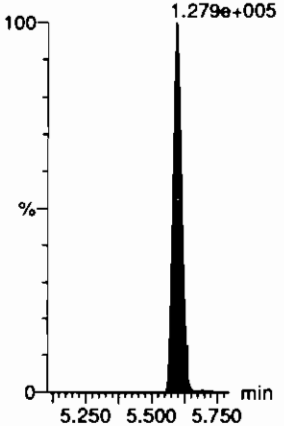
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.285e+005



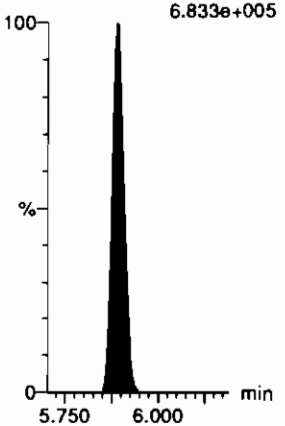
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.967e+005



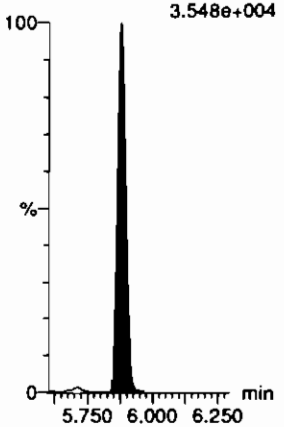
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.279e+005



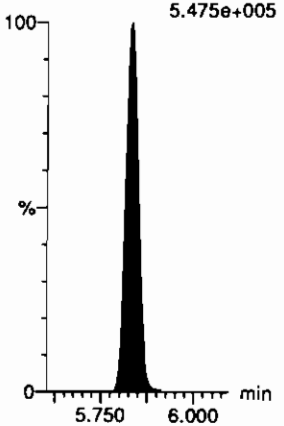
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.833e+005



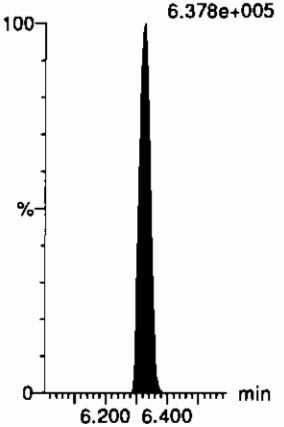
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.548e+004



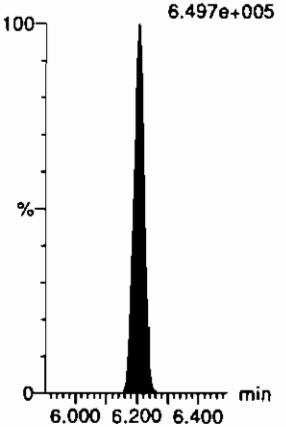
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.475e+005



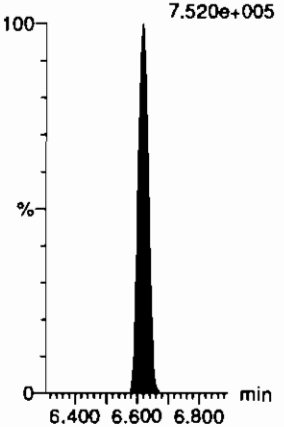
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.378e+005



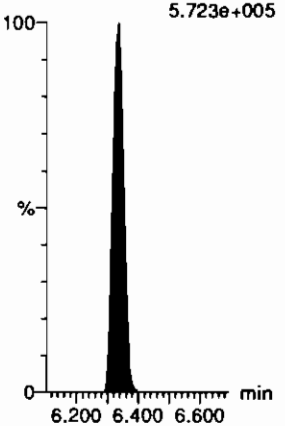
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.497e+005



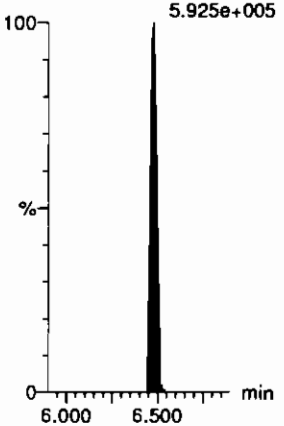
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.520e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.723e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.925e+005



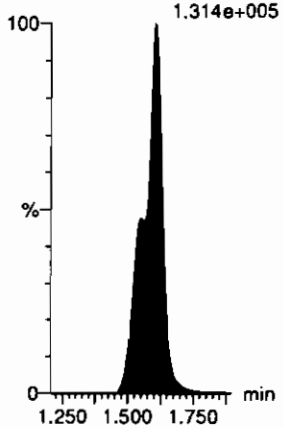
OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-48.qld

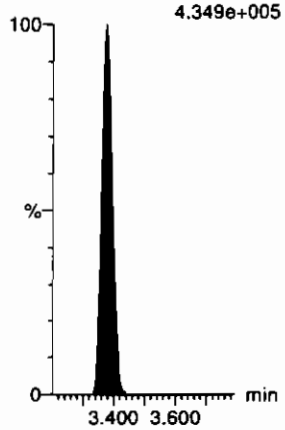
Last Altered: Tuesday, July 07, 2020 10:14:25 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:16:23 Pacific Daylight Time

Name: 200706P1-48, Date: 06-Jul-2020, Time: 18:42:17, ID: ST200706P1-11 PFC CS3 20F1906, Description: PFC CS3 20F1906

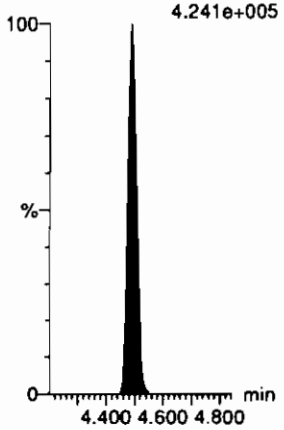
13C4-PFBA



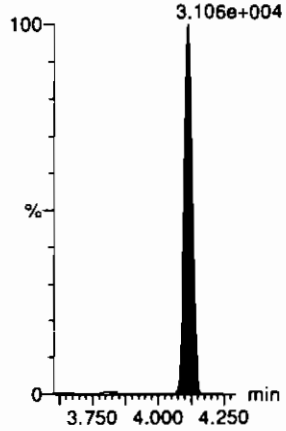
13C5-PFHxA



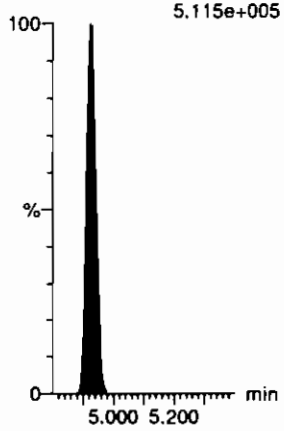
13C8-PFOA



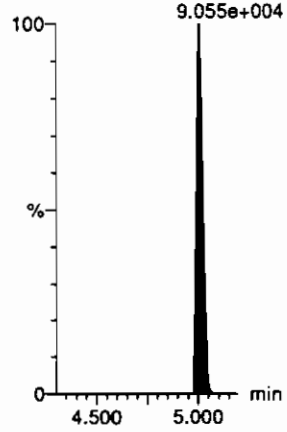
18O2-PFHxS



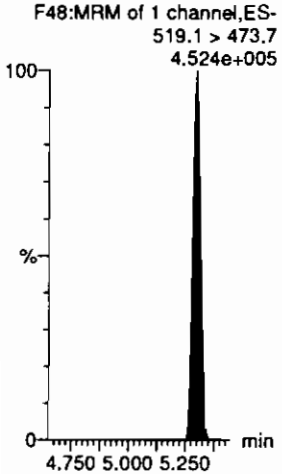
13C9-PFNA



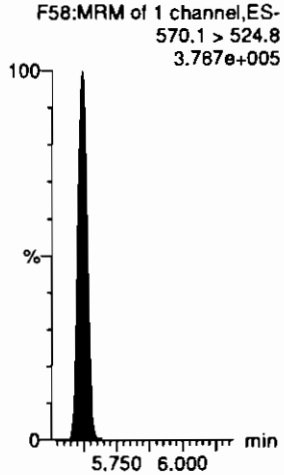
13C4-PFOS



13C6-PFDA



13C7-PFUdA



OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

Last Altered: Tuesday, July 07, 2020 10:23:37 Pacific Daylight Time
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Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

1	PFBA	213.0 > 168.8	8012.707	10050.552	1.00	1.60	9.966	10.000	9.62	96.2	NO		
2	PFPrS	249 > 80	1558.559	1527.099	1.00	1.94	12.758	10.000	9.56	95.6	NO	2.713	NO
3	3:3 FTCA	240.9 > 176.9	800.662	13437.363	1.00	2.42	0.745	10.000	9.01	90.1	NO	3.368	NO
4	PFPeA	263.1 > 218.9	10089.282	13437.363	1.00	2.57	9.385	10.000	10.1	101.3	NO		
5	PFBS	299.0 > 80	3015.340	1527.099	1.00	2.84	24.682	10.000	9.64	96.4	NO	2.439	NO
6	4:2 FTS	326.9 > 306.9	3093.074	1346.214	1.00	3.28	28.720	10.000	10.1	100.8	NO	12.003	NO
47	13C3-PFBA-EIS	216.1 > 171.8	10050.552		1.00	1.59	10050.552	12.500	14.6	116.6	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1527.099		1.00	2.84	1527.099	12.500	14.7	117.5	NO		
49	13C3-PFPeA-EIS	266.0 > 221.8	13437.363		1.00	2.57	13437.363	12.500	14.0	111.8	NO		
49	13C3-PFPeA-EIS	266.0 > 221.8	13437.363		1.00	2.57	13437.363	12.500	14.0	111.8	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1527.099		1.00	2.84	1527.099	12.500	14.7	117.5	NO		
55	13C2-4:2 FTS-EIS	329.0 >80.8	1346.214		1.00	3.28	1346.214	12.500	13.3	106.7	NO		
-1													
7	PFHxA	313.0 > 269.0	13166.781	15047.628	1.00	3.36	10.938	10.000	10.5	104.9	NO	16.582	NO
8	PFPeS	349.>80	2493.285	1527.099	1.00	3.54	20.409	10.000	9.78	97.8	NO	2.152	NO
9	HFPO-DA	285.1 > 168.9	2560.337	3145.659	1.00	3.56	10.174	10.000	10.1	101.2	NO	2.332	NO
10	5:3 FTCA	340.9 > 236.9	1612.937	12937.038	1.00	3.90	1.558	10.000	8.82	88.2	NO	1.516	NO
11	PFHpA	363.0 > 319	13780.732	12937.038	1.00	3.96	13.315	10.000	10.2	102.3	NO	56.292	NO
12	ADONA	376.8 > 250.9	22759.811	12937.038	1.00	4.07	21.991	10.000	10.1	101.1	NO	3.990	NO
57	13C2-PFHxA-EIS	315.0 > 270.0	15047.628		1.00	3.36	15047.628	12.500	13.8	110.4	NO		
51	13C3-PFBS-EIS	302.0 > 98.9	1527.099		1.00	2.84	1527.099	12.500	14.7	117.5	NO		
53	13C3-HFPO-DA-EIS	287.0 > 168.9	3145.659		1.00	3.56	3145.659	12.500	13.8	110.2	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	12937.038		1.00	3.96	12937.038	12.500	13.2	105.3	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	12937.038		1.00	3.96	12937.038	12.500	13.2	105.3	NO		
59	13C4-PFHpA-EIS	367.2 > 321.8	12937.038		1.00	3.96	12937.038	12.500	13.2	105.3	NO		
-1													
13	L-PFHxS	399 > 79.9	2658.051	2861.496	1.00	4.10	11.611	10.000	10.6	105.6	NO	4.082	NO
15	6:2 FTS	427.0 > 407	1592.953	1651.599	1.00	4.42	12.056	10.000	10.5	105.4	NO	0.761	NO
16	L-PFOA	413 > 369	13238.193	14884.313	1.00	4.48	11.118	10.000	9.81	98.1	NO	2.982	NO
18	PFecHS	461 > 381.0	2762.227	14884.313	1.00	4.49	2.320	10.000	10.3	102.9	NO	0.563	NO
19	PFHpS	449.0 > 80	2459.571	3135.890	1.00	4.58	9.804	10.000	10.1	100.7	NO	1.839	NO
20	7:3 FTCA	440.9 > 336.9	3562.670	15884.413	1.00	4.90	2.804	10.000	9.07	90.7	NO	1.307	NO
61	13C3-PFHxS-EIS	402 > 80	2861.496		1.00	4.10	2861.496	12.500	13.0	104.0	NO		
63	13C2-6:2 FTS-EIS	429.0 >79.7	1651.599		1.00	4.42	1651.599	12.500	12.8	102.6	NO		
69	13C2-PFOA-EIS	414.9 > 369.7	14884.313		1.00	4.48	14884.313	12.500	12.9	103.1	NO		
69	13C2-PFOA-EIS	414.9 > 369.7	14884.313		1.00	4.48	14884.313	12.500	12.9	103.1	NO		

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Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

71	13C8-PFOS-EIS	507.1 > 80	3135.890		1.00	4.99	3135.890	12.500	13.9	111.2	NO		
65	13C5-PFNA-EIS	468.2 > 422.9	15884.413		1.00	4.92	15884.413	12.500	13.1	104.7	NO		
-1													
21	PFNA	463.0 > 418.8	14460.560	15884.413	1.00	4.91	11.380	10.000	10.2	101.8	NO	13.189	NO
22	PFOSA	498 > 78	4086.348	7173.675	1.00	4.96	7.120	10.000	10.3	103.2	NO	20.769	NO
23	L-PFOS	499 > 80	3224.913	3135.890	1.00	4.99	12.855	10.000	10.1	101.4	NO	2.804	NO
25	9Cl-PF30NS	531 > 351	6707.201	3135.890	1.00	5.21	26.736	10.000	9.39	93.9	NO	33.447	NO
26	PFDA	513 > 469	13145.316	19387.570	1.00	5.29	8.475	10.000	9.98	99.8	NO	5.260	NO
27	8:2 FTS	526.8 > 506.9	1575.071	1594.212	1.00	5.26	12.350	10.000	9.13	91.3	NO	0.717	NO
65	13C5-PFNA-EIS	468.2 > 422.9	15884.413		1.00	4.92	15884.413	12.500	13.1	104.7	NO		
67	13C8-PFOSA-EIS	506 > 78	7173.675		1.00	4.96	7173.675	12.500	12.6	100.4	NO		
71	13C8-PFOS-EIS	507.1 > 80	3135.890		1.00	4.99	3135.890	12.500	13.9	111.2	NO		
71	13C8-PFOS-EIS	507.1 > 80	3135.890		1.00	4.99	3135.890	12.500	13.9	111.2	NO		
73	13C2-PFDA-EIS	515.1 > 469.9	19387.570		1.00	5.29	19387.570	12.500	13.0	104.0	NO		
75	13C2-8:2 FTS-EIS	529 > 80	1594.212		1.00	5.26	1594.212	12.500	14.4	115.6	NO		
-1													
28	PFNS	549 > 80	3021.391	3135.890	1.00	5.34	12.044	10.000	9.10	91.0	NO	2.340	NO
29	L-MeFOSAA	570 > 419	4150.127	4534.687	1.00	5.43	11.440	10.000	9.41	94.1	NO	1.763	NO
31	L-EtFOSAA	583.9 > 419	5476.769	4785.992	1.00	5.59	14.304	10.000	10.3	103.1	NO	1.452	NO
33	PFUdA	563.0 > 519	16435.328	18140.504	1.00	5.60	11.325	10.000	10.3	103.0	NO	18.070	NO
34	PFDS	598.8 >79.9	3061.262	3135.890	1.00	5.65	12.203	10.000	9.56	95.6	NO	2.237	NO
35	11Cl-PF30UdS	631 > 451	5486.008	25011.080	1.00	5.80	2.742	10.000	10.6	106.1	NO	15.344	NO
71	13C8-PFOS-EIS	507.1 > 80	3135.890		1.00	4.99	3135.890	12.500	13.9	111.2	NO		
77	d3-N-MeFOSAA-EIS	573.1 > 419	4534.687		1.00	5.43	4534.687	12.500	13.7	109.5	NO		
81	d5-N-EtFOSAA-EIS	589.3 > 419	4785.992		1.00	5.58	4785.992	12.500	15.2	122.0	NO		
79	13C2-PFUdA-EIS	565 > 519.8	18140.504		1.00	5.60	18140.504	12.500	11.5	91.8	NO		
71	13C8-PFOS-EIS	507.1 > 80	3135.890		1.00	4.99	3135.890	12.500	13.9	111.2	NO		
83	13C2-PFDoA-EIS	614.9 > 569.9	25011.080		1.00	5.88	25011.080	12.500	13.4	107.1	NO		
-1													
36	10:2 FTS	626.9 > 607	2052.625	1329.525	1.00	5.87	19.298	10.000	10.5	105.5	NO	0.966	NO
37	PFDoA	612.9 > 569.0	18328.338	25011.080	1.00	5.88	9.160	10.000	9.34	93.4	NO	11.313	NO
38	N-MeFOSA	512.1 > 168.9	8237.125	21553.410	1.00	5.81	57.020	50.000	51.0	101.9	NO	1.902	NO
39	PFTrDA	662.9 > 618.9	19784.354	25011.080	1.00	6.12	9.888	10.000	9.50	95.0	NO	101.735	NO
40	PFDoS	699 > 80	3542.618	24087.088	1.00	6.14	1.838	10.000	10.8	108.4	NO	2.102	NO
41	PFTeDA	713.0 > 669.0	13017.293	24087.088	1.00	6.31	6.755	10.000	10.2	101.6	NO	13.478	NO
85	13C2-10:2 FTS-EIS	632.9 > 80.0	1329.525		1.00	5.87	1329.525	12.500	12.2	97.9	NO		

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Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

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Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

				IS Area								
83 13C2-PFDoA-EIS	614.9 > 569.9	25011.080		1.00	5.88	25011.080	12.500	13.4	107.1	NO		
87 d3-N-MeFOSA-EIS	515.2 > 168.9	21553.410		1.00	5.83	21553.410	149.200	156	104.4	NO		
83 13C2-PFDoA-EIS	614.9 > 569.9	25011.080		1.00	5.88	25011.080	12.500	13.4	107.1	NO		
89 13C2-PFTeDA-EIS	715.1 > 669.7	24087.088		1.00	6.31	24087.088	12.500	12.6	101.1	NO		
89 13C2-PFTeDA-EIS	715.1 > 669.7	24087.088		1.00	6.31	24087.088	12.500	12.6	101.1	NO		
-1												
42 N-EtFOSA	526.1 > 168.9	9368.911	24071.305	1.00	6.19	58.071	50.000	50.2	100.4	NO	1.867	NO
43 PFHxDA	813 > 769	22748.705	27401.508	1.00	6.61	10.377	10.000	9.91	99.1	NO	29.821	NO
44 PFODA	913.1 > 868.8	18665.713	27401.508	1.00	6.82	8.515	10.000	10.3	102.7	NO		
45 N-MeFOSE	616.1 > 58.9	8446.872	22000.695	1.00	6.35	57.283	50.000	51.7	103.4	NO		
46 N-EtFOSE	630.1 > 58.9	8577.006	24234.545	1.00	6.49	52.804	50.000	52.2	104.4	NO		
48 13C3-PFBA-RSD	216.1 > 171.8	9954.403	11285.294	1.00	1.59	11.026	12.500	12.9	103.3	NO		
91 d5-N-ETFOSA-EIS	531.1 > 168.9	24071.305		1.00	6.20	24071.305	149.200	155	103.9	NO		
93 13C2-PFHxDA-EIS	815 > 769.7	27401.508		1.00	6.61	27401.508	12.500	13.0	103.9	NO		
93 13C2-PFHxDA-EIS	815 > 769.7	27401.508		1.00	6.61	27401.508	12.500	13.0	103.9	NO		
95 d7-N-MeFOSE-EIS	623.1 > 58.9	22000.695		1.00	6.33	22000.695	149.200	163	109.4	NO		
97 d9-N-EtFOSE-EIS	639.2 > 58.8	24234.545		1.00	6.48	24234.545	149.200	163	109.2	NO		
50 13C3-PFPeA-RSD	266.0 > 221.8	13437.363	17339.709	1.00	2.57	9.687	12.500	12.9	103.1	NO		
-1												
52 13C3-PFBS-RSD	302.0 > 98.9	1527.099	1201.153	1.00	2.84	15.892	12.500	13.0	103.7	NO		
54 13C3-HFPO-DA-RSD	287.0 > 168.9	3145.659	17339.709	1.00	3.56	2.268	12.500	12.0	95.9	NO		
56 13C2-4:2 FTS-RSD	329.0 >80.8	1346.214	1201.153	1.00	3.28	14.010	12.500	12.4	99.0	NO		
58 13C2-PFHxA-RSD	315.0 > 270.0	15047.628	17339.709	1.00	3.36	10.848	12.500	12.3	98.7	NO		
60 13C4-PFHpA-RSD	367.2 > 321.8	12937.038	17339.709	1.00	3.96	9.326	12.500	12.3	98.3	NO		
62 13C3-PFHxS-RSD	402 > 80	2861.496	1201.153	1.00	4.10	29.779	12.500	12.1	96.7	NO		
64 13C2-6:2 FTS-RSD	429.0 >79.7	1651.599	3680.862	1.00	4.42	5.609	12.500	11.9	94.9	NO		
66 13C5-PFNA-RSD	468.2 > 422.9	15884.413	17489.506	1.00	4.92	11.353	12.500	12.1	96.5	NO		
68 13C8-PFOSA-RSD	506 > 78	7173.675	15077.218	1.00	4.96	5.947	12.500	12.2	97.8	NO		
70 13C2-PFOA-RSD	414.9 > 369.7	14884.313	13697.632	1.00	4.48	13.583	12.500	12.4	99.4	NO		
72 13C8-PFOS-RSD	507.1 > 80	3135.890	3680.862	1.00	4.99	10.649	12.500	12.2	97.4	NO		
74 13C2-PFDA-RSD	515.1 > 469.9	19387.570	15966.805	1.00	5.29	15.178	12.500	12.1	96.8	NO		
-1												
76 13C2-8:2 FTS-RSD	529 > 80	1594.163	3680.862	1.00	5.26	5.414	12.500	11.9	94.9	NO		
78 d3-N-MeFOSAA-RSD	573.1 > 419	4534.687	15077.218	1.00	5.43	3.760	12.500	12.8	102.6	NO		
80 13C2-PFUdA-RSD	565 > 519.8	18140.504	15077.218	1.00	5.60	15.040	12.500	11.6	92.9	NO		
82 d5-N-EtFOSAA-RSD	589.3 > 419	4785.992	15077.218	1.00	5.58	3.968	12.500	14.0	112.2	NO		

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Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

84	13C2-PFDoA-RSD	614.9 > 569.9	25011.080	15966.805	1.00	5.88	19.581	12.500	12.6	101.1	NO
86	13C2-10:2 FTS-RSD	632.9 > 80.0	1329.525	3680.862	1.00	5.87	4.515	12.500	11.8	94.1	NO
88	d3-N-MeFOSA-RSD	515.2 > 168.9	21553.410	15077.218	1.00	5.83	17.869	149.200	154	103.4	NO
90	13C2-PFTeDA-RSD	715.1 > 669.7	24087.088	15077.218	1.00	6.31	19.970	12.500	12.2	97.8	NO
92	d5-N-ETFOSA-RSD	531.1 > 168.9	24071.305	15077.218	1.00	6.20	19.957	149.200	153	102.6	NO
94	13C2-PFHxDA-RSD	815 > 769.7	27401.508	15077.218	1.00	6.61	22.718	12.500	12.8	102.3	NO
96	d7-N-MeFOSE-RSD	623.1 > 58.9	22151.820	15077.218	1.00	6.33	18.365	149.200	154	103.5	NO
98	d9-N-EtFOSE-RSD	639.2 > 58.8	24389.221	15077.218	1.00	6.48	20.220	149.200	154	102.9	NO
-1											
99	13C4-PFBA	217.0 > 172.0	11285.294	11285.294	1.00	1.60	12.500	12.500	12.5	100.0	NO
1...	13C5-PFHxA	318.0 > 272.9	17339.709	17339.709	1.00	3.36	12.500	12.500	12.5	100.0	NO
1...	13C8-PFOA	420.9 > 376.0	13697.632	13697.632	1.00	4.48	12.500	12.500	12.5	100.0	NO
1...	18O2-PFHxS	403.0 > 103	1201.153	1201.153	1.00	4.10	12.500	12.500	12.5	100.0	NO
1...	13C9-PFNA	472.2 > 426.9	17489.506	17489.506	1.00	4.92	12.500	12.500	12.5	100.0	NO
1...	13C4-PFOS	503 > 79.7	3680.862	3680.862	1.00	4.99	12.500	12.500	12.5	100.0	NO
1...	13C6-PFDA	519.1 > 473.7	15966.805	15966.805	1.00	5.29	12.500	12.500	12.5	100.0	NO
1...	13C7-PFUdA	570.1 > 524.8	15077.218	15077.218	1.00	5.60	12.500	12.500	12.5	100.0	NO

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Vista Analytical Laboratory

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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: PFBA

1	200706P1-19	ST200706P1-1 PFC CS-2 20F1901	06-Jul-20	13:13:57
2	200706P1-20	ST200706P1-2 PFC CS-1 20F1902	06-Jul-20	13:24:27
3	200706P1-21	ST200706P1-3 PFC CS0 20F1903	06-Jul-20	13:34:57
4	200706P1-22	ST200706P1-4 PFC CS1 20F1904	06-Jul-20	13:45:26
5	200706P1-23	ST200706P1-5 PFC CS2 20F1905	06-Jul-20	13:55:58
6	200706P1-24	ST200706P1-6 PFC CS3 20F1906	06-Jul-20	14:06:27
7	200706P1-25	ST200706P1-7 PFC CS4 20F1907	06-Jul-20	14:16:59
8	200706P1-26	ST200706P1-8 PFC CS5 20F1908	06-Jul-20	14:27:27
9	200706P1-27	ST200706P1-9 PFC CS6 20F1909	06-Jul-20	14:37:59
10	200706P1-28	ST200706P1-10 PFC CS7 20F1910	06-Jul-20	14:48:28
11	200706P1-29	IB	06-Jul-20	14:58:58
12	200706P1-30	ICV200706P1-1 PFC ICV 20F1911	06-Jul-20	15:09:30
13	200706P1-31	IB	06-Jul-20	15:19:59
14	200706P1-32	B0F0205-BS1 OPR 0.25	06-Jul-20	15:30:30
15	200706P1-33	2001315-06 24-GW-24NEW4-20200618 0.25948	06-Jul-20	15:41:01
16	200706P1-34	2001315-08 24-GW-08DGMW73-20200618 0.25501	06-Jul-20	15:51:31
17	200706P1-35	2001345-06@5X Septic Receiving 0.11338	06-Jul-20	16:02:00
18	200706P1-36	IB	06-Jul-20	16:12:35
19	200706P1-37	2001315-06 24-GW-24NEW4-20200618 0.25948	06-Jul-20	16:46:41
20	200706P1-38	2001315-08 24-GW-08DGMW73-20200618 0.25501	06-Jul-20	16:57:15
21	200706P1-39	2001326-01 REEPEF2658FS 0.11212	06-Jul-20	17:07:46
22	200706P1-40	B0G0023-BLK1 Method Blank 0.01	06-Jul-20	17:18:14
23	200706P1-41	B0G0023-BS1 OPR 0.01	06-Jul-20	17:28:46
24	200706P1-42	B0G0023-BSD1 LCSD 0.01	06-Jul-20	17:39:17
25	200706P1-43	2001353-01RE1 CAVERLY 0.01	06-Jul-20	17:49:46
26	200706P1-44	2001353-02RE1 SOMERSET FARMS 0.01	06-Jul-20	18:00:17
27	200706P1-45	2001353-03 TOZIER 0.01	06-Jul-20	18:10:46
28	200706P1-46	2001353-04RE1 TOZIER (2 vials-same) 0.01	06-Jul-20	18:21:18
29	200706P1-47	IB	06-Jul-20	18:31:47
30	200706P1-48	ST200706P1-11 PFC CS3 20F1906	06-Jul-20	18:42:17
31	200706P1-49	IB	06-Jul-20	18:52:49
32	200706P1-50	B0F0257-BLK1 Method Blank 0.25	06-Jul-20	19:03:20

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Compound name: PFBA

33	200706P1-51	B0F0257-BS1 OPR 0.25	06-Jul-20	19:13:50
34	200706P1-52	B0F0257-BSD1 LCSD 0.25	06-Jul-20	19:24:18
35	200706P1-53	B0F0257-MS1 Matrix Spike 0.2511	06-Jul-20	19:34:50
36	200706P1-54	B0F0257-MSD1 Matrix Spike Dup 0.24211	06-Jul-20	19:45:19
37	200706P1-55	2001356-01 ET-LW02-2020 0.25782	06-Jul-20	19:55:51
38	200706P1-56	IB	06-Jul-20	20:06:19
39	200706P1-57	2001357-01 SB01-20200624 0.24654	06-Jul-20	20:16:52
40	200706P1-58	2001357-02 EB01-20200624 0.24804	06-Jul-20	20:27:21
41	200706P1-59	2001357-03 I006MW065-20200624 0.25563	06-Jul-20	20:37:52
42	200706P1-60	IB	06-Jul-20	20:48:23
43	200706P1-61	2001357-04 DUP01-20200624 0.25403	06-Jul-20	20:58:53
44	200706P1-62	IB	06-Jul-20	21:09:22
45	200706P1-63	2001358-01 EB02-20200624 0.24128	06-Jul-20	21:19:52
46	200706P1-64	2001358-02 24-GW-24MW06-20200624 0.26389	06-Jul-20	21:30:23
47	200706P1-65	2001358-03 DUP01-20200624 0.26301	06-Jul-20	21:40:52
48	200706P1-66	2001358-04 24-GW-24MW10D-20200624 0.25918	08-Jul-20	21:51:24
49	200706P1-67	2001358-05 DUP02-20200624 0.2559	06-Jul-20	22:01:54
50	200706P1-68	2001358-06 24-GW-24MW10C-20200624 0.25497	06-Jul-20	22:12:25
51	200706P1-69	2001358-07 24-GW-24MW07R-20200624 0.25444	06-Jul-20	22:22:53
52	200706P1-70	B0F0172-BLK1 Method Blank 0.25	06-Jul-20	22:33:25
53	200706P1-71	B0F0172-BS1 OPR 0.25	06-Jul-20	22:43:54
54	200706P1-72	2001276-01 Equipment Blank-1 0.22934	06-Jul-20	22:54:26
55	200706P1-73	ST200706P1-12 PFC CS3 20F1906	06-Jul-20	23:04:55
56	200706P1-74	IB	06-Jul-20	23:15:27
57	200706P1-75	2001276-02 MW-20-01 0.25109	06-Jul-20	23:25:56
58	200706P1-76	2001276-03 Field Blank 0.24862	06-Jul-20	23:36:27
59	200706P1-77	2001276-04 MW-20-02 0.26126	06-Jul-20	23:46:56
60	200706P1-78	2001276-05 MW-20-03 0.24623	06-Jul-20	23:57:28
61	200706P1-79	2001276-06 Equipment Blank-2 0.24081	07-Jul-20	00:07:57
62	200706P1-80	2001276-07 Duplicate-1 0.24702	07-Jul-20	00:18:27
63	200706P1-81	B0F0088-BLK1 Method Blank 5	07-Jul-20	00:28:59
84	200706P1-82	B0F0088-BS1 OPR 5	07-Jul-20	00:39:27
65	200706P1-83	B0F0088-BSD1 LCSD 5	07-Jul-20	00:50:00
66	200706P1-84	2001248-01 05082020 B 5	07-Jul-20	01:00:28
67	200706P1-85	2001250-01 05082020 A 5	07-Jul-20	01:10:58
68	200706P1-86	ST200706P1-13 PFC CS3 20F1906	07-Jul-20	01:21:30

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Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
69	200706P1-87	IB	07-Jul-20	01:31:59
70	200706P1-88	2001251-01 05082020 C 5	07-Jul-20	01:42:31
71	200706P1-89	2001252-01 05082020 E 2.5	07-Jul-20	01:53:00
72	200706P1-90	2001351-01 05082020AY 2.5	07-Jul-20	02:03:30
73	200706P1-91	2001375-01 05082020AF 3	07-Jul-20	02:14:01
74	200706P1-92	2001376-01 05082020T 2.5	07-Jul-20	02:24:33
75	200706P1-93	2001383-01 05082020AQ 3	07-Jul-20	02:35:01
76	200706P1-94	2001384-01 05082020AG 2.5	07-Jul-20	02:45:33
77	200706P1-95	2001391-01 05082020J 2.5	07-Jul-20	02:56:03
78	200706P1-96	2001392-01 05082020R 3	07-Jul-20	03:06:32
79	200706P1-97	2001393-01 05082020G 2.5	07-Jul-20	03:17:04
80	200706P1-98	ST200706P1-14 PFC CS3 20F1906	07-Jul-20	03:27:34
81	200706P1-99	IB	07-Jul-20	03:38:03
82	200706P1-100	2001402-01 06122020A 5	07-Jul-20	03:48:35
83	200706P1-101	2001403-01 05082020AN 2.5	07-Jul-20	03:59:04
84	200706P1-102	2001302-01@5X QP-1 0.03392	07-Jul-20	04:09:35
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88	200706P1-106	2001302-05@5X OP-5 0.03336	07-Jul-20	04:51:36
89	200706P1-107	2001302-06@5X OP-6 0.03266	07-Jul-20	05:02:06
90	200706P1-108	2001302-07@5X OP-7 0.03389	07-Jul-20	05:12:35
91	200706P1-109	2001302-08@5X OP-8 0.03326	07-Jul-20	05:23:07
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97	200706P1-115	2001302-12@5X OP-12 0.03372	07-Jul-20	06:26:08
98	200706P1-116	2001302-13@5X OP-13 0.03255	07-Jul-20	06:36:39
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Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

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Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

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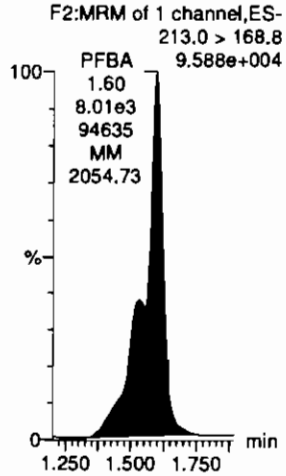

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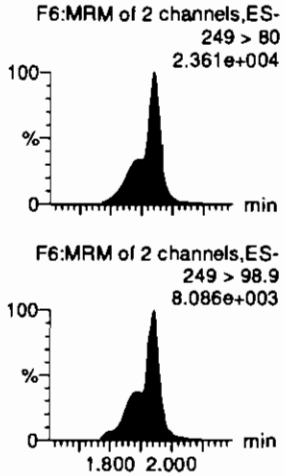
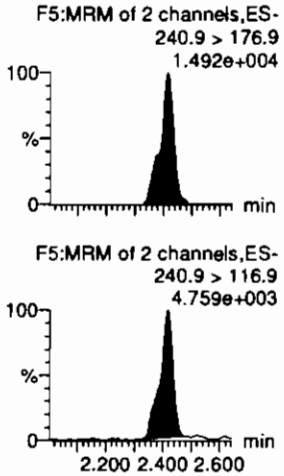


3:3 FTCA



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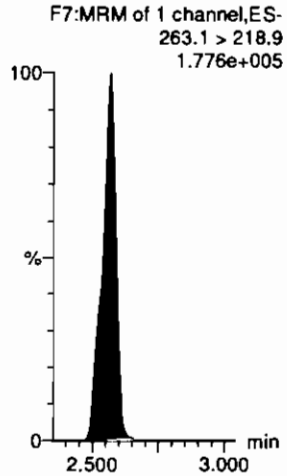

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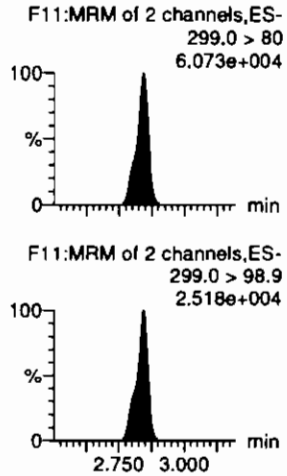
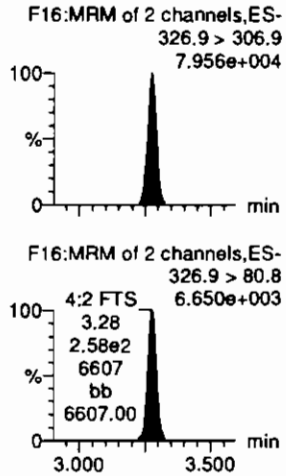
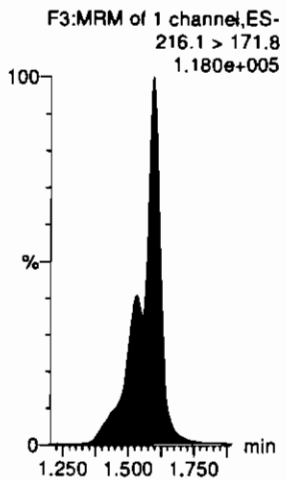


4:2 FTS



13C3-PFBA-EIS



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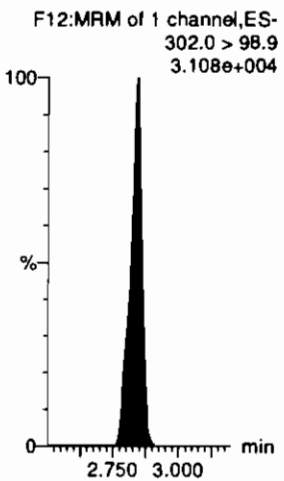

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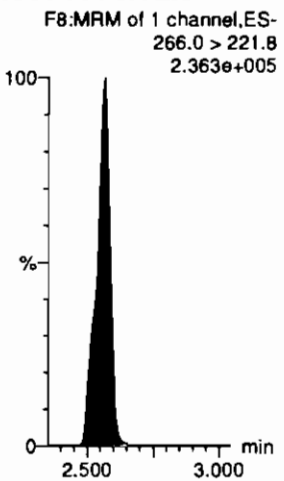

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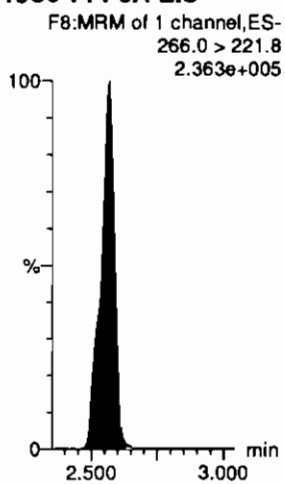

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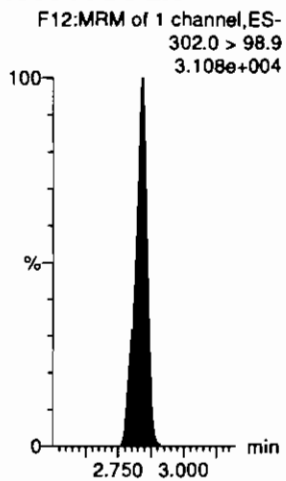
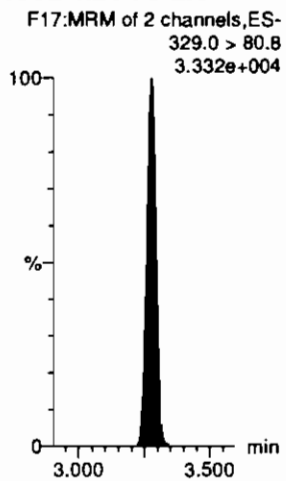


13C2-4:2 FTS-EIS



OPV 7/7/2020

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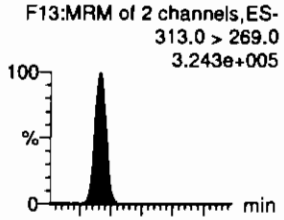
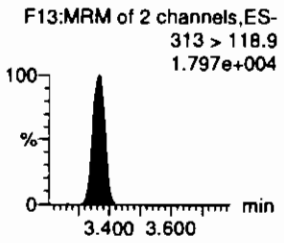
Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

PFHxA





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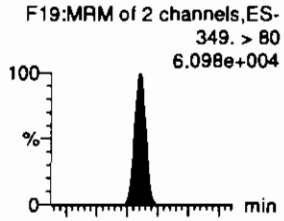
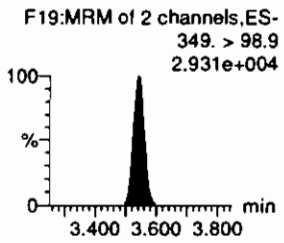
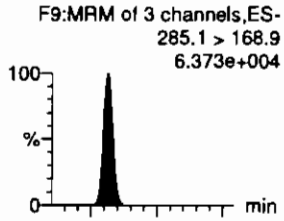
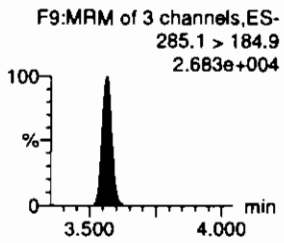


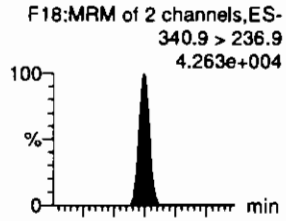


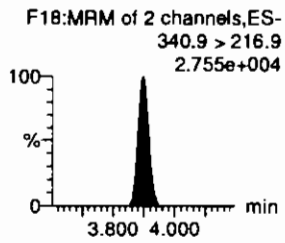
HFPO-DA





5:3 FTCA





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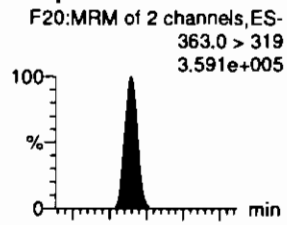

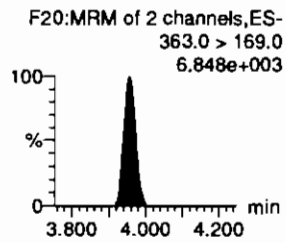

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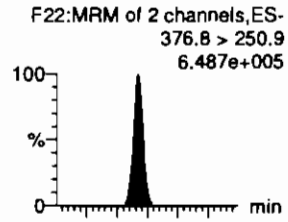

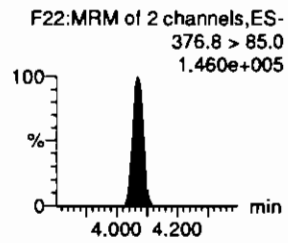

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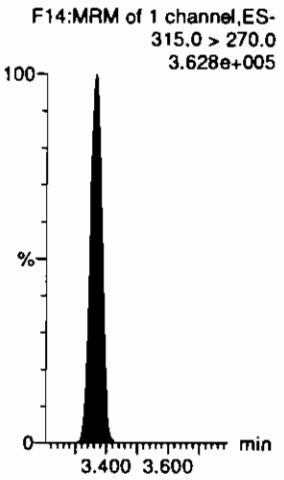

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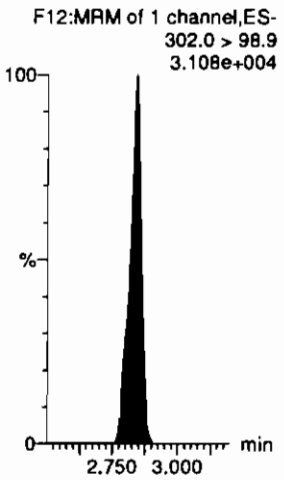

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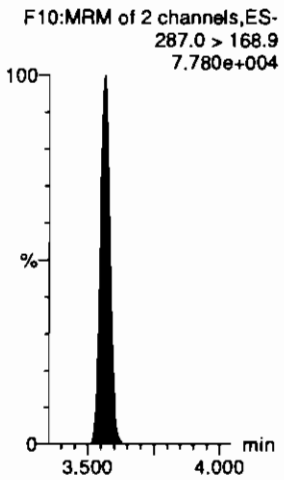

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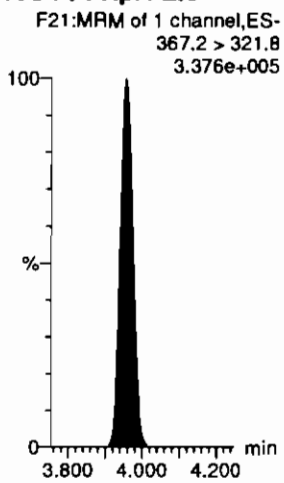

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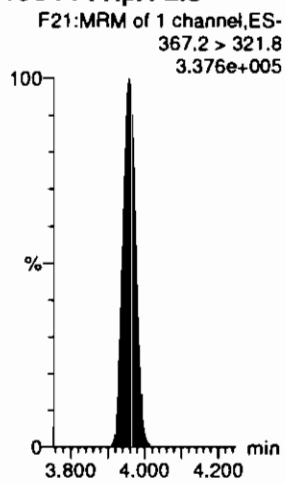

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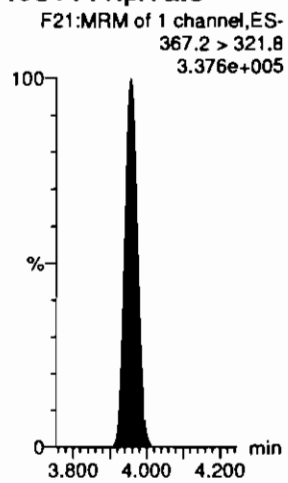

OPV 7/7/2020

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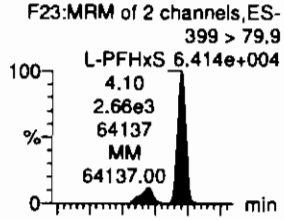
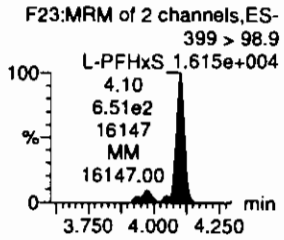
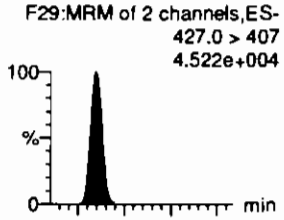
Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

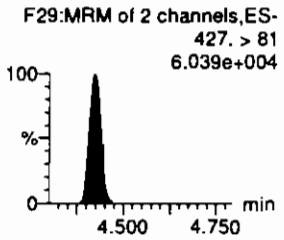
L-PFHxS



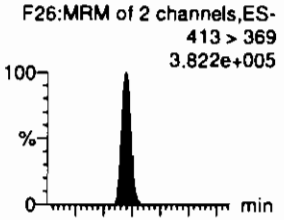


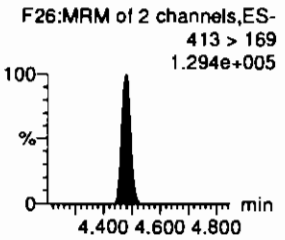
6:2 FTS





L-PFOA





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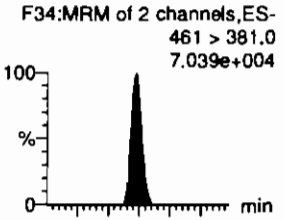

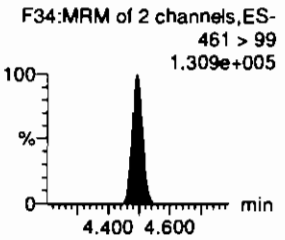

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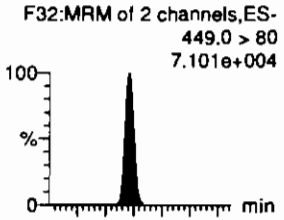
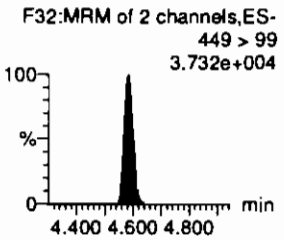
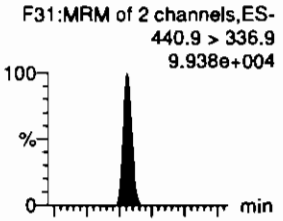
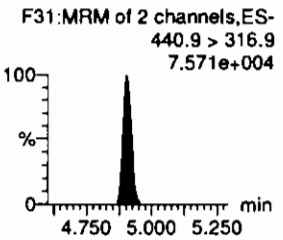


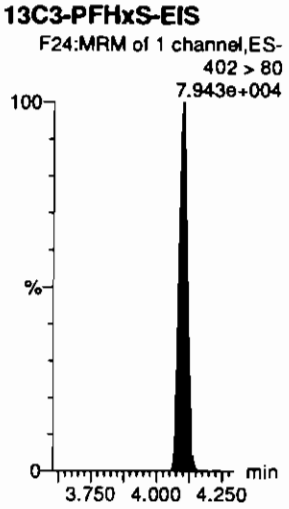


7:3 FTCA

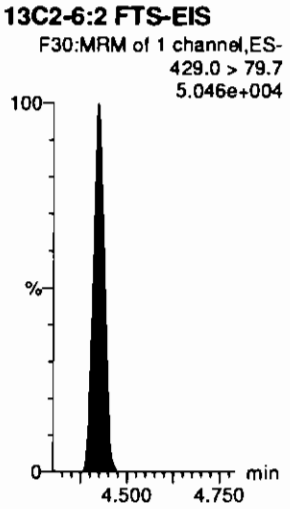




13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



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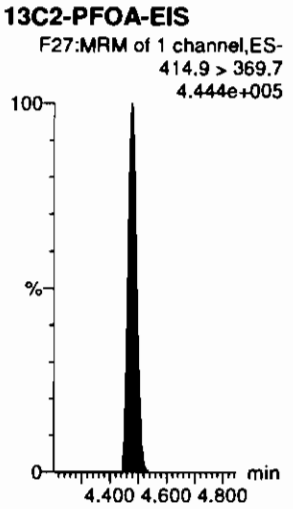

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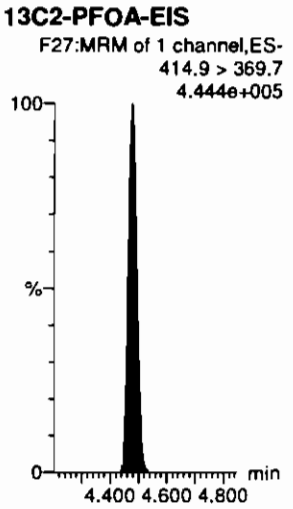

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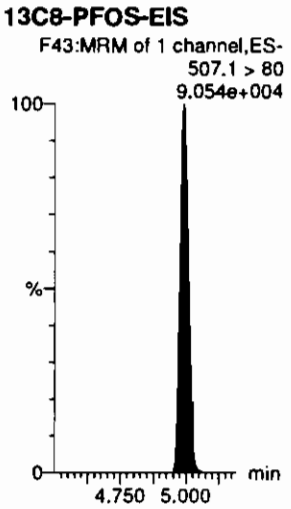
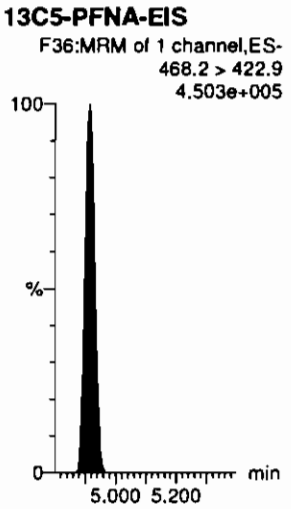


13C5-PFNA-EIS



OPV 7/7/2020

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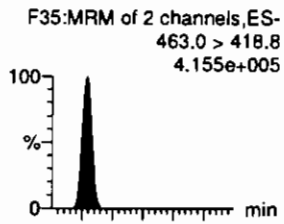
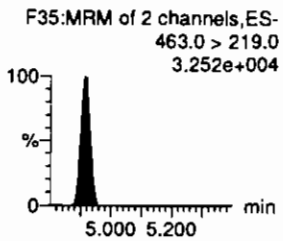
Last Altered: Tuesday, July 07, 2020 10:23:37 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

PFNA





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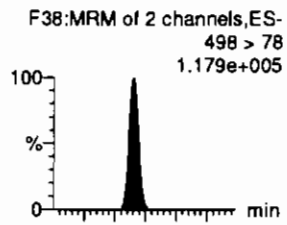

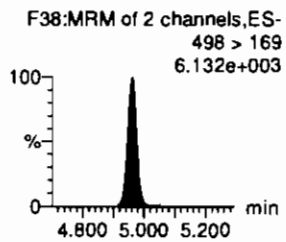

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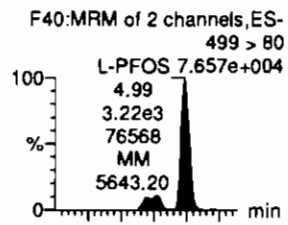
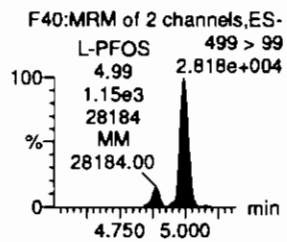
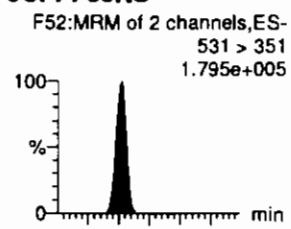
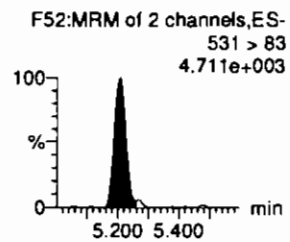




9Cl-PF30NS





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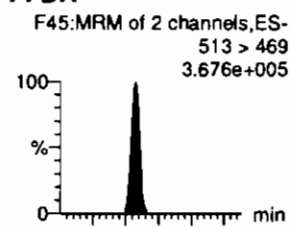

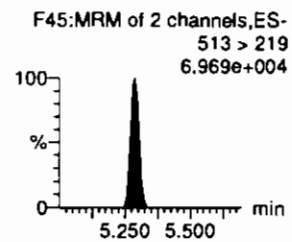

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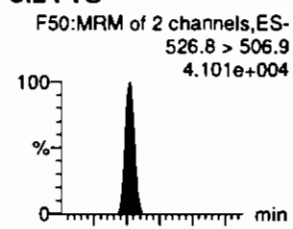

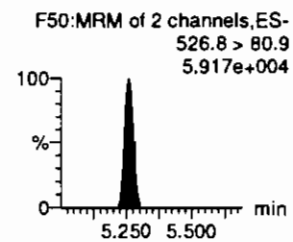

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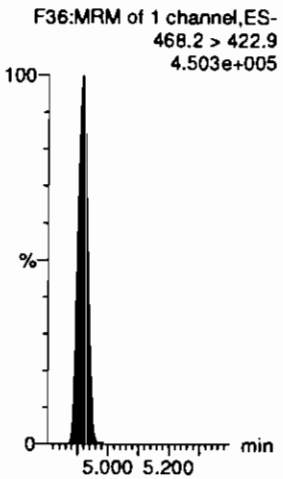
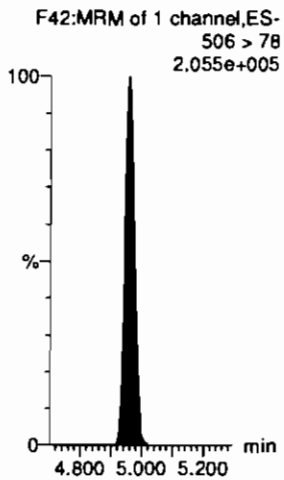


13C8-PFOSA-EIS



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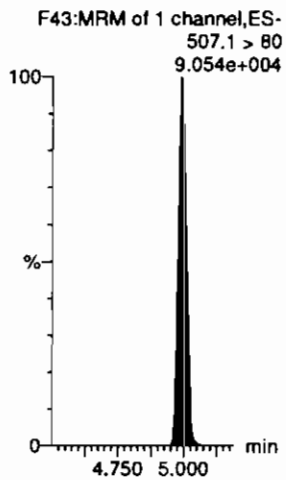

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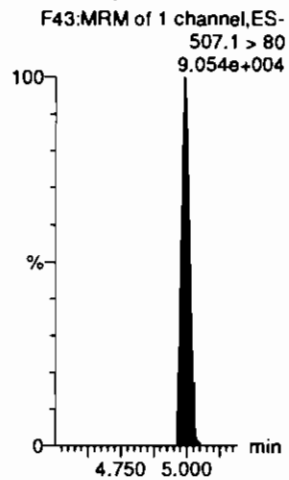

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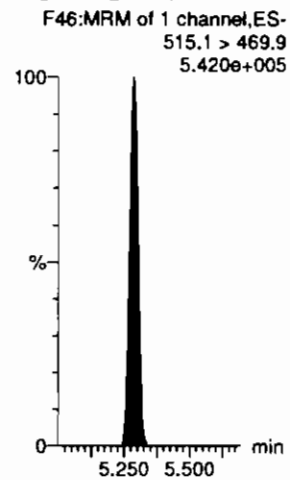

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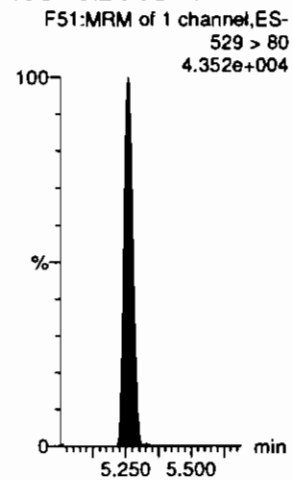

OPV 7/7/2020

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Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

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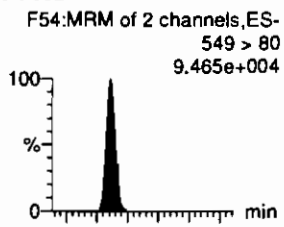

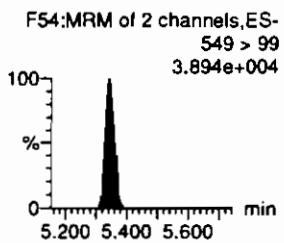

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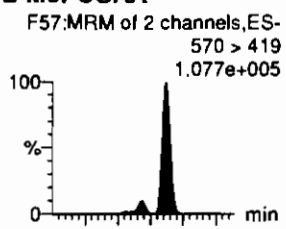

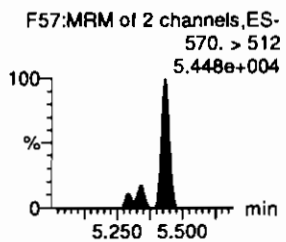

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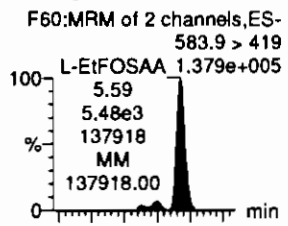

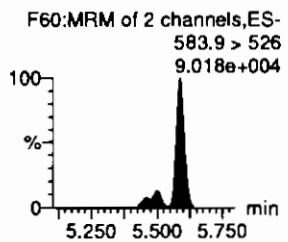

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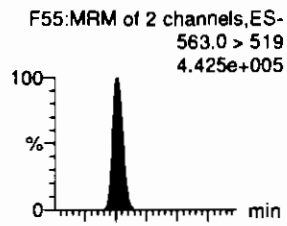

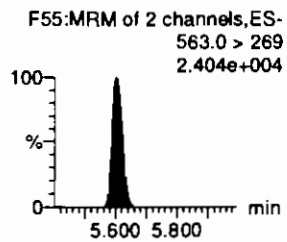

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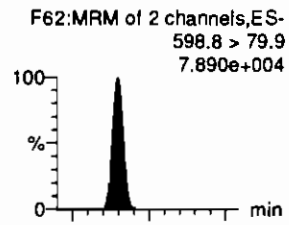

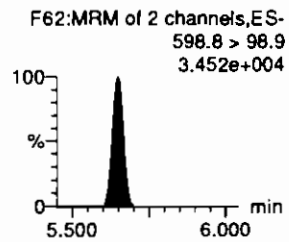

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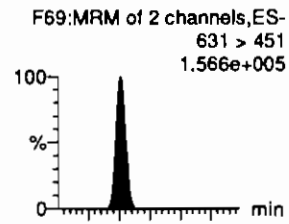
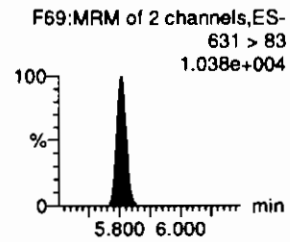
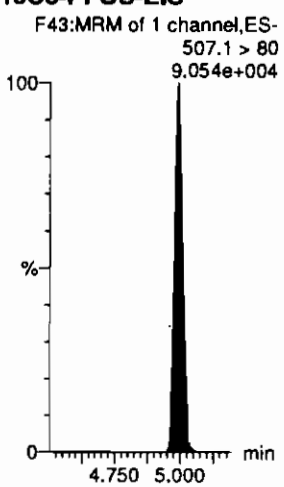




13C8-PFOS-EIS



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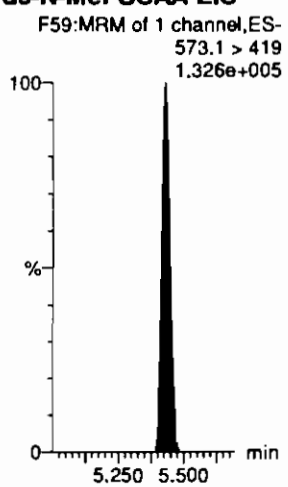

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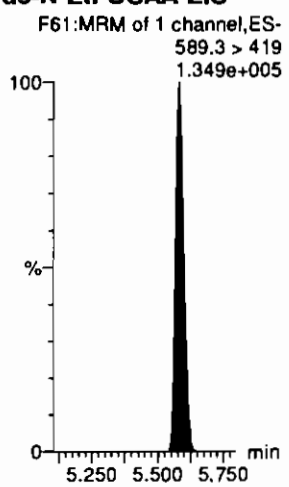

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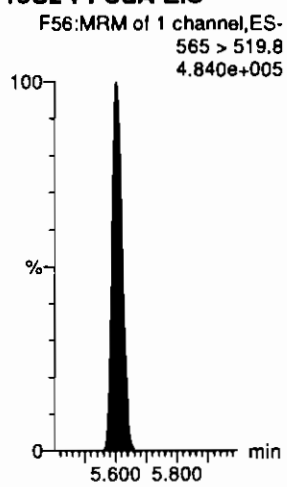

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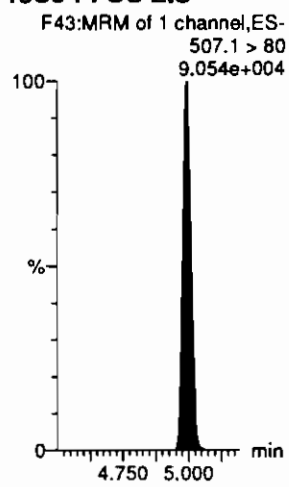

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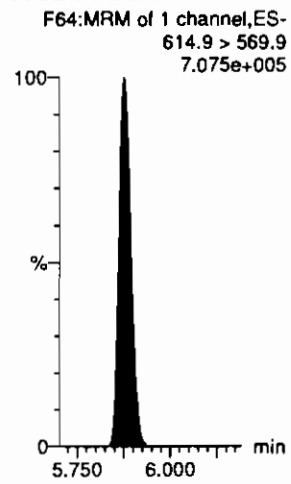

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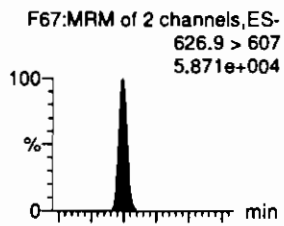
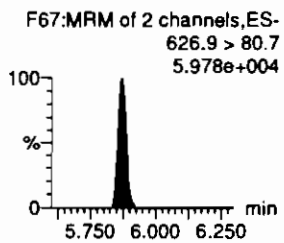
10:2 FTS





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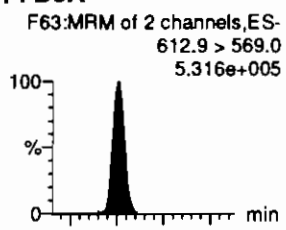
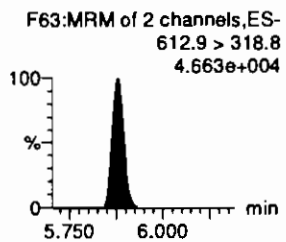
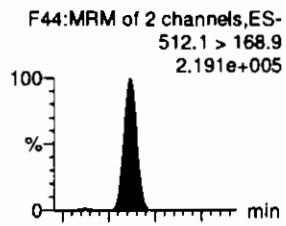
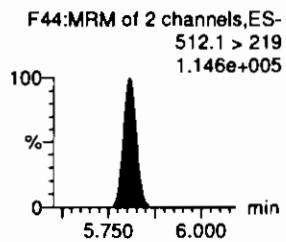




N-MeFOSA





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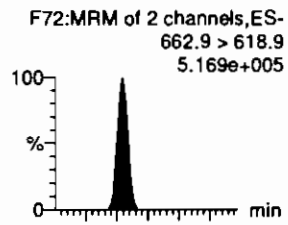

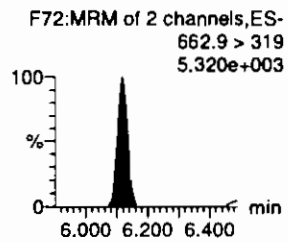

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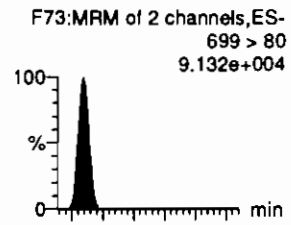

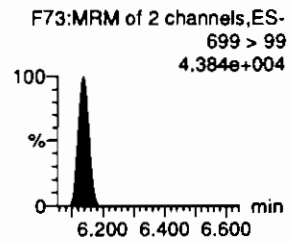

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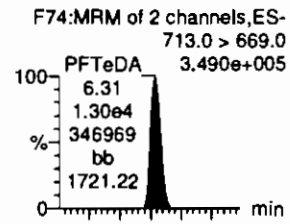

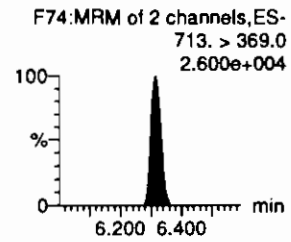

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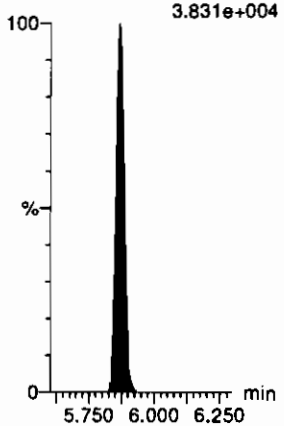
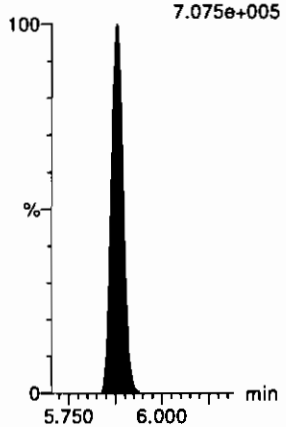
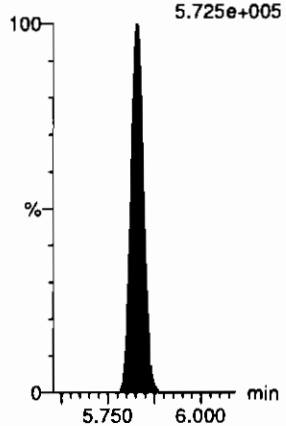


13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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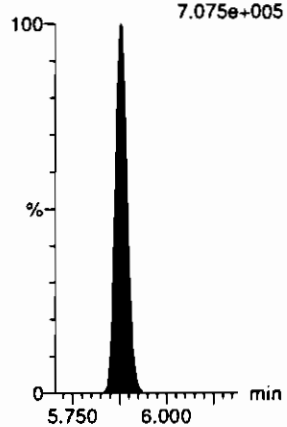
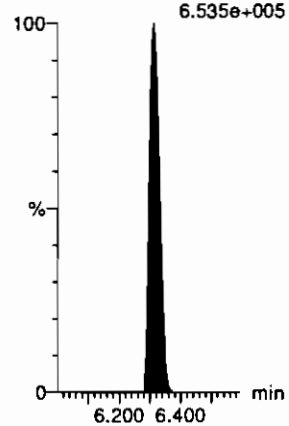


13C2-PFTeDA-EIS



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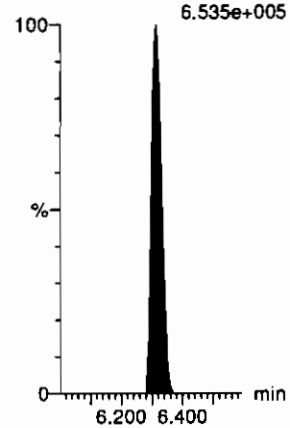

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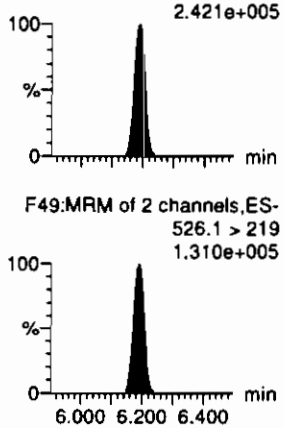
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

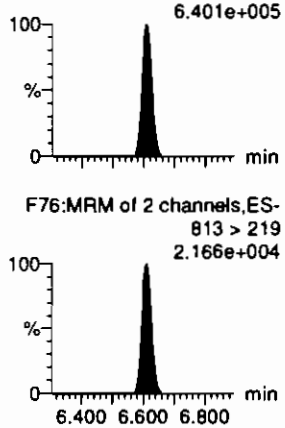
Last Altered: Tuesday, July 07, 2020 10:23:37 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

N-EtFOSA



PFHxDA



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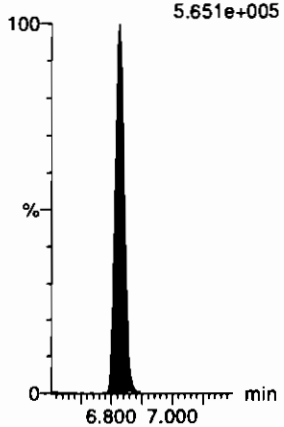
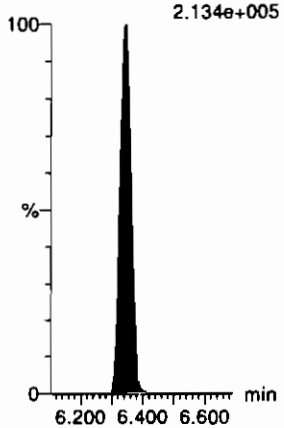


N-MeFOSE



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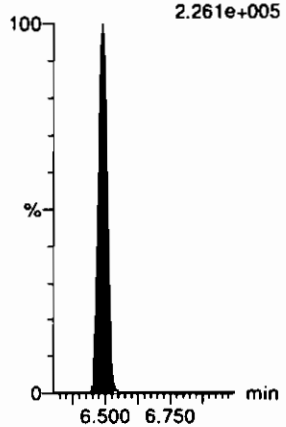
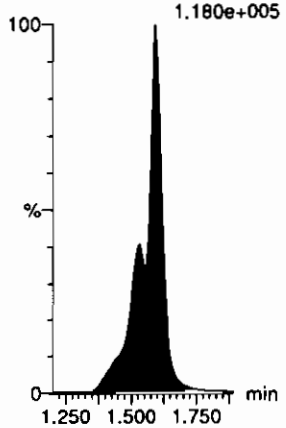
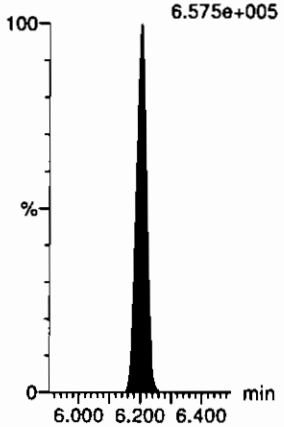


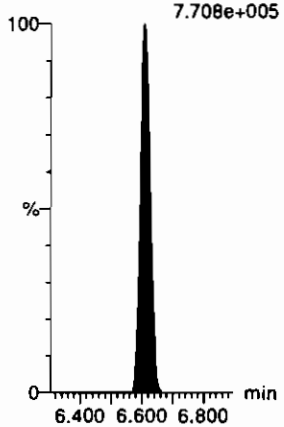
13C3-PFBA-RSD



d5-N-ETFOSA-EIS



13C2-PFHxDA-EIS



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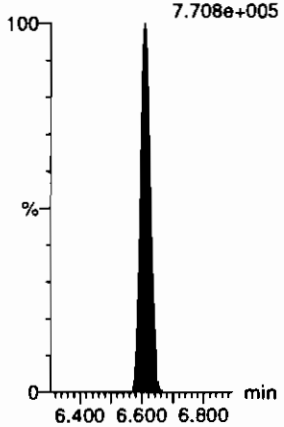
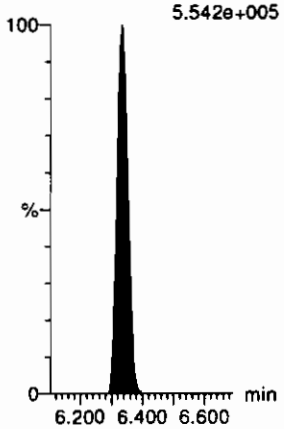
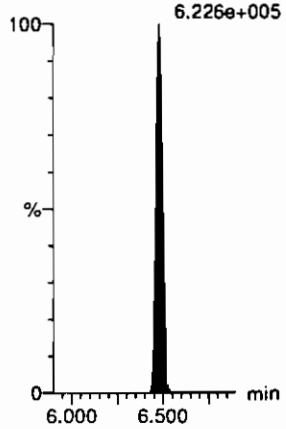


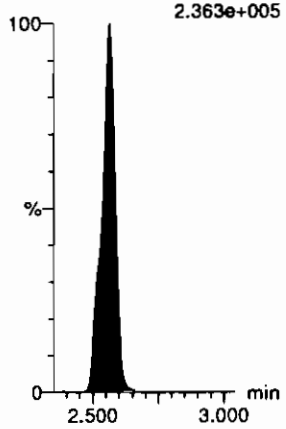
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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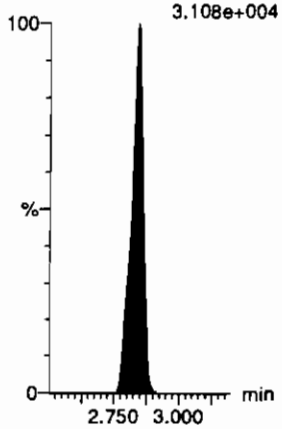
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

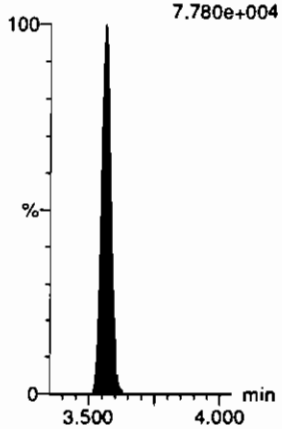
Last Altered: Tuesday, July 07, 2020 10:23:37 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

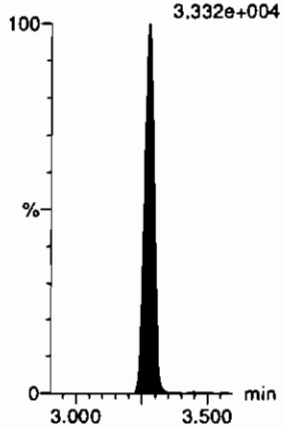
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.108e+004



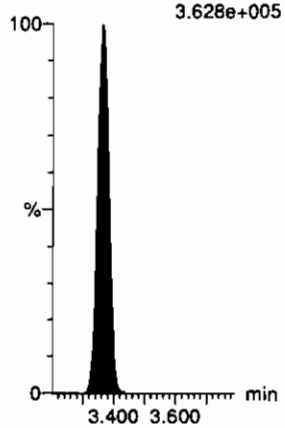
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.780e+004



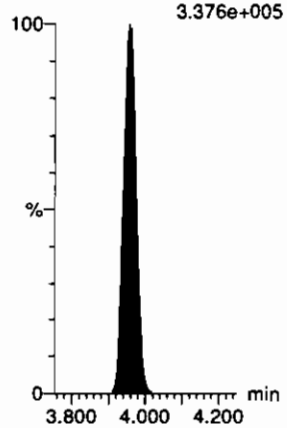
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.332e+004



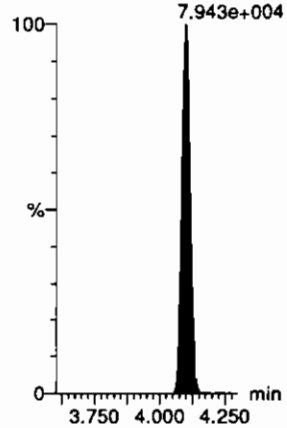
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.628e+005



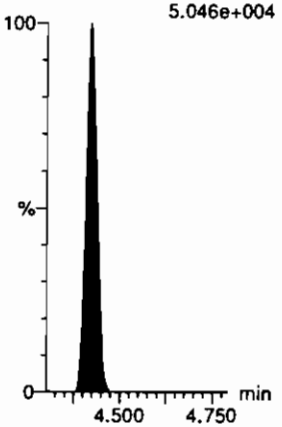
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.376e+005



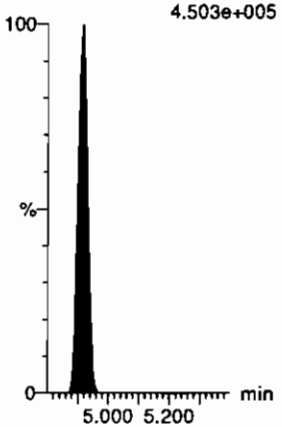
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
7.943e+004



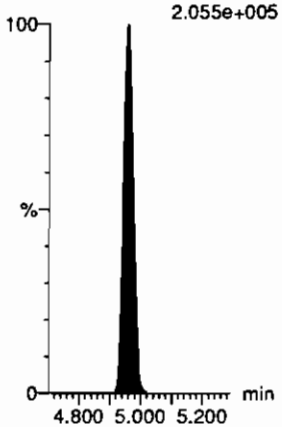
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
5.046e+004



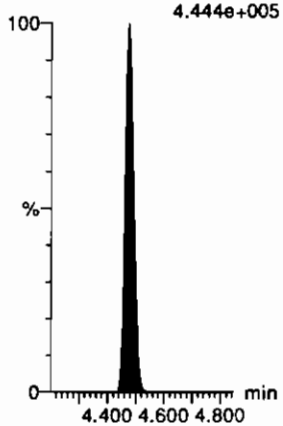
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.503e+005



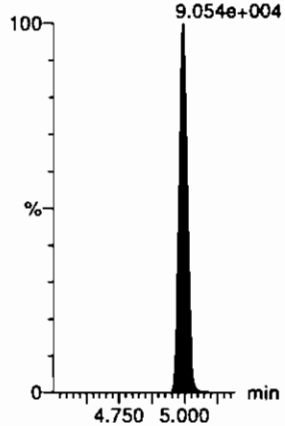
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.055e+005



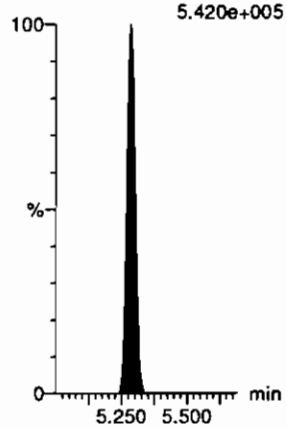
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
4.444e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
9.054e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.420e+005



OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-73.qld

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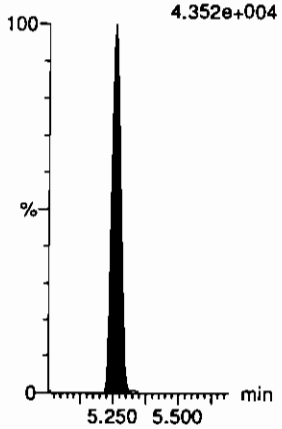
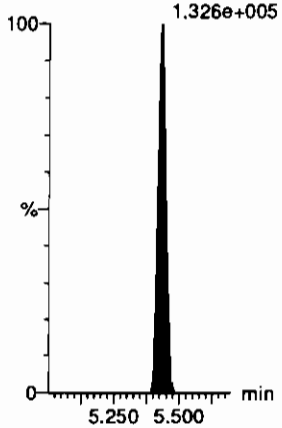
Printed: Tuesday, July 07, 2020 10:23:55 Pacific Daylight Time

Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

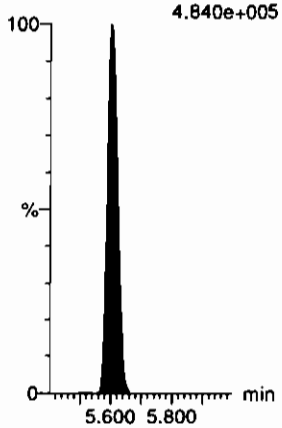
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
4.352e+004



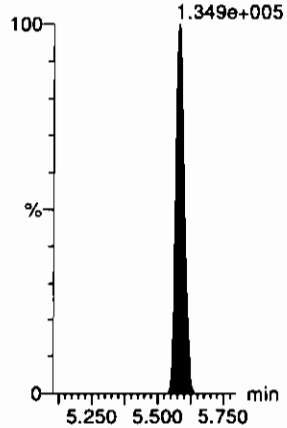
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.326e+005



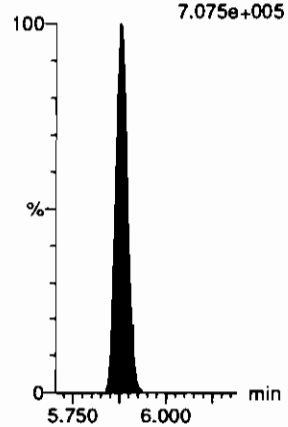
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.840e+005



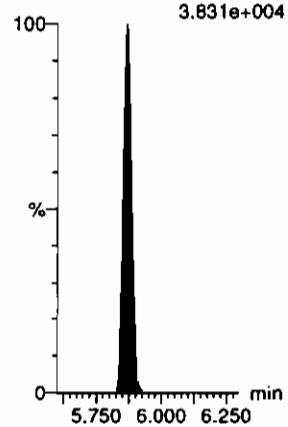
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.349e+005



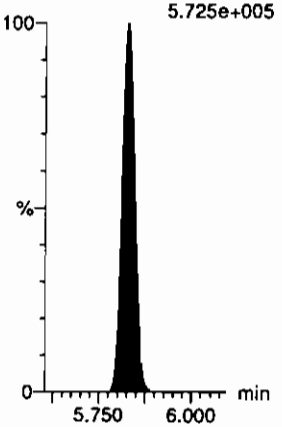
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
7.075e+005



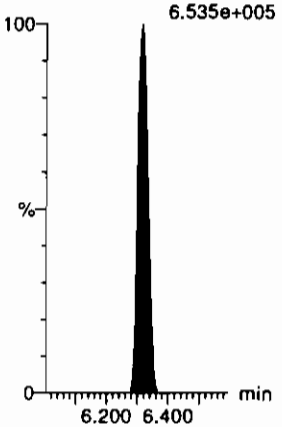
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.831e+004



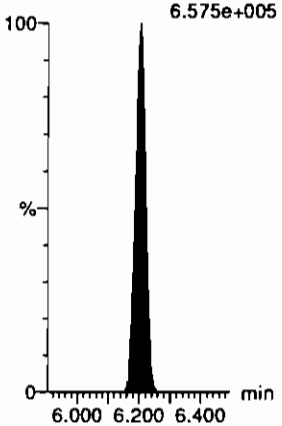
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.725e+005



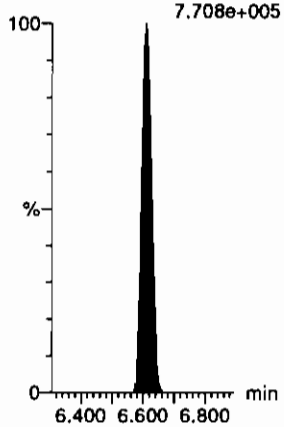
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.535e+005



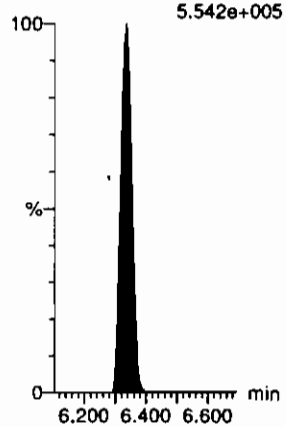
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.575e+005



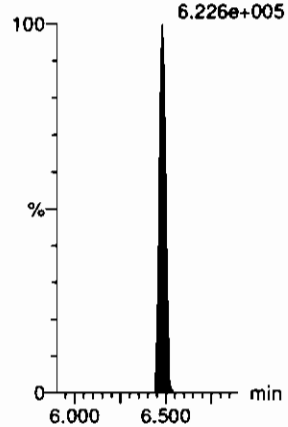
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.708e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.542e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
6.226e+005



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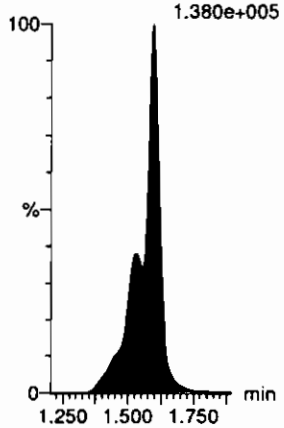
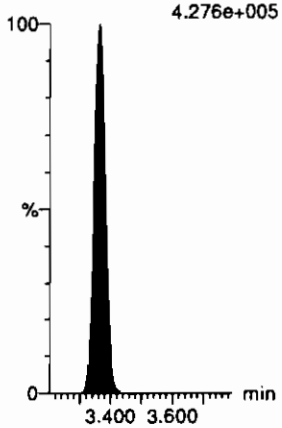
Name: 200706P1-73, Date: 06-Jul-2020, Time: 23:04:55, ID: ST200706P1-12 PFC CS3 20F1906, Description: PFC CS3 20F1906

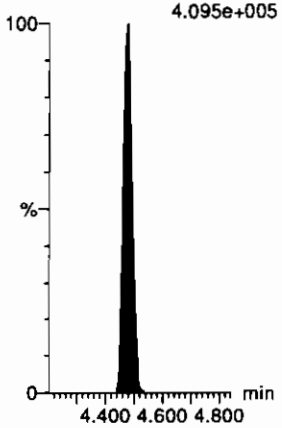
13C4-PFBA



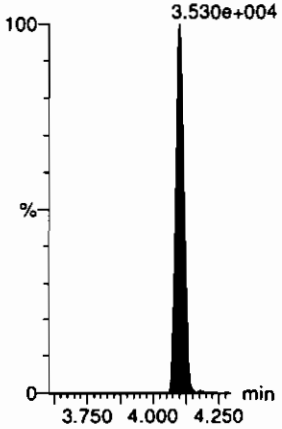
13C5-PFHxA



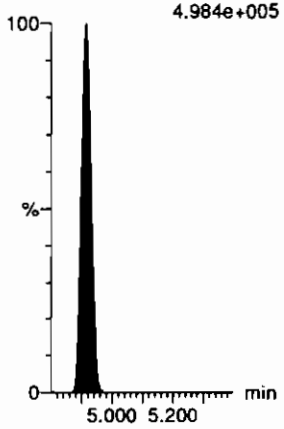
13C8-PFOA



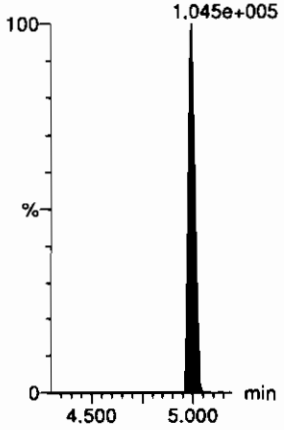
18O2-PFHxS



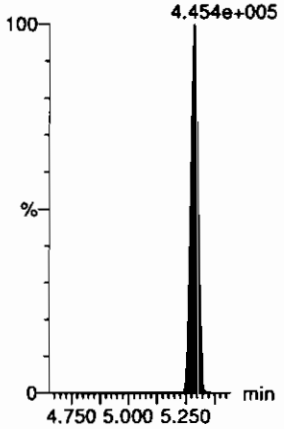
13C9-PFNA



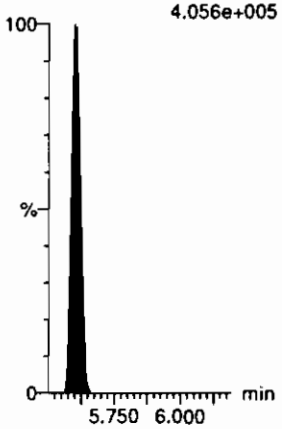
13C4-PFOS



13C6-PFDA



13C7-PFUdA



OPV 7/7/2020

INITIAL CALIBRATION (ICAL)

INCLUDING ASSOCIATED

INITIAL CALIBRATION VERIFICATION (ICV) AND INSTRUMENT BLANK (IB)

High Points
3:3FTCA: 10
5:3FTCA:
7:3FTCA:
HFPO-DA: 250

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

✓ 7R 07/07/2020

Compound name: PFBA
Correlation coefficient: r = 0.999694, r^2 = 0.999388
Calibration curve: 1.03125 * x + 0.0440308
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	1.62	224.138	8928.727	0.314	0.3	4.6	NO	0.999	NO	MM
2	200706P1-20	Standard	0.500	1.63	361.015	8907.738	0.507	0.4	-10.3	NO	0.999	NO	MM
3	200706P1-21	Standard	1.000	1.62	709.130	8876.085	0.999	0.9	-7.4	NO	0.999	NO	MM
4	200706P1-22	Standard	2.000	1.62	1468.812	8766.956	2.094	2.0	-0.6	NO	0.999	NO	MM
5	200706P1-23	Standard	5.000	1.62	4013.645	9407.555	5.333	5.1	2.6	NO	0.999	NO	MM
6	200706P1-24	Standard	10.000	1.62	7317.820	8620.372	10.611	10.2	2.5	NO	0.999	NO	MM
7	200706P1-25	Standard	50.000	1.62	38762.715	8816.157	54.960	53.3	6.5	NO	0.999	NO	MM
8	200706P1-26	Standard	100.000	1.62	78662.734	9290.569	105.837	102.6	2.6	NO	0.999	NO	MM
9	200706P1-27	Standard	250.000	1.62	191600.359	9147.883	261.810	253.8	1.5	NO	0.999	NO	MM
10	200706P1-28	Standard	500.000	1.62	379082.063	9375.081	505.438	490.1	-2.0	NO	0.999	NO	MM

Compound name: PFPrS
Coefficient of Determination: R^2 = 0.999729
Calibration curve: 0.000149868 * x^2 + 1.33446 * x + -0.0189522
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	1.98	36.254	1430.774	0.317	0.3	0.6	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	1.97	66.678	1426.593	0.584	0.5	-9.6	NO	1.000	NO	MM
3	200706P1-21	Standard	1.000	1.96	126.238	1288.172	1.225	0.9	-6.8	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	1.97	309.717	1362.586	2.841	2.1	7.1	NO	1.000	NO	MM
5	200706P1-23	Standard	5.000	1.97	806.974	1453.176	6.941	5.2	4.3	NO	1.000	NO	MM
6	200706P1-24	Standard	10.000	1.97	1418.837	1300.054	13.642	10.2	2.3	NO	1.000	NO	MM
7	200706P1-25	Standard	50.000	1.97	7679.092	1359.451	70.608	52.6	5.2	NO	1.000	NO	MM
8	200706P1-26	Standard	100.000	1.97	15324.713	1462.386	130.991	97.1	-2.9	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	1.97	37135.824	1358.583	341.678	249.1	-0.4	NO	1.000	NO	MM
10	200706P1-28	Standard	500.000	1.96	72343.227	1281.324	705.747	500.7	0.1	NO	1.000	NO	MM

OPV 07/07/20

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Compound name: 3:3 FTCA
Coefficient of Determination: R^2 = 0.999100
Calibration curve: -0.000123651 * x^2 + 0.0842724 * x + -0.00450239
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	2.45	16.831	12471.803	0.017	0.3	1.5	NO	0.999	NO	MM
2	200706P1-20	Standard	0.500	2.44	36.185	12358.682	0.037	0.5	-2.4	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	2.45	74.965	12332.146	0.076	1.0	-4.4	NO	0.999	NO	MM
4	200706P1-22	Standard	2.000	2.44	146.643	12447.334	0.147	1.8	-9.7	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	2.44	406.714	13036.096	0.390	4.7	-5.7	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	2.44	767.598	12020.107	0.798	9.7	-3.4	NO	0.999	NO	MM
7	200706P1-25	Standard	50.000	2.45	4122.975	12771.221	4.035	51.9	3.8	NO	0.999	NO	MM
8	200706P1-26	Standard	100.000	2.44	7452.707	13078.910	7.123	98.9	-1.1	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	2.44	4127.253	12597.564	4.095	52.7	-78.9	YES	0.999	NO	MMX
10	200706P1-28	Standard	500.000	2.44	7500.442	11987.368	7.821	110.9	-77.8	YES	0.999	NO	MMX

Compound name: PFPeA
Coefficient of Determination: R^2 = 0.999942
Calibration curve: -4.09095e-005 * x^2 + 0.926116 * x + 0.00438806
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	2.60	238.196	12471.803	0.239	0.3	1.2	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	2.60	460.626	12358.682	0.466	0.5	-0.3	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	2.60	850.795	12332.146	0.862	0.9	-7.4	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	2.59	1880.688	12447.334	1.889	2.0	1.7	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	2.60	5018.948	13036.096	4.813	5.2	3.9	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	2.59	9078.976	12020.107	9.441	10.2	1.9	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	2.60	47747.203	12771.221	46.733	50.6	1.1	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	2.59	96911.305	13078.910	92.622	100.5	0.5	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	2.59	228499.891	12597.564	226.730	247.5	-1.0	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	2.59	435206.156	11987.368	453.817	501.1	0.2	NO	1.000	NO	bb

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Compound name: PFBS
Coefficient of Determination: R^2 = 0.999832
Calibration curve: -0.000209368 * x^2 + 2.56013 * x + 0.0091719
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	2.87	67.622	1430.774	0.591	0.2	-9.1	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	2.87	145.417	1426.593	1.274	0.5	-1.2	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	2.87	250.462	1288.172	2.430	0.9	-5.4	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	2.87	595.881	1362.586	5.466	2.1	6.6	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	2.87	1584.747	1453.176	13.632	5.3	6.5	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	2.87	2727.353	1300.054	26.223	10.2	2.5	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	2.87	14348.611	1359.451	131.934	51.7	3.5	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	2.87	29385.908	1462.386	251.181	98.9	-1.1	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	2.87	67410.695	1358.583	620.230	247.3	-1.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	2.87	126203.414	1281.324	1231.182	501.5	0.3	NO	1.000	NO	bb

Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.999612
Calibration curve: -0.00110944 * x^2 + 2.87043 * x + -0.114307
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.31	61.119	1271.797	0.601	0.2	-0.4	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	3.31	123.574	1275.190	1.211	0.5	-7.6	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	3.31	282.822	1294.699	2.731	1.0	-0.9	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	3.31	597.155	1286.646	5.801	2.1	3.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	3.31	1471.553	1387.692	13.255	4.7	-6.7	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	3.31	2754.299	1261.296	27.296	9.6	-4.2	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	3.31	14316.868	1305.578	137.074	48.7	-2.6	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	3.30	27991.281	1218.574	287.132	104.3	4.3	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	3.30	60501.387	1180.548	640.607	246.7	-1.3	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	3.31	109654.984	1181.993	1159.641	501.1	0.2	NO	1.000	NO	bb

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Compound name: PFHxA
Correlation coefficient: r = 0.999727, r^2 = 0.999454
Calibration curve: 1.03548 * x + 0.0754497
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.38	431.505	14936.540	0.361	0.3	10.4	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	3.39	599.944	14827.862	0.506	0.4	-16.9	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	3.39	1380.920	14195.111	1.216	1.1	10.1	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	3.39	2554.808	14182.590	2.252	2.1	5.1	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	3.39	6792.274	15680.674	5.415	5.2	3.1	NO	0.999	NO	MM
6	200706P1-24	Standard	10.000	3.39	12631.318	13629.407	11.585	11.1	11.1	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	3.39	63029.477	14633.210	53.841	51.9	3.8	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	3.39	125325.680	14554.702	107.633	103.9	3.9	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	3.39	294457.438	14243.385	258.416	249.5	-0.2	NO	0.999	NO	bb
10	200706P1-28	Standard	500.000	3.39	566684.250	13865.558	510.874	493.3	-1.3	NO	0.999	NO	bb

Compound name: PFPeS
Coefficient of Determination: R^2 = 0.999616
Calibration curve: -0.000388732 * x^2 + 2.09219 * x + -0.0212532
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.57	46.266	1430.774	0.404	0.2	-18.7	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	3.57	120.203	1426.593	1.053	0.5	2.7	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	3.57	248.538	1288.172	2.412	1.2	16.3	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	3.57	412.033	1362.586	3.780	1.8	-9.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	3.57	1295.522	1453.176	11.144	5.3	6.8	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	3.57	2134.522	1300.054	20.523	9.8	-1.6	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	3.57	11848.764	1359.451	108.948	52.6	5.2	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	3.57	23990.066	1462.386	205.059	99.9	-0.1	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	3.57	53147.805	1358.583	489.000	244.9	-2.0	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	3.57	97715.898	1281.324	953.271	502.6	0.5	NO	1.000	NO	MM

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Compound name: HFPO-DA
Coefficient of Determination: R^2 = 0.999787
Calibration curve: -0.00042067 * x^2 + 1.01205 * x + -0.0211231
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.58	39.732	2996.421	0.166	0.2	-26.1	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	3.59	133.603	3291.715	0.507	0.5	4.5	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	3.59	284.533	3299.751	1.078	1.1	8.6	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	3.59	479.142	2848.392	2.103	2.1	5.0	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	3.59	1296.487	3231.837	5.015	5.0	-0.3	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	3.59	2324.764	2853.265	10.185	10.1	1.3	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	3.59	12478.461	3226.841	48.339	48.8	-2.5	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	3.59	24613.289	3134.820	98.145	101.3	1.3	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	3.59	57722.828	3186.079	226.465	249.7	-0.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	3.59	110444.586	3076.034	448.811	586.4	17.3	NO	1.000	NO	bbX

Compound name: 5:3 FTCA
Coefficient of Determination: R^2 = 0.999294
Calibration curve: -0.000279748 * x^2 + 0.179933 * x + -0.0070197
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.92	44.897	12966.955	0.043	0.3	11.9	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	3.93	71.677	12233.538	0.073	0.4	-10.7	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	3.92	161.051	12536.285	0.161	0.9	-6.7	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	3.92	342.720	12763.619	0.336	1.9	-4.5	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	3.92	881.611	12970.818	0.850	4.8	-4.1	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	3.92	1668.424	12289.430	1.697	9.6	-3.9	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	3.92	8728.139	12769.633	8.544	51.7	3.3	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	3.92	15605.692	12943.463	15.071	99.1	-0.9	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	3.92	8733.977	11840.771	9.220	56.2	-77.5	YES	0.999	NO	bbX
10	200706P1-28	Standard	500.000	3.92	16260.669	11650.135	17.447	119.0	-76.2	YES	0.999	NO	bbX

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Compound name: PFHpA
Coefficient of Determination: R^2 = 0.999869
Calibration curve: -0.000182594 * x^2 + 1.3002 * x + 0.0362384
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	3.99	418.160	12966.955	0.403	0.3	12.9	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	3.99	658.920	12233.538	0.673	0.5	-2.0	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	3.98	1310.164	12536.285	1.306	1.0	-2.3	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	3.98	2635.286	12763.619	2.581	2.0	-2.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	3.98	6939.015	12970.818	6.687	5.1	2.4	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	3.98	12993.593	12289.430	13.216	10.2	1.5	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	3.98	67866.617	12769.633	66.434	51.4	2.9	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	3.98	129715.906	12943.463	125.272	97.7	-2.3	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	3.98	297924.625	11840.771	314.511	250.7	0.3	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	3.98	563375.000	11650.135	604.473	500.0	-0.0	NO	1.000	NO	bb

Compound name: ADONA
Coefficient of Determination: R^2 = 0.999933
Calibration curve: -0.000211186 * x^2 + 2.1692 * x + 0.077206
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.10	554.163	12966.955	0.534	0.2	-15.7	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	4.10	1238.257	12233.538	1.265	0.5	9.5	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	4.10	2290.803	12536.285	2.284	1.0	1.8	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	4.10	4434.866	12763.619	4.343	2.0	-1.6	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	4.10	11838.877	12970.818	11.409	5.2	4.5	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	4.10	21671.572	12289.430	22.043	10.1	1.4	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	4.10	112033.008	12769.633	109.667	50.8	1.5	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	4.10	219256.641	12943.463	211.745	98.5	-1.5	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	4.09	501761.875	11840.771	529.697	250.3	0.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	4.09	961901.500	11650.135	1032.071	500.1	0.0	NO	1.000	NO	bb

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Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.998975
Calibration curve: -1.6968e-005 * x^2 + 1.09268 * x + 0.0771315
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.13	72.119	2847.260	0.317	0.2	-12.3	NO	0.999	NO	MM
2	200706P1-20	Standard	0.500	4.13	145.439	2779.479	0.654	0.5	5.6	NO	0.999	NO	MM
3	200706P1-21	Standard	1.000	4.13	249.120	2651.918	1.174	1.0	0.4	NO	0.999	NO	MM
4	200706P1-22	Standard	2.000	4.13	541.163	2816.980	2.401	2.1	6.4	NO	0.999	NO	MM
5	200706P1-23	Standard	5.000	4.13	1349.779	3217.580	5.244	4.7	-5.4	NO	0.999	NO	MM
6	200706P1-24	Standard	10.000	4.13	2401.274	2751.402	10.909	9.9	-0.9	NO	0.999	NO	MM
7	200706P1-25	Standard	50.000	4.13	12677.968	2742.332	57.788	52.9	5.7	NO	0.999	NO	MM
8	200706P1-26	Standard	100.000	4.13	24617.160	2706.095	113.712	104.2	4.2	NO	0.999	NO	MM
9	200706P1-27	Standard	250.000	4.13	54337.816	2614.377	259.803	238.6	-4.6	NO	0.999	NO	MM
10	200706P1-28	Standard	500.000	4.13	108657.328	2482.339	547.152	504.6	0.9	NO	0.999	NO	MM

Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.997712
Calibration curve: -0.000191359 * x^2 + 1.14566 * x + 0.00198468
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.46	32.399	1614.767	0.251	0.2	-13.1	NO	0.998	NO	bb
2	200706P1-20	Standard	0.500	4.45	79.715	1610.712	0.619	0.5	7.7	NO	0.998	NO	bb
3	200706P1-21	Standard	1.000	4.46	131.763	1404.711	1.173	1.0	2.2	NO	0.998	NO	bb
4	200706P1-22	Standard	2.000	4.45	272.289	1542.265	2.207	1.9	-3.7	NO	0.998	NO	bb
5	200706P1-23	Standard	5.000	4.45	750.350	1637.135	5.729	5.0	0.1	NO	0.998	NO	bb
6	200706P1-24	Standard	10.000	4.45	1442.196	1609.265	11.202	9.8	-2.1	NO	0.998	NO	bb
7	200706P1-25	Standard	50.000	4.45	7648.623	1440.831	66.356	58.5	17.0	NO	0.998	NO	bb
8	200706P1-26	Standard	100.000	4.45	13593.849	1590.387	106.844	94.8	-5.2	NO	0.998	NO	bb
9	200706P1-27	Standard	250.000	4.45	31713.313	1483.970	267.132	243.0	-2.8	NO	0.998	NO	bb
10	200706P1-28	Standard	500.000	4.45	62559.508	1478.616	528.869	504.1	0.8	NO	0.998	NO	bb

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Compound name: L-PFOA
Coefficient of Determination: R^2 = 0.999173
Calibration curve: -0.000202972 * x^2 + 1.13013 * x + 0.0543225
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.51	402.750	14231.127	0.354	0.3	6.0	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	4.51	746.570	14540.555	0.642	0.5	4.0	NO	0.999	NO	MM
3	200706P1-21	Standard	1.000	4.51	1359.390	14506.504	1.171	1.0	-1.1	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	4.51	2821.796	14455.132	2.440	2.1	5.6	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	4.51	7101.591	14986.464	5.923	5.2	4.0	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	4.51	12739.101	14430.539	11.035	9.7	-2.7	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	4.51	64434.711	14123.512	57.028	50.9	1.8	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	4.50	125726.648	13491.245	116.489	105.0	5.0	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	4.50	279348.875	13468.371	259.264	239.7	-4.1	NO	0.999	NO	bb
10	200706P1-28	Standard	500.000	4.50	516969.813	12462.934	518.507	504.5	0.9	NO	0.999	NO	bb

Compound name: PFecHS
Coefficient of Determination: R^2 = 0.999583
Calibration curve: -1.03658e-005 * x^2 + 0.226457 * x + -0.0088356
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.52	50.094	14231.127	0.044	0.2	-6.7	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	4.52	101.628	14540.555	0.087	0.4	-15.0	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	4.52	253.716	14506.504	0.219	1.0	0.4	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	4.52	534.832	14455.132	0.462	2.1	4.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	4.52	1394.911	14986.464	1.163	5.2	3.6	NO	1.000	NO	bd
6	200706P1-24	Standard	10.000	4.52	2494.757	14430.539	2.161	9.6	-4.1	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	4.52	12767.402	14123.512	11.300	50.1	0.1	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	4.52	25309.250	13491.245	23.450	104.1	4.1	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	4.52	58804.926	13468.371	54.577	243.8	-2.5	NO	1.000	NO	MM
10	200706P1-28	Standard	500.000	4.52	110806.039	12462.934	111.136	502.3	0.5	NO	1.000	NO	bb

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Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999887
Calibration curve: -0.000106932 * x^2 + 0.973986 * x + 0.00516936
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.61	53.117	2884.344	0.230	0.2	-7.6	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	4.61	138.128	2845.779	0.607	0.6	23.5	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	4.61	218.210	3008.333	0.907	0.9	-7.4	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	4.61	453.914	2875.965	1.973	2.0	1.0	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	4.61	1119.986	3118.928	4.489	4.6	-7.9	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	4.61	2148.840	2818.869	9.529	9.8	-2.1	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	4.61	11341.566	2950.445	48.050	49.6	-0.8	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	4.61	21786.094	2787.149	97.708	101.4	1.4	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	4.61	50363.949	2663.154	236.392	249.5	-0.2	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	4.61	94909.617	2577.664	460.250	500.0	-0.0	NO	1.000	NO	bb

Compound name: 7:3 FTCA
Coefficient of Determination: R^2 = 0.999371
Calibration curve: -0.000492227 * x^2 + 0.313584 * x + 0.000408564
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.93	111.070	14827.067	0.094	0.3	19.0	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	4.93	194.742	15608.248	0.156	0.5	-0.7	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	4.93	314.573	15269.105	0.258	0.8	-17.9	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	4.93	719.897	14161.967	0.635	2.0	1.6	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	4.93	2008.997	15977.628	1.572	5.1	1.0	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	4.93	3579.841	15164.249	2.951	9.6	-4.5	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	4.93	18687.814	15860.334	14.728	51.1	2.1	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	4.93	32013.811	15209.911	26.310	99.4	-0.6	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	4.93	17797.135	14402.273	15.446	53.8	-78.5	YES	0.999	NO	bbX
10	200706P1-28	Standard	500.000	4.93	30134.631	13593.457	27.711	106.0	-78.8	YES	0.999	NO	bbX

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Compound name: PFNA
Coefficient of Determination: R^2 = 0.999826
Calibration curve: -9.83022e-005 * x^2 + 1.11707 * x + 0.0195168
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.94	353.683	14827.067	0.298	0.2	-0.2	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	4.94	686.247	15608.248	0.550	0.5	-5.1	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	4.94	1390.156	15269.105	1.138	1.0	0.1	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	4.94	2837.898	14161.967	2.505	2.2	11.3	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	4.94	6815.411	15977.628	5.332	4.8	-4.8	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	4.94	13724.298	15164.249	11.313	10.1	1.2	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	4.94	68681.820	15860.334	54.130	48.6	-2.7	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	4.94	133434.094	15209.911	109.660	99.0	-1.0	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	4.94	319612.250	14402.273	277.397	254.0	1.6	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	4.94	578770.500	13593.457	532.214	498.3	-0.3	NO	1.000	NO	bb

Compound name: PFOSA
Coefficient of Determination: R^2 = 0.999934
Calibration curve: -5.74782e-005 * x^2 + 0.690246 * x + 0.00511601
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	4.99	104.279	7350.009	0.177	0.2	-0.2	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	4.99	185.141	7155.503	0.323	0.5	-7.8	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	4.99	396.909	6949.531	0.714	1.0	2.7	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	4.99	820.227	7224.200	1.419	2.0	2.5	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	4.98	2290.898	7949.741	3.602	5.2	4.3	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	4.99	3983.124	7142.181	6.971	10.1	1.0	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	4.99	20044.924	7268.384	34.473	50.1	0.3	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	4.99	39994.836	7226.727	69.179	101.1	1.1	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	4.99	90138.398	6740.430	167.160	247.3	-1.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	4.99	168738.094	6362.523	331.508	501.2	0.2	NO	1.000	NO	bb

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Compound name: L-PFOS
Coefficient of Determination: R^2 = 0.999703
Calibration curve: -0.000187013 * x^2 + 1.27905 * x + -0.0944633
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.02	53.010	2884.344	0.230	0.3	1.4	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	5.02	112.943	2845.779	0.496	0.5	-7.7	NO	1.000	NO	MM
3	200706P1-21	Standard	1.000	5.02	242.326	3008.333	1.007	0.9	-13.9	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	5.02	569.359	2875.965	2.475	2.0	0.5	NO	1.000	NO	MM
5	200706P1-23	Standard	5.000	5.02	1445.085	3118.928	5.792	4.6	-7.9	NO	1.000	NO	MM
6	200706P1-24	Standard	10.000	5.02	2835.026	2818.869	12.572	9.9	-0.8	NO	1.000	NO	MM
7	200706P1-25	Standard	50.000	5.02	14350.122	2950.445	60.796	47.9	-4.1	NO	1.000	NO	MM
8	200706P1-26	Standard	100.000	5.02	28907.240	2787.149	129.645	103.0	3.0	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	5.02	65694.383	2663.154	308.349	250.3	0.1	NO	1.000	NO	MM
10	200706P1-28	Standard	500.000	5.02	122082.406	2577.664	592.021	499.4	-0.1	NO	1.000	NO	MM

Compound name: 9Cl-PF30NS
Coefficient of Determination: R^2 = 0.999799
Calibration curve: -0.000316616 * x^2 + 2.84896 * x + 0.0165096
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.24	199.800	2884.344	0.866	0.3	19.3	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	5.24	286.510	2845.779	1.258	0.4	-12.8	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	5.23	691.518	3008.333	2.873	1.0	0.3	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	5.24	1367.717	2875.965	5.945	2.1	4.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	5.23	3352.800	3118.928	13.437	4.7	-5.7	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	5.23	6173.412	2818.869	27.375	9.6	-3.9	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	5.24	33013.273	2950.445	139.866	49.4	-1.3	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	5.23	61952.328	2787.149	277.848	98.6	-1.4	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	5.23	150274.875	2663.154	705.343	254.8	1.9	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	5.23	276304.250	2577.664	1339.897	497.8	-0.4	NO	1.000	NO	bb

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Compound name: PFDA
Coefficient of Determination: R^2 = 0.999933
Calibration curve: -0.000101556 * x^2 + 0.846184 * x + 0.0441258
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.31	370.801	18137.861	0.256	0.2	-0.1	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	5.31	761.356	19338.936	0.492	0.5	5.9	NO	1.000	NO	MM
3	200706P1-21	Standard	1.000	5.31	1374.172	18429.492	0.932	1.0	4.9	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	5.31	2759.825	19687.527	1.752	2.0	1.0	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	5.31	7278.292	19663.701	4.627	5.4	8.4	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	5.31	12883.442	18643.387	8.638	10.2	1.7	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	5.31	66944.820	19964.771	41.914	49.8	-0.4	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	5.31	132335.688	19861.670	83.286	99.6	-0.4	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	5.31	314015.188	19146.473	205.009	249.7	-0.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	5.31	582916.063	18310.025	397.949	500.3	0.1	NO	1.000	NO	bb

Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.998921
Calibration curve: -0.000876709 * x^2 + 1.37036 * x + -0.084038
Response type: Internal Std (Ref 75), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.29	19.813	1541.506	0.161	0.2	-28.6	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	5.29	101.800	1580.063	0.805	0.6	29.9	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	5.29	163.951	1512.862	1.355	1.1	5.1	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	5.29	297.397	1542.955	2.409	1.8	-8.9	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	5.29	644.510	1469.703	5.482	4.1	-18.6	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	5.29	1466.993	1379.408	13.294	9.8	-1.8	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	5.29	7679.081	1477.570	64.964	49.0	-2.0	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	5.29	13518.479	1351.704	125.013	97.4	-2.6	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	5.29	34192.176	1433.317	298.191	261.4	4.5	NO	0.999	NO	bb
10	200706P1-28	Standard	500.000	5.29	57850.203	1567.050	461.458	491.1	-1.8	NO	0.999	NO	bb

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Compound name: PFNS
Coefficient of Determination: R^2 = 0.999393
Calibration curve: -0.000161375 * x^2 + 1.33537 * x + -0.0984438
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.37	43.194	2884.344	0.187	0.2	-14.4	NO	0.999	NO	bb
2	200706P1-20	Standard	0.500	5.37	107.916	2845.779	0.474	0.4	-14.3	NO	0.999	NO	bb
3	200706P1-21	Standard	1.000	5.37	283.382	3008.333	1.177	1.0	-4.4	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	5.37	662.211	2875.965	2.878	2.2	11.5	NO	0.999	NO	bb
5	200706P1-23	Standard	5.000	5.37	1595.811	3118.928	6.396	4.9	-2.7	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	5.37	2824.457	2818.869	12.525	9.5	-5.4	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	5.37	15054.567	2950.445	63.781	48.1	-3.8	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	5.37	30957.924	2787.149	138.842	105.4	5.4	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	5.37	67847.297	2663.154	318.454	245.9	-1.7	NO	0.999	NO	bb
10	200706P1-28	Standard	500.000	5.37	129647.547	2577.664	628.707	501.2	0.2	NO	0.999	NO	bb

Compound name: L-MeFOSAA
Coefficient of Determination: R^2 = 0.999777
Calibration curve: -0.000326513 * x^2 + 1.22499 * x + -0.0565243
Response type: Internal Std (Ref 77), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.46	71.988	4408.401	0.204	0.2	-14.9	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	5.46	224.694	4346.208	0.646	0.6	14.8	NO	1.000	NO	MM
3	200706P1-21	Standard	1.000	5.46	360.872	4230.765	1.066	0.9	-8.3	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	5.46	790.665	4359.749	2.267	1.9	-5.1	NO	1.000	NO	MM
5	200706P1-23	Standard	5.000	5.46	2062.203	4489.936	5.741	4.7	-5.2	NO	1.000	NO	MM
6	200706P1-24	Standard	10.000	5.46	4063.961	4139.533	12.272	10.1	0.9	NO	1.000	NO	MM
7	200706P1-25	Standard	50.000	5.46	20269.383	4321.417	58.631	48.5	-2.9	NO	1.000	NO	MM
8	200706P1-26	Standard	100.000	5.46	41898.453	4277.929	122.426	102.8	2.8	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	5.46	94387.063	4146.951	284.507	248.8	-0.5	NO	1.000	NO	MM
10	200706P1-28	Standard	500.000	5.46	179868.844	4234.389	530.976	500.2	0.0	NO	1.000	NO	MM

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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999878
Calibration curve: -0.000317928 * x^2 + 1.39659 * x + -0.0635925
Response type: Internal Std (Ref 81), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.62	84.529	3974.848	0.266	0.2	-5.6	NO	1.000	NO	MM
2	200706P1-20	Standard	0.500	5.62	239.245	4387.888	0.682	0.5	6.7	NO	1.000	NO	MM
3	200706P1-21	Standard	1.000	5.61	432.019	4370.321	1.236	0.9	-6.9	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	5.62	918.698	4172.910	2.752	2.0	0.8	NO	1.000	NO	MM
5	200706P1-23	Standard	5.000	5.61	2404.692	4350.434	6.909	5.0	-0.0	NO	1.000	NO	MM
6	200706P1-24	Standard	10.000	5.61	4571.777	3924.268	14.563	10.5	5.0	NO	1.000	NO	MM
7	200706P1-25	Standard	50.000	5.62	23885.766	4351.004	68.621	49.7	-0.5	NO	1.000	NO	MM
8	200706P1-26	Standard	100.000	5.61	46426.203	4188.651	138.548	101.6	1.6	NO	1.000	NO	MM
9	200706P1-27	Standard	250.000	5.61	105011.930	4036.783	325.172	246.7	-1.3	NO	1.000	NO	MM
10	200706P1-28	Standard	500.000	5.61	187964.344	3787.376	620.365	501.5	0.3	NO	1.000	NO	MM

Compound name: PFUdA
Coefficient of Determination: R^2 = 0.999582
Calibration curve: -0.000302944 * x^2 + 1.10094 * x + 0.0188328
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.63	461.576	18683.264	0.309	0.3	5.4	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	5.63	937.633	19852.086	0.590	0.5	3.8	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	5.63	1553.115	18480.219	1.051	0.9	-6.3	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	5.63	3505.071	19143.811	2.289	2.1	3.1	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	5.63	9315.438	20906.857	5.570	5.0	1.0	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	5.63	15562.638	19766.689	9.841	8.9	-10.6	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	5.63	84420.508	19028.625	55.456	51.1	2.1	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	5.63	167107.594	18950.932	110.224	103.0	3.0	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	5.63	374620.313	18632.748	251.318	244.7	-2.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	5.63	640302.250	16795.816	476.534	502.2	0.4	NO	1.000	NO	bb

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Compound name: PFDS
Coefficient of Determination: R^2 = 0.999869
Calibration curve: -0.000337564 * x^2 + 1.29291 * x + -0.129711
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.67	32.038	2884.344	0.139	0.2	-16.9	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	5.67	121.310	2845.779	0.533	0.5	2.5	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	5.67	326.817	3008.333	1.358	1.2	15.1	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	5.67	587.988	2875.965	2.556	2.1	3.9	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	5.67	1529.713	3118.928	6.131	4.8	-3.0	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	5.67	2892.042	2818.869	12.824	10.0	0.5	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	5.67	14611.049	2950.445	61.902	48.6	-2.8	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	5.67	28054.248	2787.149	125.820	100.0	0.0	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	5.67	64957.836	2663.154	304.891	252.6	1.0	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	5.67	115615.516	2577.664	560.660	498.7	-0.3	NO	1.000	NO	bb

Compound name: 11Cl-PF30UdS
Correlation coefficient: r = 0.999153, r^2 = 0.998308
Calibration curve: 0.257476 * x + 0.00892294
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.83	118.626	22810.775	0.065	0.2	-12.9	NO	0.998	NO	bb
2	200706P1-20	Standard	0.500	5.83	272.501	25244.645	0.135	0.5	-2.1	NO	0.998	NO	bb
3	200706P1-21	Standard	1.000	5.83	462.737	24211.764	0.239	0.9	-10.7	NO	0.998	NO	bb
4	200706P1-22	Standard	2.000	5.83	1046.674	24340.117	0.538	2.1	2.7	NO	0.998	NO	bb
5	200706P1-23	Standard	5.000	5.83	2744.988	25408.879	1.350	5.2	4.2	NO	0.998	NO	bb
6	200706P1-24	Standard	10.000	5.83	5078.613	23356.371	2.718	10.5	5.2	NO	0.998	NO	bb
7	200706P1-25	Standard	50.000	5.83	26426.852	23355.100	14.144	54.9	9.8	NO	0.998	NO	bb
8	200706P1-26	Standard	100.000	5.83	51772.281	24096.184	26.857	104.3	4.3	NO	0.998	NO	bb
9	200706P1-27	Standard	250.000	5.83	118299.969	22303.783	66.300	257.5	3.0	NO	0.998	NO	bb
10	200706P1-28	Standard	500.000	5.83	212004.250	21320.014	124.299	482.7	-3.5	NO	0.998	NO	bb

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Compound name: 10:2 FTS
Correlation coefficient: r = 0.998475, r^2 = 0.996952
Calibration curve: 1.81347 * x + 0.168501
Response type: Internal Std (Ref 85), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.90	73.153	1299.524	0.704	0.3	18.0	NO	0.997	NO	bb
2	200706P1-20	Standard	0.500	5.90	106.562	1409.232	0.945	0.4	-14.3	NO	0.997	NO	bb
3	200706P1-21	Standard	1.000	5.89	216.690	1381.627	1.960	1.0	-1.2	NO	0.997	NO	bb
4	200706P1-22	Standard	2.000	5.89	381.125	1355.605	3.514	1.8	-7.8	NO	0.997	NO	bb
5	200706P1-23	Standard	5.000	5.90	1091.328	1274.760	10.701	5.8	16.2	NO	0.997	NO	bb
6	200706P1-24	Standard	10.000	5.89	2124.764	1357.960	19.558	10.7	6.9	NO	0.997	NO	bb
7	200706P1-25	Standard	50.000	5.90	10322.251	1263.989	102.080	56.2	12.4	NO	0.997	NO	bb
8	200706P1-26	Standard	100.000	5.89	18470.209	1154.229	200.028	110.2	10.2	NO	0.997	NO	bb
9	200706P1-27	Standard	250.000	5.89	40601.520	1113.270	455.881	251.3	0.5	NO	0.997	NO	bb
10	200706P1-28	Standard	500.000	5.89	66252.156	949.242	872.435	481.0	-3.8	NO	0.997	NO	bb

Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999844
Calibration curve: -0.000264449 * x^2 + 0.982944 * x + 0.00539633
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	5.90	505.708	22810.775	0.277	0.3	10.6	NO	1.000	NO	db
2	200706P1-20	Standard	0.500	5.90	1033.096	25244.645	0.512	0.5	3.0	NO	1.000	NO	db
3	200706P1-21	Standard	1.000	5.90	1840.692	24211.764	0.950	1.0	-3.8	NO	1.000	NO	MM
4	200706P1-22	Standard	2.000	5.90	3658.658	24340.117	1.879	1.9	-4.6	NO	1.000	NO	MM
5	200706P1-23	Standard	5.000	5.90	9857.521	25408.879	4.849	4.9	-1.3	NO	1.000	NO	MM
6	200706P1-24	Standard	10.000	5.90	17716.777	23356.371	9.482	9.7	-3.3	NO	1.000	NO	MM
7	200706P1-25	Standard	50.000	5.90	93610.125	23355.100	50.102	51.7	3.4	NO	1.000	NO	MM
8	200706P1-26	Standard	100.000	5.90	180757.547	24096.184	93.769	98.0	-2.0	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	5.90	410882.656	22303.783	230.276	251.3	0.5	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	5.90	724978.313	21320.014	425.057	499.6	-0.1	NO	1.000	NO	bb

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Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999940
Calibration curve: -7.96999e-005 * x^2 + 1.12175 * x + 0.0605427
Response type: Internal Std (Ref 87), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	1.250	5.81	171.562	20355.828	1.257	1.1	-14.6	NO	1.000	NO	bb
2	200706P1-20	Standard	2.500	5.81	429.880	20279.811	3.163	2.8	10.6	NO	1.000	NO	bb
3	200706P1-21	Standard	5.000	5.82	799.827	20965.770	5.692	5.0	0.4	NO	1.000	NO	bb
4	200706P1-22	Standard	10.000	5.82	1629.668	20813.816	11.682	10.4	3.7	NO	1.000	NO	bb
5	200706P1-23	Standard	25.000	5.82	4178.511	21672.008	28.767	25.6	2.5	NO	1.000	NO	bb
6	200706P1-24	Standard	50.000	5.82	7871.369	20647.168	56.880	50.8	1.7	NO	1.000	NO	bb
7	200706P1-25	Standard	250.000	5.82	39017.539	21174.100	274.931	249.5	-0.2	NO	1.000	NO	bb
8	200706P1-26	Standard	500.000	5.82	74542.289	20387.346	545.520	504.3	0.9	NO	1.000	NO	bb
9	200706P1-27	Standard	1250.000	5.81	159620.969	18792.607	1267.278	1238.7	-0.9	NO	1.000	NO	bb
10	200706P1-28	Standard	2500.000	5.81	275508.969	17789.584	2310.675	2506.0	0.2	NO	1.000	NO	bb

Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999936
Calibration curve: -0.000414303 * x^2 + 1.04415 * x + 0.00171537
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	6.14	468.496	22810.775	0.257	0.2	-2.3	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	6.14	1152.923	25244.645	0.571	0.5	9.0	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	6.14	1977.301	24211.764	1.021	1.0	-2.4	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	6.14	3935.513	24340.117	2.021	1.9	-3.2	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	6.14	10632.552	25408.879	5.231	5.0	0.4	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	6.14	19007.156	23356.371	10.172	9.8	-2.2	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	6.14	97115.727	23355.100	51.978	50.8	1.6	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	6.14	190868.766	24096.184	99.014	98.7	-1.3	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	6.14	421501.438	22303.783	236.228	251.3	0.5	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	6.14	713175.125	21320.014	418.137	499.4	-0.1	NO	1.000	NO	bb

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Compound name: PFDoS
Coefficient of Determination: R^2 = 0.999610
Calibration curve: -4.68396e-005 * x^2 + 0.17052 * x + -0.00392295
Response type: Internal Std (Ref 89), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	6.16	79.862	23296.811	0.043	0.3	9.7	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	6.16	176.105	25347.914	0.087	0.5	6.5	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	6.16	283.332	24321.422	0.146	0.9	-12.3	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	6.16	567.318	23906.566	0.297	1.8	-11.8	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	6.16	1829.969	25577.697	0.894	5.3	5.5	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	6.16	3312.936	23822.789	1.738	10.2	2.5	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	6.16	16284.360	24780.746	8.214	48.9	-2.3	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	6.16	32384.986	23560.986	17.181	103.7	3.7	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	6.16	72912.734	23364.986	39.007	245.3	-1.9	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	6.16	128623.484	21788.924	73.789	502.0	0.4	NO	1.000	NO	bb

Compound name: PFTeDA
Correlation coefficient: r = 0.999411, r^2 = 0.998822
Calibration curve: 0.656798 * x + 0.0803604
Response type: Internal Std (Ref 89), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	6.34	414.867	23296.811	0.223	0.2	-13.4	NO	0.999	NO	MM
2	200706P1-20	Standard	0.500	6.34	773.273	25347.914	0.381	0.5	-8.4	NO	0.999	NO	MM
3	200706P1-21	Standard	1.000	6.34	1385.224	24321.422	0.712	1.0	-3.8	NO	0.999	NO	bb
4	200706P1-22	Standard	2.000	6.34	2799.478	23906.566	1.464	2.1	5.3	NO	0.999	NO	MM
5	200706P1-23	Standard	5.000	6.34	7070.250	25577.697	3.455	5.1	2.8	NO	0.999	NO	bb
6	200706P1-24	Standard	10.000	6.34	13621.163	23822.789	7.147	10.8	7.6	NO	0.999	NO	bb
7	200706P1-25	Standard	50.000	6.34	68093.477	24780.746	34.348	52.2	4.3	NO	0.999	NO	bb
8	200706P1-26	Standard	100.000	6.34	132185.453	23560.986	70.129	106.7	6.7	NO	0.999	NO	bb
9	200706P1-27	Standard	250.000	6.33	312192.125	23364.986	167.019	254.2	1.7	NO	0.999	NO	bb
10	200706P1-28	Standard	500.000	6.33	556678.000	21788.924	319.358	486.1	-2.8	NO	0.999	NO	bb

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Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999747
Calibration curve: -6.96201e-005 * x^2 + 1.16259 * x + -0.107454
Response type: Internal Std (Ref 91), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	1.250	6.19	187.912	23217.701	1.208	1.1	-9.5	NO	1.000	NO	bb
2	200706P1-20	Standard	2.500	6.19	457.506	23650.156	2.886	2.6	3.0	NO	1.000	NO	bb
3	200706P1-21	Standard	5.000	6.19	938.745	23147.498	6.051	5.3	6.0	NO	1.000	NO	bb
4	200706P1-22	Standard	10.000	6.19	1790.665	23462.338	11.387	9.9	-1.1	NO	1.000	NO	bb
5	200706P1-23	Standard	25.000	6.19	4815.911	24914.057	28.841	24.9	-0.3	NO	1.000	NO	bb
6	200706P1-24	Standard	50.000	6.19	8962.970	23161.109	57.738	49.9	-0.2	NO	1.000	NO	bb
7	200706P1-25	Standard	250.000	6.19	45685.664	23538.484	289.581	253.0	1.2	NO	1.000	NO	bb
8	200706P1-26	Standard	500.000	6.19	86995.922	22448.846	578.194	513.2	2.6	NO	1.000	NO	bb
9	200706P1-27	Standard	1250.000	6.19	189637.125	21512.914	1315.203	1220.6	-2.4	NO	1.000	NO	bb
10	200706P1-28	Standard	2500.000	6.19	324338.656	19492.205	2482.599	2514.0	0.6	NO	1.000	NO	bb

Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.999789
Calibration curve: -0.000190466 * x^2 + 1.03254 * x + 0.163583
Response type: Internal Std (Ref 93), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	6.63	799.401	25406.275	0.393	0.2	-11.0	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	6.63	1483.510	27130.332	0.684	0.5	0.7	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	6.63	2491.544	26103.717	1.193	1.0	-0.3	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	6.63	4777.866	26556.000	2.249	2.0	1.0	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	6.63	12350.689	27161.623	5.684	5.4	7.0	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	6.63	22227.100	26370.029	10.536	10.1	0.6	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	6.63	109164.680	26053.225	52.376	51.0	2.1	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	6.63	217865.219	26467.854	102.891	101.4	1.4	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	6.63	492183.344	25481.225	241.444	244.7	-2.1	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	6.63	902398.125	23953.805	470.905	502.5	0.5	NO	1.000	NO	bb

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Compound name: PFODA
Coefficient of Determination: R^2 = 0.999877
Calibration curve: -8.33174e-005 * x^2 + 0.828517 * x + 0.0120589
Response type: Internal Std (Ref 93), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	0.250	6.85	450.793	25406.275	0.222	0.3	1.3	NO	1.000	NO	bb
2	200706P1-20	Standard	0.500	6.84	896.249	27130.332	0.413	0.5	-3.2	NO	1.000	NO	bb
3	200706P1-21	Standard	1.000	6.84	1791.579	26103.717	0.858	1.0	2.1	NO	1.000	NO	bb
4	200706P1-22	Standard	2.000	6.84	3588.470	26556.000	1.689	2.0	1.2	NO	1.000	NO	bb
5	200706P1-23	Standard	5.000	6.84	9227.053	27161.623	4.246	5.1	2.3	NO	1.000	NO	bb
6	200706P1-24	Standard	10.000	6.84	17499.887	26370.029	8.295	10.0	0.1	NO	1.000	NO	bb
7	200706P1-25	Standard	50.000	6.85	89170.227	26053.225	42.783	51.9	3.8	NO	1.000	NO	bb
8	200706P1-26	Standard	100.000	6.84	171890.313	26467.854	81.179	99.0	-1.0	NO	1.000	NO	bb
9	200706P1-27	Standard	250.000	6.84	408207.031	25481.225	200.249	247.9	-0.9	NO	1.000	NO	bb
10	200706P1-28	Standard	500.000	6.84	755594.000	23953.805	394.297	501.1	0.2	NO	1.000	NO	bb

Compound name: N-MeFOSE
Correlation coefficient: r = 0.999753, r^2 = 0.999506
Calibration curve: 1.10054 * x + 0.364944
Response type: Internal Std (Ref 95), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	1.250	6.34	195.169	20481.053	1.422	1.0	-23.2	NO	1.000	NO	MM
2	200706P1-20	Standard	2.500	6.34	439.277	20843.604	3.144	2.5	1.0	NO	1.000	NO	bb
3	200706P1-21	Standard	5.000	6.34	818.329	20414.760	5.981	5.1	2.1	NO	1.000	NO	bb
4	200706P1-22	Standard	10.000	6.34	1592.070	20055.193	11.844	10.4	4.3	NO	1.000	NO	MM
5	200706P1-23	Standard	25.000	6.34	4282.778	22627.299	28.240	25.3	1.3	NO	1.000	NO	bb
6	200706P1-24	Standard	50.000	6.34	7981.183	20102.832	59.235	53.5	7.0	NO	1.000	NO	bb
7	200706P1-25	Standard	250.000	6.35	40518.207	20711.023	291.889	264.9	6.0	NO	1.000	NO	bb
8	200706P1-26	Standard	500.000	6.34	79844.242	20885.109	570.395	518.0	3.6	NO	1.000	NO	bb
9	200706P1-27	Standard	1250.000	6.34	188797.938	20707.771	1360.294	1235.7	-1.1	NO	1.000	NO	bb
10	200706P1-28	Standard	2500.000	6.34	353058.344	19318.008	2726.798	2477.4	-0.9	NO	1.000	NO	bb

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Compound name: N-EtFOSE
Correlation coefficient: r = 0.999137, r^2 = 0.998274
Calibration curve: 1.00495 * x + 0.335204
Response type: Internal Std (Ref 97), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

1	200706P1-19	Standard	1.250	6.49	207.125	22385.490	1.380	1.0	-16.8	NO	0.998	NO	bb
2	200706P1-20	Standard	2.500	6.49	430.853	22515.381	2.855	2.5	0.3	NO	0.998	NO	bb
3	200706P1-21	Standard	5.000	6.49	806.541	22580.791	5.329	5.0	-0.6	NO	0.998	NO	bb
4	200706P1-22	Standard	10.000	6.49	1687.779	21905.441	11.496	11.1	11.1	NO	0.998	NO	bb
5	200706P1-23	Standard	25.000	6.49	4436.875	23437.969	28.244	27.8	11.1	NO	0.998	NO	bb
6	200706P1-24	Standard	50.000	6.49	8060.291	22186.262	54.205	53.6	7.2	NO	0.998	NO	bb
7	200706P1-25	Standard	250.000	6.49	41995.930	22694.074	276.098	274.4	9.8	NO	0.998	NO	bb
8	200706P1-26	Standard	500.000	6.49	84331.070	23318.145	539.588	536.6	7.3	NO	0.998	NO	bb
9	200706P1-27	Standard	1250.000	6.49	196343.016	23270.990	1258.837	1252.3	0.2	NO	0.998	NO	bb
10	200706P1-28	Standard	2500.000	6.49	382750.500	23386.736	2441.827	2429.5	-2.8	NO	0.998	NO	bb

Compound name: 13C3-PFBA-EIS
Response Factor: 689.63
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	1.63	8928.727	8928.727	12.9	3.6	NO	NO	MMX
2	200706P1-20	Standard	12.500	1.62	8907.738	8907.738	12.9	3.3	NO	NO	MMX
3	200706P1-21	Standard	12.500	1.62	8876.085	8876.085	12.9	3.0	NO	NO	MMX
4	200706P1-22	Standard	12.500	1.62	8766.956	8766.956	12.7	1.7	NO	NO	MMX
5	200706P1-23	Standard	12.500	1.62	9407.555	9407.555	13.6	9.1	NO	NO	MMX
6	200706P1-24	Standard	12.500	1.62	8620.372	8620.372	12.5	0.0	NO	NO	MM
7	200706P1-25	Standard	12.500	1.62	8816.157	8816.157	12.8	2.3	NO	NO	MMX
8	200706P1-26	Standard	12.500	1.62	9290.569	9290.569	13.5	7.8	NO	NO	MMX
9	200706P1-27	Standard	12.500	1.62	9147.883	9147.883	13.3	6.1	NO	NO	MMX
10	200706P1-28	Standard	12.500	1.62	9375.081	9375.081	13.6	8.8	NO	NO	MMX

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Compound name: 13C3-PFBA-RSD
Response Factor: 0.854301
RRF SD: 0.0333349, Relative SD: 3.90201
Response type: Internal Std (Ref 99), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	1.63	9004.832	9571.630	11.760	13.8	10.1	NO	NO	MM
2	200706P1-20	Standard	12.500	1.62	8792.936	10495.767	10.472	12.3	-1.9	NO	NO	MM
3	200706P1-21	Standard	12.500	1.62	8849.034	10322.609	10.716	12.5	0.3	NO	NO	MM
4	200706P1-22	Standard	12.500	1.62	8712.763	10427.793	10.444	12.2	-2.2	NO	NO	MM
5	200706P1-23	Standard	12.500	1.62	9389.854	10992.993	10.677	12.5	-0.0	NO	NO	MM
6	200706P1-24	Standard	12.500	1.62	8525.373	10121.277	10.529	12.3	-1.4	NO	NO	MM
7	200706P1-25	Standard	12.500	1.62	8712.147	10409.653	10.462	12.2	-2.0	NO	NO	MM
8	200706P1-26	Standard	12.500	1.62	9265.158	10665.174	10.859	12.7	1.7	NO	NO	MM
9	200706P1-27	Standard	12.500	1.62	8912.315	10876.274	10.243	12.0	-4.1	NO	NO	MM
10	200706P1-28	Standard	12.500	1.62	9235.906	10864.321	10.626	12.4	-0.5	NO	NO	MM

Compound name: 13C3-PFPeA-EIS
Response Factor: 961.609
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	2.60	12471.803	12471.803	13.0	3.8	NO	NO	MMX
2	200706P1-20	Standard	12.500	2.60	12358.682	12358.682	12.9	2.8	NO	NO	MMX
3	200706P1-21	Standard	12.500	2.59	12332.146	12332.146	12.8	2.6	NO	NO	MMX
4	200706P1-22	Standard	12.500	2.59	12447.334	12447.334	12.9	3.6	NO	NO	MMX
5	200706P1-23	Standard	12.500	2.60	13036.096	13036.096	13.6	8.5	NO	NO	MMX
6	200706P1-24	Standard	12.500	2.59	12020.107	12020.107	12.5	0.0	NO	NO	MM
7	200706P1-25	Standard	12.500	2.59	12771.221	12771.221	13.3	6.2	NO	NO	MMX
8	200706P1-26	Standard	12.500	2.59	13078.910	13078.910	13.6	8.8	NO	NO	MMX
9	200706P1-27	Standard	12.500	2.59	12597.564	12597.564	13.1	4.8	NO	NO	MMX
10	200706P1-28	Standard	12.500	2.59	11987.368	11987.368	12.5	-0.3	NO	NO	MMX

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Compound name: 13C3-PFPeA-RSD
Response Factor: 0.751613
RRF SD: 0.0255308, Relative SD: 3.39681
Response type: Internal Std (Ref 101), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	2.60	12294.415	15792.443	9.731	12.9	3.6	NO	NO	bb
2	200706P1-20	Standard	12.500	2.60	12221.346	16933.953	9.021	12.0	-4.0	NO	NO	bb
3	200706P1-21	Standard	12.500	2.59	12213.532	16418.008	9.299	12.4	-1.0	NO	NO	bb
4	200706P1-22	Standard	12.500	2.59	12291.335	16457.064	9.336	12.4	-0.6	NO	NO	bb
5	200706P1-23	Standard	12.500	2.60	12950.499	18353.051	8.820	11.7	-6.1	NO	NO	bb
6	200706P1-24	Standard	12.500	2.59	11947.754	15564.020	9.596	12.8	2.1	NO	NO	bb
7	200706P1-25	Standard	12.500	2.59	12611.794	17166.877	9.183	12.2	-2.3	NO	NO	bb
8	200706P1-26	Standard	12.500	2.59	12776.837	16410.266	9.732	12.9	3.6	NO	NO	bb
9	200706P1-27	Standard	12.500	2.59	12498.843	16063.282	9.726	12.9	3.5	NO	NO	bb
10	200706P1-28	Standard	12.500	2.59	11893.112	15638.367	9.506	12.6	1.2	NO	NO	bb

Compound name: 13C3-PFBS-EIS
Response Factor: 104.004
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	2.87	1430.774	1430.774	13.8	10.1	NO	NO	bbX
2	200706P1-20	Standard	12.500	2.87	1426.593	1426.593	13.7	9.7	NO	NO	bbX
3	200706P1-21	Standard	12.500	2.87	1288.172	1288.172	12.4	-0.9	NO	NO	bbX
4	200706P1-22	Standard	12.500	2.87	1362.586	1362.586	13.1	4.8	NO	NO	bbX
5	200706P1-23	Standard	12.500	2.87	1453.176	1453.176	14.0	11.8	NO	NO	bbX
6	200706P1-24	Standard	12.500	2.87	1300.054	1300.054	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	2.87	1359.451	1359.451	13.1	4.6	NO	NO	bbX
8	200706P1-26	Standard	12.500	2.87	1462.386	1462.386	14.1	12.5	NO	NO	bbX
9	200706P1-27	Standard	12.500	2.87	1358.583	1358.583	13.1	4.5	NO	NO	bbX
10	200706P1-28	Standard	12.500	2.87	1281.324	1281.324	12.3	-1.4	NO	NO	bbX

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Compound name: 13C3-PFBS-RSD
Response Factor: 1.22602
RRF SD: 0.060142, Relative SD: 4.90549
Response type: Internal Std (Ref 102), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	2.87	1430.774	1112.618	16.074	13.1	4.9	NO	NO	bb
2	200706P1-20	Standard	12.500	2.87	1426.593	1135.557	15.704	12.8	2.5	NO	NO	bb
3	200706P1-21	Standard	12.500	2.87	1288.172	1029.912	15.634	12.8	2.0	NO	NO	bb
4	200706P1-22	Standard	12.500	2.87	1362.586	1172.076	14.532	11.9	-5.2	NO	NO	bb
5	200706P1-23	Standard	12.500	2.87	1453.176	1315.580	13.807	11.3	-9.9	NO	NO	bb
6	200706P1-24	Standard	12.500	2.87	1300.054	1066.013	15.244	12.4	-0.5	NO	NO	bb
7	200706P1-25	Standard	12.500	2.87	1359.451	1118.342	15.195	12.4	-0.8	NO	NO	bb
8	200706P1-26	Standard	12.500	2.87	1462.386	1109.793	16.471	13.4	7.5	NO	NO	bb
9	200706P1-27	Standard	12.500	2.87	1358.583	1116.404	15.212	12.4	-0.7	NO	NO	bb
10	200706P1-28	Standard	12.500	2.87	1281.324	1041.527	15.378	12.5	0.3	NO	NO	bb

Compound name: 13C3-HFPO-DA-EIS
Response Factor: 228.261
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	3.59	2996.421	2996.421	13.1	5.0	NO	NO	bbX
2	200706P1-20	Standard	12.500	3.59	3291.715	3291.715	14.4	15.4	NO	NO	bbX
3	200706P1-21	Standard	12.500	3.59	3299.751	3299.751	14.5	15.6	NO	NO	bbX
4	200706P1-22	Standard	12.500	3.59	2848.392	2848.392	12.5	-0.2	NO	NO	bbX
5	200706P1-23	Standard	12.500	3.59	3231.837	3231.837	14.2	13.3	NO	NO	bbX
6	200706P1-24	Standard	12.500	3.59	2853.265	2853.265	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.59	3226.841	3226.841	14.1	13.1	NO	NO	bbX
8	200706P1-26	Standard	12.500	3.59	3134.820	3134.820	13.7	9.9	NO	NO	bbX
9	200706P1-27	Standard	12.500	3.59	3186.079	3186.079	14.0	11.7	NO	NO	bbX
10	200706P1-28	Standard	12.500	3.59	3076.034	3076.034	13.5	7.8	NO	NO	bbX

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Compound name: 13C3-HFPO-DA-RSD
Response Factor: 0.189164
RRF SD: 0.00929102, Relative SD: 4.91161
Response type: Internal Std (Ref 101), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	3.59	2996.421	15792.443	2.372	12.5	0.3	NO	NO	bb
2	200706P1-20	Standard	12.500	3.59	3291.715	16933.953	2.430	12.8	2.8	NO	NO	bb
3	200706P1-21	Standard	12.500	3.59	3299.751	16418.008	2.512	13.3	6.2	NO	NO	bb
4	200706P1-22	Standard	12.500	3.59	2848.392	16457.064	2.164	11.4	-8.5	NO	NO	bb
5	200706P1-23	Standard	12.500	3.59	3231.837	18353.051	2.201	11.6	-6.9	NO	NO	bb
6	200706P1-24	Standard	12.500	3.59	2853.265	15564.020	2.292	12.1	-3.1	NO	NO	bb
7	200706P1-25	Standard	12.500	3.59	3226.841	17166.877	2.350	12.4	-0.6	NO	NO	bb
8	200706P1-26	Standard	12.500	3.59	3134.820	16410.266	2.388	12.6	1.0	NO	NO	bb
9	200706P1-27	Standard	12.500	3.59	3186.079	16063.282	2.479	13.1	4.9	NO	NO	bb
10	200706P1-28	Standard	12.500	3.59	3076.034	15638.367	2.459	13.0	4.0	NO	NO	bb

Compound name: 13C2-4:2 FTS-EIS
Response Factor: 100.904
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	3.31	1271.797	1271.797	12.6	0.8	NO	NO	bbX
2	200706P1-20	Standard	12.500	3.31	1275.190	1275.190	12.6	1.1	NO	NO	bbX
3	200706P1-21	Standard	12.500	3.31	1294.699	1294.699	12.8	2.6	NO	NO	bbX
4	200706P1-22	Standard	12.500	3.31	1286.646	1286.646	12.8	2.0	NO	NO	bbX
5	200706P1-23	Standard	12.500	3.31	1387.692	1387.692	13.8	10.0	NO	NO	bbX
6	200706P1-24	Standard	12.500	3.31	1261.296	1261.296	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.31	1305.578	1305.578	12.9	3.5	NO	NO	bbX
8	200706P1-26	Standard	12.500	3.30	1218.574	1218.574	12.1	-3.4	NO	NO	bbX
9	200706P1-27	Standard	12.500	3.30	1180.548	1180.548	11.7	-6.4	NO	NO	bbX
10	200706P1-28	Standard	12.500	3.30	1181.993	1181.993	11.7	-6.3	NO	NO	bbX

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Compound name: 13C2-4:2 FTS-RSD
Response Factor: 1.13166
RRF SD: 0.0610809, Relative SD: 5.39744
Response type: Internal Std (Ref 102), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	3.31	1271.797	1112.618	14.288	12.6	1.0	NO	NO	bb
2	200706P1-20	Standard	12.500	3.31	1275.190	1135.557	14.037	12.4	-0.8	NO	NO	bb
3	200706P1-21	Standard	12.500	3.31	1294.699	1029.912	15.714	13.9	11.1	NO	NO	bb
4	200706P1-22	Standard	12.500	3.31	1286.646	1172.076	13.722	12.1	-3.0	NO	NO	bb
5	200706P1-23	Standard	12.500	3.31	1387.692	1315.580	13.185	11.7	-6.8	NO	NO	bb
6	200706P1-24	Standard	12.500	3.31	1261.296	1066.013	14.790	13.1	4.6	NO	NO	bb
7	200706P1-25	Standard	12.500	3.31	1305.578	1118.342	14.593	12.9	3.2	NO	NO	bb
8	200706P1-26	Standard	12.500	3.30	1218.574	1109.793	13.725	12.1	-3.0	NO	NO	bb
9	200706P1-27	Standard	12.500	3.30	1180.548	1116.404	13.218	11.7	-6.6	NO	NO	bb
10	200706P1-28	Standard	12.500	3.30	1181.993	1041.527	14.186	12.5	0.3	NO	NO	bb

Compound name: 13C2-PFHxA-EIS
Response Factor: 1090.35
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	3.38	14936.540		14936.540	13.7	9.6	NO	NO	bbX
2	200706P1-20	Standard	12.500	3.39	14827.862		14827.862	13.6	8.8	NO	NO	bbX
3	200706P1-21	Standard	12.500	3.39	14195.111		14195.111	13.0	4.2	NO	NO	bbX
4	200706P1-22	Standard	12.500	3.39	14182.590		14182.590	13.0	4.1	NO	NO	bbX
5	200706P1-23	Standard	12.500	3.39	15680.674		15680.674	14.4	15.1	NO	NO	bbX
6	200706P1-24	Standard	12.500	3.39	13629.407		13629.407	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.39	14633.210		14633.210	13.4	7.4	NO	NO	bbX
8	200706P1-26	Standard	12.500	3.39	14554.702		14554.702	13.3	6.8	NO	NO	bbX
9	200706P1-27	Standard	12.500	3.39	14243.385		14243.385	13.1	4.5	NO	NO	bbX
10	200706P1-28	Standard	12.500	3.39	13865.558		13865.558	12.7	1.7	NO	NO	bbX

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Compound name: 13C2-PFHxA-RSD
Response Factor: 0.87906
RRF SD: 0.0268355, Relative SD: 3.05275
Response type: Internal Std (Ref 101), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	3.38	14936.540	15792.443	11.823	13.4	7.6	NO	NO	bb
2	200706P1-20	Standard	12.500	3.39	14827.862	16933.953	10.945	12.5	-0.4	NO	NO	bb
3	200706P1-21	Standard	12.500	3.39	14195.111	16418.008	10.808	12.3	-1.6	NO	NO	bb
4	200706P1-22	Standard	12.500	3.39	14182.590	16457.064	10.772	12.3	-2.0	NO	NO	bb
5	200706P1-23	Standard	12.500	3.39	15680.674	18353.051	10.680	12.1	-2.8	NO	NO	bb
6	200706P1-24	Standard	12.500	3.39	13629.407	15564.020	10.946	12.5	-0.4	NO	NO	bb
7	200706P1-25	Standard	12.500	3.39	14633.210	17166.877	10.655	12.1	-3.0	NO	NO	bb
8	200706P1-26	Standard	12.500	3.39	14554.702	16410.266	11.087	12.6	0.9	NO	NO	bb
9	200706P1-27	Standard	12.500	3.39	14243.385	16063.282	11.084	12.6	0.9	NO	NO	bb
10	200706P1-28	Standard	12.500	3.39	13865.558	15638.367	11.083	12.6	0.9	NO	NO	bb

Compound name: 13C4-PFHpA-EIS
Response Factor: 983.154
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	3.98	12966.955	12966.955	13.2	5.5	NO	NO	bbX
2	200706P1-20	Standard	12.500	3.98	12233.538	12233.538	12.4	-0.5	NO	NO	bbX
3	200706P1-21	Standard	12.500	3.98	12536.285	12536.285	12.8	2.0	NO	NO	bbX
4	200706P1-22	Standard	12.500	3.98	12763.619	12763.619	13.0	3.9	NO	NO	bbX
5	200706P1-23	Standard	12.500	3.98	12970.818	12970.818	13.2	5.5	NO	NO	bbX
6	200706P1-24	Standard	12.500	3.98	12289.430	12289.430	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.98	12769.633	12769.633	13.0	3.9	NO	NO	bbX
8	200706P1-26	Standard	12.500	3.98	12943.463	12943.463	13.2	5.3	NO	NO	bbX
9	200706P1-27	Standard	12.500	3.98	11840.771	11840.771	12.0	-3.7	NO	NO	bbX
10	200706P1-28	Standard	12.500	3.98	11650.135	11650.135	11.8	-5.2	NO	NO	bbX

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Compound name: 13C4-PFHpA-RSD
Response Factor: 0.75937
RRF SD: 0.03487, Relative SD: 4.59197
Response type: Internal Std (Ref 101), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	3.98	12966.955	15792.443	10.264	13.5	8.1	NO	NO	bb
2	200706P1-20	Standard	12.500	3.98	12233.538	16933.953	9.030	11.9	-4.9	NO	NO	bb
3	200706P1-21	Standard	12.500	3.98	12536.285	16418.008	9.545	12.6	0.6	NO	NO	bb
4	200706P1-22	Standard	12.500	3.98	12763.619	16457.064	9.695	12.8	2.1	NO	NO	bb
5	200706P1-23	Standard	12.500	3.98	12970.818	18353.051	8.834	11.6	-6.9	NO	NO	bb
6	200706P1-24	Standard	12.500	3.98	12289.430	15564.020	9.870	13.0	4.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.98	12769.633	17166.877	9.298	12.2	-2.0	NO	NO	bb
8	200706P1-26	Standard	12.500	3.98	12943.463	16410.266	9.859	13.0	3.9	NO	NO	bb
9	200706P1-27	Standard	12.500	3.98	11840.771	16063.282	9.214	12.1	-2.9	NO	NO	bb
10	200706P1-28	Standard	12.500	3.98	11650.135	15638.367	9.312	12.3	-1.9	NO	NO	bb

Compound name: 13C3-PFHxS-EIS
Response Factor: 220.112
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	4.13	2847.260	2847.260	12.9	3.5	NO	NO	bbX
2	200706P1-20	Standard	12.500	4.13	2779.479	2779.479	12.6	1.0	NO	NO	bbX
3	200706P1-21	Standard	12.500	4.13	2651.918	2651.918	12.0	-3.6	NO	NO	bbX
4	200706P1-22	Standard	12.500	4.13	2816.980	2816.980	12.8	2.4	NO	NO	bbX
5	200706P1-23	Standard	12.500	4.13	3217.580	3217.580	14.6	16.9	NO	NO	bbX
6	200706P1-24	Standard	12.500	4.13	2751.402	2751.402	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.13	2742.332	2742.332	12.5	-0.3	NO	NO	bbX
8	200706P1-26	Standard	12.500	4.13	2706.095	2706.095	12.3	-1.6	NO	NO	bbX
9	200706P1-27	Standard	12.500	4.13	2614.377	2614.377	11.9	-5.0	NO	NO	bbX
10	200706P1-28	Standard	12.500	4.13	2482.339	2482.339	11.3	-9.8	NO	NO	bbX

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Compound name: 13C3-PFHxS-RSD
Response Factor: 2.46275
RRF SD: 0.0826774, Relative SD: 3.35712
Response type: Internal Std (Ref 102), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.13	2847.260	1112.618	31.988	13.0	3.9	NO	NO	bb
2	200706P1-20	Standard	12.500	4.13	2779.479	1135.557	30.596	12.4	-0.6	NO	NO	bb
3	200706P1-21	Standard	12.500	4.13	2651.918	1029.912	32.186	13.1	4.6	NO	NO	bb
4	200706P1-22	Standard	12.500	4.13	2816.980	1172.076	30.043	12.2	-2.4	NO	NO	bb
5	200706P1-23	Standard	12.500	4.13	3217.580	1315.580	30.572	12.4	-0.7	NO	NO	bb
6	200706P1-24	Standard	12.500	4.13	2751.402	1066.013	32.263	13.1	4.8	NO	NO	bb
7	200706P1-25	Standard	12.500	4.13	2742.332	1118.342	30.652	12.4	-0.4	NO	NO	bb
8	200706P1-26	Standard	12.500	4.13	2706.095	1109.793	30.480	12.4	-1.0	NO	NO	bb
9	200706P1-27	Standard	12.500	4.13	2614.377	1116.404	29.272	11.9	-4.9	NO	NO	bb
10	200706P1-28	Standard	12.500	4.13	2482.339	1041.527	29.792	12.1	-3.2	NO	NO	bb

Compound name: 13C2-6:2 FTS-EIS
Response Factor: 128.741
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	4.45	1614.767	1614.767	12.5	0.3	NO	NO	bbX
2	200706P1-20	Standard	12.500	4.45	1610.712	1610.712	12.5	0.1	NO	NO	bbX
3	200706P1-21	Standard	12.500	4.45	1404.711	1404.711	10.9	-12.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	4.45	1542.265	1542.265	12.0	-4.2	NO	NO	bbX
5	200706P1-23	Standard	12.500	4.45	1637.135	1637.135	12.7	1.7	NO	NO	bbX
6	200706P1-24	Standard	12.500	4.45	1609.265	1609.265	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.45	1440.831	1440.831	11.2	-10.5	NO	NO	bbX
8	200706P1-26	Standard	12.500	4.45	1590.387	1590.387	12.4	-1.2	NO	NO	bbX
9	200706P1-27	Standard	12.500	4.45	1483.970	1483.970	11.5	-7.8	NO	NO	bbX
10	200706P1-28	Standard	12.500	4.45	1478.616	1478.616	11.5	-8.1	NO	NO	bbX

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Compound name: 13C2-6:2 FTS-RSD
Response Factor: 0.472755
RRF SD: 0.0294663, Relative SD: 6.2329
Response type: Internal Std (Ref 105), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.45	1614.767	3112.113	6.486	13.7	9.8	NO	NO	bb
2	200706P1-20	Standard	12.500	4.45	1610.712	3516.579	5.725	12.1	-3.1	NO	NO	bb
3	200706P1-21	Standard	12.500	4.45	1404.711	3143.465	5.586	11.8	-5.5	NO	NO	bb
4	200706P1-22	Standard	12.500	4.45	1542.265	3349.641	5.755	12.2	-2.6	NO	NO	bb
5	200706P1-23	Standard	12.500	4.45	1637.135	3463.788	5.908	12.5	-0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	4.45	1609.265	3222.088	6.243	13.2	5.6	NO	NO	bb
7	200706P1-25	Standard	12.500	4.45	1440.831	3410.395	5.281	11.2	-10.6	NO	NO	bb
8	200706P1-26	Standard	12.500	4.45	1590.387	3432.673	5.791	12.3	-2.0	NO	NO	bb
9	200706P1-27	Standard	12.500	4.45	1483.970	3113.743	5.957	12.6	0.8	NO	NO	bb
10	200706P1-28	Standard	12.500	4.45	1478.616	2905.585	6.361	13.5	7.6	NO	NO	bb

Compound name: 13C5-PFNA-EIS
Response Factor: 1213.14
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	4.94	14827.067	14827.067	12.2	-2.2	NO	NO	bbX
2	200706P1-20	Standard	12.500	4.94	15608.248	15608.248	12.9	2.9	NO	NO	bbX
3	200706P1-21	Standard	12.500	4.94	15269.105	15269.105	12.6	0.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	4.94	14161.967	14161.967	11.7	-6.6	NO	NO	bbX
5	200706P1-23	Standard	12.500	4.94	15977.628	15977.628	13.2	5.4	NO	NO	bbX
6	200706P1-24	Standard	12.500	4.94	15164.249	15164.249	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.94	15860.334	15860.334	13.1	4.6	NO	NO	bbX
8	200706P1-26	Standard	12.500	4.94	15209.911	15209.911	12.5	0.3	NO	NO	bbX
9	200706P1-27	Standard	12.500	4.94	14402.273	14402.273	11.9	-5.0	NO	NO	bbX
10	200706P1-28	Standard	12.500	4.94	13593.457	13593.457	11.2	-10.4	NO	NO	bbX

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Compound name: 13C5-PFNA-RSD
Response Factor: 0.941081
RRF SD: 0.0326164, Relative SD: 3.46585
Response type: Internal Std (Ref 104), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.94	14827.067	14826.541	12.500	13.3	6.3	NO	NO	bb
2	200706P1-20	Standard	12.500	4.94	15608.248	16698.430	11.684	12.4	-0.7	NO	NO	bb
3	200706P1-21	Standard	12.500	4.94	15269.105	16406.395	11.634	12.4	-1.1	NO	NO	bb
4	200706P1-22	Standard	12.500	4.94	14161.967	16149.805	10.961	11.6	-6.8	NO	NO	bb
5	200706P1-23	Standard	12.500	4.94	15977.628	17268.395	11.566	12.3	-1.7	NO	NO	bb
6	200706P1-24	Standard	12.500	4.94	15164.249	15863.199	11.949	12.7	1.6	NO	NO	bb
7	200706P1-25	Standard	12.500	4.94	15860.334	16381.950	12.102	12.9	2.9	NO	NO	bb
8	200706P1-26	Standard	12.500	4.94	15209.911	15859.456	11.988	12.7	1.9	NO	NO	bb
9	200706P1-27	Standard	12.500	4.94	14402.273	15578.559	11.556	12.3	-1.8	NO	NO	bb
10	200706P1-28	Standard	12.500	4.94	13593.457	14529.391	11.695	12.4	-0.6	NO	NO	bb

Compound name: 13C8-PFOSA-EIS
Response Factor: 571.374
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	4.99	7350.009	7350.009	12.9	2.9	NO	NO	bbX
2	200706P1-20	Standard	12.500	4.99	7155.503	7155.503	12.5	0.2	NO	NO	bbX
3	200706P1-21	Standard	12.500	4.99	6949.531	6949.531	12.2	-2.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	4.99	7224.200	7224.200	12.6	1.1	NO	NO	bbX
5	200706P1-23	Standard	12.500	4.99	7949.741	7949.741	13.9	11.3	NO	NO	bbX
6	200706P1-24	Standard	12.500	4.98	7142.181	7142.181	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.99	7268.384	7268.384	12.7	1.8	NO	NO	bbX
8	200706P1-26	Standard	12.500	4.99	7226.727	7226.727	12.6	1.2	NO	NO	bbX
9	200706P1-27	Standard	12.500	4.99	6740.430	6740.430	11.8	-5.6	NO	NO	bbX
10	200706P1-28	Standard	12.500	4.98	6362.523	6362.523	11.1	-10.9	NO	NO	bbX

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Compound name: 13C8-PFOSA-RSD
Response Factor: 0.486256
RRF SD: 0.0261204, Relative SD: 5.37173
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.99	7350.009	14039.590	6.544	13.5	7.7	NO	NO	bb
2	200706P1-20	Standard	12.500	4.99	7155.503	15869.678	5.636	11.6	-7.3	NO	NO	bb
3	200706P1-21	Standard	12.500	4.99	6949.531	14615.809	5.944	12.2	-2.2	NO	NO	bb
4	200706P1-22	Standard	12.500	4.99	7224.200	14751.563	6.122	12.6	0.7	NO	NO	bb
5	200706P1-23	Standard	12.500	4.99	7949.741	15184.211	6.544	13.5	7.7	NO	NO	bb
6	200706P1-24	Standard	12.500	4.98	7142.181	14215.874	6.280	12.9	3.3	NO	NO	bb
7	200706P1-25	Standard	12.500	4.99	7268.384	15481.095	5.869	12.1	-3.4	NO	NO	bb
8	200706P1-26	Standard	12.500	4.99	7226.727	15001.885	6.022	12.4	-0.9	NO	NO	bb
9	200706P1-27	Standard	12.500	4.99	6740.430	14984.139	5.623	11.6	-7.5	NO	NO	bb
10	200706P1-28	Standard	12.500	4.98	6362.523	12829.642	6.199	12.7	2.0	NO	NO	bb

Compound name: 13C2-PFOA-EIS
Response Factor: 1154.44
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	4.51	14231.127	14231.127	12.3	-1.4	NO	NO	bbX
2	200706P1-20	Standard	12.500	4.51	14540.555	14540.555	12.6	0.8	NO	NO	bbX
3	200706P1-21	Standard	12.500	4.51	14506.504	14506.504	12.6	0.5	NO	NO	bbX
4	200706P1-22	Standard	12.500	4.51	14455.132	14455.132	12.5	0.2	NO	NO	bbX
5	200706P1-23	Standard	12.500	4.51	14986.464	14986.464	13.0	3.9	NO	NO	bbX
6	200706P1-24	Standard	12.500	4.51	14430.539	14430.539	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.51	14123.512	14123.512	12.2	-2.1	NO	NO	bbX
8	200706P1-26	Standard	12.500	4.51	13491.245	13491.245	11.7	-6.5	NO	NO	bbX
9	200706P1-27	Standard	12.500	4.50	13468.371	13468.371	11.7	-6.7	NO	NO	bbX
10	200706P1-28	Standard	12.500	4.50	12462.934	12462.934	10.8	-13.6	NO	NO	bbX

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Compound name: 13C2-PFOA-RSD
Response Factor: 1.09364
RRF SD: 0.0333738, Relative SD: 3.05162
Response type: Internal Std (Ref 103), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.51	14231.127	12519.366	14.209	13.0	3.9	NO	NO	bb
2	200706P1-20	Standard	12.500	4.51	14540.555	13839.076	13.134	12.0	-3.9	NO	NO	bb
3	200706P1-21	Standard	12.500	4.51	14506.504	13084.422	13.859	12.7	1.4	NO	NO	bb
4	200706P1-22	Standard	12.500	4.51	14455.132	13029.019	13.868	12.7	1.4	NO	NO	bb
5	200706P1-23	Standard	12.500	4.51	14986.464	14240.478	13.155	12.0	-3.8	NO	NO	bb
6	200706P1-24	Standard	12.500	4.51	14430.539	13030.224	13.843	12.7	1.3	NO	NO	bb
7	200706P1-25	Standard	12.500	4.51	14123.512	13296.607	13.277	12.1	-2.9	NO	NO	bb
8	200706P1-26	Standard	12.500	4.51	13491.245	12409.222	13.590	12.4	-0.6	NO	NO	bb
9	200706P1-27	Standard	12.500	4.50	13468.371	12509.283	13.458	12.3	-1.6	NO	NO	bb
10	200706P1-28	Standard	12.500	4.50	12462.934	10884.975	14.312	13.1	4.7	NO	NO	bb

Compound name: 13C8-PFOS-EIS
Response Factor: 225.51
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.02	2884.344	2884.344	12.8	2.3	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.02	2845.779	2845.779	12.6	1.0	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.02	3008.333	3008.333	13.3	6.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.02	2875.965	2875.965	12.8	2.0	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.02	3118.928	3118.928	13.8	10.6	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.02	2818.869	2818.869	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.02	2950.445	2950.445	13.1	4.7	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.02	2787.149	2787.149	12.4	-1.1	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.02	2663.154	2663.154	11.8	-5.5	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.02	2577.664	2577.664	11.4	-8.6	NO	NO	bbX

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Compound name: 13C8-PFOS-RSD
Response Factor: 0.874647
RRF SD: 0.0462578, Relative SD: 5.28874
Response type: Internal Std (Ref 105), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.02	2884.344	3112.113	11.585	13.2	6.0	NO	NO	bb
2	200706P1-20	Standard	12.500	5.02	2845.779	3516.579	10.116	11.6	-7.5	NO	NO	bb
3	200706P1-21	Standard	12.500	5.02	3008.333	3143.465	11.963	13.7	9.4	NO	NO	bb
4	200706P1-22	Standard	12.500	5.02	2875.965	3349.641	10.732	12.3	-1.8	NO	NO	bb
5	200706P1-23	Standard	12.500	5.02	3118.928	3463.788	11.255	12.9	2.9	NO	NO	bb
6	200706P1-24	Standard	12.500	5.02	2818.869	3222.088	10.936	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.02	2950.445	3410.395	10.814	12.4	-1.1	NO	NO	bb
8	200706P1-26	Standard	12.500	5.02	2787.149	3432.673	10.149	11.6	-7.2	NO	NO	bb
9	200706P1-27	Standard	12.500	5.02	2663.154	3113.743	10.691	12.2	-2.2	NO	NO	bb
10	200706P1-28	Standard	12.500	5.02	2577.664	2905.585	11.089	12.7	1.4	NO	NO	bb

Compound name: 13C2-PFDA-EIS
Response Factor: 1491.47
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.31	18137.861		18137.861	12.2	-2.7	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.31	19338.936		19338.936	13.0	3.7	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.31	18429.492		18429.492	12.4	-1.1	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.31	19687.527		19687.527	13.2	5.6	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.31	19663.701		19663.701	13.2	5.5	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.31	18643.387		18643.387	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.31	19964.771		19964.771	13.4	7.1	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.31	19861.670		19861.670	13.3	6.5	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.31	19146.473		19146.473	12.8	2.7	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.31	18310.025		18310.025	12.3	-1.8	NO	NO	bbX

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Compound name: 13C2-PFDA-RSD
Response Factor: 1.25394
RRF SD: 0.0652637, Relative SD: 5.20471
Response type: Internal Std (Ref 106), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.31	18137.861	14024.693	16.166	12.9	3.1	NO	NO	bb
2	200706P1-20	Standard	12.500	5.31	19338.936	16270.641	14.857	11.8	-5.2	NO	NO	bb
3	200706P1-21	Standard	12.500	5.31	18429.492	15005.021	15.353	12.2	-2.1	NO	NO	bb
4	200706P1-22	Standard	12.500	5.31	19687.527	15649.067	15.726	12.5	0.3	NO	NO	bb
5	200706P1-23	Standard	12.500	5.31	19663.701	16678.373	14.737	11.8	-6.0	NO	NO	bb
6	200706P1-24	Standard	12.500	5.31	18643.387	13685.886	17.028	13.6	8.6	NO	NO	bb
7	200706P1-25	Standard	12.500	5.31	19964.771	15985.261	15.612	12.5	-0.4	NO	NO	bb
8	200706P1-26	Standard	12.500	5.31	19861.670	16564.369	14.988	12.0	-4.4	NO	NO	bb
9	200706P1-27	Standard	12.500	5.31	19146.473	15629.832	15.312	12.2	-2.3	NO	NO	bb
10	200706P1-28	Standard	12.500	5.31	18310.025	13493.237	16.962	13.5	8.2	NO	NO	bb

Compound name: 13C2-8:2 FTS-EIS
Response Factor: 110.353
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.29	1541.506	1541.506	14.0	11.8	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.29	1580.063	1580.063	14.3	14.5	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.29	1512.862	1512.862	13.7	9.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.29	1542.955	1542.955	14.0	11.9	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.29	1469.703	1469.703	13.3	6.5	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.29	1379.408	1379.408	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.29	1477.570	1477.570	13.4	7.1	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.29	1351.704	1351.704	12.2	-2.0	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.29	1433.317	1433.317	13.0	3.9	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.29	1567.050	1567.050	14.2	13.6	NO	NO	bbX

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Compound name: 13C2-8:2 FTS-RSD
Response Factor: 0.456564
RRF SD: 0.0413402, Relative SD: 9.05463
Response type: Internal Std (Ref 105), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.29	1541.506	3112.113	6.192	13.6	8.5	NO	NO	bb
2	200706P1-20	Standard	12.500	5.29	1580.063	3516.579	5.616	12.3	-1.6	NO	NO	bb
3	200706P1-21	Standard	12.500	5.29	1512.862	3143.465	6.016	13.2	5.4	NO	NO	bb
4	200706P1-22	Standard	12.500	5.29	1542.955	3349.641	5.758	12.6	0.9	NO	NO	bb
5	200706P1-23	Standard	12.500	5.29	1469.703	3463.788	5.304	11.6	-7.1	NO	NO	bb
6	200706P1-24	Standard	12.500	5.29	1379.408	3222.088	5.351	11.7	-6.2	NO	NO	bb
7	200706P1-25	Standard	12.500	5.29	1477.570	3410.395	5.416	11.9	-5.1	NO	NO	bb
8	200706P1-26	Standard	12.500	5.29	1351.704	3432.673	4.922	10.8	-13.8	NO	NO	bb
9	200706P1-27	Standard	12.500	5.29	1433.317	3113.743	5.754	12.6	0.8	NO	NO	bb
10	200706P1-28	Standard	12.500	5.29	1567.050	2905.585	6.742	14.8	18.1	NO	NO	bb

Compound name: d3-N-MeFOSAA-EIS
Response Factor: 331.163
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.46	4408.401	4408.401	13.3	6.5	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.46	4346.208	4346.208	13.1	5.0	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.46	4230.765	4230.765	12.8	2.2	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.46	4359.749	4359.749	13.2	5.3	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.46	4489.936	4489.936	13.6	8.5	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.45	4139.533	4139.533	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.46	4321.417	4321.417	13.0	4.4	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.46	4277.929	4277.929	12.9	3.3	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.45	4146.951	4146.951	12.5	0.2	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.45	4234.389	4234.389	12.8	2.3	NO	NO	bbX

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Compound name: d3-N-MeFOSAA-RSD
Response Factor: 0.293087
RRF SD: 0.0174045, Relative SD: 5.93836
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.46	4408.401	14039.590	3.925	13.4	7.1	NO	NO	bb
2	200706P1-20	Standard	12.500	5.46	4346.208	15869.678	3.423	11.7	-6.6	NO	NO	bb
3	200706P1-21	Standard	12.500	5.46	4230.765	14615.809	3.618	12.3	-1.2	NO	NO	bb
4	200706P1-22	Standard	12.500	5.46	4359.749	14751.563	3.694	12.6	0.8	NO	NO	bb
5	200706P1-23	Standard	12.500	5.46	4489.936	15184.211	3.696	12.6	0.9	NO	NO	bb
6	200706P1-24	Standard	12.500	5.45	4139.533	14215.874	3.640	12.4	-0.6	NO	NO	bb
7	200706P1-25	Standard	12.500	5.46	4321.417	15481.095	3.489	11.9	-4.8	NO	NO	bb
8	200706P1-26	Standard	12.500	5.46	4277.929	15001.885	3.564	12.2	-2.7	NO	NO	bb
9	200706P1-27	Standard	12.500	5.45	4146.951	14984.139	3.459	11.8	-5.6	NO	NO	bb
10	200706P1-28	Standard	12.500	5.45	4234.389	12829.642	4.126	14.1	12.6	NO	NO	bb

Compound name: 13C2-PFUdA-EIS
Response Factor: 1581.34
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.63	18683.264	18683.264	11.8	-5.5	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.63	19852.086	19852.086	12.6	0.4	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.63	18480.219	18480.219	11.7	-6.5	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.63	19143.811	19143.811	12.1	-3.2	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.63	20906.857	20906.857	13.2	5.8	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.63	19766.689	19766.689	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.63	19028.625	19028.625	12.0	-3.7	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.63	18950.932	18950.932	12.0	-4.1	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.63	18632.748	18632.748	11.8	-5.7	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.63	16795.816	16795.816	10.6	-15.0	NO	NO	bbX

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Compound name: 13C2-PFUdA-RSD
Response Factor: 1.29562
RRF SD: 0.0559514, Relative SD: 4.31849
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.63	18683.264	14039.590	16.634	12.8	2.7	NO	NO	bb
2	200706P1-20	Standard	12.500	5.63	19852.086	15869.678	15.637	12.1	-3.4	NO	NO	bb
3	200706P1-21	Standard	12.500	5.63	18480.219	14615.809	15.805	12.2	-2.4	NO	NO	bb
4	200706P1-22	Standard	12.500	5.63	19143.811	14751.563	16.222	12.5	0.2	NO	NO	bb
5	200706P1-23	Standard	12.500	5.63	20906.857	15184.211	17.211	13.3	6.3	NO	NO	bb
6	200706P1-24	Standard	12.500	5.63	19766.689	14215.874	17.381	13.4	7.3	NO	NO	bb
7	200706P1-25	Standard	12.500	5.63	19028.625	15481.095	15.364	11.9	-5.1	NO	NO	bb
8	200706P1-26	Standard	12.500	5.63	18950.932	15001.885	15.790	12.2	-2.5	NO	NO	bb
9	200706P1-27	Standard	12.500	5.63	18632.748	14984.139	15.544	12.0	-4.0	NO	NO	bb
10	200706P1-28	Standard	12.500	5.63	16795.816	12829.642	16.364	12.6	1.0	NO	NO	bb

Compound name: d5-N-EtFOSAA-EIS
Response Factor: 313.941
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.61	3974.848	3974.848	12.7	1.3	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.61	4387.888	4387.888	14.0	11.8	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.61	4370.321	4370.321	13.9	11.4	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.61	4172.910	4172.910	13.3	6.3	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.61	4350.434	4350.434	13.9	10.9	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.61	3924.268	3924.268	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.61	4351.004	4351.004	13.9	10.9	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.61	4188.651	4188.651	13.3	6.7	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.60	4036.783	4036.783	12.9	2.9	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.60	3787.376	3787.376	12.1	-3.5	NO	NO	bbX

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Compound name: d5-N-EtFOSAA-RSD
Response Factor: 0.282893
RRF SD: 0.00889003, Relative SD: 3.14254
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.61	3974.848	14039.590	3.539	12.5	0.1	NO	NO	bb
2	200706P1-20	Standard	12.500	5.61	4387.888	15869.678	3.456	12.2	-2.3	NO	NO	bb
3	200706P1-21	Standard	12.500	5.61	4370.321	14615.809	3.738	13.2	5.7	NO	NO	bb
4	200706P1-22	Standard	12.500	5.61	4172.910	14751.563	3.536	12.5	-0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	5.61	4350.434	15184.211	3.581	12.7	1.3	NO	NO	bb
6	200706P1-24	Standard	12.500	5.61	3924.268	14215.874	3.451	12.2	-2.4	NO	NO	bb
7	200706P1-25	Standard	12.500	5.61	4351.004	15481.095	3.513	12.4	-0.7	NO	NO	bb
8	200706P1-26	Standard	12.500	5.61	4188.651	15001.885	3.490	12.3	-1.3	NO	NO	bb
9	200706P1-27	Standard	12.500	5.60	4036.783	14984.139	3.368	11.9	-4.8	NO	NO	bb
10	200706P1-28	Standard	12.500	5.60	3787.376	12829.642	3.690	13.0	4.4	NO	NO	bb

Compound name: 13C2-PFDoA-EIS
Response Factor: 1868.51
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.90	22810.775	22810.775	12.2	-2.3	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.90	25244.645	25244.645	13.5	8.1	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.90	24211.764	24211.764	13.0	3.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.90	24340.117	24340.117	13.0	4.2	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.90	25408.879	25408.879	13.6	8.8	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.90	23356.371	23356.371	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.90	23355.100	23355.100	12.5	-0.0	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.90	24096.184	24096.184	12.9	3.2	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.90	22303.783	22303.783	11.9	-4.5	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.90	21320.014	21320.014	11.4	-8.7	NO	NO	bbX

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Compound name: 13C2-PFDoA-RSD
Response Factor: 1.54998
RRF SD: 0.0870364, Relative SD: 5.61531
Response type: Internal Std (Ref 106), Area * (IS Conc. / IS Area)
Curve type: RF

		Type	Std Conc	RT	Area	IS Area	Response	Conc	%Dev	Cmpd Flag	Cmpd Rej	Calib Rej	Integ Alg
1	200706P1-19	Standard	12.500	5.90	22810.775	14024.693	20.331	13.1	4.9	NO	NO		bb
2	200706P1-20	Standard	12.500	5.90	25244.645	16270.641	19.394	12.5	0.1	NO	NO		bb
3	200706P1-21	Standard	12.500	5.90	24211.764	15005.021	20.170	13.0	4.1	NO	NO		bb
4	200706P1-22	Standard	12.500	5.90	24340.117	15649.067	19.442	12.5	0.3	NO	NO		bb
5	200706P1-23	Standard	12.500	5.90	25408.879	16678.373	19.043	12.3	-1.7	NO	NO		bb
6	200706P1-24	Standard	12.500	5.90	23356.371	13685.886	21.333	13.8	10.1	NO	NO		bb
7	200706P1-25	Standard	12.500	5.90	23355.100	15985.261	18.263	11.8	-5.7	NO	NO		bb
8	200706P1-26	Standard	12.500	5.90	24096.184	16564.369	18.184	11.7	-6.1	NO	NO		bb
9	200706P1-27	Standard	12.500	5.90	22303.783	15629.832	17.838	11.5	-7.9	NO	NO		bb
10	200706P1-28	Standard	12.500	5.90	21320.014	13493.237	19.751	12.7	1.9	NO	NO		bb

Compound name: 13C2-10:2 FTS-EIS
Response Factor: 108.637
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

		Type	Std Conc	RT	Area	IS Area	Response	Conc	%Dev	Cmpd Flag	Cmpd Rej	Calib Rej	Integ Alg
1	200706P1-19	Standard	12.500	5.89	1299.524		1299.524	12.0	-4.3	NO	NO		bbX
2	200706P1-20	Standard	12.500	5.89	1409.232		1409.232	13.0	3.8	NO	NO		bbX
3	200706P1-21	Standard	12.500	5.89	1381.627		1381.627	12.7	1.7	NO	NO		bbX
4	200706P1-22	Standard	12.500	5.89	1355.605		1355.605	12.5	-0.2	NO	NO		bbX
5	200706P1-23	Standard	12.500	5.89	1274.760		1274.760	11.7	-6.1	NO	NO		bbX
6	200706P1-24	Standard	12.500	5.89	1357.960		1357.960	12.5	0.0	NO	NO		bb
7	200706P1-25	Standard	12.500	5.89	1263.989		1263.989	11.6	-6.9	NO	NO		MMX
8	200706P1-26	Standard	12.500	5.89	1154.229		1154.229	10.6	-15.0	NO	NO		MMX
9	200706P1-27	Standard	12.500	5.89	1113.270		1113.270	10.2	-18.0	NO	NO		MMX
10	200706P1-28	Standard	12.500	5.89	949.242		949.242	8.7	-30.1	YES	NO		MMX

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Compound name: 13C2-10:2 FTS-RSD
Response Factor: 0.383921
RRF SD: 0.038237, Relative SD: 9.95958
Response type: Internal Std (Ref 105), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.89	1299.524	3112.113	5.220	13.6	8.8	NO	NO	bb
2	200706P1-20	Standard	12.500	5.89	1409.232	3516.579	5.009	13.0	4.4	NO	NO	bb
3	200706P1-21	Standard	12.500	5.89	1381.627	3143.465	5.494	14.3	14.5	NO	NO	bb
4	200706P1-22	Standard	12.500	5.89	1355.605	3349.641	5.059	13.2	5.4	NO	NO	bb
5	200706P1-23	Standard	12.500	5.89	1274.760	3463.788	4.600	12.0	-4.1	NO	NO	bb
6	200706P1-24	Standard	12.500	5.89	1357.960	3222.088	5.268	13.7	9.8	NO	NO	bb
7	200706P1-25	Standard	12.500	5.89	1250.593	3410.395	4.584	11.9	-4.5	NO	NO	bb
8	200706P1-26	Standard	12.500	5.89	1157.615	3432.673	4.215	11.0	-12.2	NO	NO	MM
9	200706P1-27	Standard	12.500	5.89	1113.269	3113.743	4.469	11.6	-6.9	NO	NO	MM
10	200706P1-28	Standard	12.500	5.89	946.437	2905.585	4.072	10.6	-15.2	NO	NO	db

Compound name: d3-N-MeFOSA-EIS
Response Factor: 138.386
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	149.200	5.84	20355.828	20355.828	147.1	-1.4	NO	NO	bbX
2	200706P1-20	Standard	149.200	5.84	20279.811	20279.811	146.5	-1.8	NO	NO	bbX
3	200706P1-21	Standard	149.200	5.84	20965.770	20965.770	151.5	1.5	NO	NO	bbX
4	200706P1-22	Standard	149.200	5.84	20813.816	20813.816	150.4	0.8	NO	NO	bbX
5	200706P1-23	Standard	149.200	5.84	21672.008	21672.008	156.6	5.0	NO	NO	bbX
6	200706P1-24	Standard	149.200	5.84	20647.168	20647.168	149.2	0.0	NO	NO	bb
7	200706P1-25	Standard	149.200	5.84	21174.100	21174.100	153.0	2.6	NO	NO	bbX
8	200706P1-26	Standard	149.200	5.84	20387.346	20387.346	147.3	-1.3	NO	NO	bbX
9	200706P1-27	Standard	149.200	5.84	18792.607	18792.607	135.8	-9.0	NO	NO	bbX
10	200706P1-28	Standard	149.200	5.84	17789.584	17789.584	128.6	-13.8	NO	NO	bbX

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Compound name: d3-N-MeFOSA-RSD
Response Factor: 0.115787
RRF SD: 0.00580031, Relative SD: 5.00945
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	149.200	5.84	20355.828	14039.590	18.124	156.5	4.9	NO	NO	bb
2	200706P1-20	Standard	149.200	5.84	20279.811	15869.678	15.974	138.0	-7.5	NO	NO	bb
3	200706P1-21	Standard	149.200	5.84	20965.770	14615.809	17.931	154.9	3.8	NO	NO	bb
4	200706P1-22	Standard	149.200	5.84	20813.816	14751.563	17.637	152.3	2.1	NO	NO	bb
5	200706P1-23	Standard	149.200	5.84	21672.008	15184.211	17.841	154.1	3.3	NO	NO	bb
6	200706P1-24	Standard	149.200	5.84	20647.168	14215.874	18.155	156.8	5.1	NO	NO	bb
7	200706P1-25	Standard	149.200	5.84	21174.100	15481.095	17.097	147.7	-1.0	NO	NO	bb
8	200706P1-26	Standard	149.200	5.84	20387.346	15001.885	16.987	146.7	-1.7	NO	NO	bb
9	200706P1-27	Standard	149.200	5.84	18792.607	14984.139	15.677	135.4	-9.3	NO	NO	bb
10	200706P1-28	Standard	149.200	5.84	17789.584	12829.642	17.333	149.7	0.3	NO	NO	bb

Compound name: 13C2-PFTeDA-EIS
Response Factor: 1905.82
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	6.34	23296.811	23296.811	12.2	-2.2	NO	NO	bbX
2	200706P1-20	Standard	12.500	6.34	25347.914	25347.914	13.3	6.4	NO	NO	bbX
3	200706P1-21	Standard	12.500	6.34	24321.422	24321.422	12.8	2.1	NO	NO	bbX
4	200706P1-22	Standard	12.500	6.34	23906.566	23906.566	12.5	0.4	NO	NO	bbX
5	200706P1-23	Standard	12.500	6.33	25577.697	25577.697	13.4	7.4	NO	NO	bbX
6	200706P1-24	Standard	12.500	6.33	23822.789	23822.789	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	6.34	24780.746	24780.746	13.0	4.0	NO	NO	bbX
8	200706P1-26	Standard	12.500	6.34	23560.986	23560.986	12.4	-1.1	NO	NO	bbX
9	200706P1-27	Standard	12.500	6.33	23364.986	23364.986	12.3	-1.9	NO	NO	bbX
10	200706P1-28	Standard	12.500	6.33	21788.924	21788.924	11.4	-8.5	NO	NO	bbX

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Compound name: 13C2-PFTeDA-RSD
Response Factor: 1.63304
RRF SD: 0.0496816, Relative SD: 3.04227
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	6.34	23296.811	14039.590	20.742	12.7	1.6	NO	NO	bb
2	200706P1-20	Standard	12.500	6.34	25347.914	15869.678	19.966	12.2	-2.2	NO	NO	bb
3	200706P1-21	Standard	12.500	6.34	24321.422	14615.809	20.801	12.7	1.9	NO	NO	bb
4	200706P1-22	Standard	12.500	6.34	23906.566	14751.563	20.258	12.4	-0.8	NO	NO	bb
5	200706P1-23	Standard	12.500	6.33	25577.697	15184.211	21.056	12.9	3.2	NO	NO	bb
6	200706P1-24	Standard	12.500	6.33	23822.789	14215.874	20.947	12.8	2.6	NO	NO	bb
7	200706P1-25	Standard	12.500	6.34	24780.746	15481.095	20.009	12.3	-2.0	NO	NO	bb
8	200706P1-26	Standard	12.500	6.34	23560.986	15001.885	19.632	12.0	-3.8	NO	NO	bb
9	200706P1-27	Standard	12.500	6.33	23364.986	14984.139	19.491	11.9	-4.5	NO	NO	bb
10	200706P1-28	Standard	12.500	6.33	21788.924	12829.642	21.229	13.0	4.0	NO	NO	bb

Compound name: d5-N-ETFOSA-EIS
Response Factor: 155.235
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	149.200	6.21	23217.701	23217.701	149.6	0.2	NO	NO	bbX
2	200706P1-20	Standard	149.200	6.21	23650.156	23650.156	152.4	2.1	NO	NO	bbX
3	200706P1-21	Standard	149.200	6.21	23147.498	23147.498	149.1	-0.1	NO	NO	bbX
4	200706P1-22	Standard	149.200	6.21	23462.338	23462.338	151.1	1.3	NO	NO	bbX
5	200706P1-23	Standard	149.200	6.21	24914.057	24914.057	160.5	7.6	NO	NO	bbX
6	200706P1-24	Standard	149.200	6.21	23161.109	23161.109	149.2	0.0	NO	NO	bb
7	200706P1-25	Standard	149.200	6.21	23538.484	23538.484	151.6	1.6	NO	NO	bbX
8	200706P1-26	Standard	149.200	6.21	22448.846	22448.846	144.6	-3.1	NO	NO	bbX
9	200706P1-27	Standard	149.200	6.21	21512.914	21512.914	138.6	-7.1	NO	NO	bbX
10	200706P1-28	Standard	149.200	6.21	19492.205	19492.205	125.6	-15.8	NO	NO	bbX

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Compound name: d5-N-ETFOSA-RSD
Response Factor: 0.130363
RRF SD: 0.0061827, Relative SD: 4.74267
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	149.200	6.21	23217.701	14039.590	20.672	158.6	6.3	NO	NO	bb
2	200706P1-20	Standard	149.200	6.21	23650.156	15869.678	18.628	142.9	-4.2	NO	NO	bb
3	200706P1-21	Standard	149.200	6.21	23147.498	14615.809	19.797	151.9	1.8	NO	NO	bb
4	200706P1-22	Standard	149.200	6.21	23462.338	14751.563	19.881	152.5	2.2	NO	NO	bb
5	200706P1-23	Standard	149.200	6.21	24914.057	15184.211	20.510	157.3	5.4	NO	NO	bb
6	200706P1-24	Standard	149.200	6.21	23161.109	14215.874	20.366	156.2	4.7	NO	NO	bb
7	200706P1-25	Standard	149.200	6.21	23538.484	15481.095	19.006	145.8	-2.3	NO	NO	bb
8	200706P1-26	Standard	149.200	6.21	22448.846	15001.885	18.705	143.5	-3.8	NO	NO	bb
9	200706P1-27	Standard	149.200	6.21	21512.914	14984.139	17.946	137.7	-7.7	NO	NO	bb
10	200706P1-28	Standard	149.200	6.21	19492.205	12829.642	18.991	145.7	-2.4	NO	NO	bb

Compound name: 13C2-PFHxDA-EIS
Response Factor: 2109.6
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	6.63	25406.275	25406.275	12.0	-3.7	NO	NO	bbX
2	200706P1-20	Standard	12.500	6.63	27130.332	27130.332	12.9	2.9	NO	NO	bbX
3	200706P1-21	Standard	12.500	6.63	26103.717	26103.717	12.4	-1.0	NO	NO	bbX
4	200706P1-22	Standard	12.500	6.63	26556.000	26556.000	12.6	0.7	NO	NO	bbX
5	200706P1-23	Standard	12.500	6.63	27161.623	27161.623	12.9	3.0	NO	NO	bbX
6	200706P1-24	Standard	12.500	6.63	26370.029	26370.029	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	6.63	26053.225	26053.225	12.3	-1.2	NO	NO	bbX
8	200706P1-26	Standard	12.500	6.63	26467.854	26467.854	12.5	0.4	NO	NO	bbX
9	200706P1-27	Standard	12.500	6.63	25481.225	25481.225	12.1	-3.4	NO	NO	bbX
10	200706P1-28	Standard	12.500	6.63	23953.805	23953.805	11.4	-9.2	NO	NO	bbX

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Compound name: 13C2-PFHxDA-RSD
Response Factor: 1.7764
RRF SD: 0.0627321, Relative SD: 3.53142
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	6.63	25406.275	14039.590	22.620	12.7	1.9	NO	NO	bb
2	200706P1-20	Standard	12.500	6.63	27130.332	15869.678	21.370	12.0	-3.8	NO	NO	bb
3	200706P1-21	Standard	12.500	6.63	26103.717	14615.809	22.325	12.6	0.5	NO	NO	bb
4	200706P1-22	Standard	12.500	6.63	26556.000	14751.563	22.503	12.7	1.3	NO	NO	bb
5	200706P1-23	Standard	12.500	6.63	27161.623	15184.211	22.360	12.6	0.7	NO	NO	bb
6	200706P1-24	Standard	12.500	6.63	26370.029	14215.874	23.187	13.1	4.4	NO	NO	bb
7	200706P1-25	Standard	12.500	6.63	26053.225	15481.095	21.036	11.8	-5.3	NO	NO	bb
8	200706P1-26	Standard	12.500	6.63	26467.854	15001.885	22.054	12.4	-0.7	NO	NO	bb
9	200706P1-27	Standard	12.500	6.63	25481.225	14984.139	21.257	12.0	-4.3	NO	NO	bb
10	200706P1-28	Standard	12.500	6.63	23953.805	12829.642	23.338	13.1	5.1	NO	NO	bb

Compound name: d7-N-MeFOSE-EIS
Response Factor: 134.737
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	149.200	6.33	20481.053	20481.053	152.0	1.9	NO	NO	bbX
2	200706P1-20	Standard	149.200	6.33	20843.604	20843.604	154.7	3.7	NO	NO	bbX
3	200706P1-21	Standard	149.200	6.33	20414.760	20414.760	151.5	1.6	NO	NO	bbX
4	200706P1-22	Standard	149.200	6.33	20055.193	20055.193	148.8	-0.2	NO	NO	bbX
5	200706P1-23	Standard	149.200	6.33	22627.299	22627.299	167.9	12.6	NO	NO	bbX
6	200706P1-24	Standard	149.200	6.33	20102.832	20102.832	149.2	0.0	NO	NO	bb
7	200706P1-25	Standard	149.200	6.34	20711.023	20711.023	153.7	3.0	NO	NO	bbX
8	200706P1-26	Standard	149.200	6.34	20885.109	20885.109	155.0	3.9	NO	NO	bbX
9	200706P1-27	Standard	149.200	6.34	20707.771	20707.771	153.7	3.0	NO	NO	bbX
10	200706P1-28	Standard	149.200	6.33	19318.008	19318.008	143.4	-3.9	NO	NO	bbX

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Compound name: d7-N-MeFOSE-RSD
Response Factor: 0.118964
RRF SD: 0.00547466, Relative SD: 4.60196
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	149.200	6.33	20625.156	14039.590	18.363	154.4	3.5	NO	NO	MM
2	200706P1-20	Standard	149.200	6.33	21038.611	15869.678	16.571	139.3	-6.6	NO	NO	MM
3	200706P1-21	Standard	149.200	6.33	20577.102	14615.809	17.598	147.9	-0.9	NO	NO	MM
4	200706P1-22	Standard	149.200	6.33	20244.988	14751.563	17.155	144.2	-3.3	NO	NO	MM
5	200706P1-23	Standard	149.200	6.33	22883.443	15184.211	18.838	158.4	6.1	NO	NO	MM
6	200706P1-24	Standard	149.200	6.33	20361.439	14215.874	17.904	150.5	0.9	NO	NO	MM
7	200706P1-25	Standard	149.200	6.34	20966.053	15481.095	16.929	142.3	-4.6	NO	NO	MM
8	200706P1-26	Standard	149.200	6.34	21032.818	15001.885	17.525	147.3	-1.3	NO	NO	MM
9	200706P1-27	Standard	149.200	6.34	20971.070	14984.139	17.494	147.1	-1.4	NO	NO	MM
10	200706P1-28	Standard	149.200	6.33	19619.432	12829.642	19.115	160.7	7.7	NO	NO	MM

Compound name: d9-N-EtFOSE-EIS
Response Factor: 148.701
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	149.200	6.48	22385.490	22385.490	150.5	0.9	NO	NO	bbX
2	200706P1-20	Standard	149.200	6.48	22515.381	22515.381	151.4	1.5	NO	NO	bbX
3	200706P1-21	Standard	149.200	6.48	22580.791	22580.791	151.9	1.8	NO	NO	bbX
4	200706P1-22	Standard	149.200	6.48	21905.441	21905.441	147.3	-1.3	NO	NO	bbX
5	200706P1-23	Standard	149.200	6.48	23437.969	23437.969	157.6	5.6	NO	NO	bbX
6	200706P1-24	Standard	149.200	6.48	22186.262	22186.262	149.2	0.0	NO	NO	bb
7	200706P1-25	Standard	149.200	6.48	22694.074	22694.074	152.6	2.3	NO	NO	bbX
8	200706P1-26	Standard	149.200	6.48	23318.145	23318.145	156.8	5.1	NO	NO	bbX
9	200706P1-27	Standard	149.200	6.48	23270.990	23270.990	156.5	4.9	NO	NO	bbX
10	200706P1-28	Standard	149.200	6.48	23386.736	23386.736	157.3	5.4	NO	NO	bbX

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Compound name: d9-N-EtFOSE-RSD
Response Factor: 0.131719
RRF SD: 0.00914172, Relative SD: 6.94031
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	149.200	6.48	22589.941	14039.590	20.113	152.7	2.3	NO	NO	MM
2	200706P1-20	Standard	149.200	6.48	22768.420	15869.678	17.934	136.2	-8.7	NO	NO	MM
3	200706P1-21	Standard	149.200	6.48	22925.510	14615.809	19.607	148.9	-0.2	NO	NO	MM
4	200706P1-22	Standard	149.200	6.48	22139.848	14751.563	18.761	142.4	-4.5	NO	NO	MM
5	200706P1-23	Standard	149.200	6.48	23738.180	15184.211	19.542	148.4	-0.6	NO	NO	MM
6	200706P1-24	Standard	149.200	6.48	22478.828	14215.874	19.766	150.1	0.6	NO	NO	MM
7	200706P1-25	Standard	149.200	6.48	22952.611	15481.095	18.533	140.7	-5.7	NO	NO	MM
8	200706P1-26	Standard	149.200	6.48	23540.660	15001.885	19.615	148.9	-0.2	NO	NO	MM
9	200706P1-27	Standard	149.200	6.48	23510.197	14984.139	19.613	148.9	-0.2	NO	NO	MM
10	200706P1-28	Standard	149.200	6.48	23651.098	12829.642	23.043	174.9	17.3	NO	NO	MM

Compound name: 13C4-PFBA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 99), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	1.62	9571.630	9571.630	12.500	12.5	0.0	NO	NO	MM
2	200706P1-20	Standard	12.500	1.62	10495.767	10495.767	12.500	12.5	0.0	NO	NO	MM
3	200706P1-21	Standard	12.500	1.62	10322.609	10322.609	12.500	12.5	0.0	NO	NO	MM
4	200706P1-22	Standard	12.500	1.62	10427.793	10427.793	12.500	12.5	0.0	NO	NO	MM
5	200706P1-23	Standard	12.500	1.62	10992.993	10992.993	12.500	12.5	0.0	NO	NO	MM
6	200706P1-24	Standard	12.500	1.62	10121.277	10121.277	12.500	12.5	0.0	NO	NO	MM
7	200706P1-25	Standard	12.500	1.62	10409.653	10409.653	12.500	12.5	0.0	NO	NO	MM
8	200706P1-26	Standard	12.500	1.62	10665.174	10665.174	12.500	12.5	0.0	NO	NO	MM
9	200706P1-27	Standard	12.500	1.62	10876.274	10876.274	12.500	12.5	0.0	NO	NO	MM
10	200706P1-28	Standard	12.500	1.62	10864.321	10864.321	12.500	12.5	0.0	NO	NO	MM

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Compound name: 13C2-FOUEA-EIS
Response Factor: 1951.29
RRF SD: 0, Relative SD: 0
Response type: External Std, Area
Curve type: RF

1	200706P1-19	Standard	12.500	5.01	23514.066	23514.066	12.1	-3.6	NO	NO	bbX
2	200706P1-20	Standard	12.500	5.01	25451.172	25451.172	13.0	4.3	NO	NO	bbX
3	200706P1-21	Standard	12.500	5.01	23973.270	23973.270	12.3	-1.7	NO	NO	bbX
4	200706P1-22	Standard	12.500	5.01	25472.313	25472.313	13.1	4.4	NO	NO	bbX
5	200706P1-23	Standard	12.500	5.01	26638.104	26638.104	13.7	9.2	NO	NO	bbX
6	200706P1-24	Standard	12.500	5.00	24391.166	24391.166	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.01	25232.289	25232.289	12.9	3.4	NO	NO	bbX
8	200706P1-26	Standard	12.500	5.01	22912.313	22912.313	11.7	-6.1	NO	NO	bbX
9	200706P1-27	Standard	12.500	5.00	23091.492	23091.492	11.8	-5.3	NO	NO	bbX
10	200706P1-28	Standard	12.500	5.00	19672.584	19672.584	10.1	-19.3	NO	NO	bbX

Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 101), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	3.38	15792.443	15792.443	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	3.39	16933.953	16933.953	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	3.39	16418.008	16418.008	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	3.39	16457.064	16457.064	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	3.39	18353.051	18353.051	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	3.39	15564.020	15564.020	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	3.39	17166.877	17166.877	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	3.39	16410.266	16410.266	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	3.39	16063.282	16063.282	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	3.39	15638.367	15638.367	12.500	12.5	0.0	NO	NO	bb

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Compound name: 18O2-PFHxS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 102), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.13	1112.618	1112.618	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	4.13	1135.557	1135.557	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	4.13	1029.912	1029.912	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	4.13	1172.076	1172.076	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	4.13	1315.580	1315.580	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	4.13	1066.013	1066.013	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.13	1118.342	1118.342	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	4.13	1109.793	1109.793	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	4.13	1116.404	1116.404	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	4.13	1041.527	1041.527	12.500	12.5	0.0	NO	NO	bb

Compound name: 13C8-PFOA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 103), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.51	12519.366	12519.366	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	4.51	13839.076	13839.076	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	4.51	13084.422	13084.422	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	4.51	13029.019	13029.019	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	4.51	14240.478	14240.478	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	4.51	13030.224	13030.224	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.51	13296.607	13296.607	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	4.50	12409.222	12409.222	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	4.50	12509.283	12509.283	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	4.50	10884.975	10884.975	12.500	12.5	0.0	NO	NO	bb

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Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 7.40149e-017, Relative SD: 7.40149e-015
Response type: Internal Std (Ref 104), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	4.94	14826.541	14826.541	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	4.94	16698.430	16698.430	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	4.94	16406.395	16406.395	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	4.94	16149.805	16149.805	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	4.94	17268.395	17268.395	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	4.94	15863.199	15863.199	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	4.94	16381.950	16381.950	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	4.94	15859.456	15859.456	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	4.94	15578.559	15578.559	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	4.94	14529.391	14529.391	12.500	12.5	0.0	NO	NO	bb

Compound name: 13C4-PFOS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 105), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.02	3112.113	3112.113	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	5.02	3516.579	3516.579	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	5.02	3143.465	3143.465	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	5.02	3349.641	3349.641	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	5.02	3463.788	3463.788	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	5.02	3222.088	3222.088	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.02	3410.395	3410.395	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	5.02	3432.673	3432.673	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	5.02	3113.743	3113.743	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	5.02	2905.585	2905.585	12.500	12.5	0.0	NO	NO	bb

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Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 106), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.31	14024.693	14024.693	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	5.31	16270.641	16270.641	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	5.31	15005.021	15005.021	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	5.31	15649.067	15649.067	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	5.31	16678.373	16678.373	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	5.31	13685.886	13685.886	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.31	15985.261	15985.261	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	5.31	16564.369	16564.369	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	5.31	15629.832	15629.832	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	5.31	13493.237	13493.237	12.500	12.5	0.0	NO	NO	bb

Compound name: 13C7-PFUdA
Response Factor: 1
RRF SD: 3.70074e-017, Relative SD: 3.70074e-015
Response type: Internal Std (Ref 107), Area * (IS Conc. / IS Area)
Curve type: RF

1	200706P1-19	Standard	12.500	5.63	14039.590	14039.590	12.500	12.5	0.0	NO	NO	bb
2	200706P1-20	Standard	12.500	5.63	15869.678	15869.678	12.500	12.5	0.0	NO	NO	bb
3	200706P1-21	Standard	12.500	5.63	14615.809	14615.809	12.500	12.5	0.0	NO	NO	bb
4	200706P1-22	Standard	12.500	5.63	14751.563	14751.563	12.500	12.5	0.0	NO	NO	bb
5	200706P1-23	Standard	12.500	5.63	15184.211	15184.211	12.500	12.5	0.0	NO	NO	bb
6	200706P1-24	Standard	12.500	5.63	14215.874	14215.874	12.500	12.5	0.0	NO	NO	bb
7	200706P1-25	Standard	12.500	5.63	15481.095	15481.095	12.500	12.5	0.0	NO	NO	bb
8	200706P1-26	Standard	12.500	5.63	15001.885	15001.885	12.500	12.5	0.0	NO	NO	bb
9	200706P1-27	Standard	12.500	5.63	14984.139	14984.139	12.500	12.5	0.0	NO	NO	bb
10	200706P1-28	Standard	12.500	5.63	12829.642	12829.642	12.500	12.5	0.0	NO	NO	bb

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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

1	PFBA	47	0.9994	NO
2	PFPrS	51	0.9997	NO
3	3:3 FTCA	49	0.9991	NO
4	PFPeA	49	0.9999	NO
5	PFBS	51	0.9998	NO
6	4:2 FTS	55	0.9996	NO
7	PFHxA	57	0.9995	NO
8	PFPeS	51	0.9996	NO
9	HFPO-DA	53	0.9998	NO
10	5:3 FTCA	59	0.9993	NO
11	PFHpA	59	0.9999	NO
12	ADONA	59	0.9999	NO
13	L-PFHxS	61	0.9990	NO
15	6:2 FTS	63	0.9977	NO
16	L-PFOA	69	0.9992	NO
18	PFecHS	69	0.9996	NO
19	PFHpS	71	0.9999	NO
20	7:3 FTCA	65	0.9994	NO
21	PFNA	65	0.9998	NO
22	PFOSA	67	0.9999	NO
23	L-PFOS	71	0.9997	NO
25	9Cl-PF30NS	71	0.9998	NO
26	PFDA	73	0.9999	NO
27	8:2 FTS	75	0.9989	NO
28	PFNS	71	0.9994	NO
29	L-MeFOSAA	77	0.9998	NO

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Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

31	L-EtFOSAA	81	0.9999	NO	
33	PFUdA	79	0.9996	NO	
34	PFDS	71	0.9999	NO	
35	11Cl-PF30UdS	83	0.9983	NO	
36	10:2 FTS	85	0.9970	NO	
37	PFDoA	83	0.9998	NO	
38	N-MeFOSA	87	0.9999	NO	
39	PFTrDA	83	0.9999	NO	
40	PFDoS	89	0.9996	NO	
41	PFTeDA	89	0.9988	NO	
42	N-EtFOSA	91	0.9997	NO	
43	PFHxDA	93	0.9998	NO	
44	PFODA	93	0.9999	NO	
45	N-MeFOSE	95	0.9995	NO	
46	N-EtFOSE	97	0.9983	NO	
47	13C3-PFBA-EIS			NO	0.000
48	13C3-PFBA-RSD	99		NO	3.902
49	13C3-PFPeA-EIS			NO	0.000
50	13C3-PFPeA-RSD	101		NO	3.397
51	13C3-PFBS-EIS			NO	0.000
52	13C3-PFBS-RSD	102		NO	4.905
53	13C3-HFPO-DA-EIS			NO	0.000
54	13C3-HFPO-DA-RSD	101		NO	4.912
55	13C2-4:2 FTS-EIS			NO	0.000
56	13C2-4:2 FTS-RSD	102		NO	5.397
57	13C2-PFHxA-EIS			NO	0.000
58	13C2-PFHxA-RSD	101		NO	3.053
59	13C4-PFHpA-EIS			NO	0.000
60	13C4-PFHpA-RSD	101		NO	4.592
61	13C3-PFHxS-EIS			NO	0.000
62	13C3-PFHxS-RSD	102		NO	3.357
63	13C2-6:2 FTS-EIS			NO	0.000

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Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

64	13C2-6:2 FTS-RSD	105	NO	6.233
65	13C5-PFNA-EIS		NO	0.000
66	13C5-PFNA-RSD	104	NO	3.466
67	13C8-PFOSA-EIS		NO	0.000
68	13C8-PFOSA-RSD	107	NO	5.372
69	13C2-PFOA-EIS		NO	0.000
70	13C2-PFOA-RSD	103	NO	3.052
71	13C8-PFOS-EIS		NO	0.000
72	13C8-PFOS-RSD	105	NO	5.289
73	13C2-PFDA-EIS		NO	0.000
74	13C2-PFDA-RSD	106	NO	5.205
75	13C2-8:2 FTS-EIS		NO	0.000
76	13C2-8:2 FTS-RSD	105	NO	9.055
77	d3-N-MeFOSAA-EIS		NO	0.000
78	d3-N-MeFOSAA-RSD	107	NO	5.938
79	13C2-PFUdA-EIS		NO	0.000
80	13C2-PFUdA-RSD	107	NO	4.318
81	d5-N-EtFOSAA-EIS		NO	0.000
82	d5-N-EtFOSAA-RSD	107	NO	3.143
83	13C2-PFDoA-EIS		NO	0.000
84	13C2-PFDoA-RSD	106	NO	5.615
85	13C2-10:2 FTS-EIS		NO	0.000
86	13C2-10:2 FTS-RSD	105	NO	9.960
87	d3-N-MeFOSA-EIS		NO	0.000
88	d3-N-MeFOSA-RSD	107	NO	5.009
89	13C2-PFTeDA-EIS		NO	0.000
90	13C2-PFTeDA-RSD	107	NO	3.042
91	d5-N-ETFOSA-EIS		NO	0.000
92	d5-N-ETFOSA-RSD	107	NO	4.743
93	13C2-PFHxDA-EIS		NO	0.000
94	13C2-PFHxDA-RSD	107	NO	3.531
95	d7-N-MeFOSE-EIS		NO	0.000
96	d7-N-MeFOSE-RSD	107	NO	4.602
97	d9-N-EtFOSE-EIS		NO	0.000
98	d9-N-EtFOSE-RSD	107	NO	6.940
99	13C4-PFBA	99	NO	0.000

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
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Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

1...	13C2-FOUEA-EIS		NO	0.000
1...	13C5-PFHxA	101	NO	0.000
1...	18O2-PFHxS	102	NO	0.000
1...	13C8-PFOA	103	NO	0.000
1...	13C9-PFNA	104	NO	0.000
1...	13C4-PFOS	105	NO	0.000
1...	13C6-PFDA	106	NO	0.000
1...	13C7-PFUdA	107	NO	0.000

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:14:38 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:15:00 Pacific Daylight Time

Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 09:14:35
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

1	PFBA	1.62	1.62			
2	PFPrS	1.81	1.97	2.684	2.684	NO
3	3:3 FTCA	2.43	2.44	3.536	3.536	NO
4	PFPeA	2.59	2.59			
5	PFBS	2.87	2.87	2.400	2.400	NO
6	4:2 FTS	3.31	3.31	11.507	11.507	NO
7	PFHxA	3.39	3.39	16.343	16.343	NO
8	PFPeS	3.80	3.57	1.941	1.941	NO
9	HFPO-DA	3.59	3.59	2.253	2.253	NO
10	5:3 FTCA	3.94	3.92	1.715	1.715	NO
11	PFHpA	3.98	3.98	53.515	53.515	NO
12	ADONA	4.08	4.10	3.855	3.855	NO
13	L-PFHxS	4.13	4.13	4.017	4.017	NO
15	6:2 FTS	4.45	4.45	0.844	0.844	NO
16	L-PFOA	4.51	4.51	3.193	3.193	NO
18	PFecHS	4.52	4.52	0.538	0.538	NO
19	PFHpS	4.56	4.61	1.736	1.736	NO
20	7:3 FTCA	4.85	4.93	1.270	1.270	NO
21	PFNA	4.94	4.94	14.123	14.123	NO
22	PFOSA	4.98	4.99	20.977	20.977	NO
23	L-PFOS	5.02	5.02	2.598	2.598	NO
25	9Cl-PF30NS	5.24	5.23	38.597	38.597	NO
26	PFDA	5.31	5.31	5.220	5.220	NO
27	8:2 FTS	5.29	5.29	0.833	0.833	NO
28	PFNS	5.39	5.37	2.459	2.459	NO
29	L-MeFOSAA	5.45	5.46	1.779	1.779	NO

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:14:38 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:15:18 Pacific Daylight Time

Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 09:14:35
Callbration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

31	L-EtFOSAA	5.61	5.61	1.390	1.390	NO
33	PFUdA	5.63	5.63	20.067	20.067	NO
34	PFDS	5.78	5.67	2.265	2.265	NO
35	11Cl-PF30UdS	5.83	5.83	17.809	17.809	NO
36	10:2 FTS	5.89	5.89	1.054	1.054	NO
37	PFDoA	5.90	5.90	12.755	12.755	NO
38	N-MeFOSA	5.83	5.82	1.955	1.955	NO
39	PFTrDA	6.16	6.14	116.572	116.572	NO
40	PFDoS	6.13	6.16	2.251	2.251	NO
41	PFTeDA	6.33	6.34	14.405	14.405	NO
42	N-EtFOSA	6.19	6.19	1.875	1.875	NO
43	PFHxDA	6.63	6.63	32.756	32.756	NO
44	PFODA	6.85	6.84			
45	N-MeFOSE	6.33	6.34			
46	N-EtFOSE	6.48	6.49			

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 09:16:38 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:16:52 Pacific Daylight Time

Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: PFBA

1	200706P1-19	ST200706P1-1 PFC CS-2 20F1901	06-Jul-20	13:13:57
2	200706P1-20	ST200706P1-2 PFC CS-1 20F1902	06-Jul-20	13:24:27
3	200706P1-21	ST200706P1-3 PFC CS0 20F1903	06-Jul-20	13:34:57
4	200706P1-22	ST200706P1-4 PFC CS1 20F1904	06-Jul-20	13:45:26
5	200706P1-23	ST200706P1-5 PFC CS2 20F1905	06-Jul-20	13:55:58
6	200706P1-24	ST200706P1-6 PFC CS3 20F1906	06-Jul-20	14:06:27
7	200706P1-25	ST200706P1-7 PFC CS4 20F1907	06-Jul-20	14:16:59
8	200706P1-26	ST200706P1-8 PFC CS5 20F1908	06-Jul-20	14:27:27
9	200706P1-27	ST200706P1-9 PFC CS6 20F1909	06-Jul-20	14:37:59
10	200706P1-28	ST200706P1-10 PFC CS7 20F1910	06-Jul-20	14:48:28
11	200706P1-29	IB	06-Jul-20	14:58:58
12	200706P1-30	ICV200706P1-1 PFC ICV 20F1911	06-Jul-20	15:09:30
13	200706P1-31	IB	06-Jul-20	15:19:59

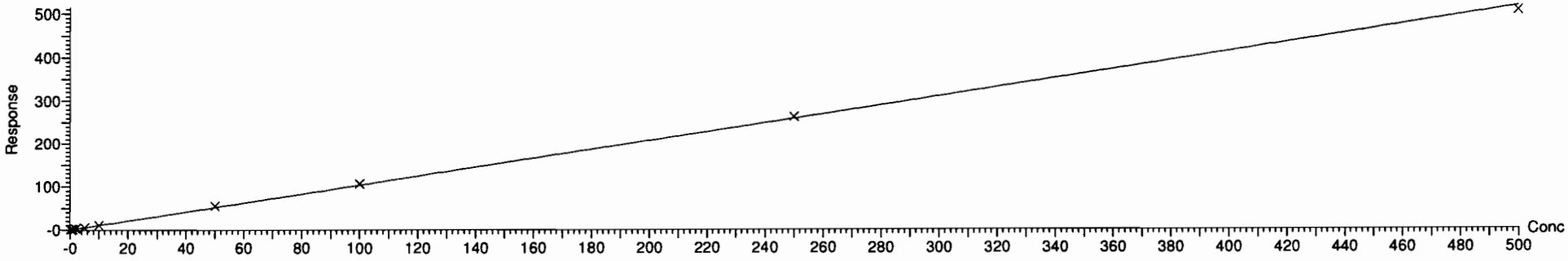
Vista Analytical Laboratory Q1

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

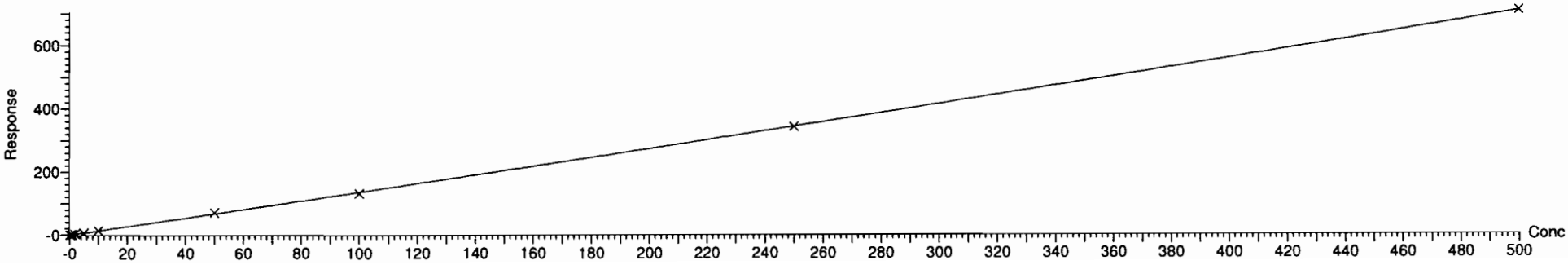
Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:21 Pacific Daylight Time

Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: PFBA
Correlation coefficient: r = 0.999694, r^2 = 0.999388
Calibration curve: 1.03125 * x + 0.0440308
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: PFPrS
Coefficient of Determination: R^2 = 0.999729
Calibration curve: 0.000149868 * x^2 + 1.33446 * x + -0.0189522
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
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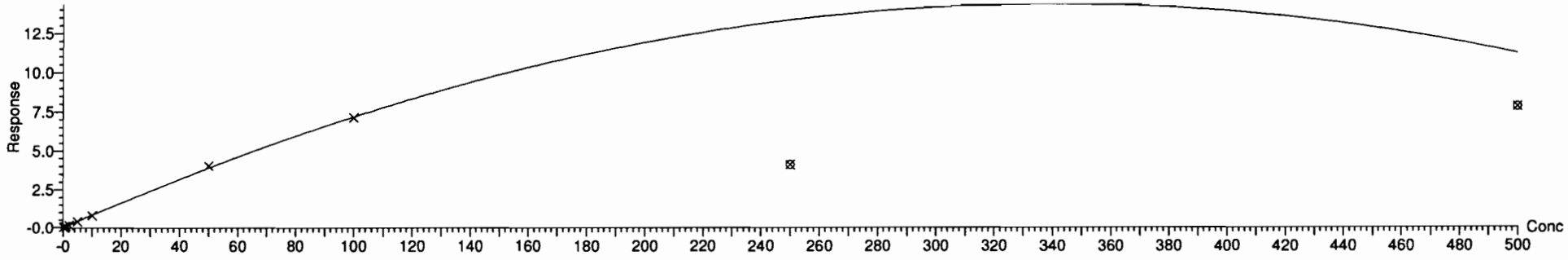
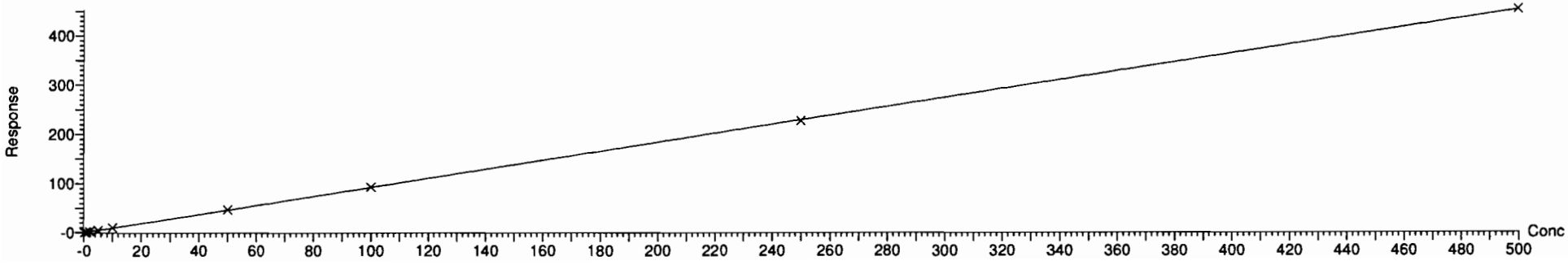
Compound name: 3:3 FTCA
Coefficient of Determination: R^2 = 0.999100
Calibration curve: -0.000123651 * x^2 + 0.0842724 * x + -0.00450239
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: PFPeA
Coefficient of Determination: R^2 = 0.999942
Calibration curve: -4.09095e-005 * x^2 + 0.926116 * x + 0.00438806
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
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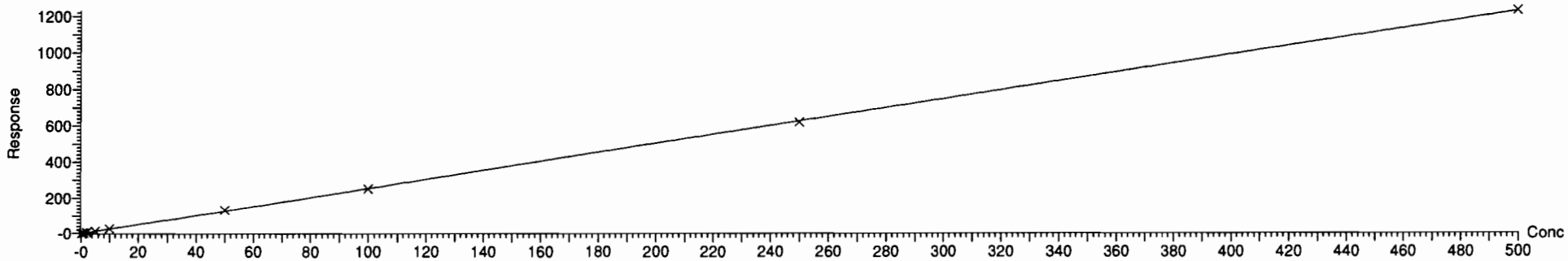
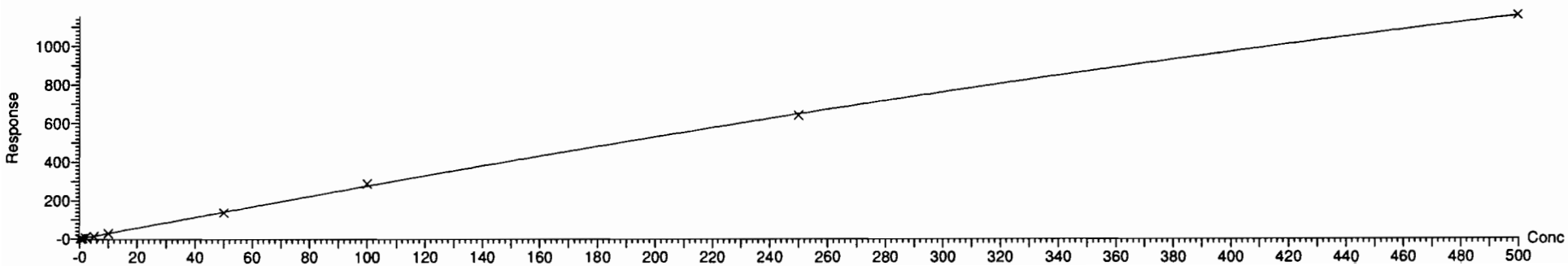
Compound name: PFBS
Coefficient of Determination: R^2 = 0.999832
Calibration curve: -0.000209368 * x^2 + 2.56013 * x + 0.0091719
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.999612
Calibration curve: -0.00110944 * x^2 + 2.87043 * x + -0.114307
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



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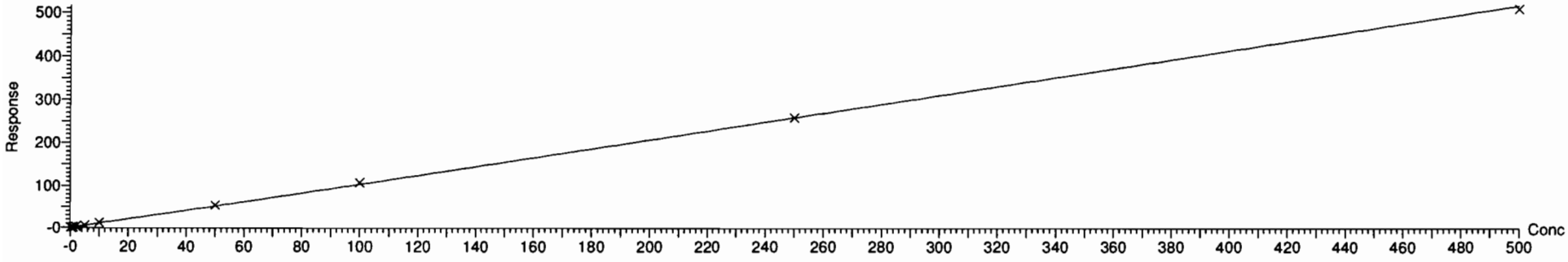
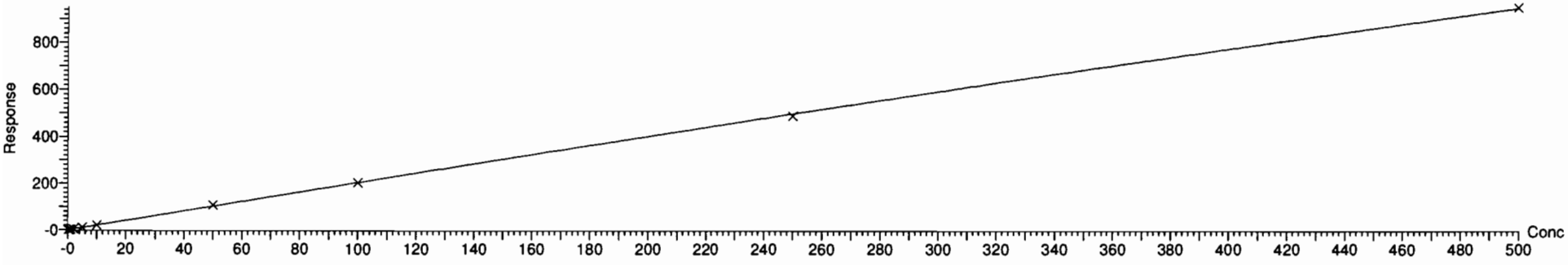
Compound name: PFHxA
Correlation coefficient: r = 0.999727, r^2 = 0.999454
Calibration curve: 1.03548 * x + 0.0754497
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: PFPeS
Coefficient of Determination: R^2 = 0.999616
Calibration curve: -0.000388732 * x^2 + 2.09219 * x + -0.0212532
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



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Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
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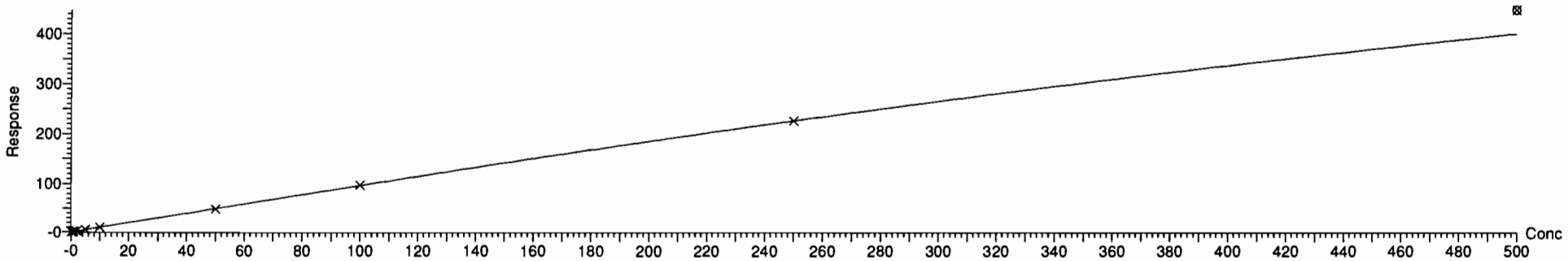
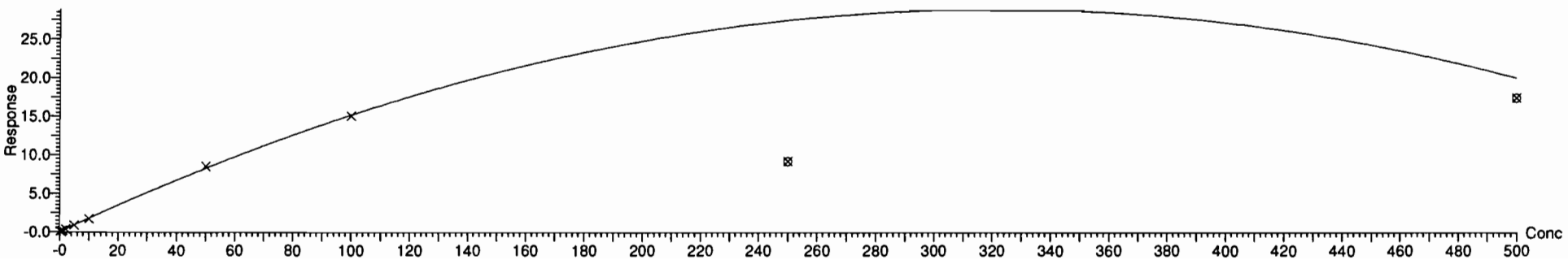
Compound name: HFPO-DA
Coefficient of Determination: R^2 = 0.999787
Calibration curve: -0.00042067 * x^2 + 1.01205 * x + -0.0211231
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: 5:3 FTCA
Coefficient of Determination: R^2 = 0.999294
Calibration curve: -0.000279748 * x^2 + 0.179933 * x + -0.0070197
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



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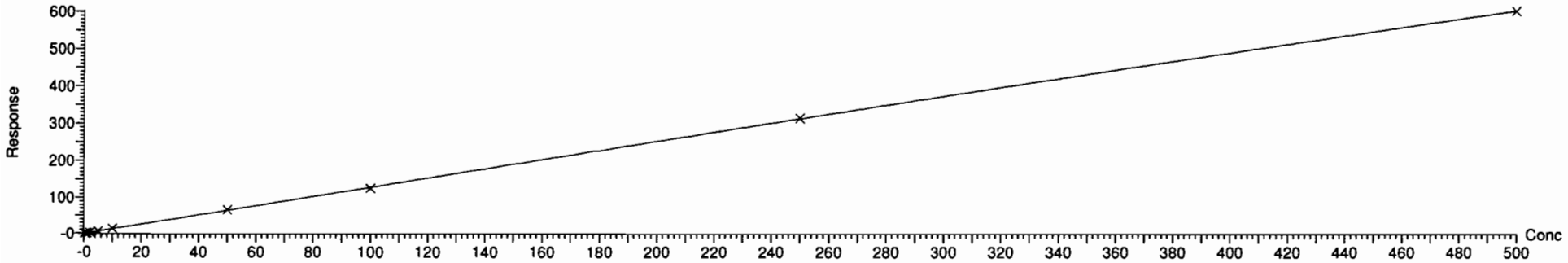
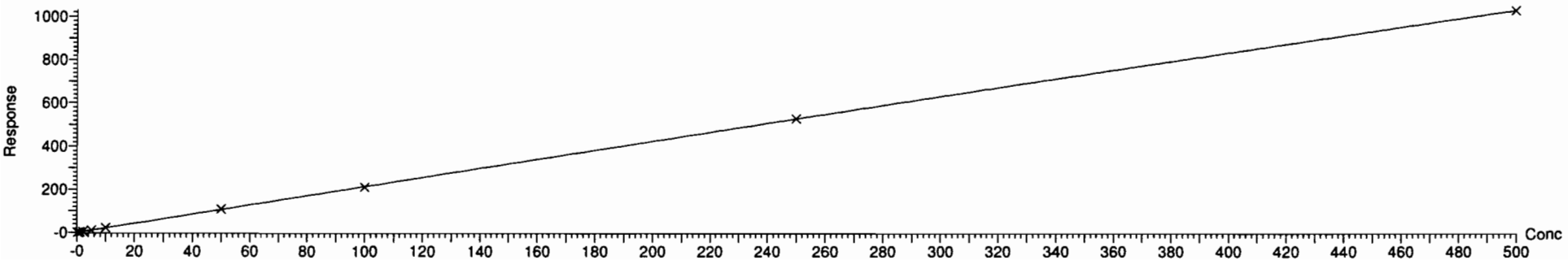
Compound name: PFHpA
Coefficient of Determination: R^2 = 0.999869
Calibration curve: -0.000182594 * x^2 + 1.3002 * x + 0.0362384
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: ADONA
Coefficient of Determination: R^2 = 0.999933
Calibration curve: -0.000211186 * x^2 + 2.1692 * x + 0.077206
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



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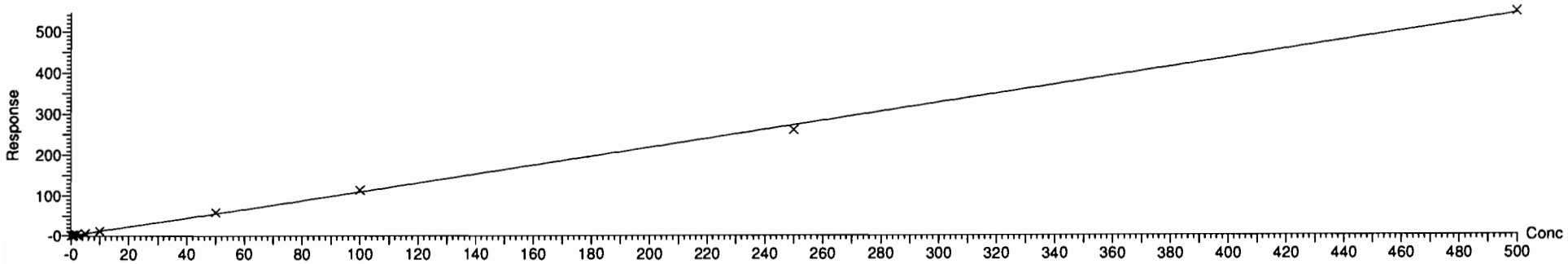
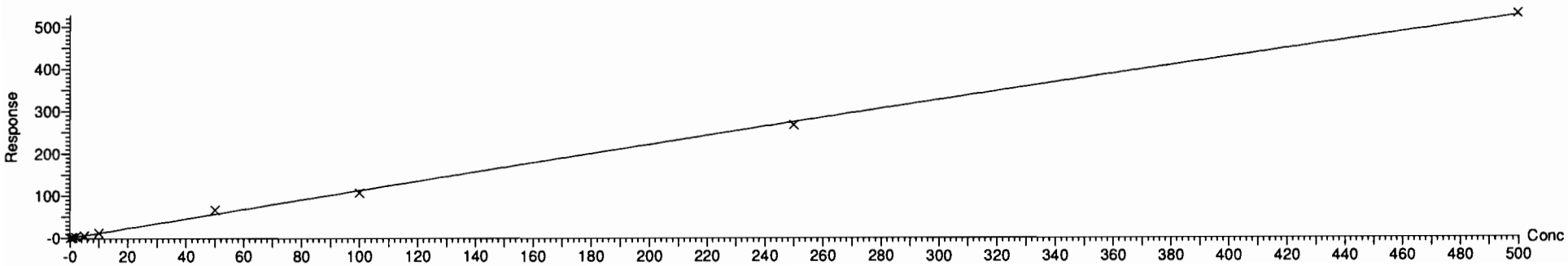
Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.998975
Calibration curve: -1.6968e-005 * x^2 + 1.09268 * x + 0.0771315
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.997712
Calibration curve: -0.000191359 * x^2 + 1.14566 * x + 0.00198468
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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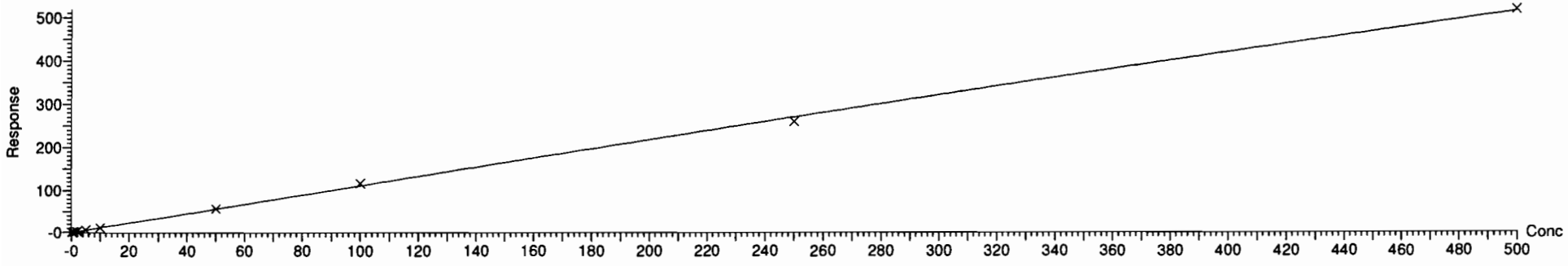
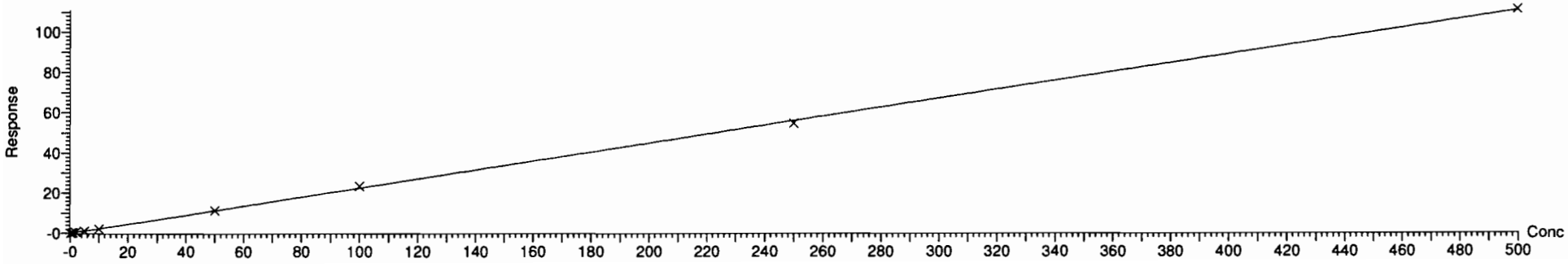
Compound name: L-PFOA
Coefficient of Determination: R^2 = 0.999173
Calibration curve: -0.000202972 * x^2 + 1.13013 * x + 0.0543225
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: PFecHS
Coefficient of Determination: R^2 = 0.999583
Calibration curve: -1.03658e-005 * x^2 + 0.226457 * x + -0.0088356
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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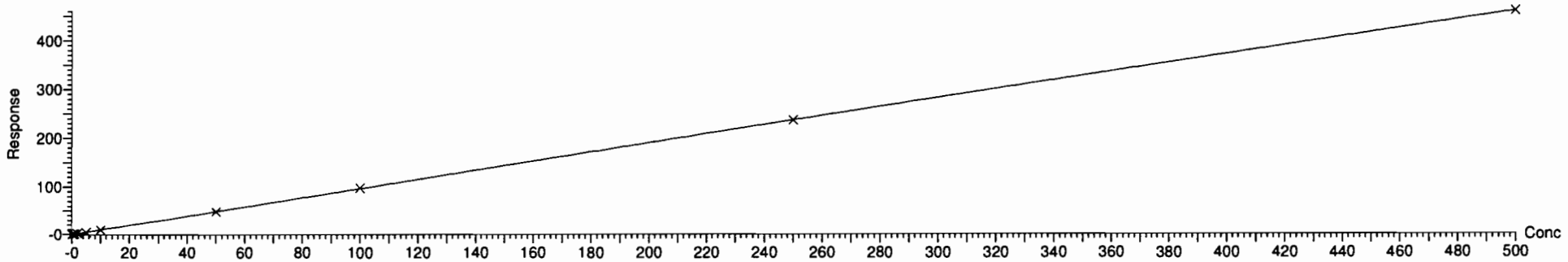
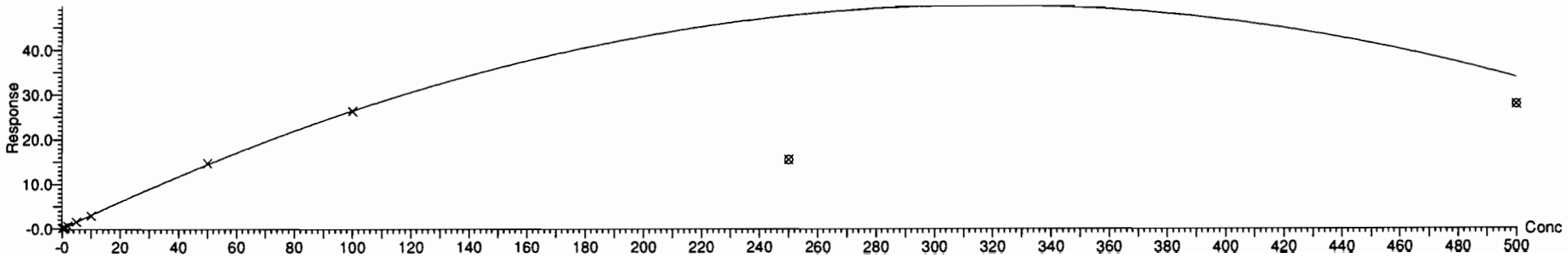
Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999887
Calibration curve: -0.000106932 * x^2 + 0.973986 * x + 0.00516936
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



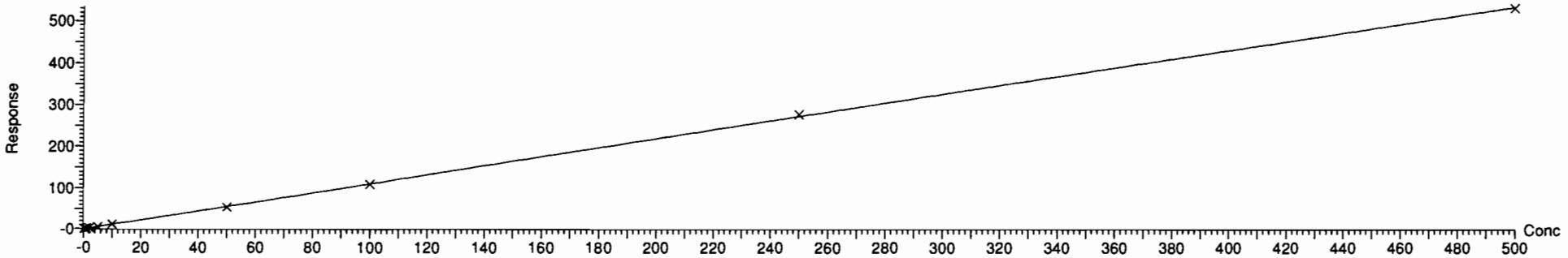
Compound name: 7:3 FTCA
Coefficient of Determination: R^2 = 0.999371
Calibration curve: -0.000492227 * x^2 + 0.313584 * x + 0.000408564
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



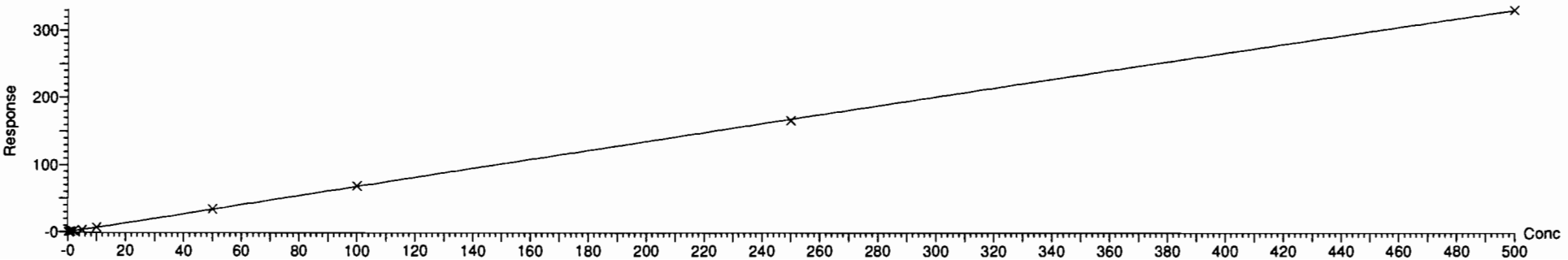
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:21 Pacific Daylight Time

Compound name: PFNA
Coefficient of Determination: R^2 = 0.999826
Calibration curve: -9.83022e-005 * x^2 + 1.11707 * x + 0.0195168
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



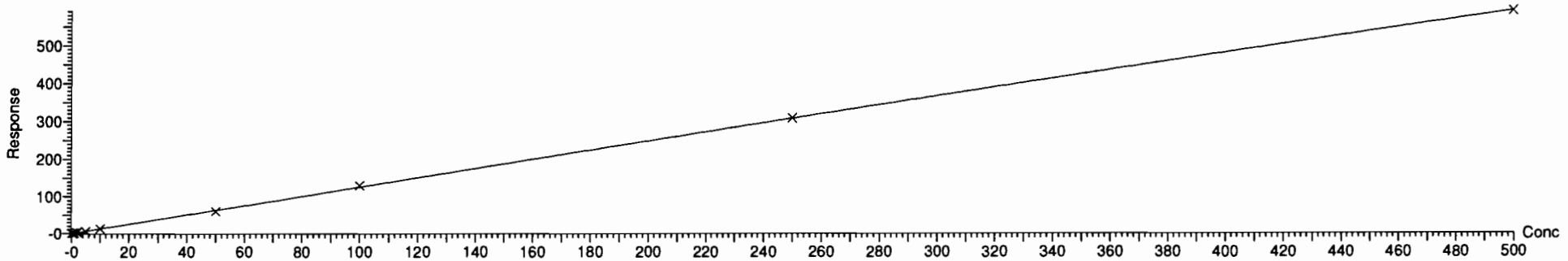
Compound name: PFOSA
Coefficient of Determination: R^2 = 0.999934
Calibration curve: -5.74782e-005 * x^2 + 0.690246 * x + 0.00511601
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



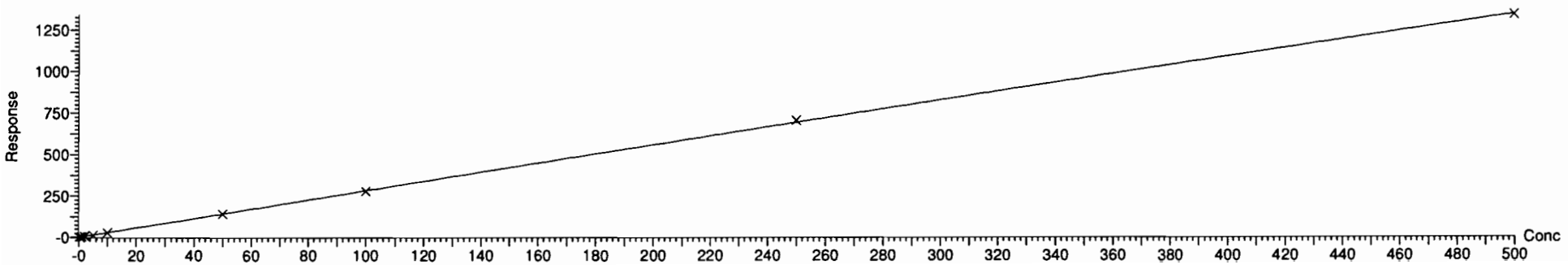
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:21 Pacific Daylight Time

Compound name: L-PFOS
Coefficient of Determination: R^2 = 0.999703
Calibration curve: -0.000187013 * x^2 + 1.27905 * x + -0.0944633
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



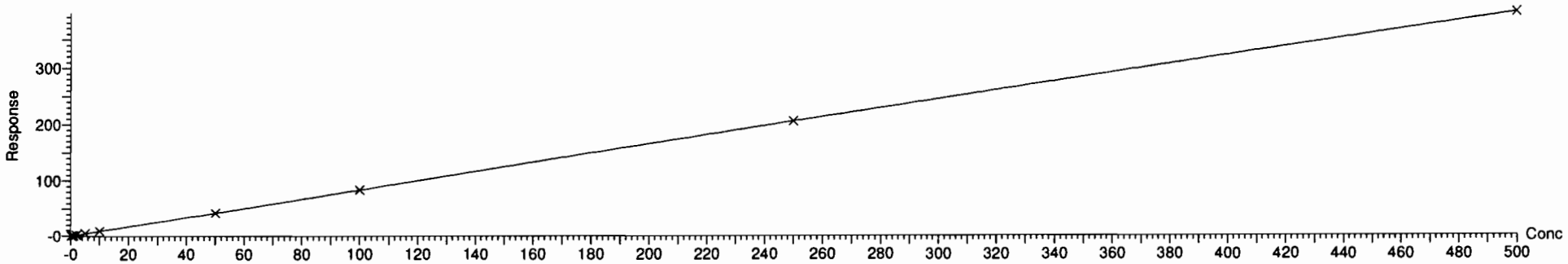
Compound name: 9Cl-PF30NS
Coefficient of Determination: R^2 = 0.999799
Calibration curve: -0.000316616 * x^2 + 2.84896 * x + 0.0165096
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



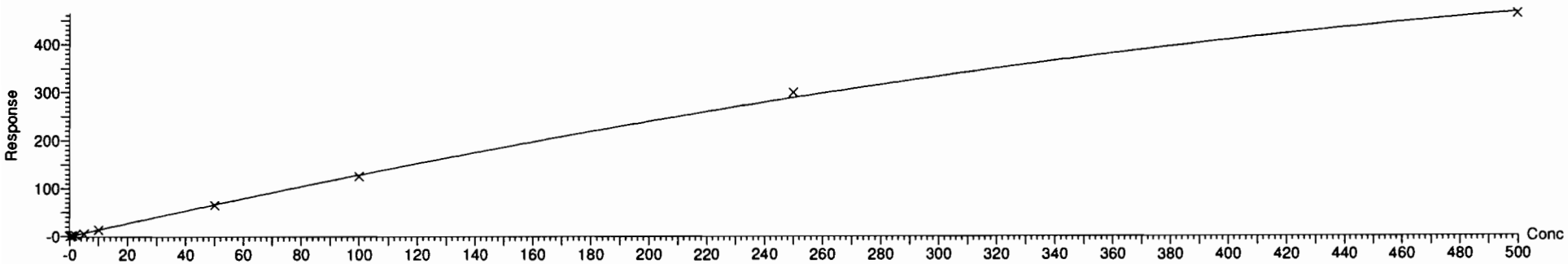
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:21 Pacific Daylight Time

Compound name: PFDA
Coefficient of Determination: R^2 = 0.999933
Calibration curve: -0.000101556 * x^2 + 0.846184 * x + 0.0441258
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



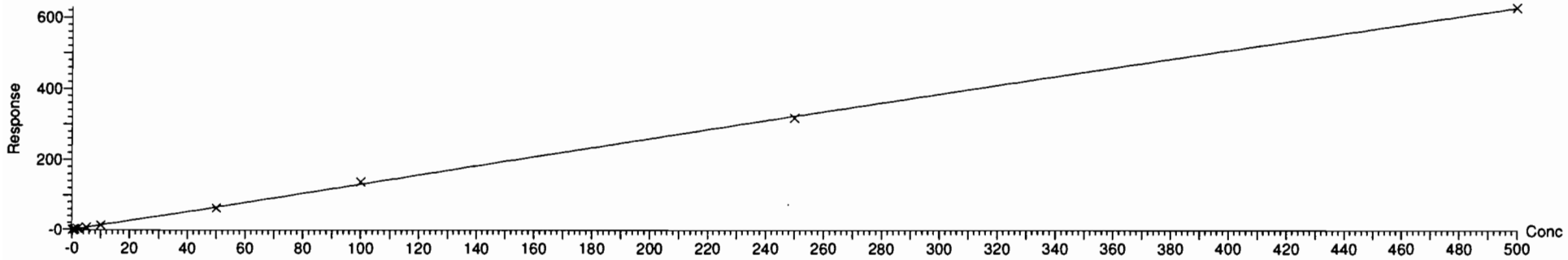
Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.998921
Calibration curve: -0.000876709 * x^2 + 1.37036 * x + -0.084038
Response type: Internal Std (Ref 75), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



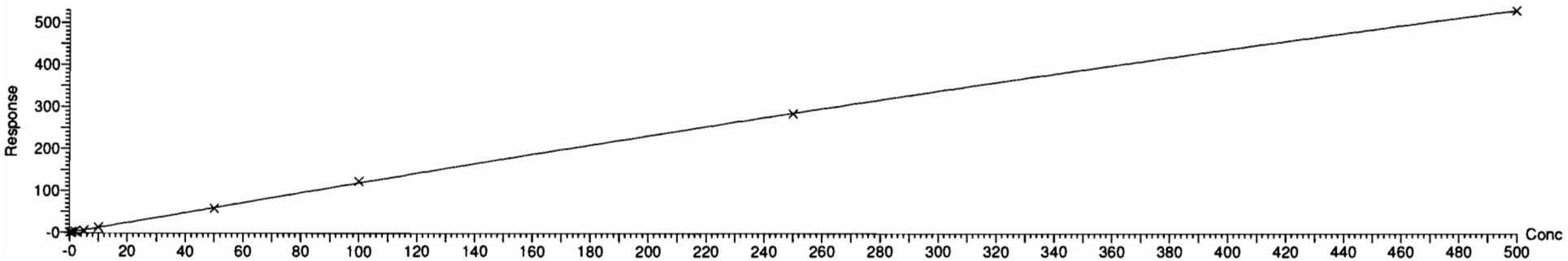
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:21 Pacific Daylight Time

Compound name: PFNS
Coefficient of Determination: R^2 = 0.999393
Calibration curve: -0.000161375 * x^2 + 1.33537 * x + -0.0984438
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Compound name: L-MeFOSAA
Coefficient of Determination: R^2 = 0.999777
Calibration curve: -0.000326513 * x^2 + 1.22499 * x + -0.0565243
Response type: Internal Std (Ref 77), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

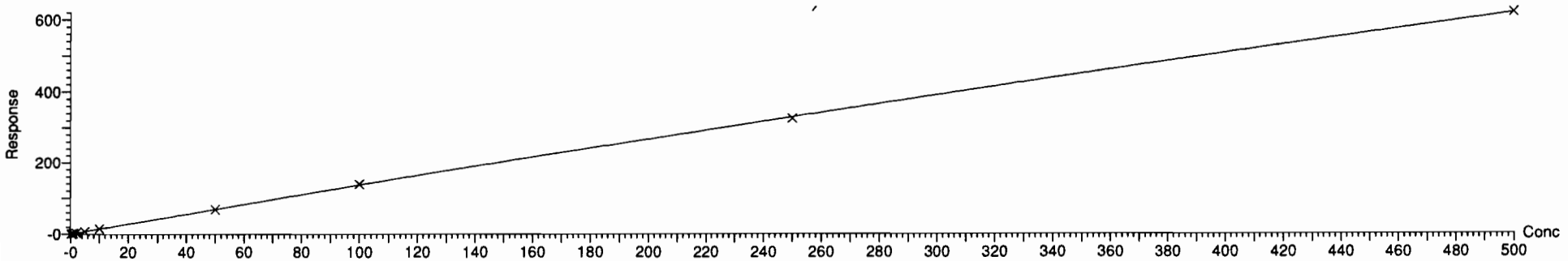


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

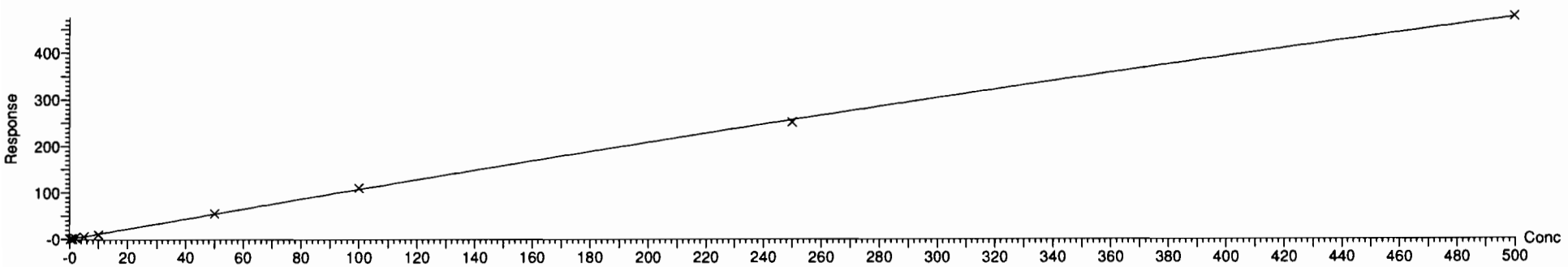
Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999878
Calibration curve: -0.000317928 * x^2 + 1.39659 * x + -0.0635925
Response type: Internal Std (Ref 81), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



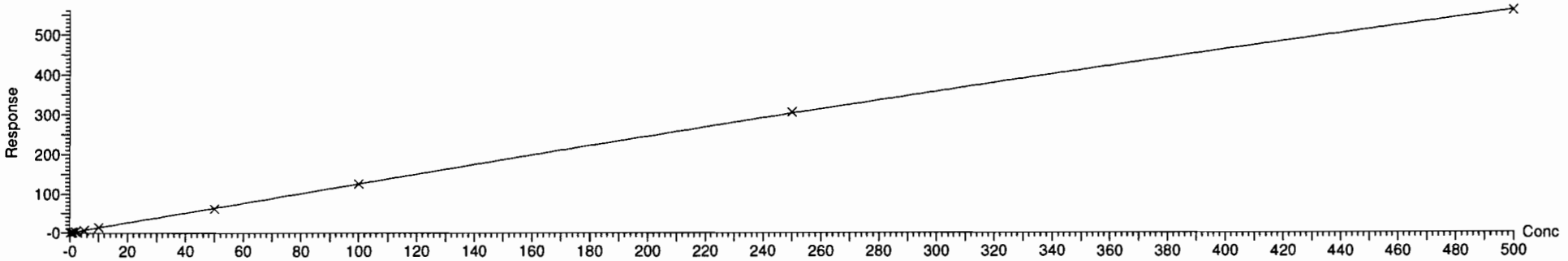
Compound name: PFUdA
Coefficient of Determination: R^2 = 0.999582
Calibration curve: -0.000302944 * x^2 + 1.10094 * x + 0.0188328
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



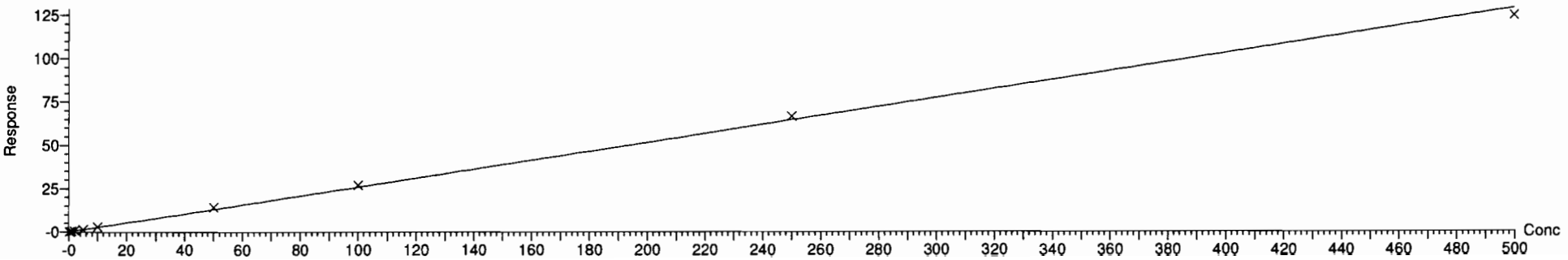
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: PFDS
Coefficient of Determination: R^2 = 0.999869
Calibration curve: -0.000337564 * x^2 + 1.29291 * x + -0.129711
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: 11Cl-PF30UdS
Correlation coefficient: r = 0.999153, r^2 = 0.998308
Calibration curve: 0.257476 * x + 0.00892294
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

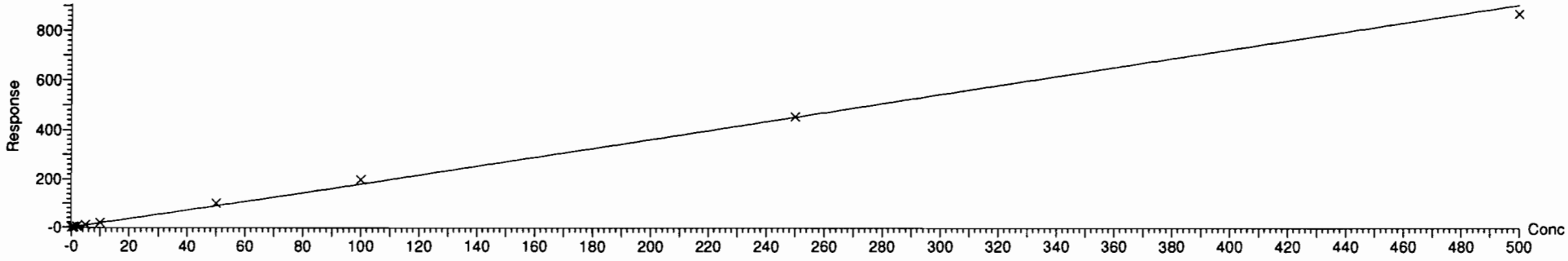


Vista Analytical Laboratory Q1

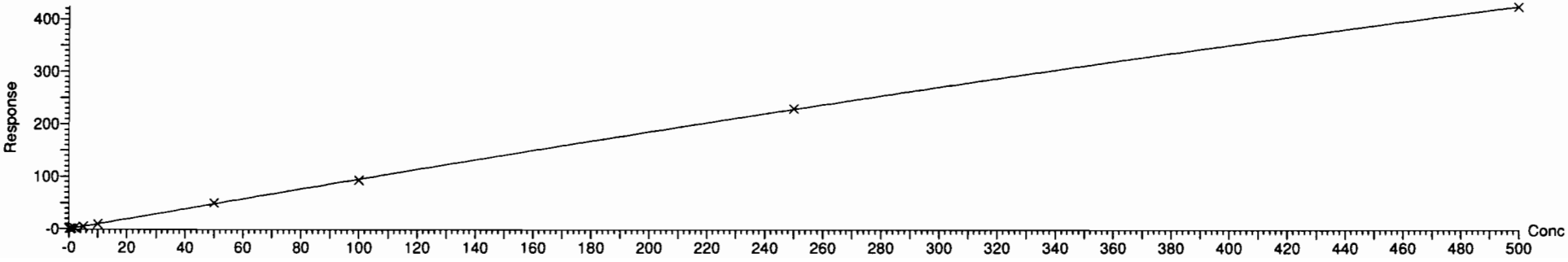
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: 10:2 FTS
Correlation coefficient: r = 0.998475, r^2 = 0.996952
Calibration curve: 1.81347 * x + 0.168501
Response type: Internal Std (Ref 85), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



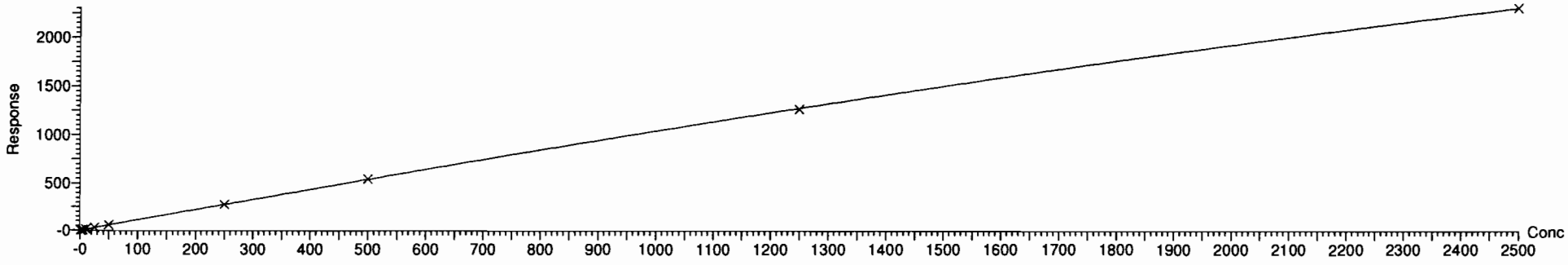
Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999844
Calibration curve: -0.000264449 * x^2 + 0.982944 * x + 0.00539633
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



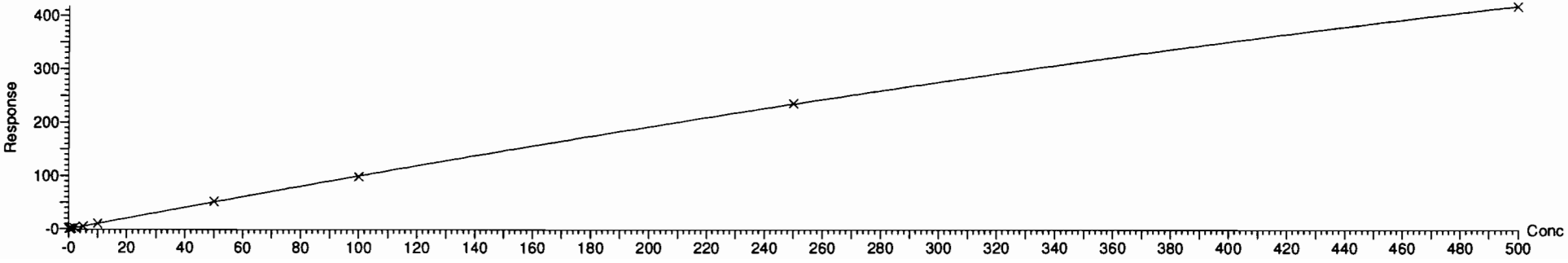
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999940
Calibration curve: -7.96999e-005 * x^2 + 1.12175 * x + 0.0605427
Response type: Internal Std (Ref 87), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



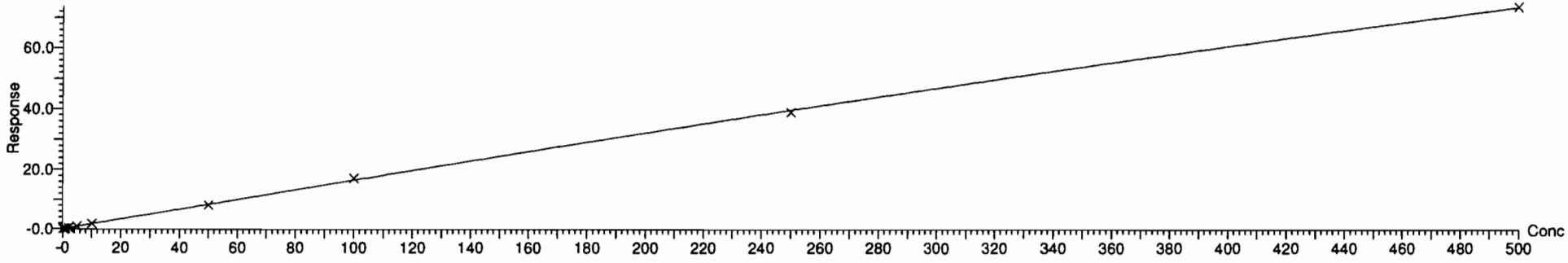
Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999936
Calibration curve: -0.000414303 * x^2 + 1.04415 * x + 0.00171537
Response type: Internal Std (Ref 83), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



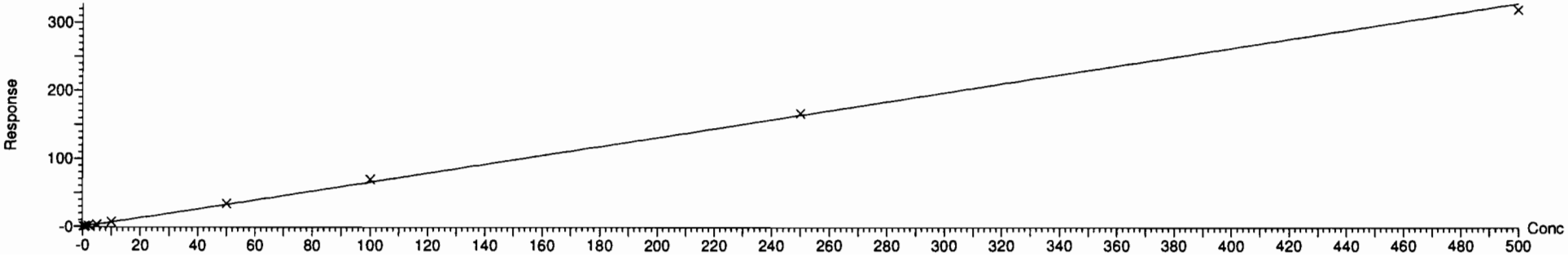
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: PFDoS
Coefficient of Determination: R^2 = 0.999610
Calibration curve: -4.68396e-005 * x^2 + 0.17052 * x + -0.00392295
Response type: Internal Std (Ref 89), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



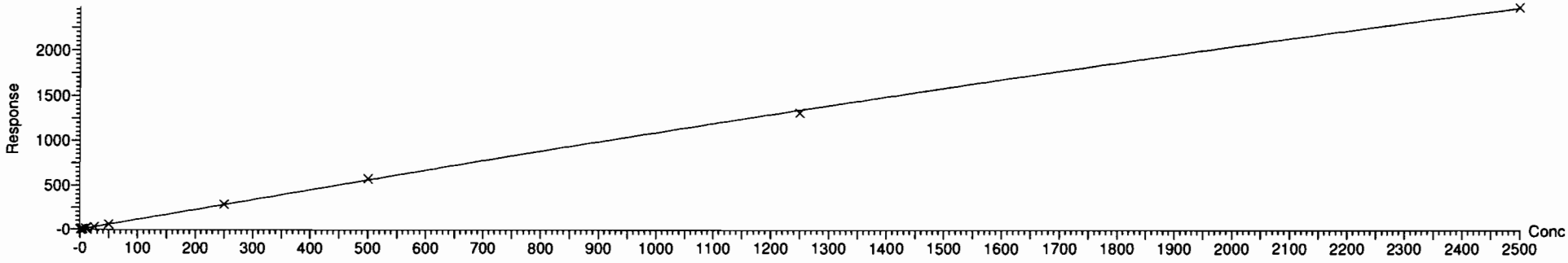
Compound name: PFTeDA
Correlation coefficient: r = 0.999411, r^2 = 0.998822
Calibration curve: 0.656798 * x + 0.0803604
Response type: Internal Std (Ref 89), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



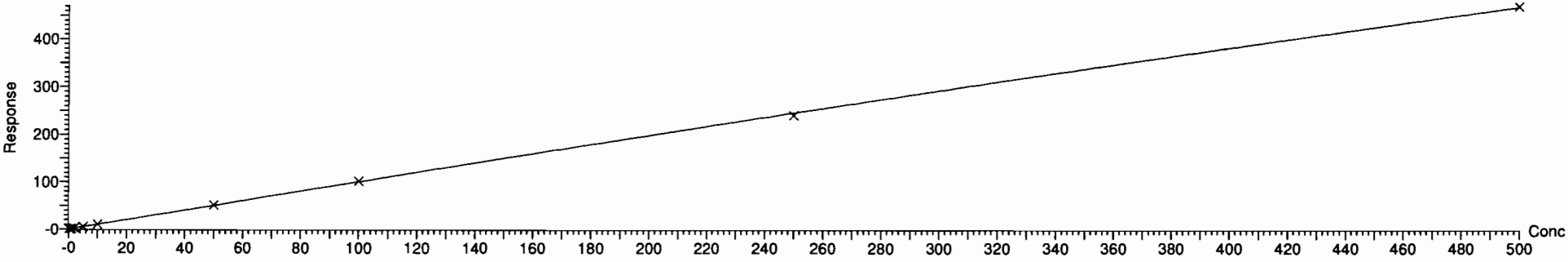
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999747
Calibration curve: -6.96201e-005 * x^2 + 1.16259 * x + -0.107454
Response type: Internal Std (Ref 91), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



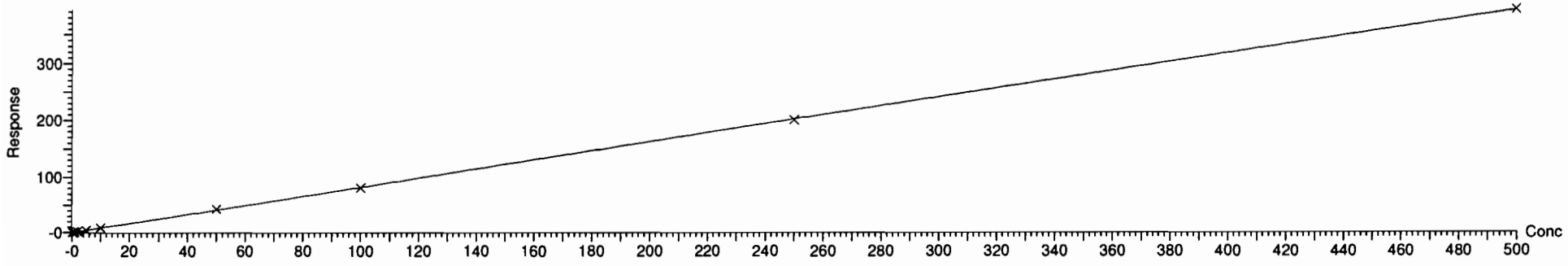
Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.999789
Calibration curve: -0.000190466 * x^2 + 1.03254 * x + 0.163583
Response type: Internal Std (Ref 93), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



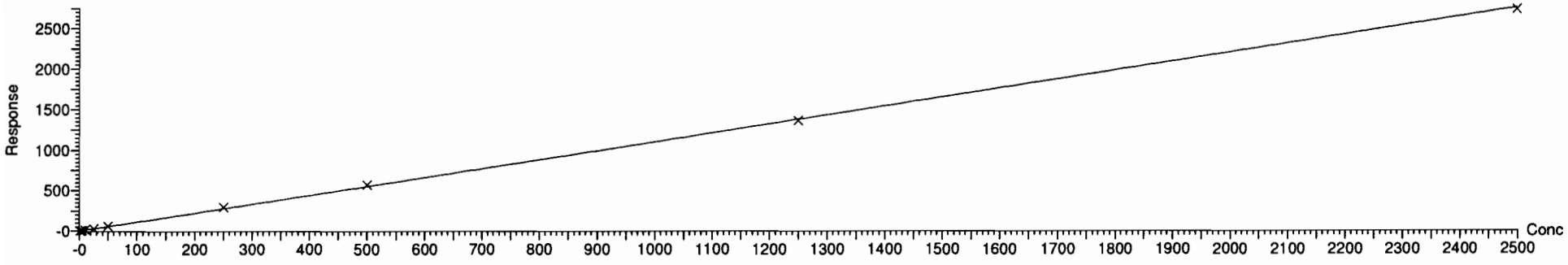
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: PFODA
Coefficient of Determination: R^2 = 0.999877
Calibration curve: -8.33174e-005 * x^2 + 0.828517 * x + 0.0120589
Response type: Internal Std (Ref 93), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



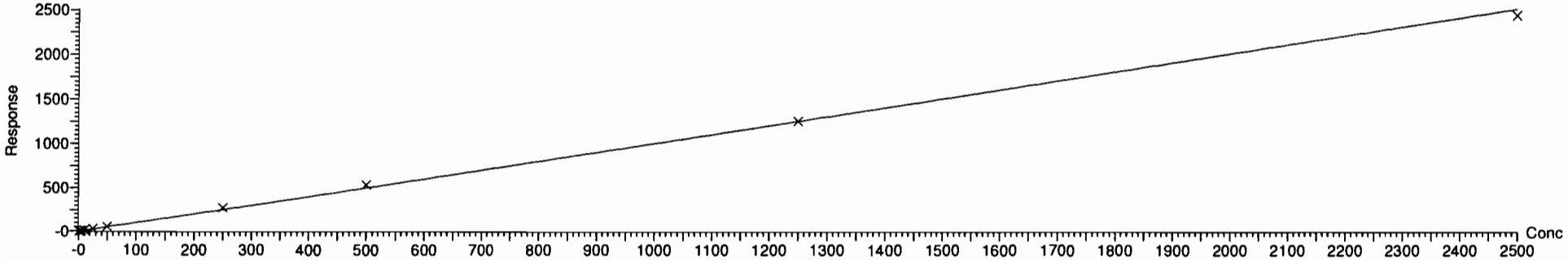
Compound name: N-MeFOSE
Correlation coefficient: r = 0.999753, r^2 = 0.999506
Calibration curve: 1.10054 * x + 0.364944
Response type: Internal Std (Ref 95), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:13:54 Pacific Daylight Time

Compound name: N-EtFOSE
Correlation coefficient: r = 0.999137, r^2 = 0.998274
Calibration curve: 1.00495 * x + 0.335204
Response type: Internal Std (Ref 97), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Vista Analytical Laboratory

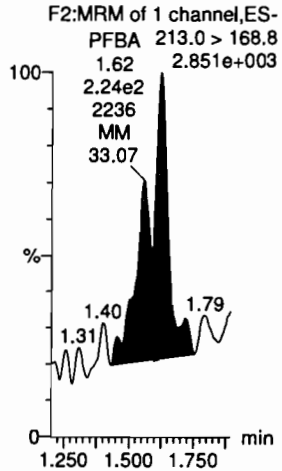
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

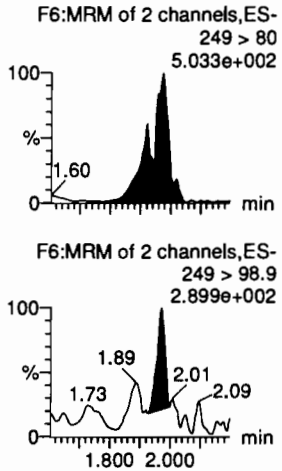
Method: D:\PFAS5.PRO\MethDB\NEW_PFAS_80C_070620.mdb 07 Jul 2020 08:33:50
Calibration: 07 Jul 2020 08:33:21

Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

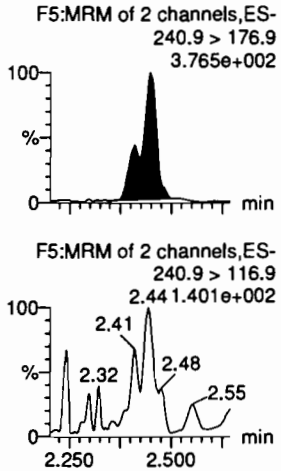
PFBA



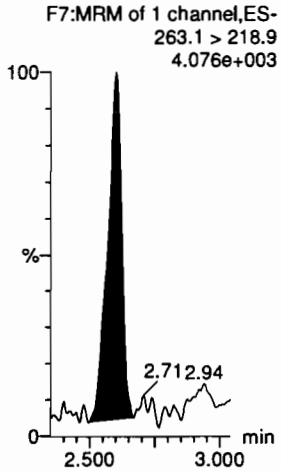
PFPrS



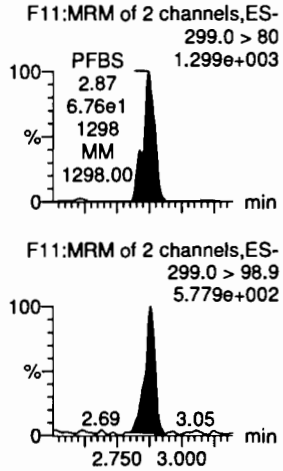
3:3 FTCA



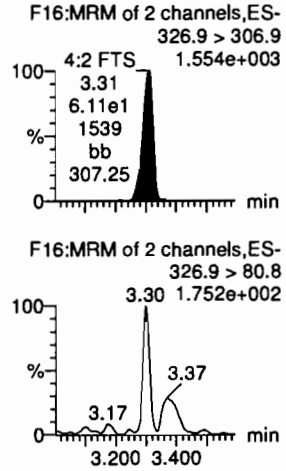
PFPeA



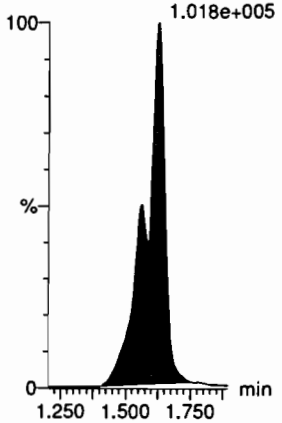
PFBS



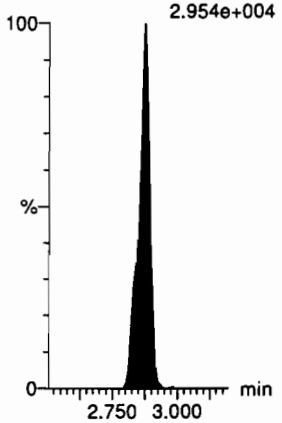
4:2 FTS



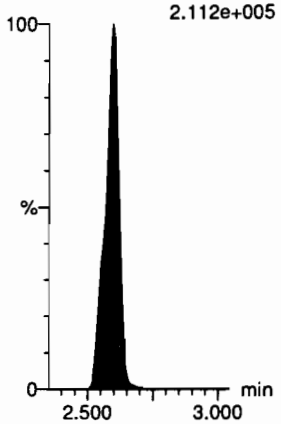
13C3-PFBA-EIS



13C3-PFBS-EIS



13C3-PFPeA-EIS



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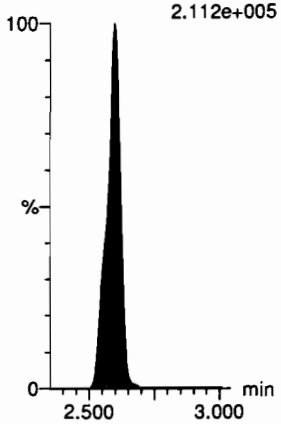

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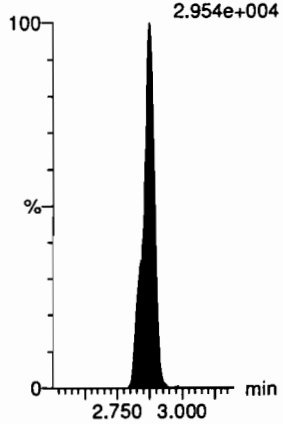

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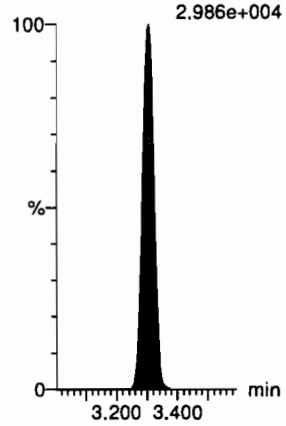

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Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

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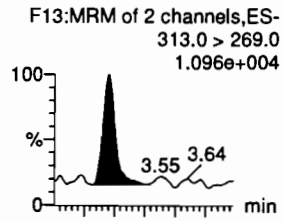

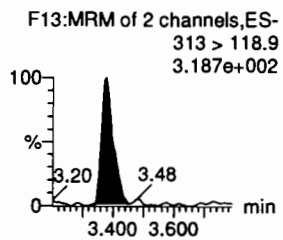

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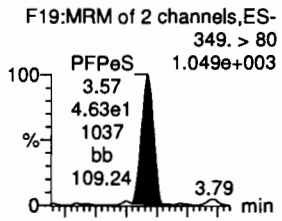

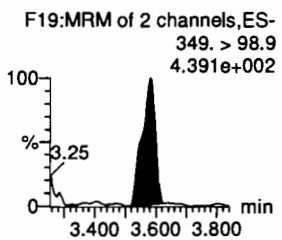

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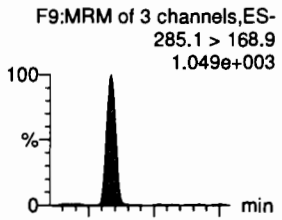

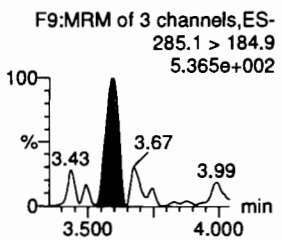

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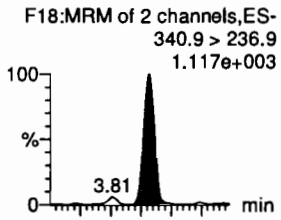

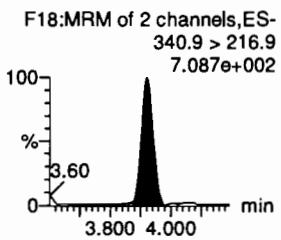

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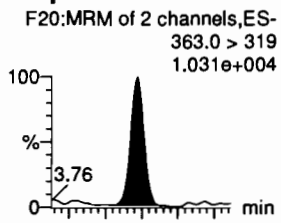

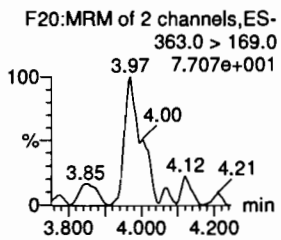

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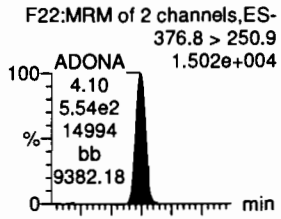

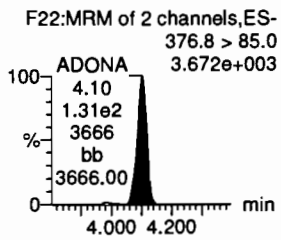

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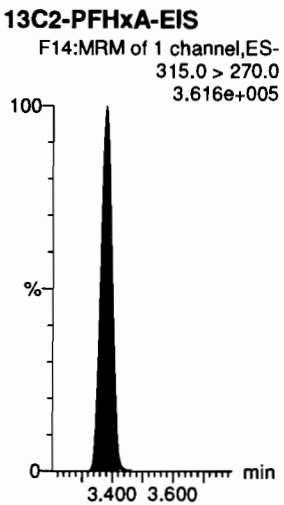

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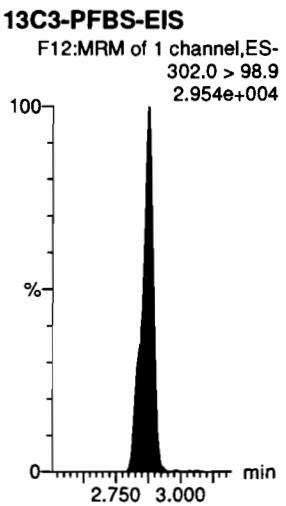

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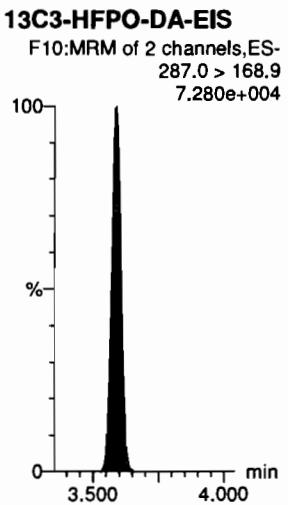

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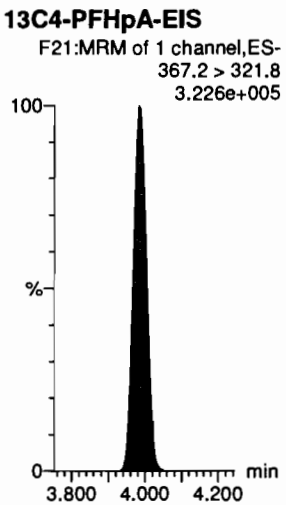

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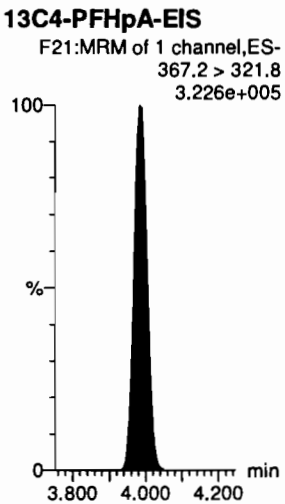

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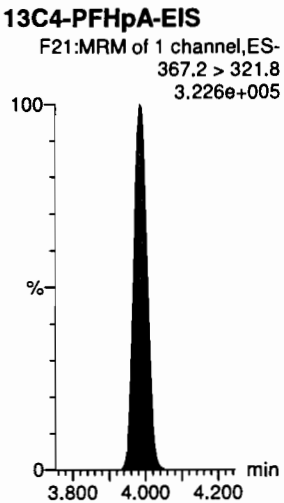

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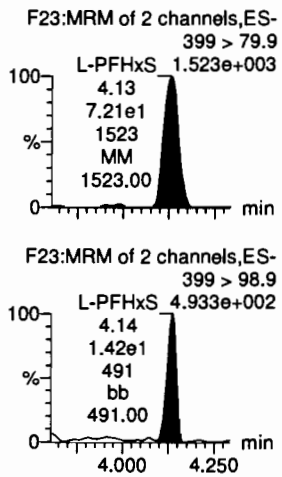
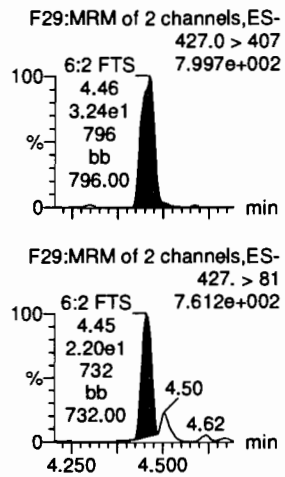
L-PFHxS



6:2 FTS



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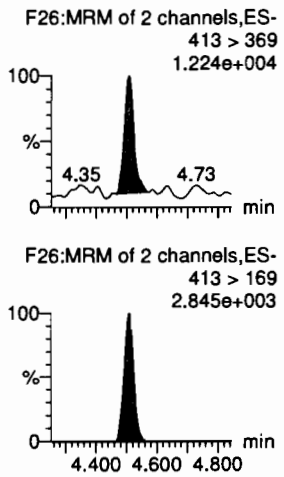

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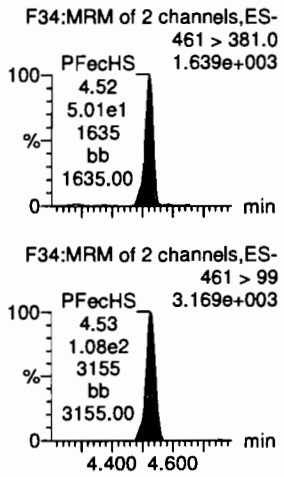

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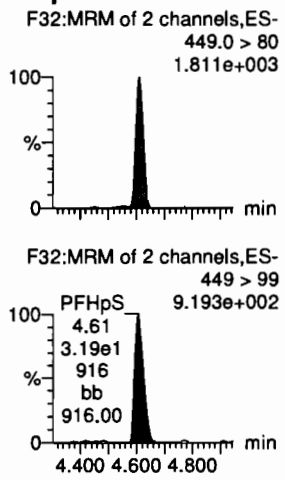
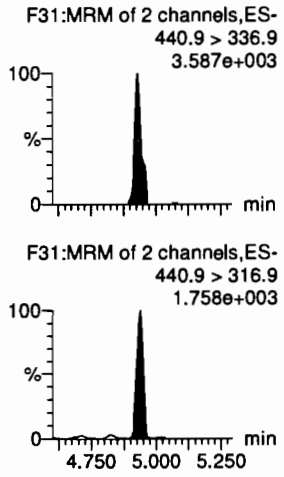


7:3 FTCA



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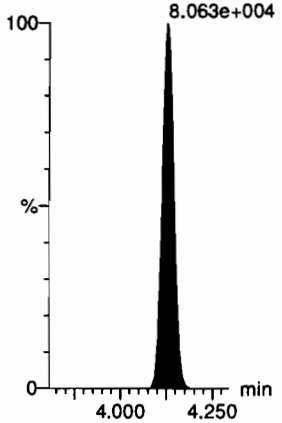

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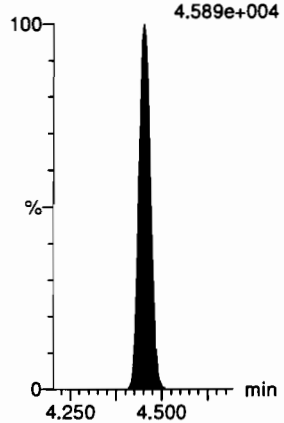

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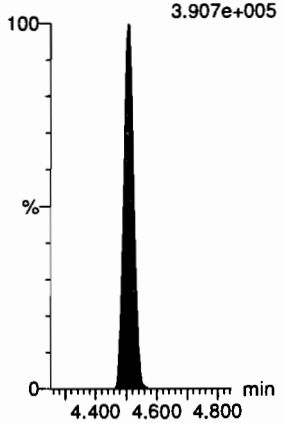

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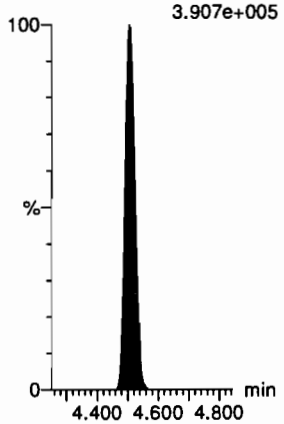

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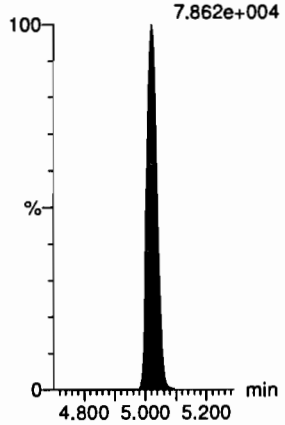
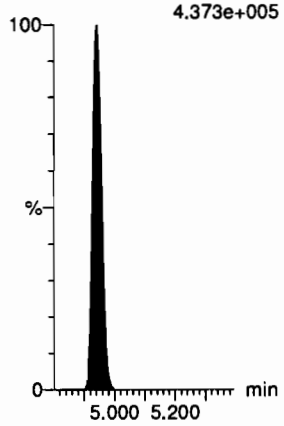


13C5-PFNA-EIS



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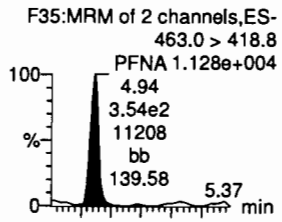

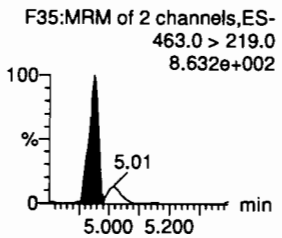

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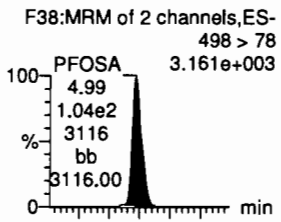
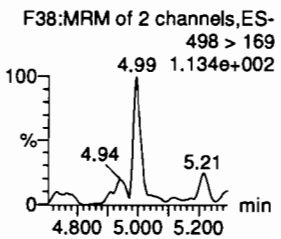
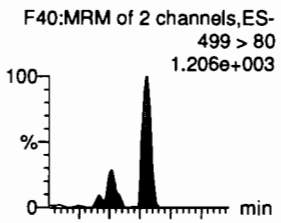
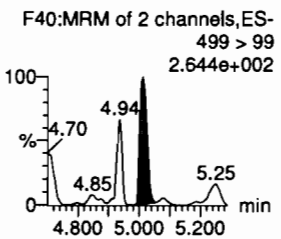




L-PFOS





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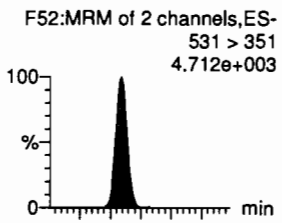

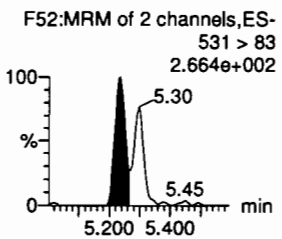

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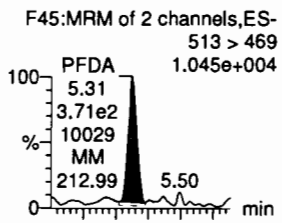
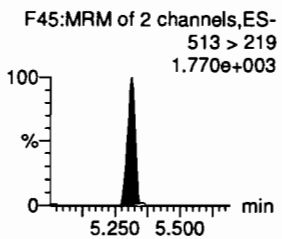
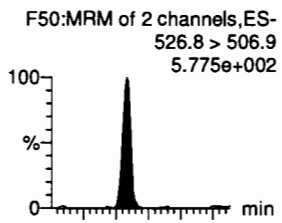
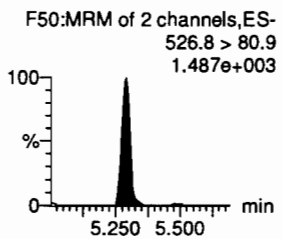


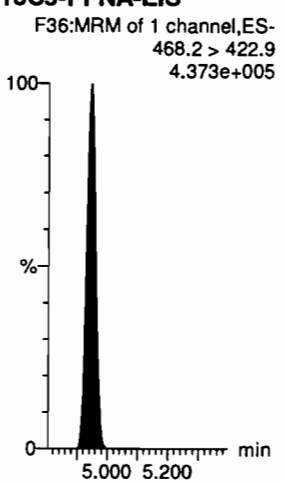


8:2 FTS

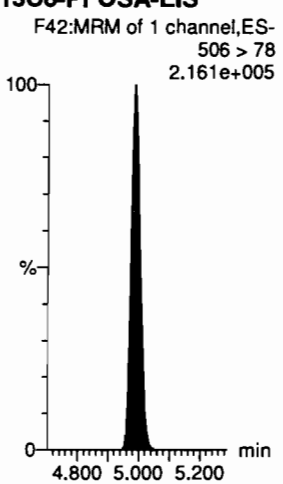




13C5-PFNA-EIS



13C8-PFOSA-EIS



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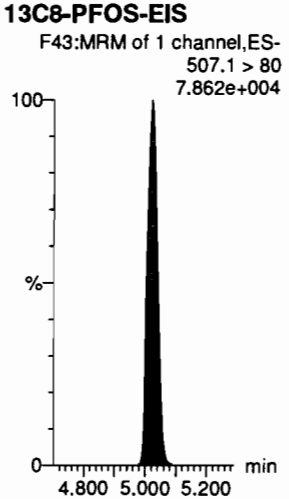

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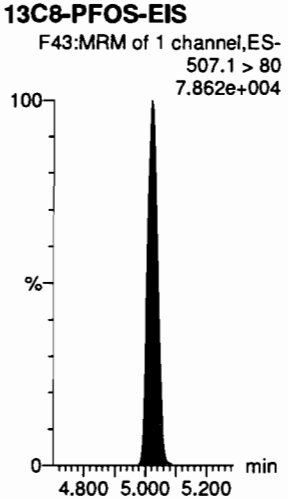

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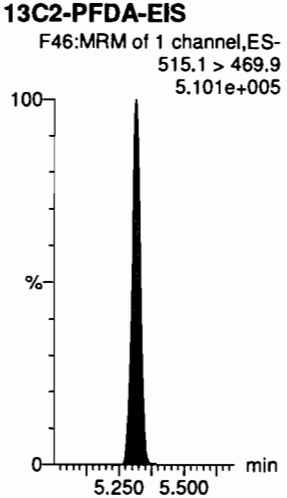

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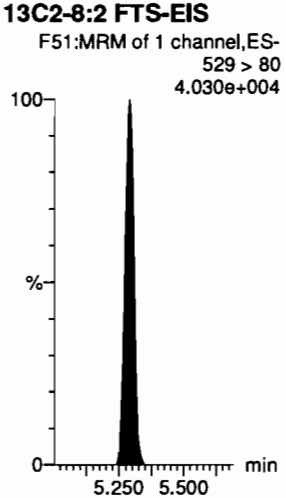

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Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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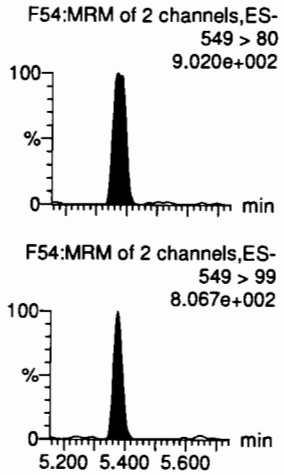
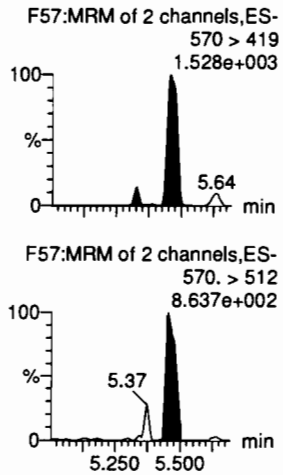
Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

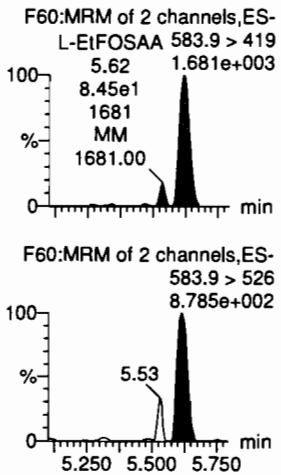
PFNS



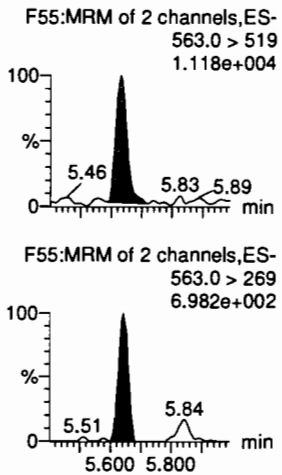
L-MeFOSAA



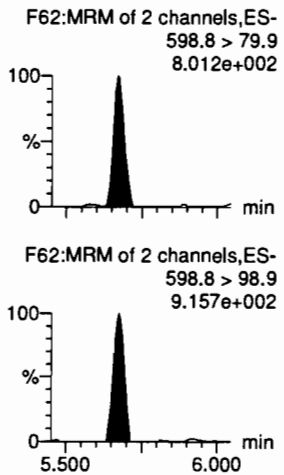
L-EtFOSAA



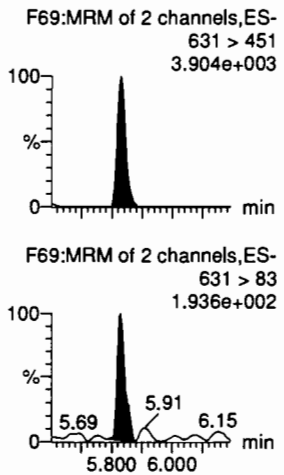
PFUdA



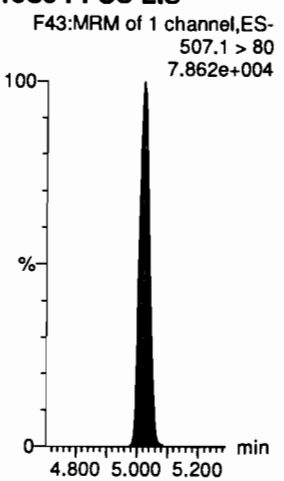
PFDS



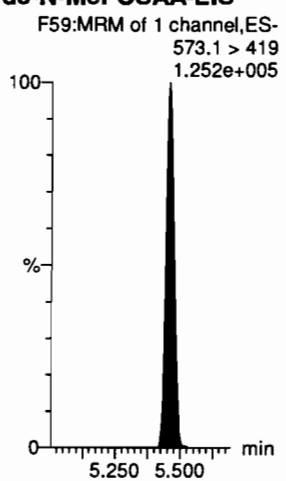
11Cl-PF30UdS



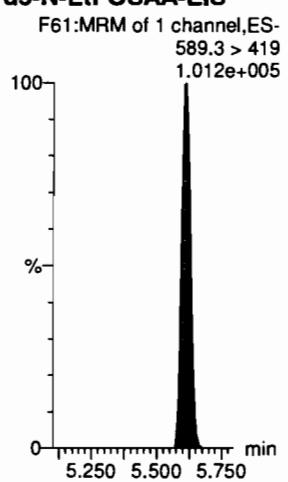
13C8-PFOS-EIS



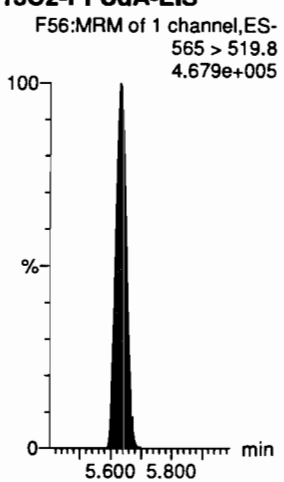
d3-N-MeFOSAA-EIS



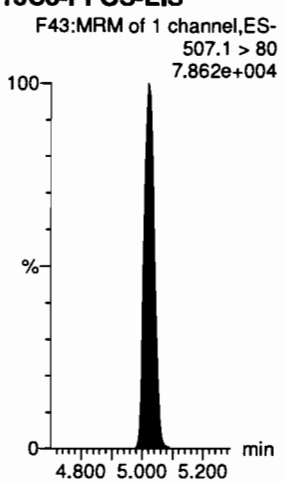
d5-N-EtFOSAA-EIS



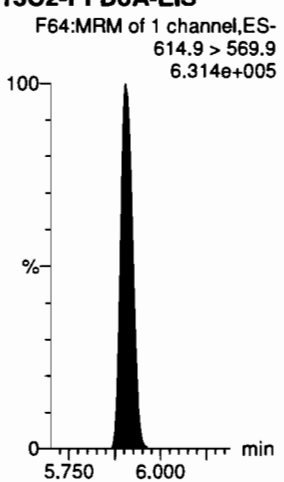
13C2-PFUdA-EIS



13C8-PFOS-EIS



13C2-PFDoA-EIS

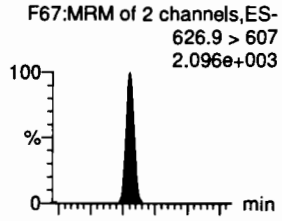


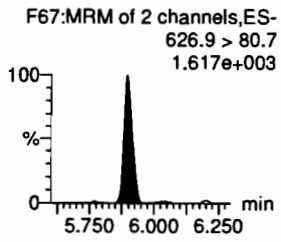
Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

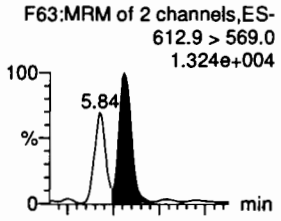
Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

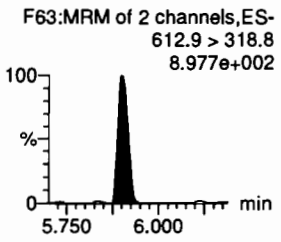
10:2 FTS



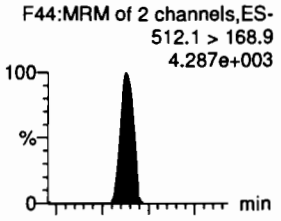


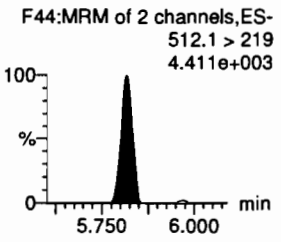
PFDoA



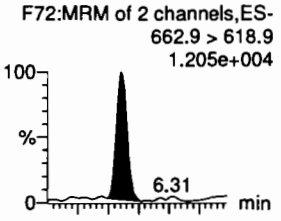


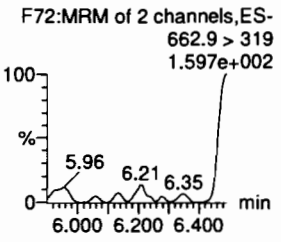
N-MeFOSA



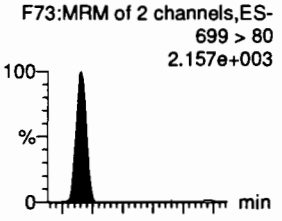


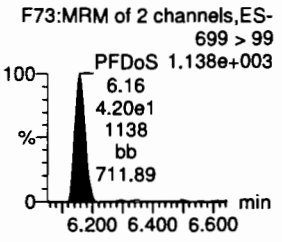
PFTrDA



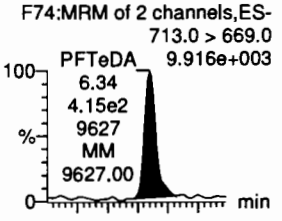


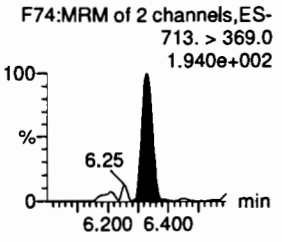
PFDoS



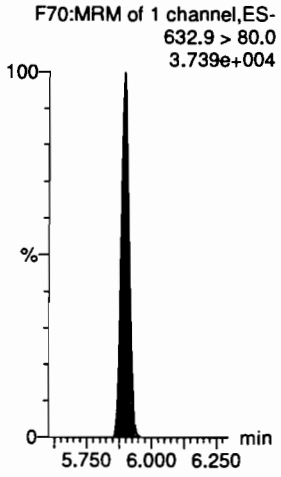


PFTeDA

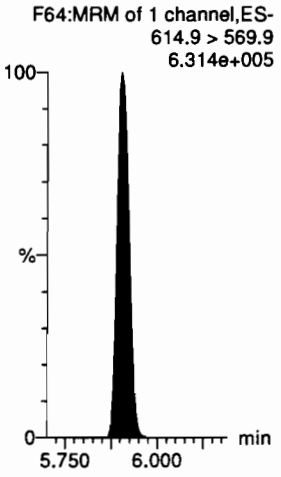




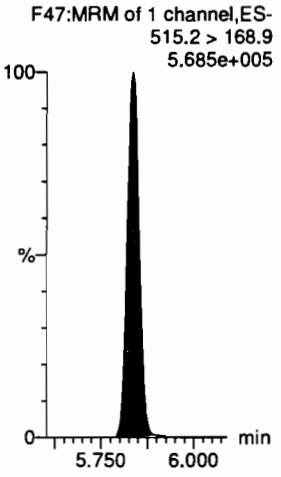
13C2-10:2 FTS-EIS



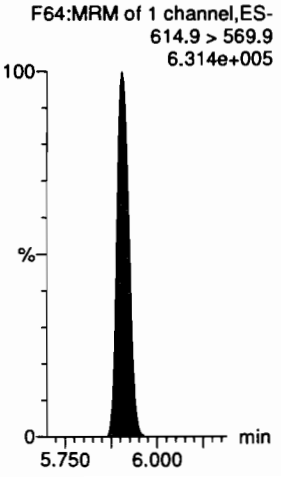
13C2-PFDoA-EIS



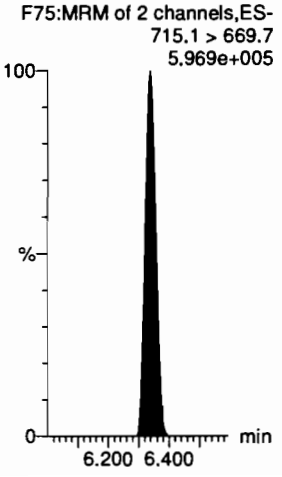
d3-N-MeFOSA-EIS



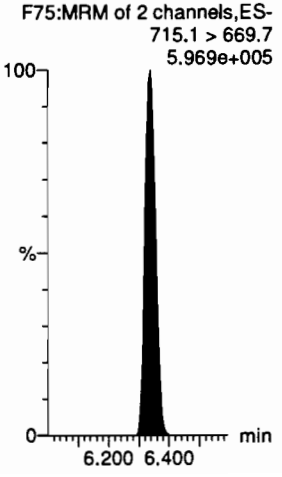
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS

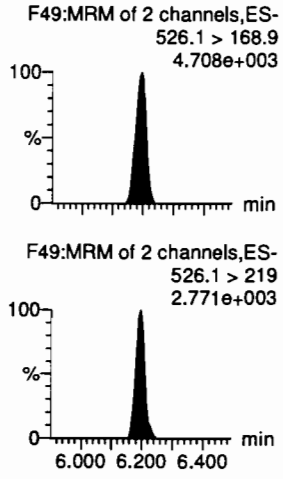


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

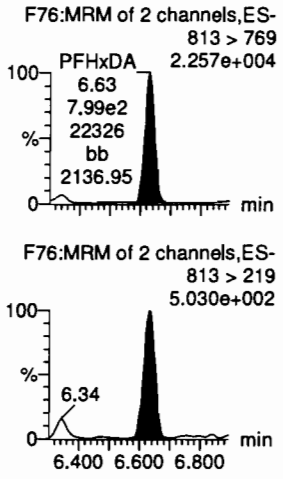
Last Altered: Tuesday, July 07, 2020 09:00:31 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:00:57 Pacific Daylight Time

Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

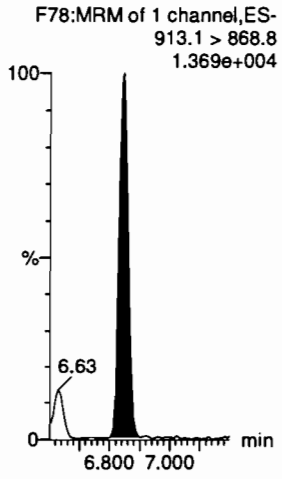
N-EtFOSA



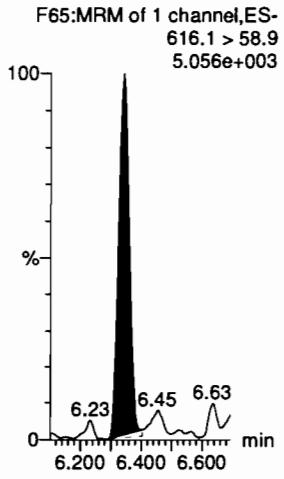
PFHxDA



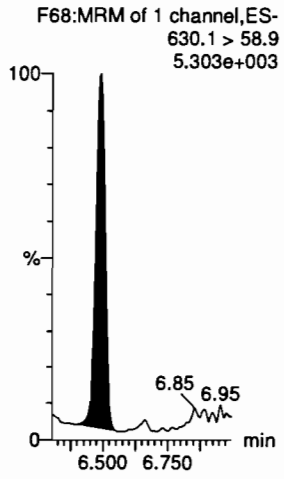
PFODA



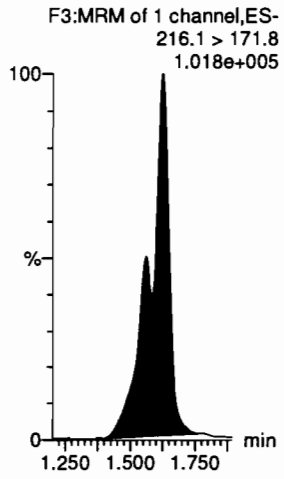
N-MeFOSE



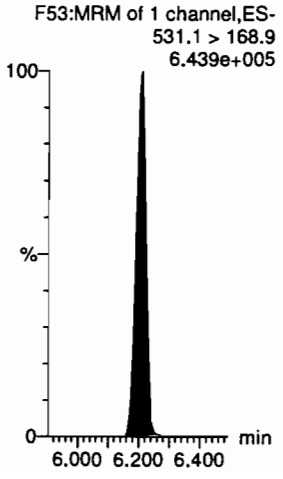
N-EtFOSE



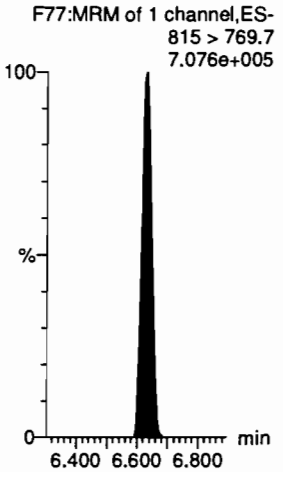
13C3-PFBA-RSD



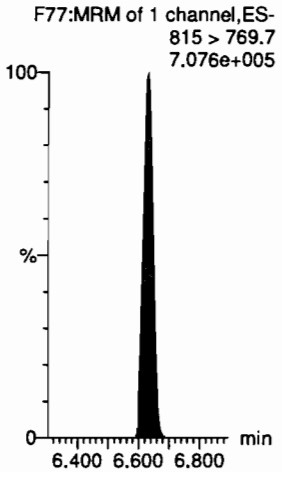
d5-N-ETFOSA-EIS



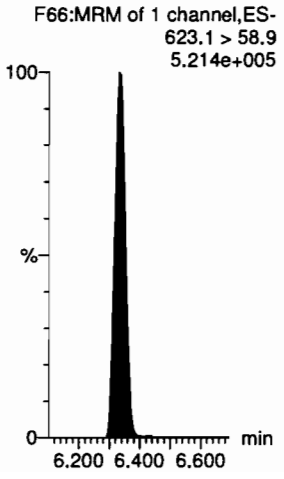
13C2-PFHxDA-EIS



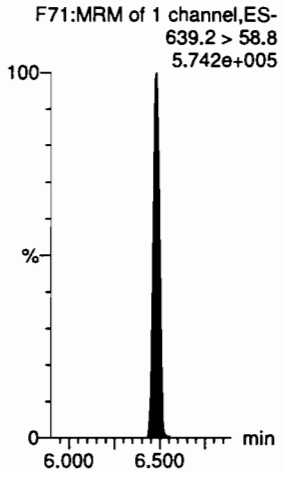
13C2-PFHxDA-EIS



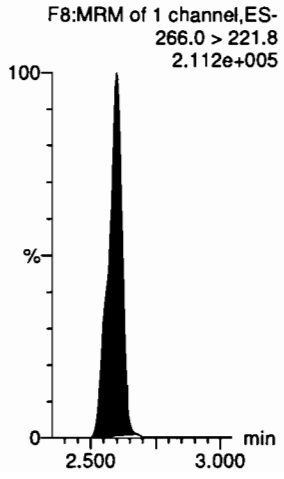
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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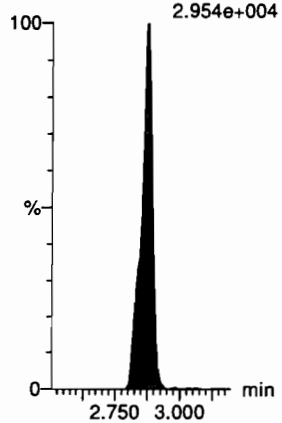
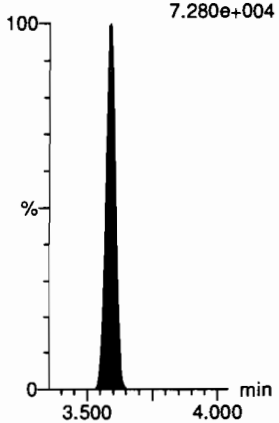
Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

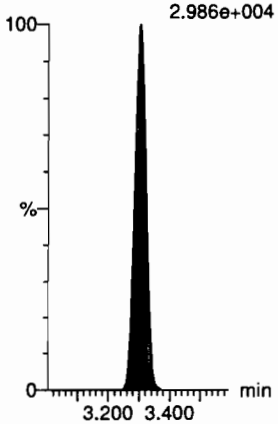
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.954e+004



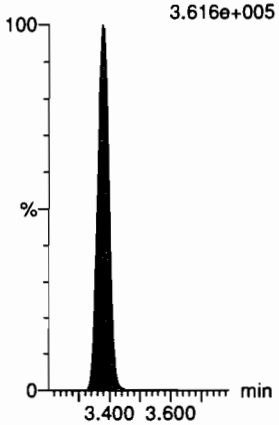
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.280e+004



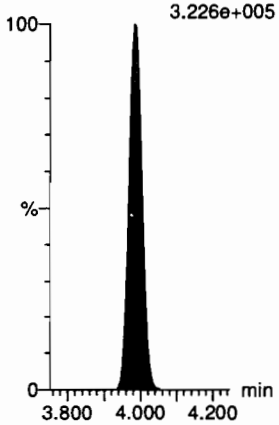
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
2.986e+004



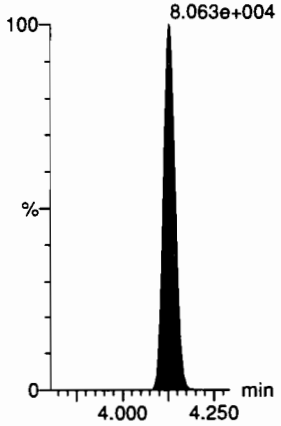
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.616e+005



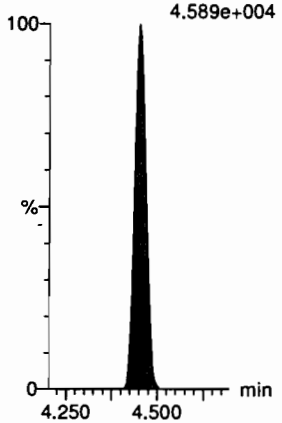
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.226e+005



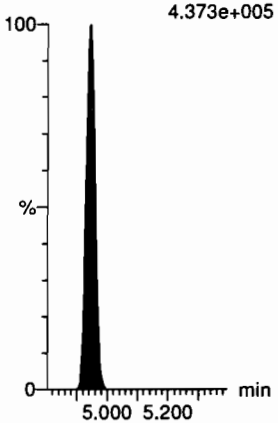
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
8.063e+004



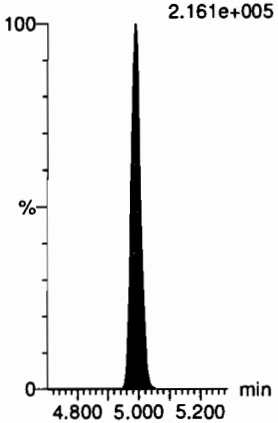
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.589e+004



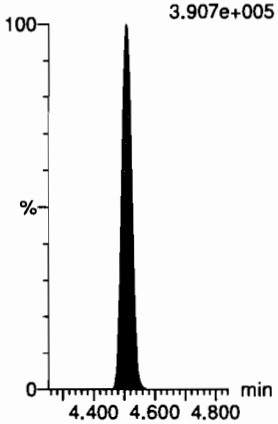
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.373e+005



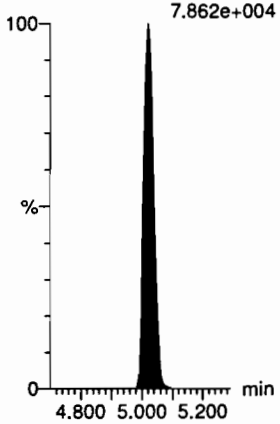
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.161e+005



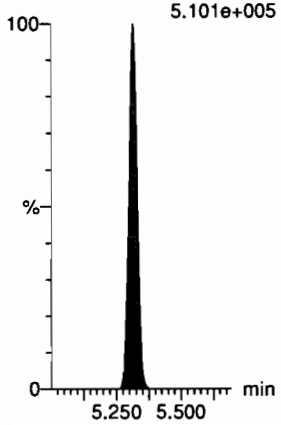
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.907e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.862e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.101e+005



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Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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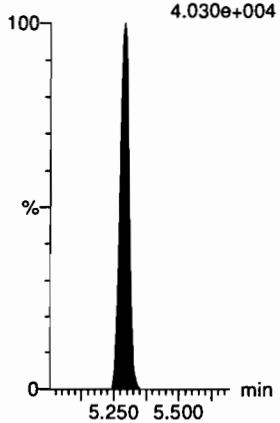
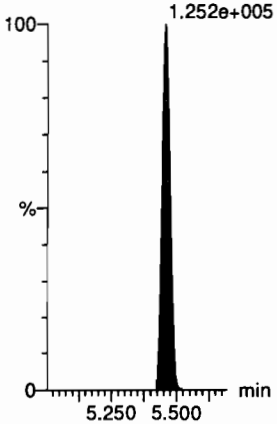
Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

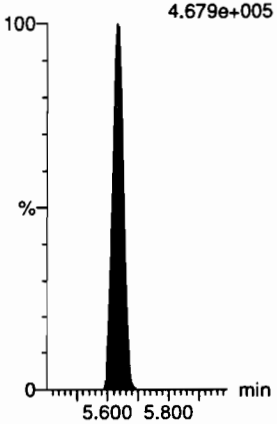
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
4.030e+004



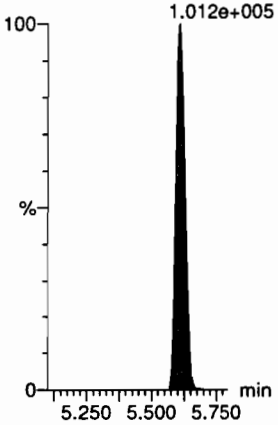
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.252e+005



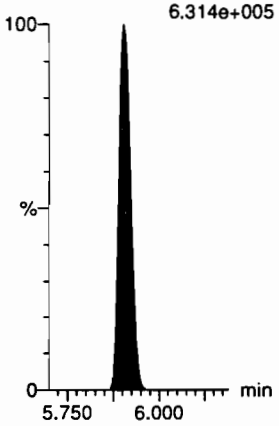
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.679e+005



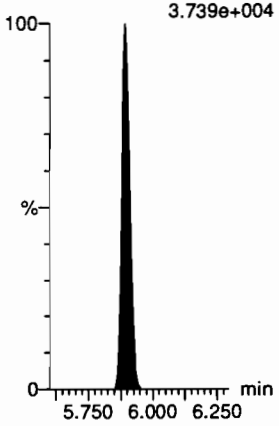
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.012e+005



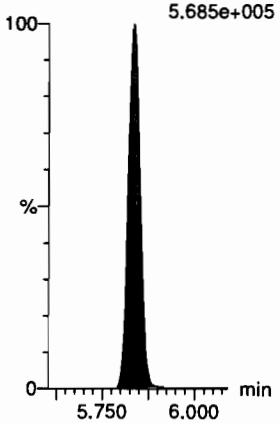
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.314e+005



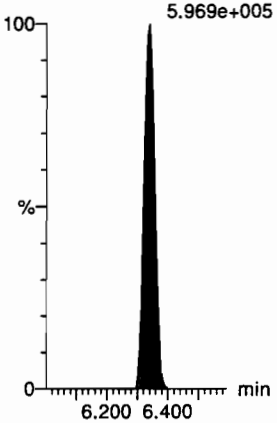
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.739e+004



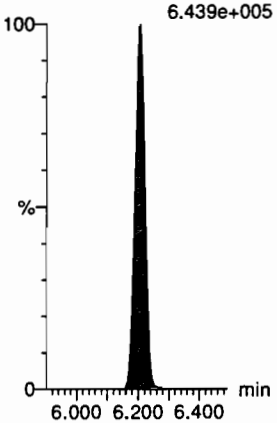
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.685e+005



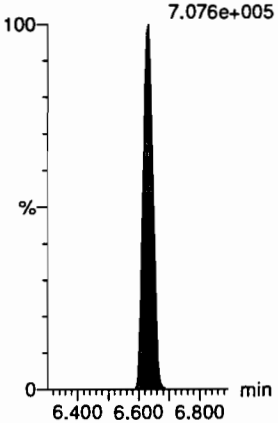
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
5.969e+005



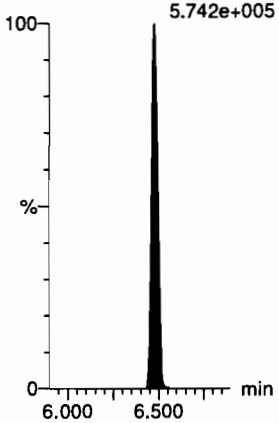
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.439e+005



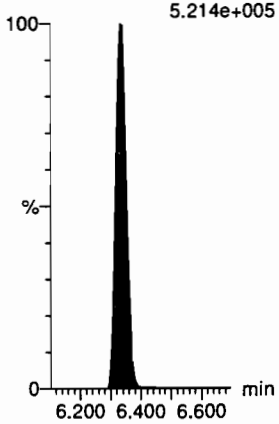
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.076e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.742e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.214e+005



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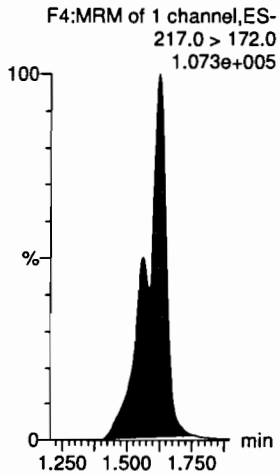
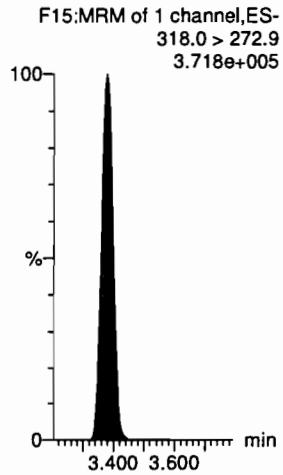
Name: 200706P1-19, Date: 06-Jul-2020, Time: 13:13:57, ID: ST200706P1-1 PFC CS-2 20F1901, Description: PFC CS-2 20F1901

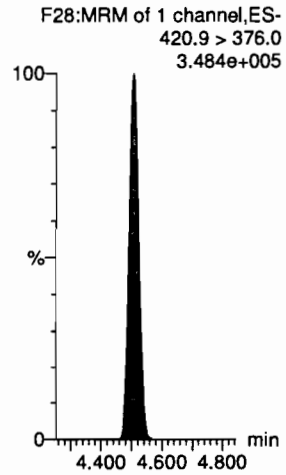
13C4-PFBA



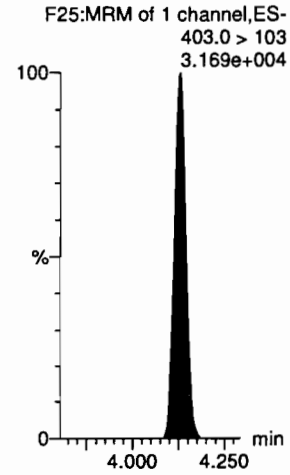
13C5-PFHxA



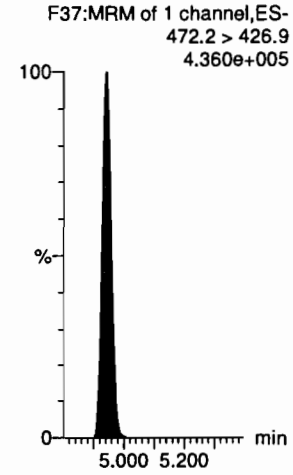
13C8-PFOA



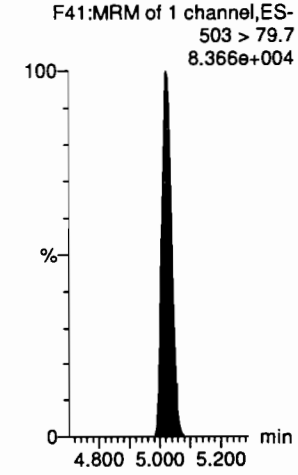
18O2-PFHxS



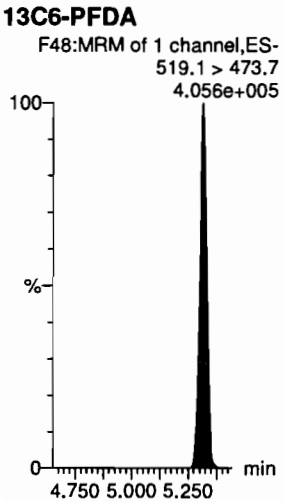
13C9-PFNA



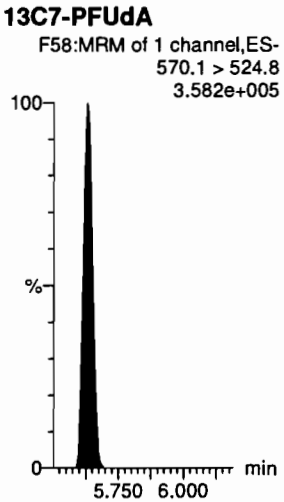
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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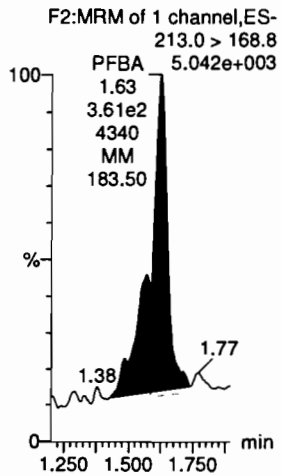
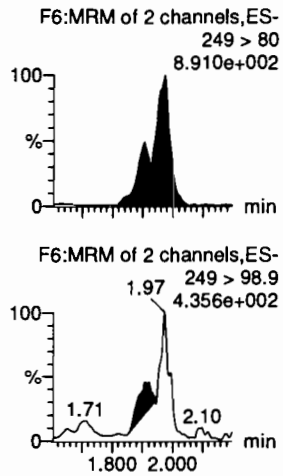
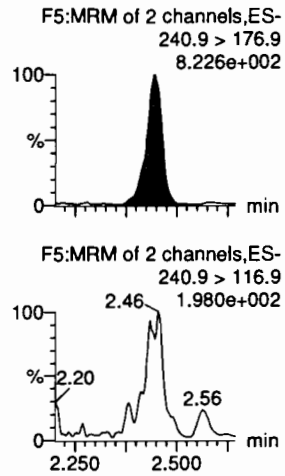
PFBA



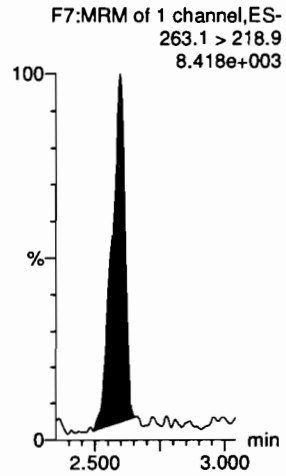
PFPrS



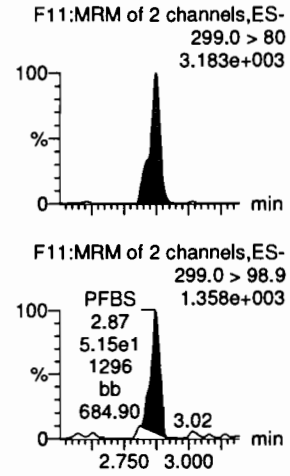
3:3 FTCA



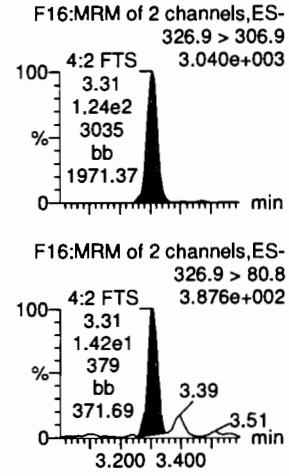
PFPeA



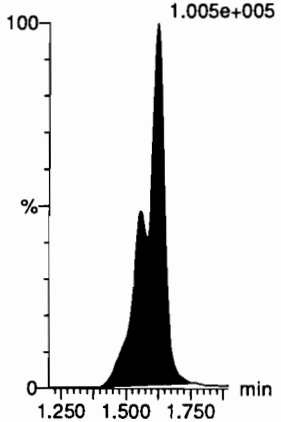
PFBS



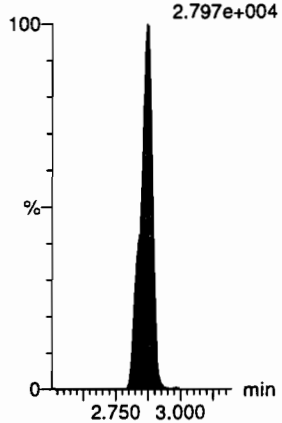
4:2 FTS



13C3-PFBA-EIS



13C3-PFBS-EIS



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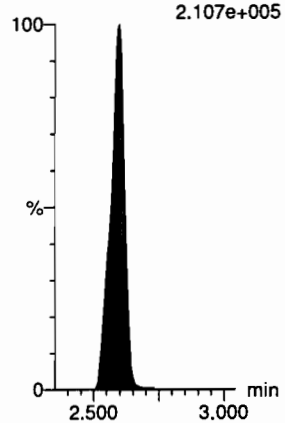

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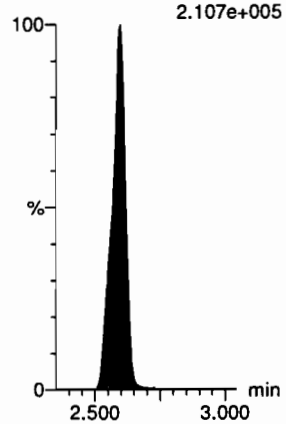

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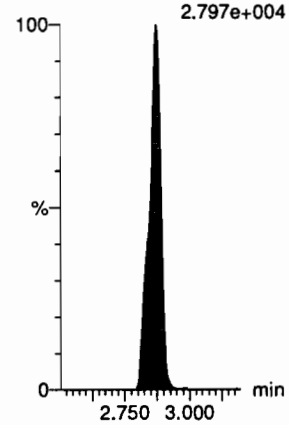
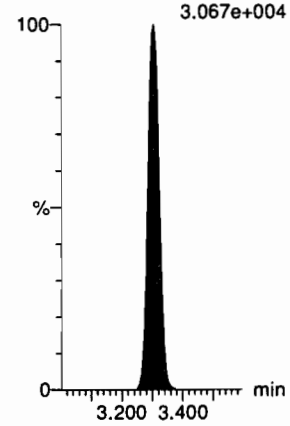


13C2-4:2 FTS-EIS



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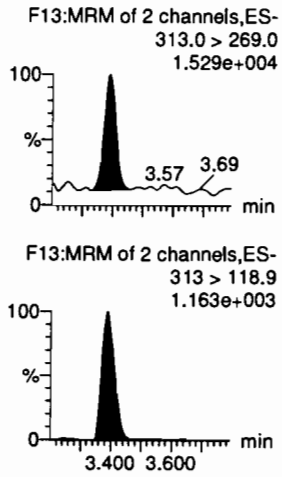
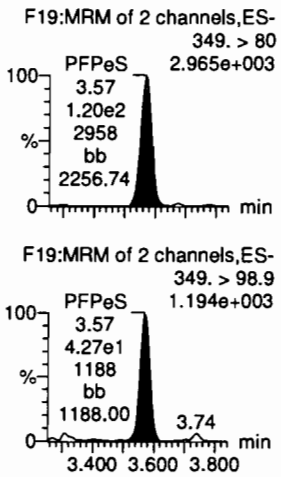
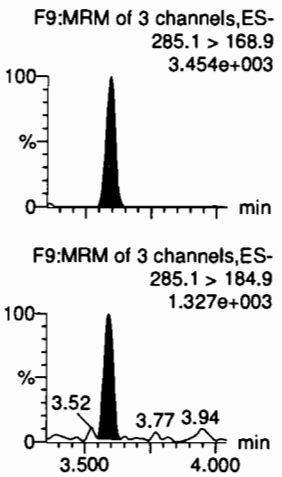
PFHxA



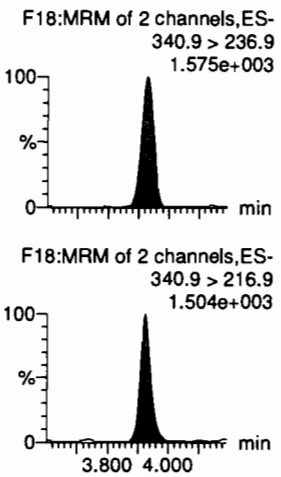
PFPeS



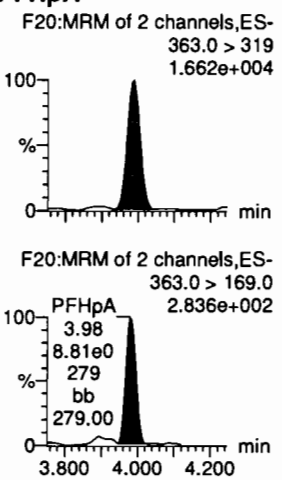
HFPO-DA



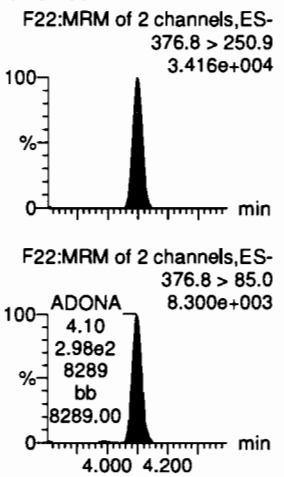
5:3 FTCA



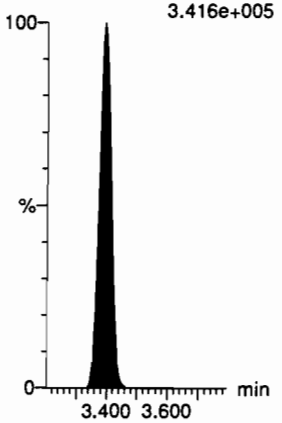
PFHpA



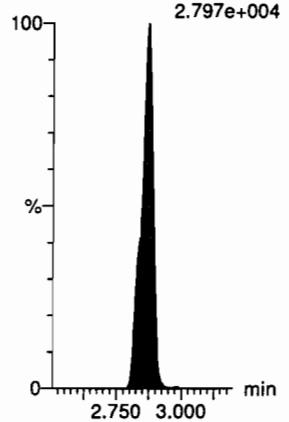
ADONA



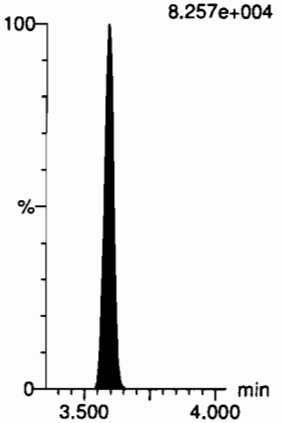
13C2-PFHxA-EIS



13C3-PFBS-EIS



13C3-HFPO-DA-EIS



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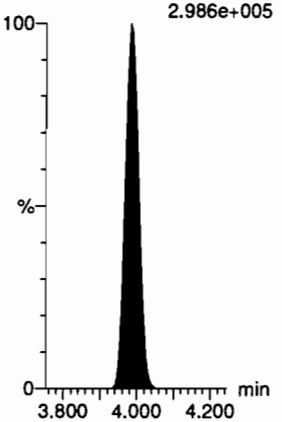

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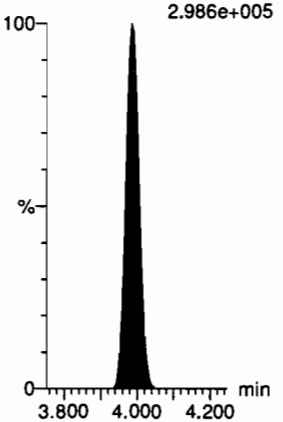

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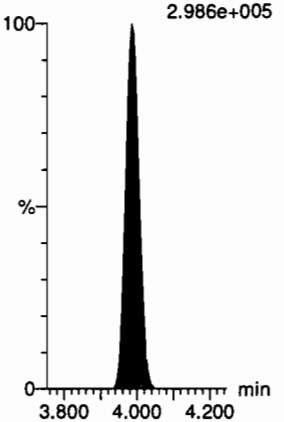

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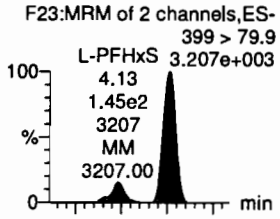
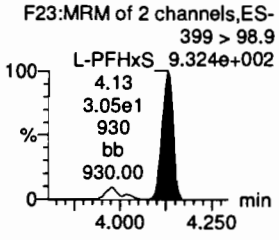
Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

L-PFHxS





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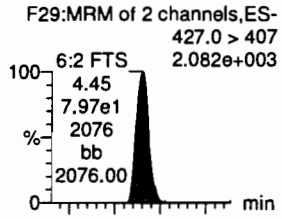

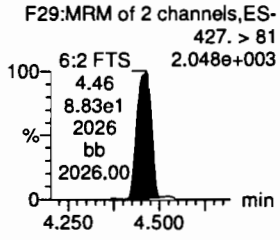

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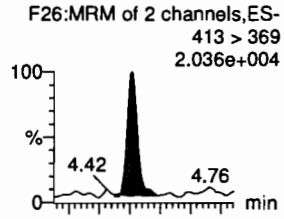

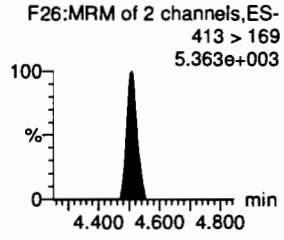

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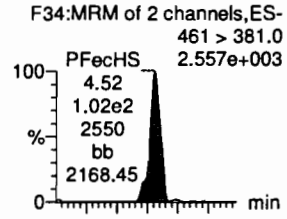

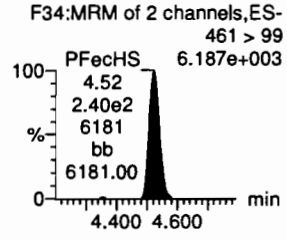

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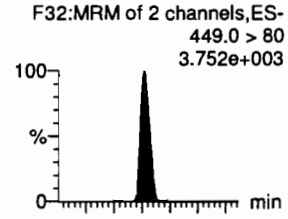

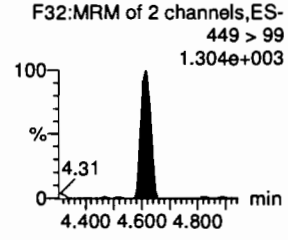

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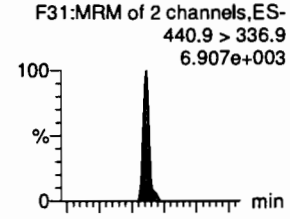

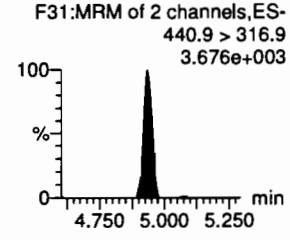

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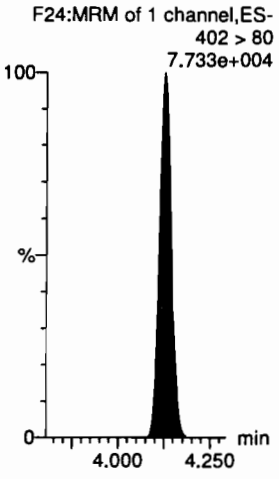
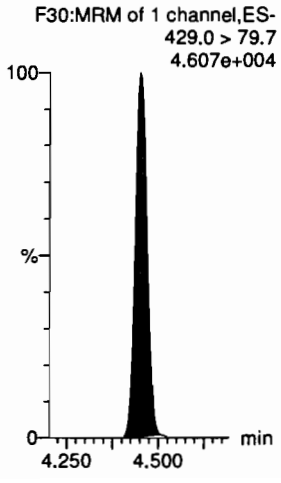


13C2-6:2 FTS-EIS



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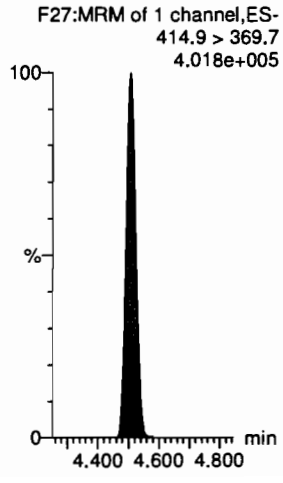

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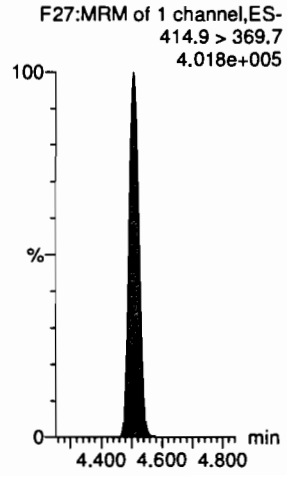
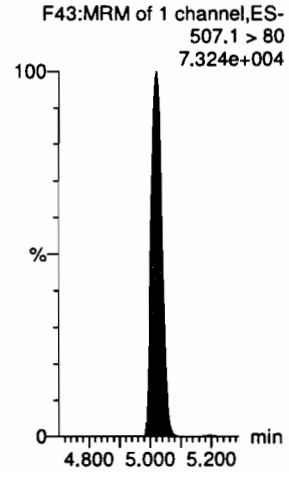
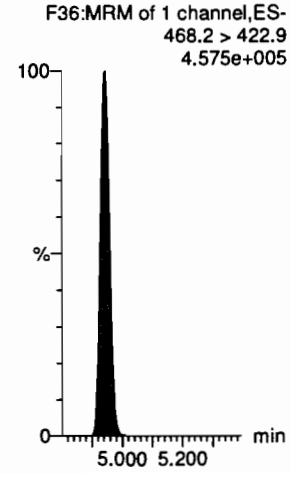


13C8-PFOS-EIS



13C5-PFNA-EIS



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Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

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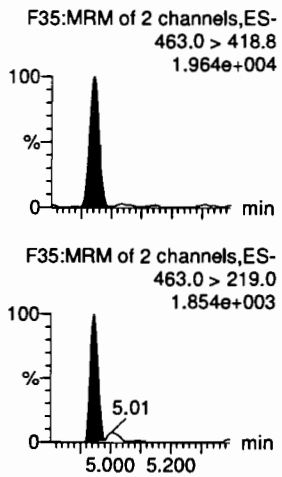

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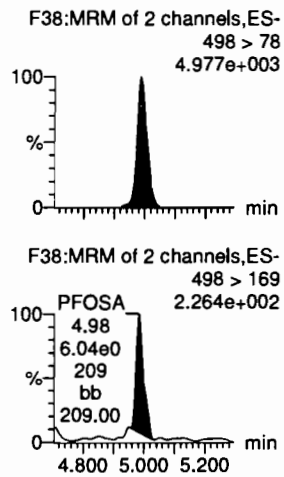

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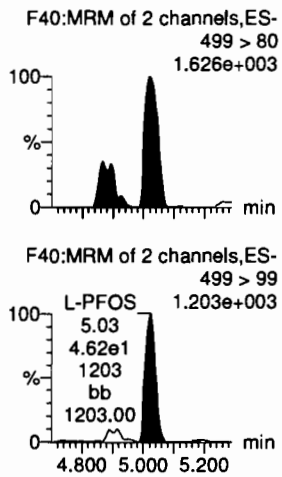

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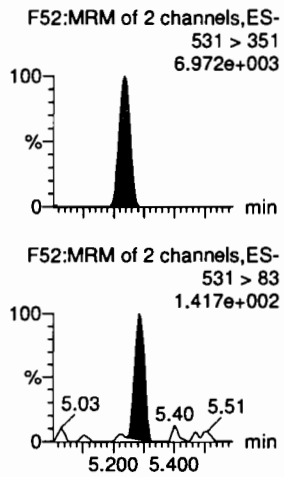

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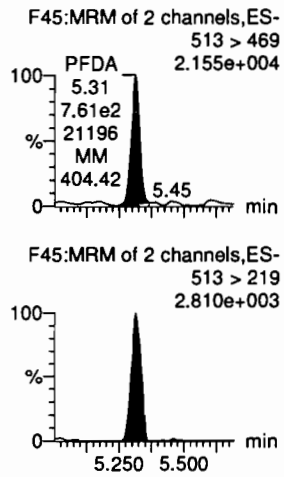
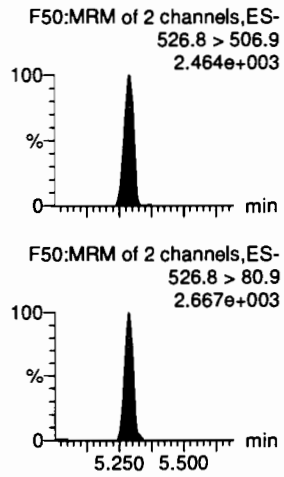


8:2 FTS



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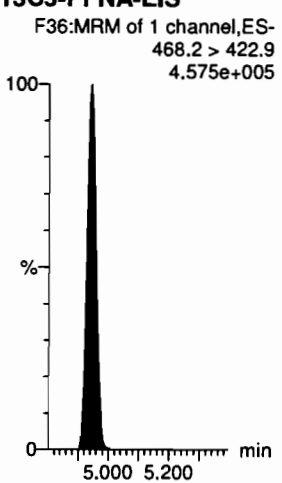

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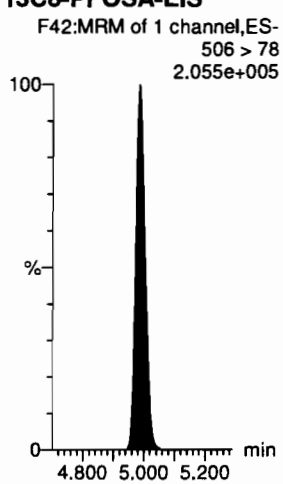

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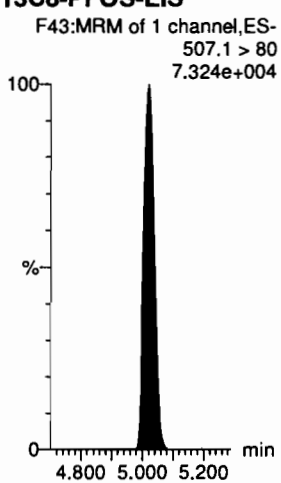

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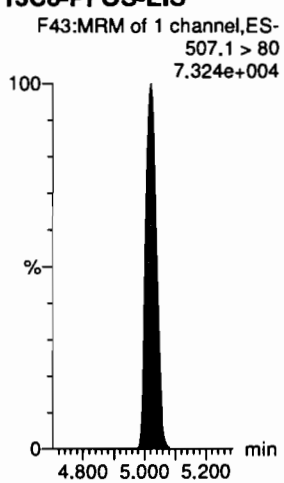

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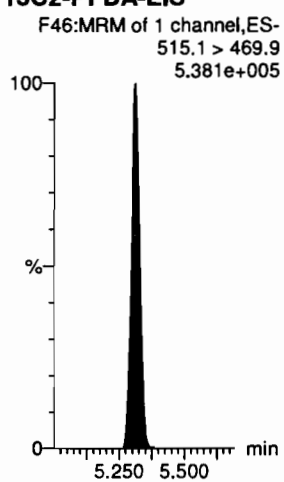

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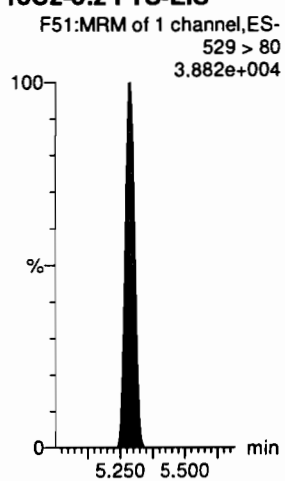

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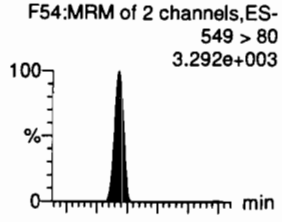

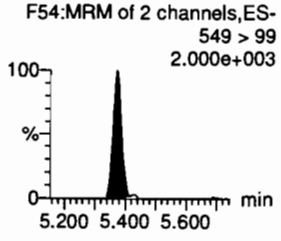

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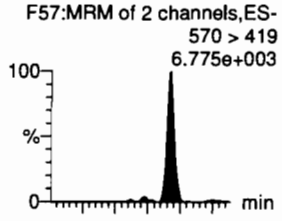

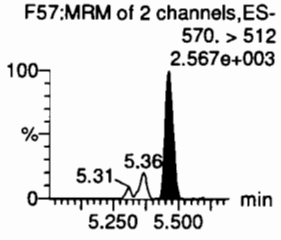

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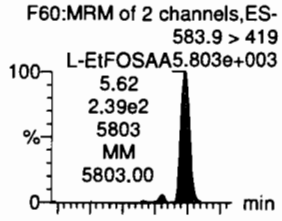

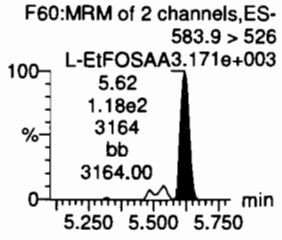

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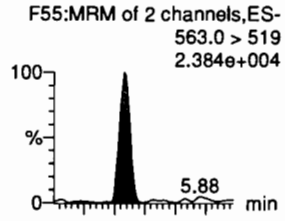

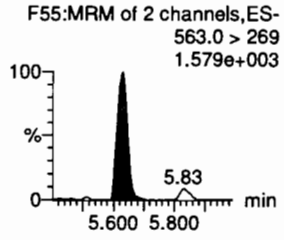

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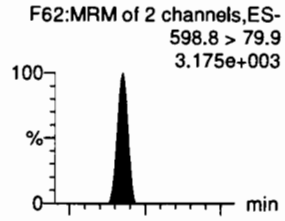

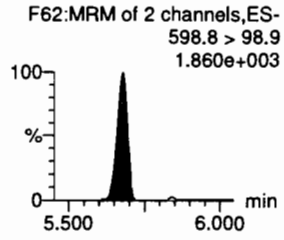

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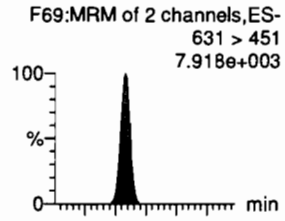
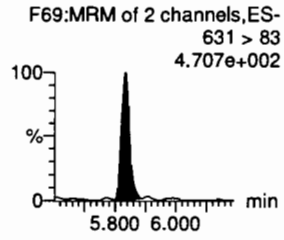
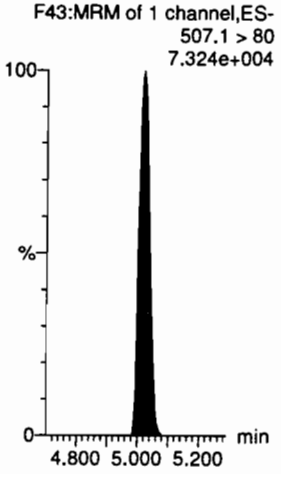




13C8-PFOS-EIS



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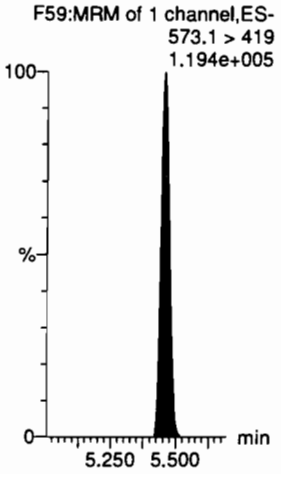

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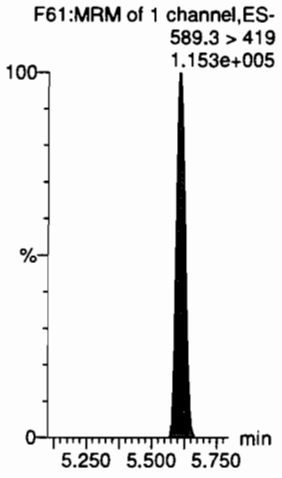

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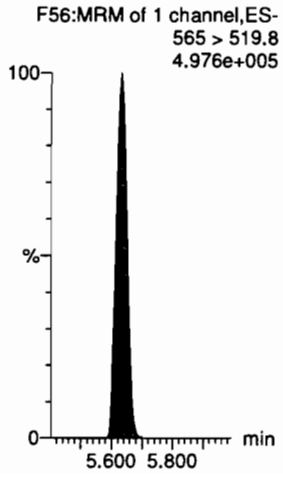

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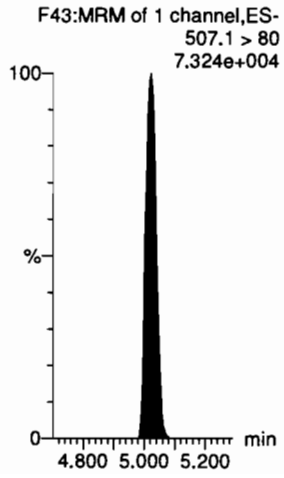

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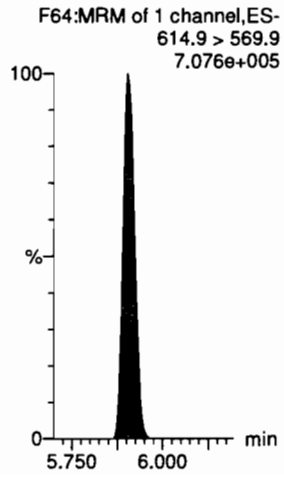

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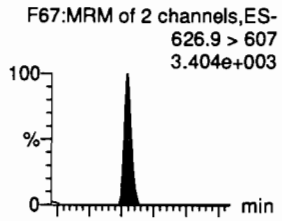
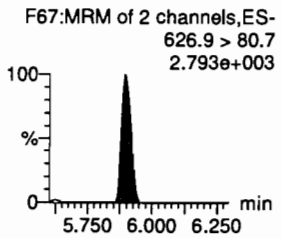
10:2 FTS





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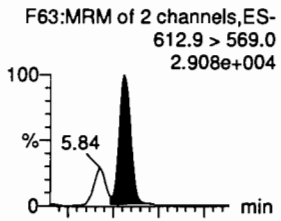
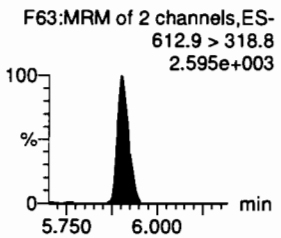
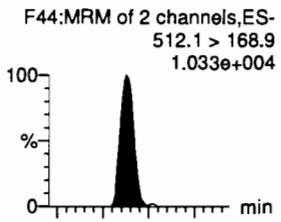
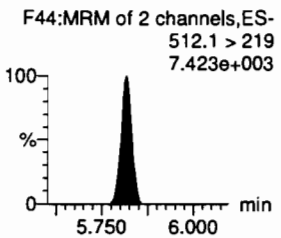


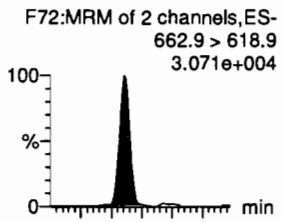


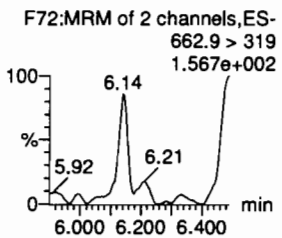
N-MeFOSA



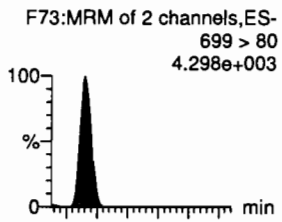


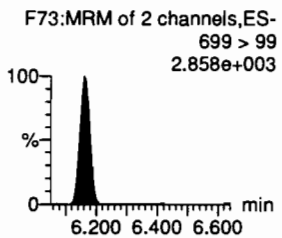
PFTrDA



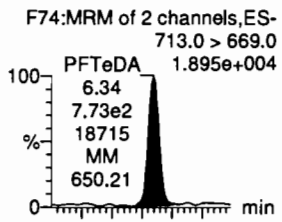


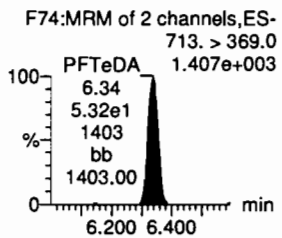
PFDoS



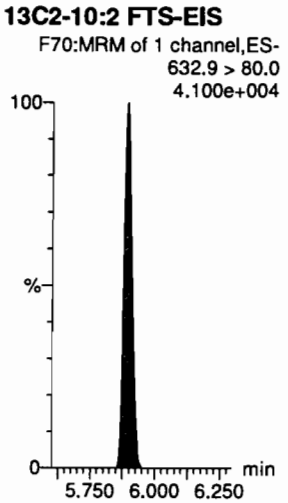


PFTeDA

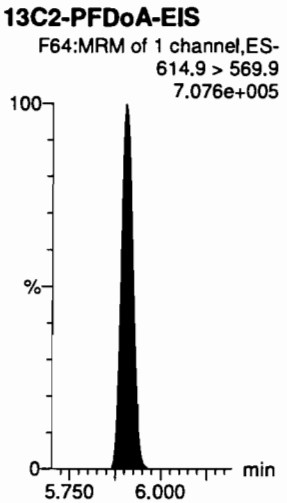




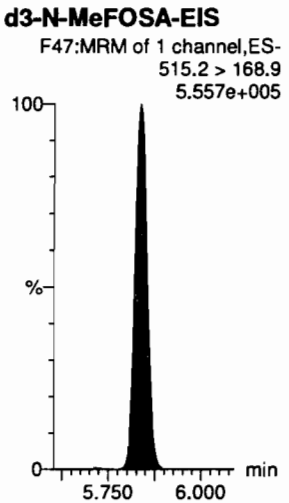
13C2-10:2 FTS-EIS



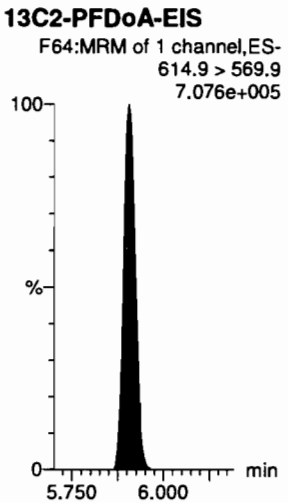
13C2-PFDoA-EIS



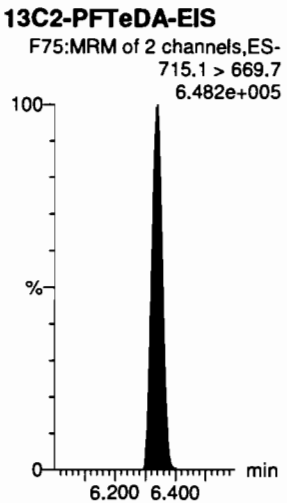
d3-N-MeFOSA-EIS



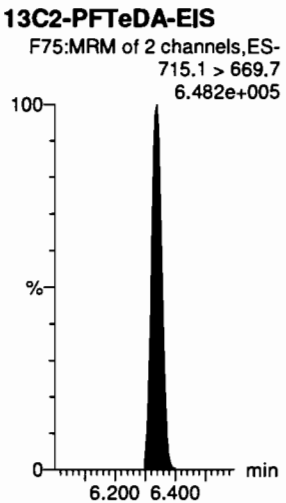
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS

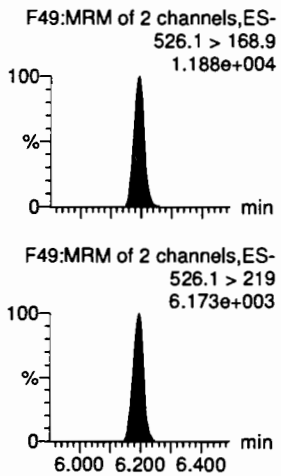


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

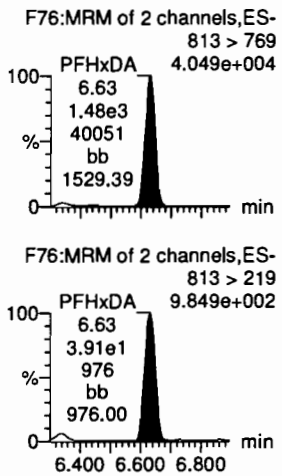
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

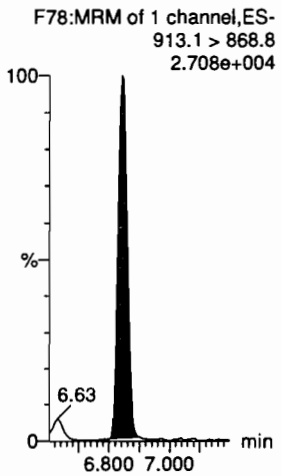
N-EtFOSA



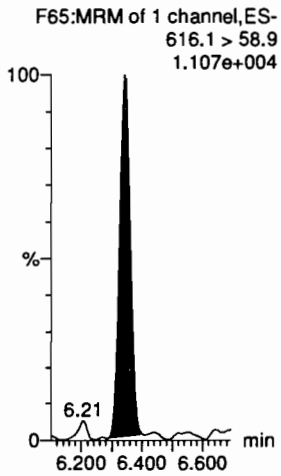
PFHxDA



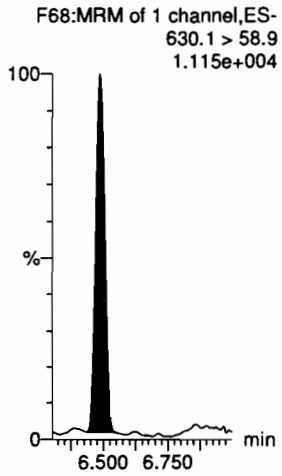
PFODA



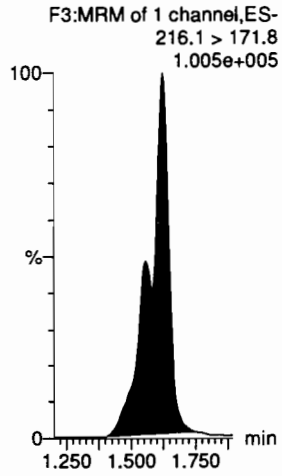
N-MeFOSE



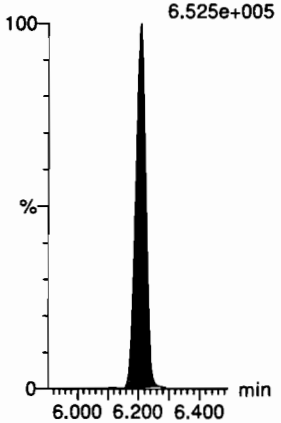
N-EtFOSE



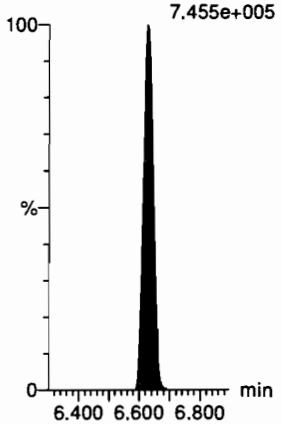
13C3-PFBA-RSD



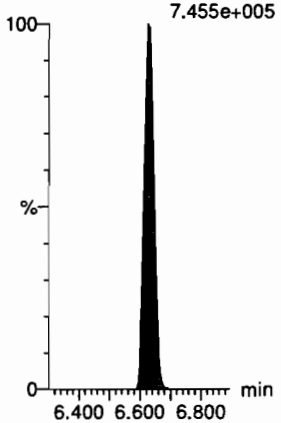
d5-N-ETFOSA-EIS



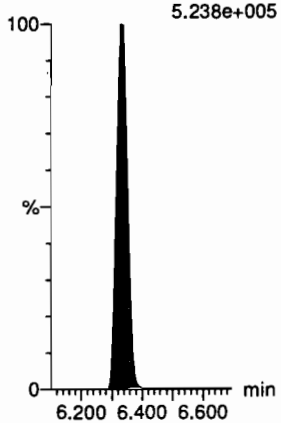
13C2-PFHxDA-EIS



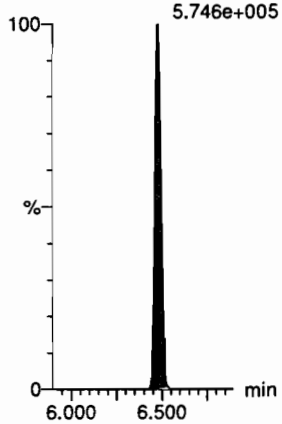
13C2-PFHxDA-EIS



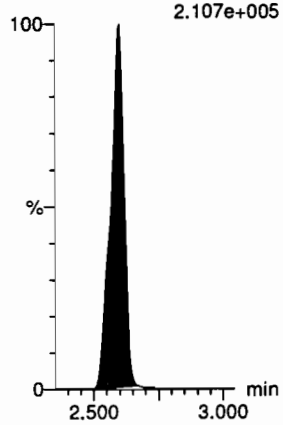
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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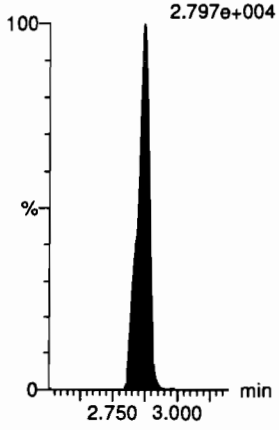
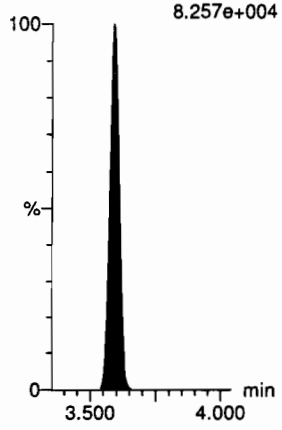
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

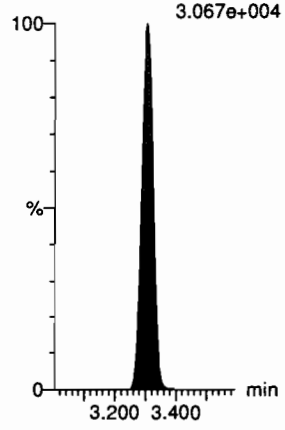
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.797e+004



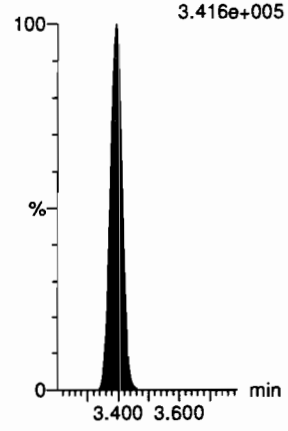
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.257e+004



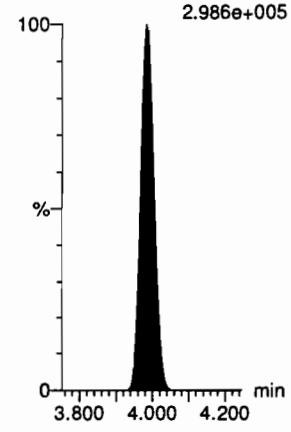
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.067e+004



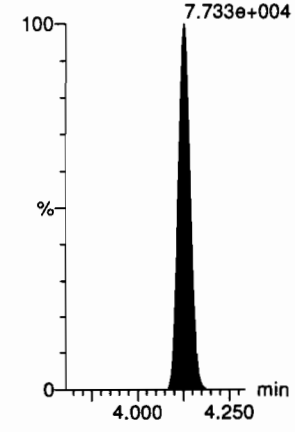
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.416e+005



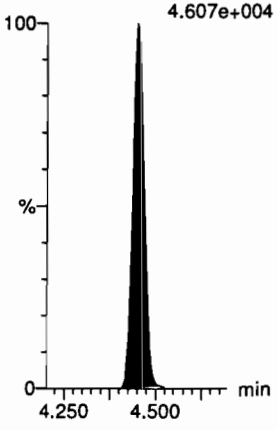
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.986e+005



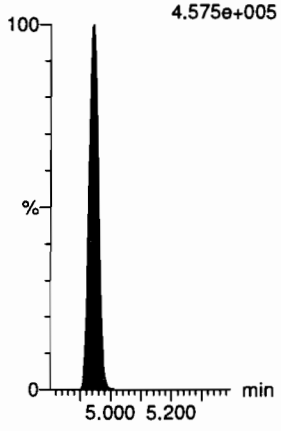
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
7.733e+004



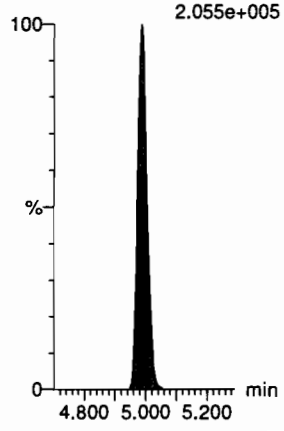
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.607e+004



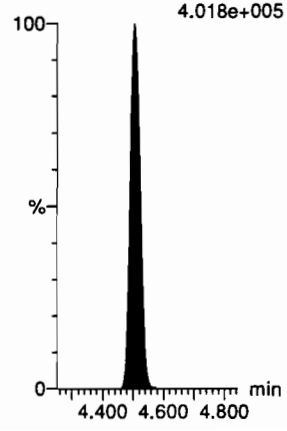
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.575e+005



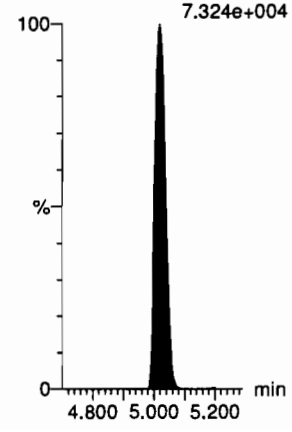
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.055e+005



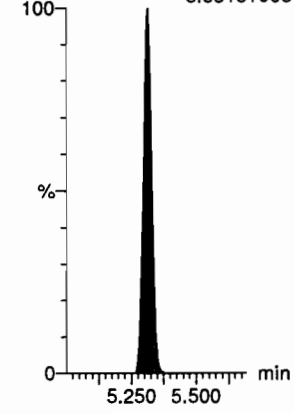
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
4.018e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.324e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.381e+005



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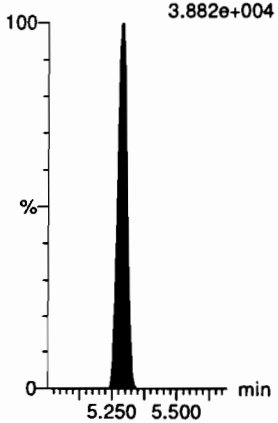
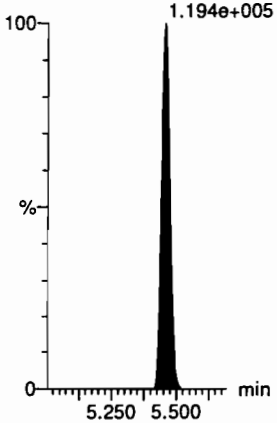
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

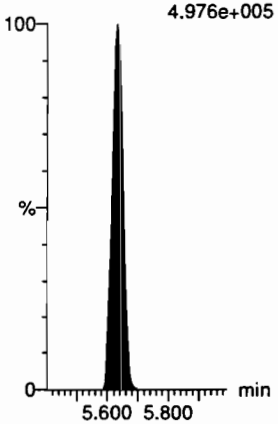
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.882e+004



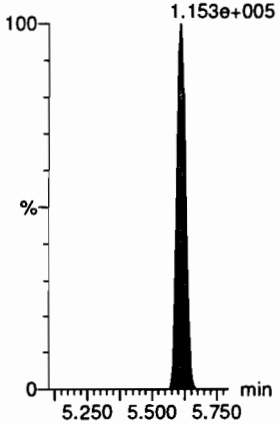
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.194e+005



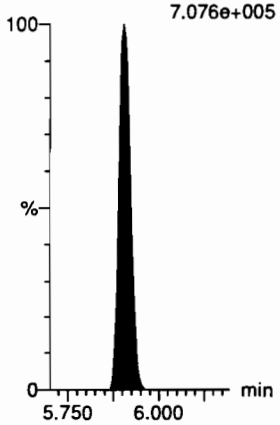
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.976e+005



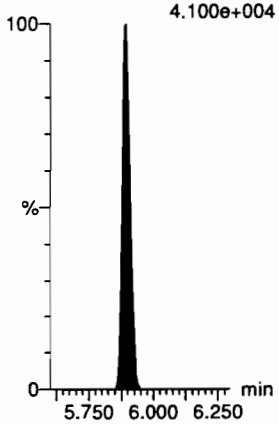
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.153e+005



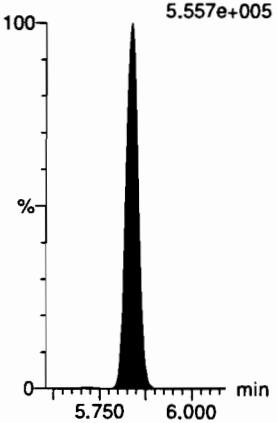
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
7.076e+005



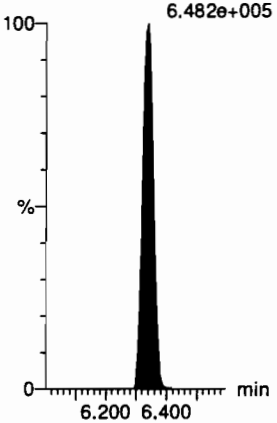
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
4.100e+004



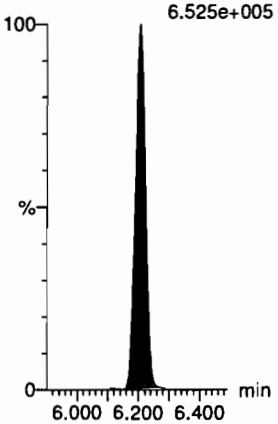
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.557e+005



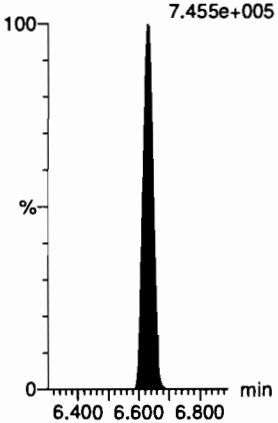
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.482e+005



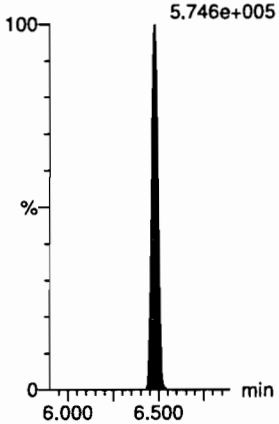
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.525e+005



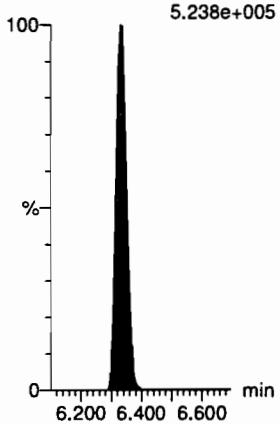
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.455e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.746e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.238e+005



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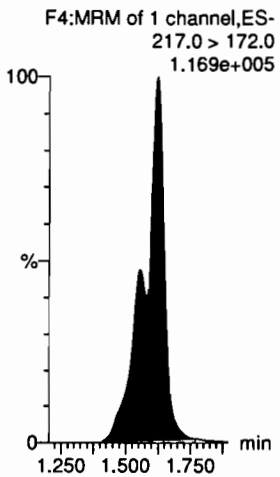
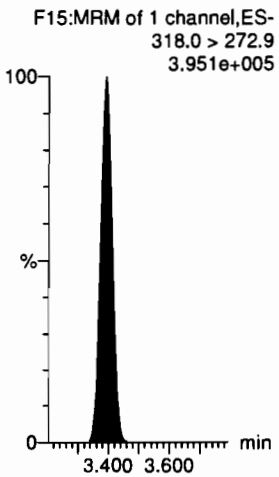
Name: 200706P1-20, Date: 06-Jul-2020, Time: 13:24:27, ID: ST200706P1-2 PFC CS-1 20F1902, Description: PFC CS-1 20F1902

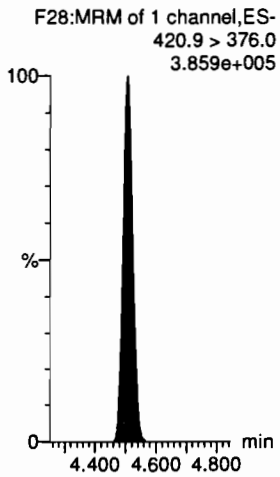
13C4-PFBA



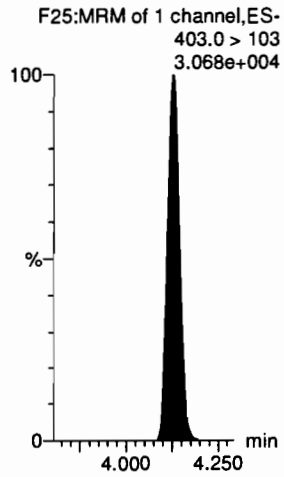
13C5-PFHxA



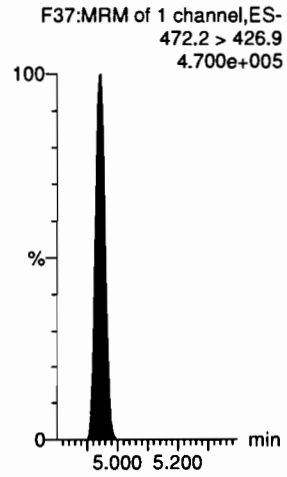
13C8-PFOA



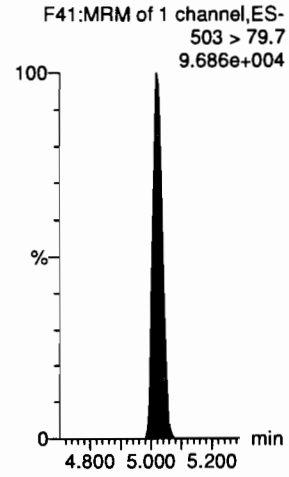
18O2-PFHxS



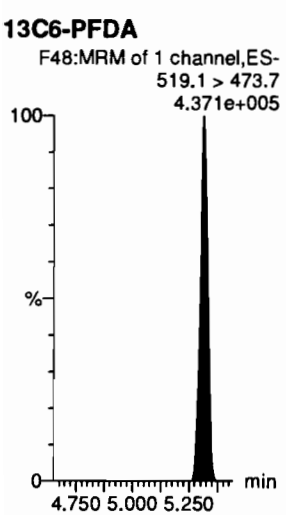
13C9-PFNA



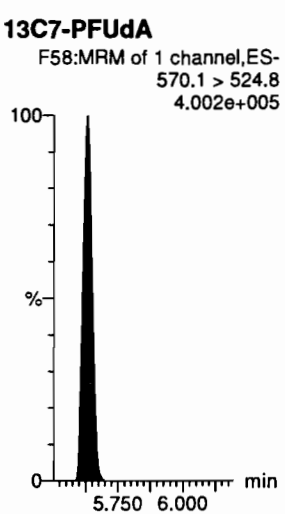
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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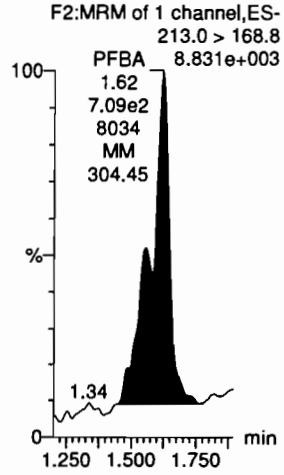
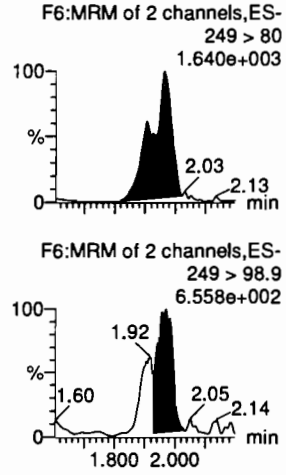
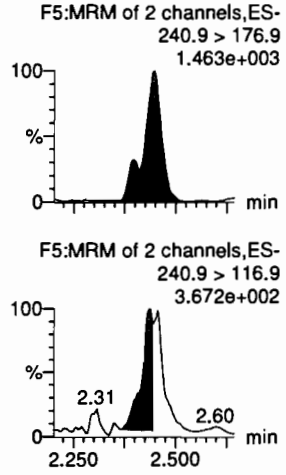
PFBA



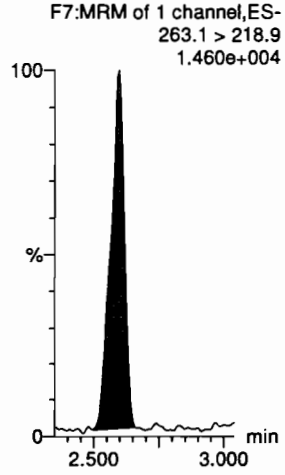
PFPrS



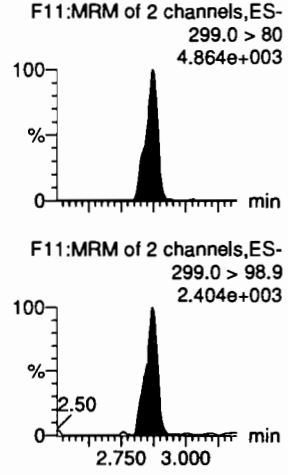
3:3 FTCA



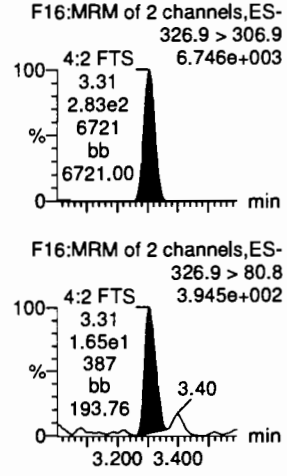
PFPeA



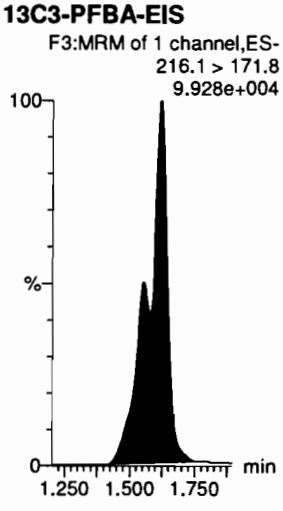
PFBS



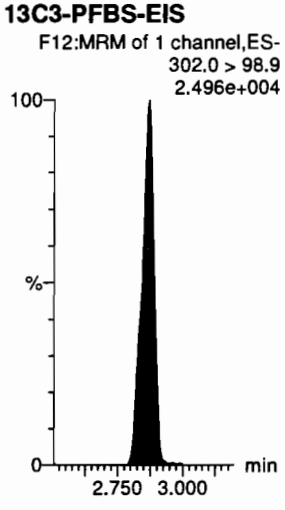
4:2 FTS



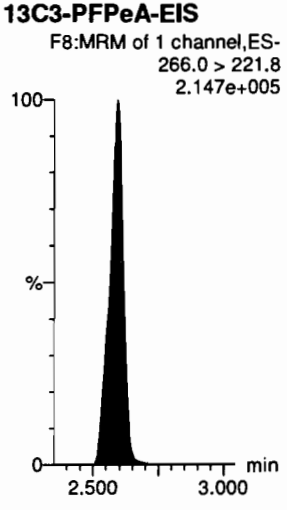
13C3-PFBA-EIS



13C3-PFBS-EIS



13C3-PFPeA-EIS



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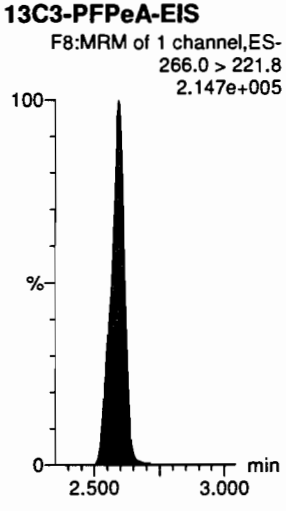

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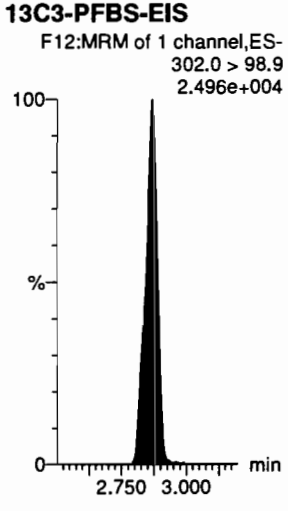
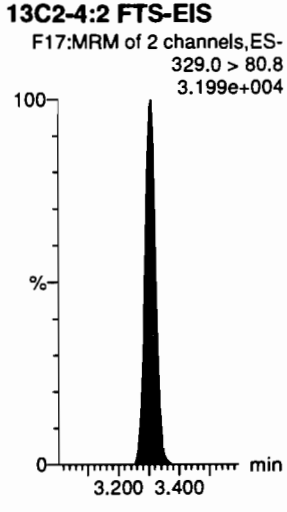


13C2-4:2 FTS-EIS



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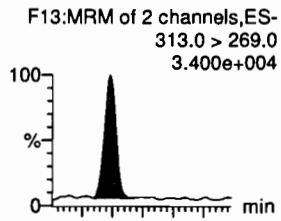
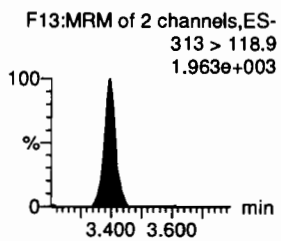
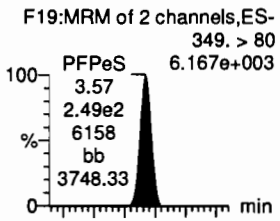
Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

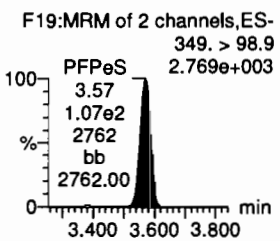
PFHxA



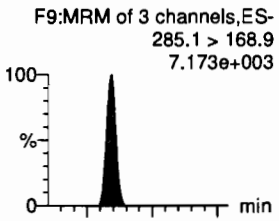


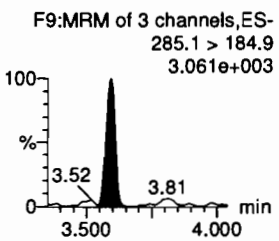
PFPeS



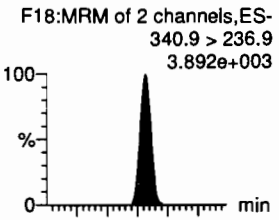


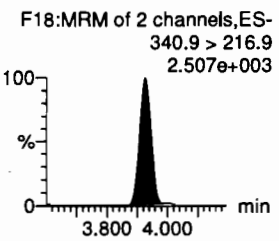
HFPO-DA



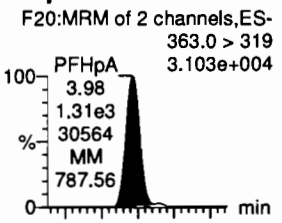


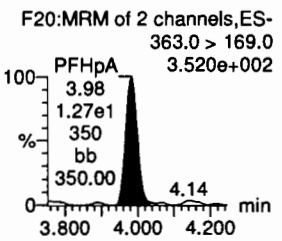
5:3 FTCA



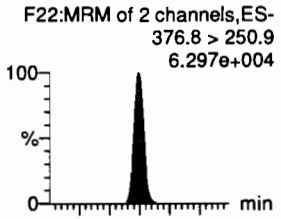


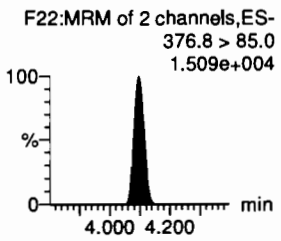
PFHpA



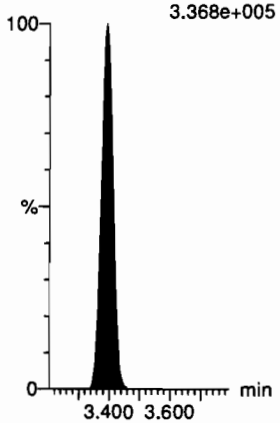


ADONA

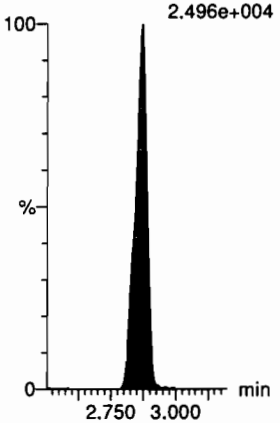




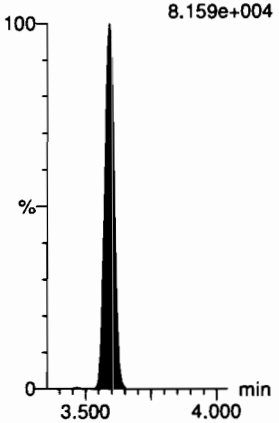
13C2-PFHxA-EIS



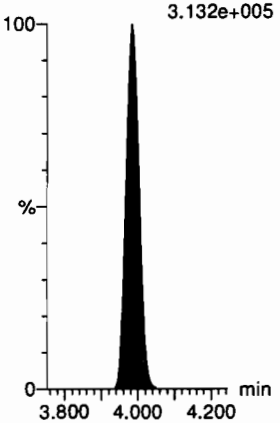
13C3-PFBS-EIS



13C3-HFPO-DA-EIS



13C4-PFHpA-EIS



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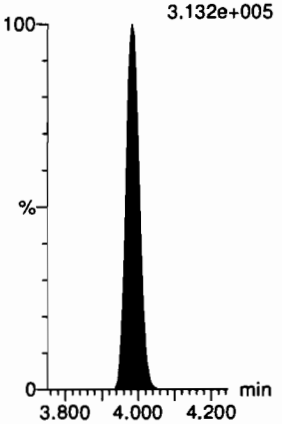

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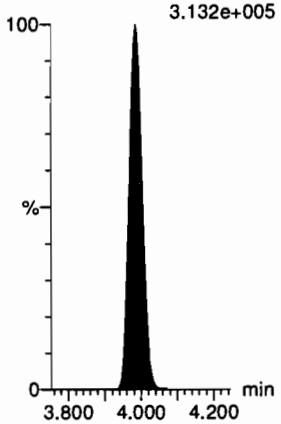

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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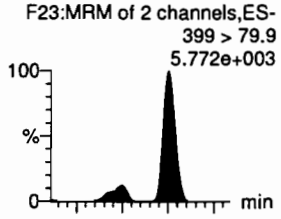
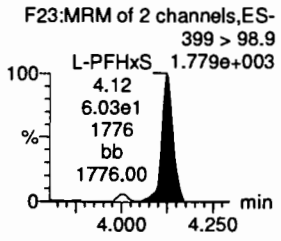
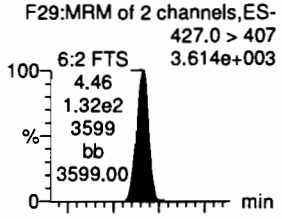
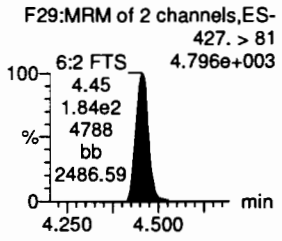
L-PFHxS



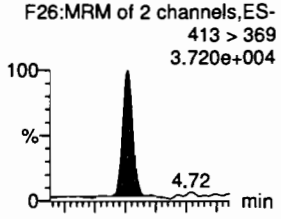


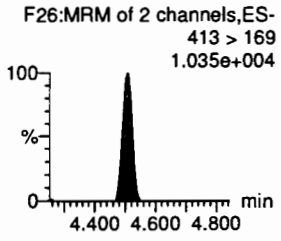
6:2 FTS



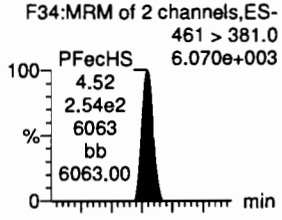


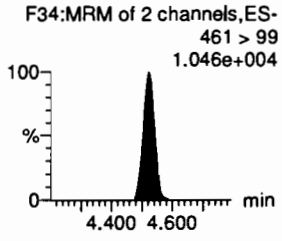
L-PFOA



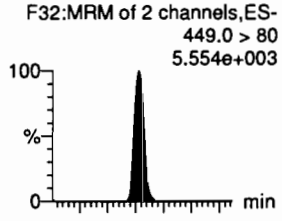


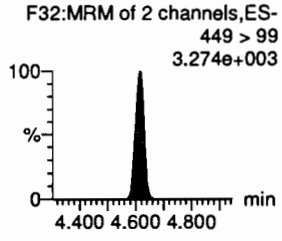
PFEChS



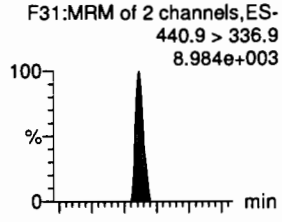


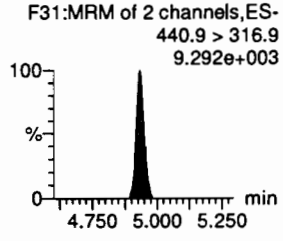
PFHpS



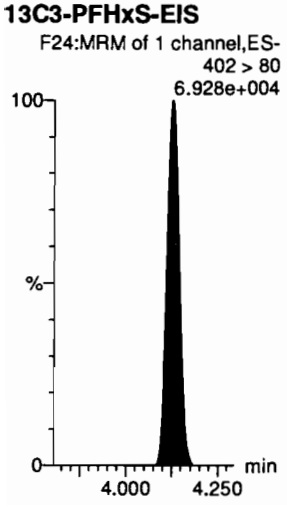


7:3 FTCA

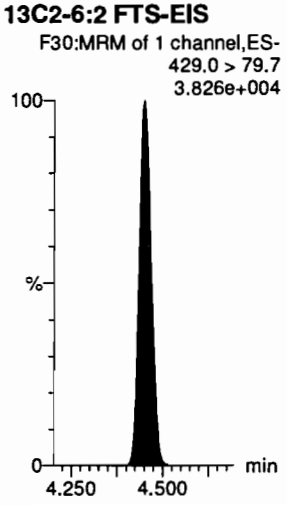




13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



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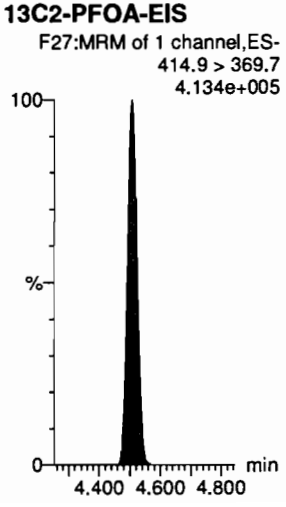

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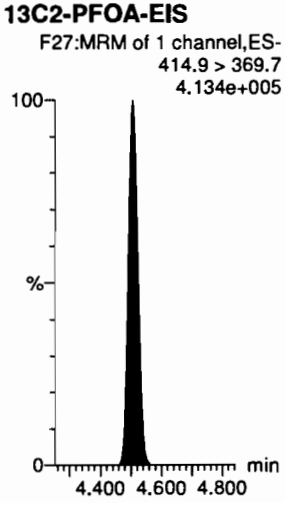
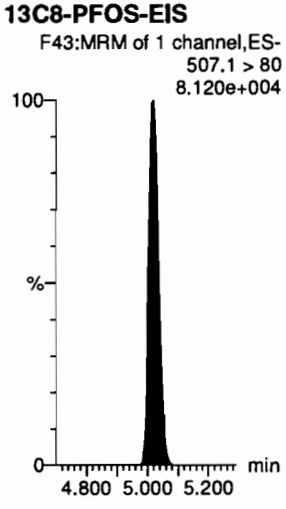
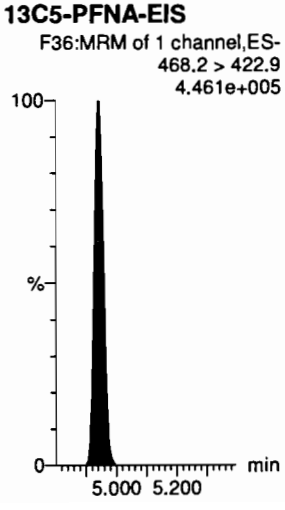


13C8-PFOS-EIS



13C5-PFNA-EIS



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Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

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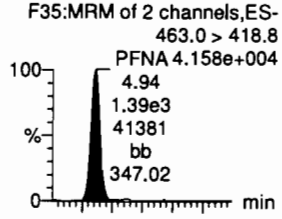

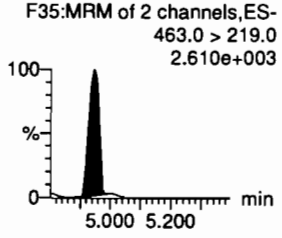

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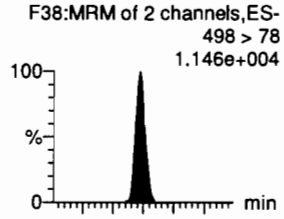

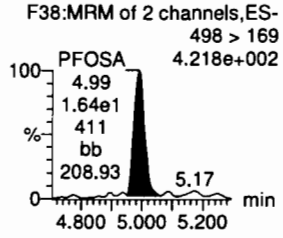

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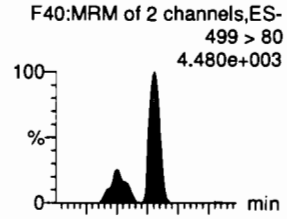
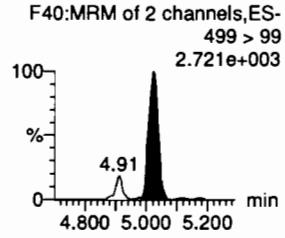
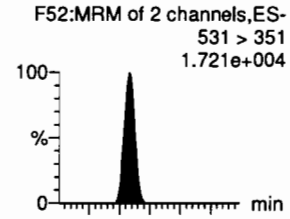
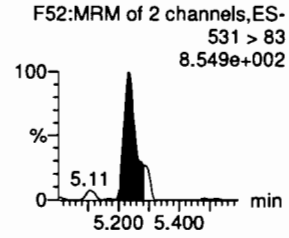




9Cl-PF30NS





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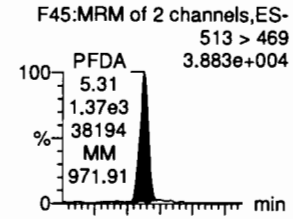
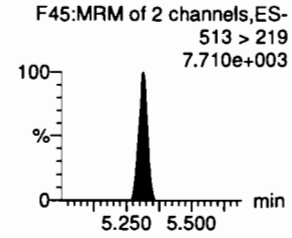
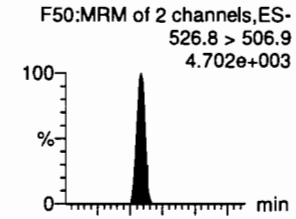
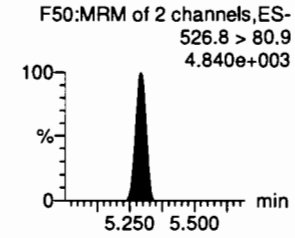


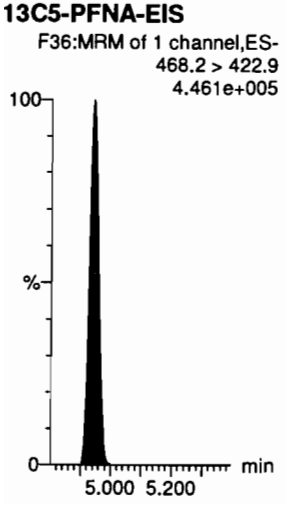


8:2 FTS

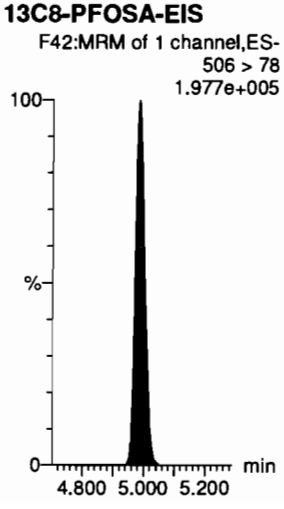




13C5-PFNA-EIS



13C8-PFOSA-EIS



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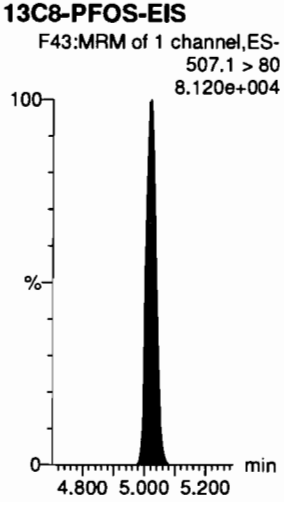

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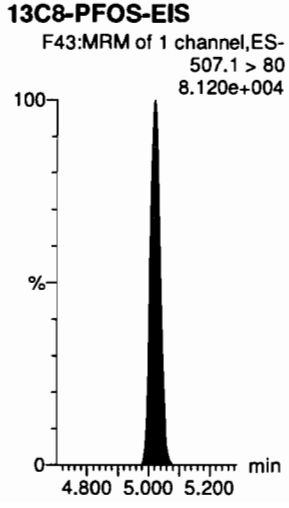
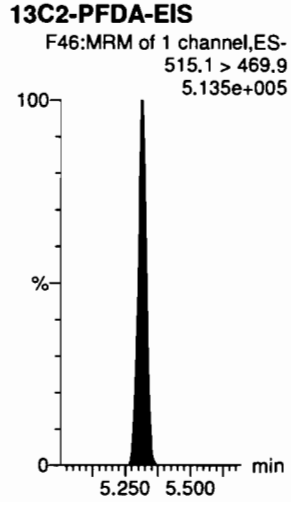
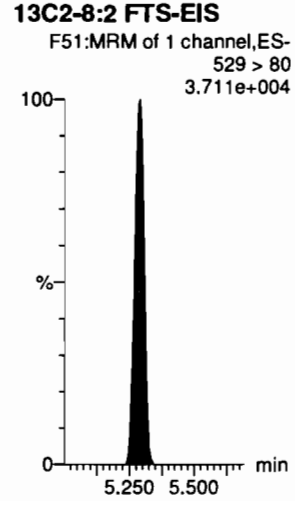


13C2-PFDA-EIS



13C2-8:2 FTS-EIS



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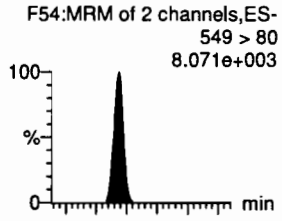
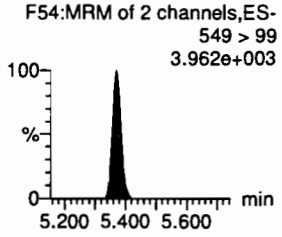
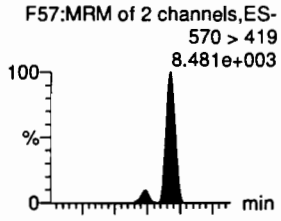
Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

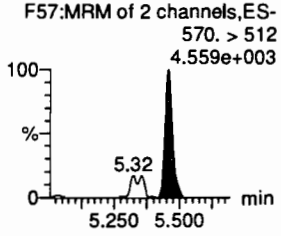
PFNS





L-MeFOSAA





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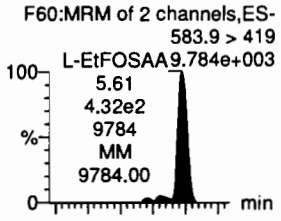

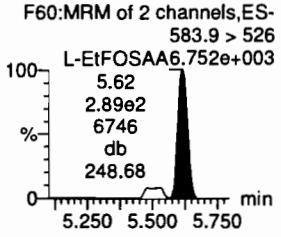

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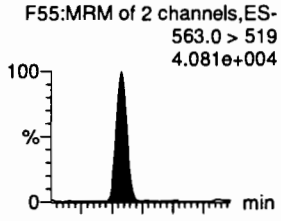

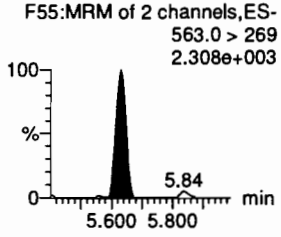

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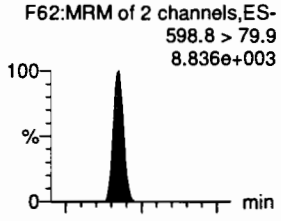

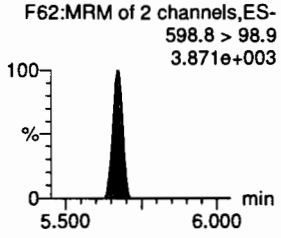

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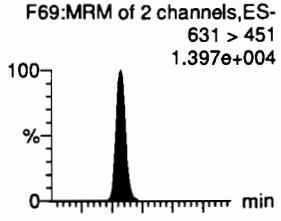
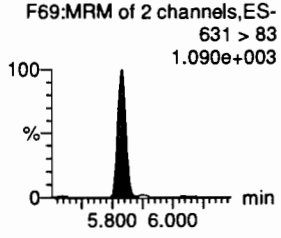
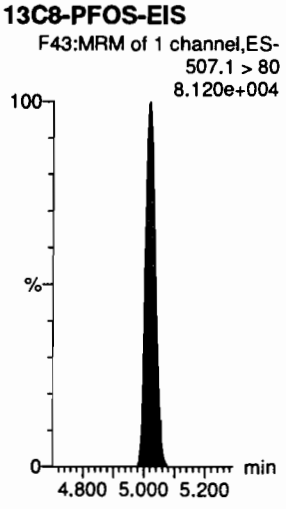




13C8-PFOS-EIS



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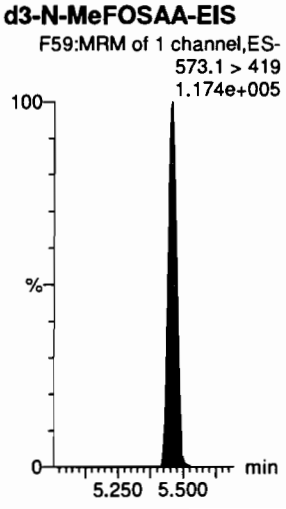

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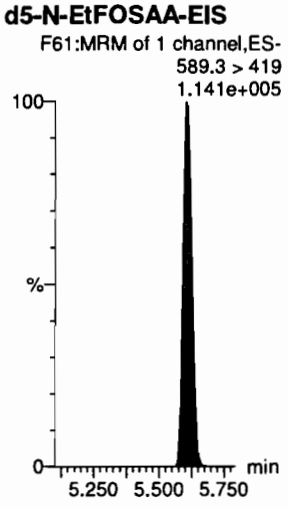
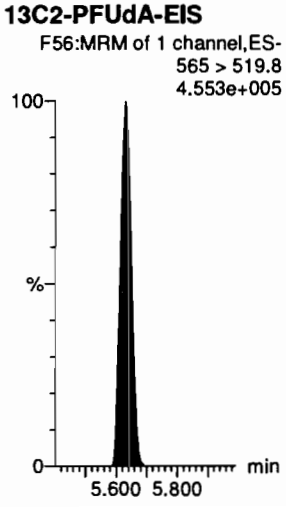


13C2-PFUdA-EIS



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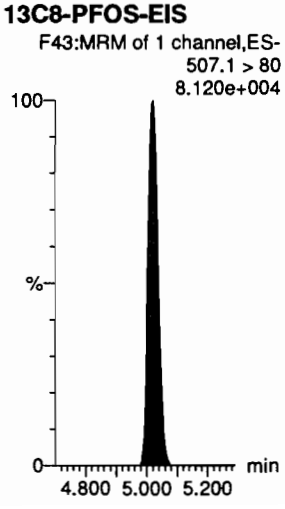

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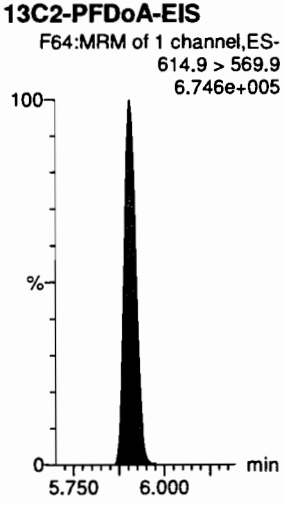

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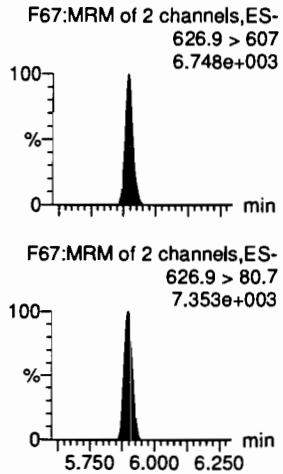
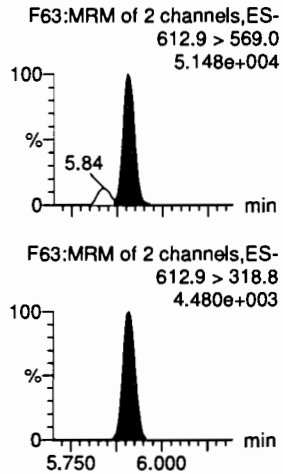
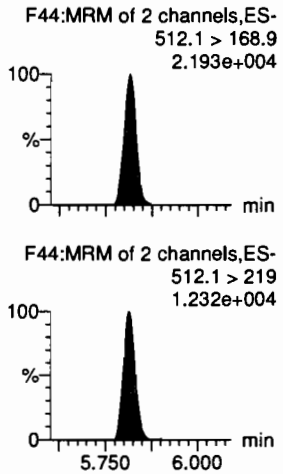
10:2 FTS



PFDoA



N-MeFOSA



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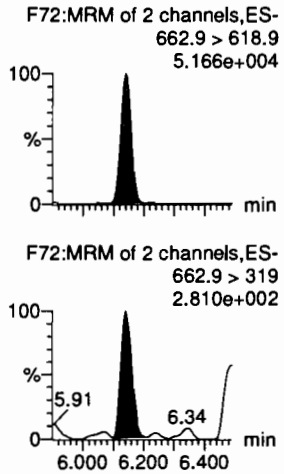
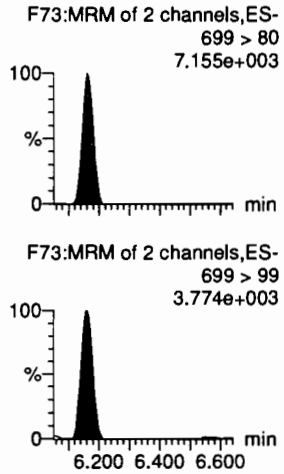
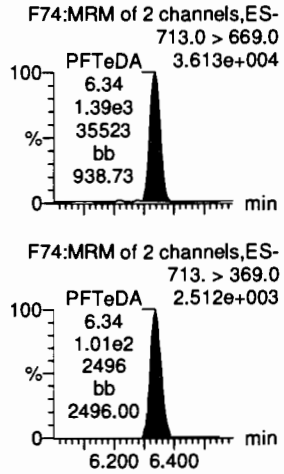


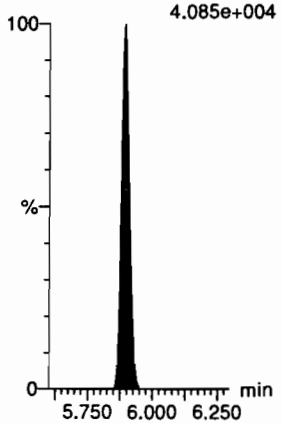
PFDoS



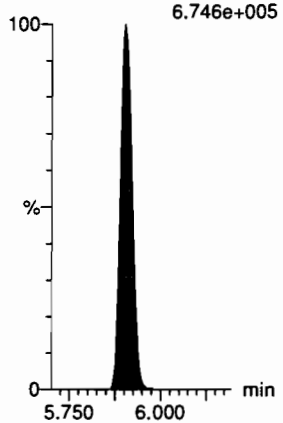
PFTeDA



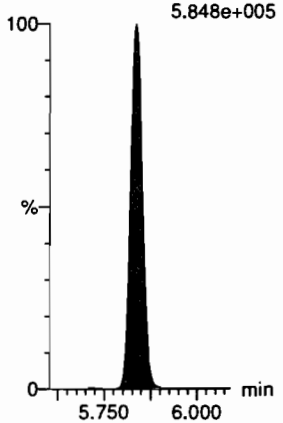
13C2-10:2 FTS-EIS



13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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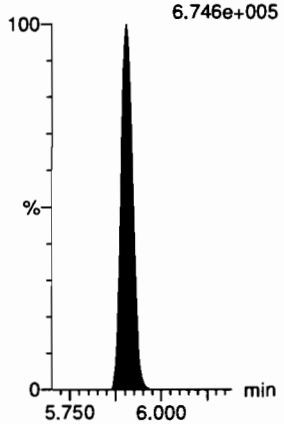
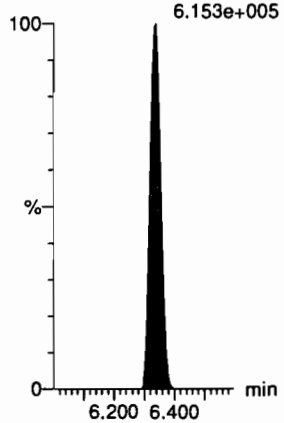
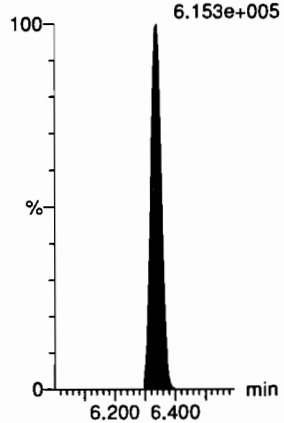


13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



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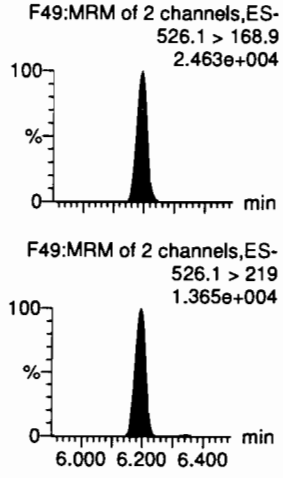
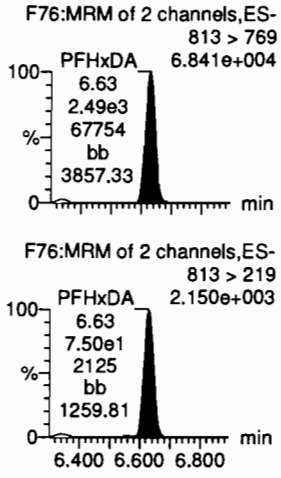
Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

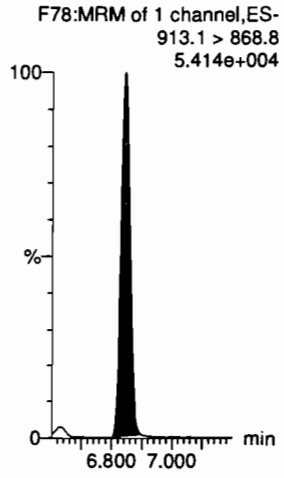
N-EtFOSA



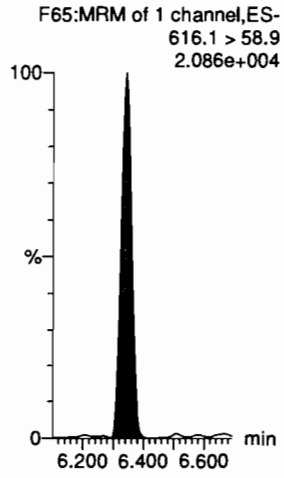
PFHxDA



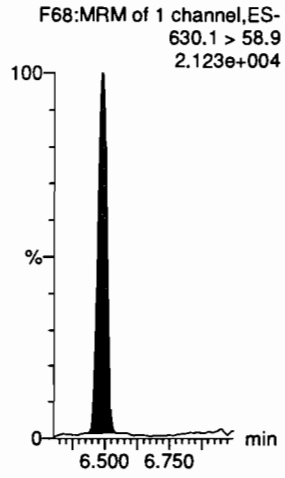
PFODA



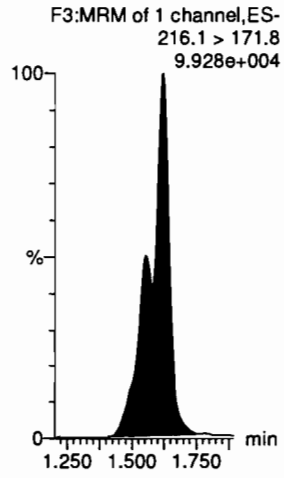
N-MeFOSE



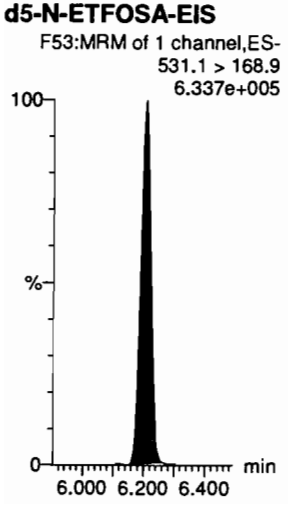
N-EtFOSE



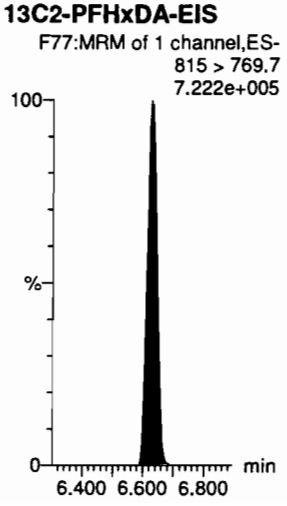
13C3-PFBA-RSD



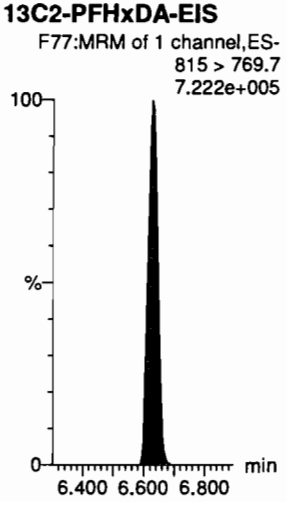
d5-N-ETFOSA-EIS



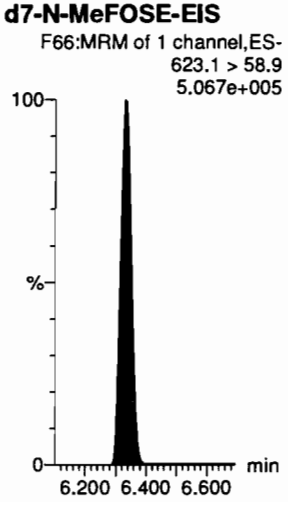
13C2-PFHxDA-EIS



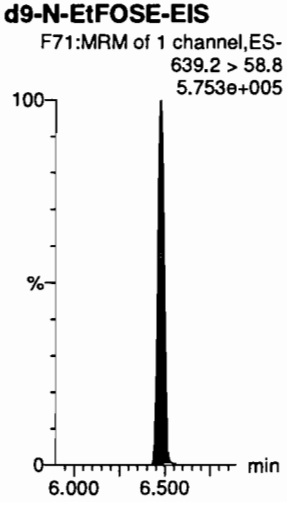
13C2-PFHxDA-EIS



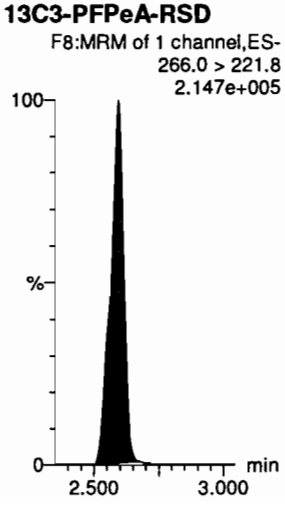
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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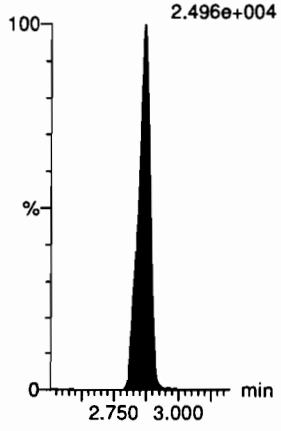
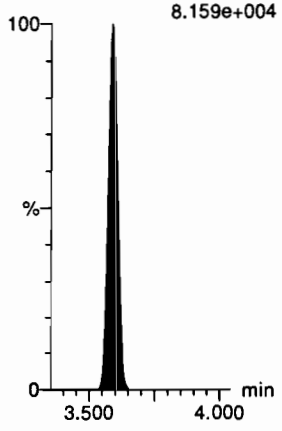
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

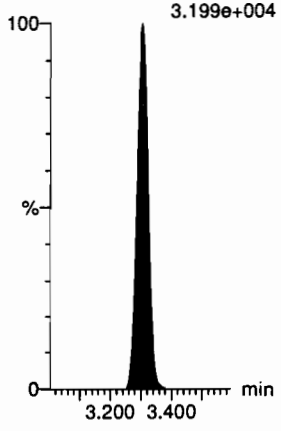
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.496e+004



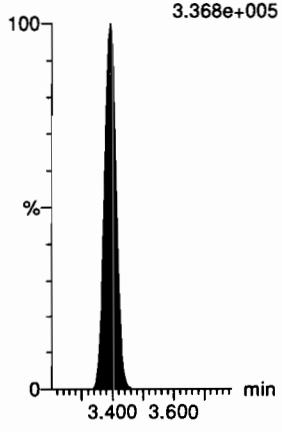
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.159e+004



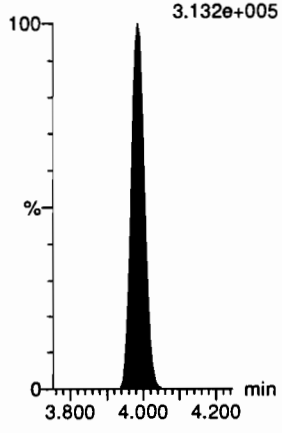
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.199e+004



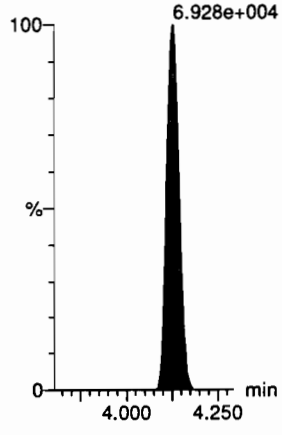
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.368e+005



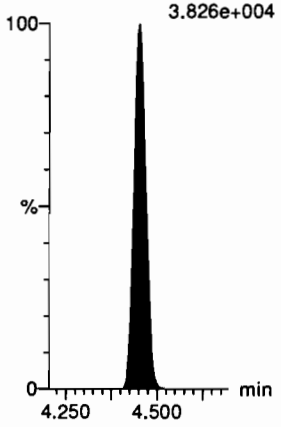
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.132e+005



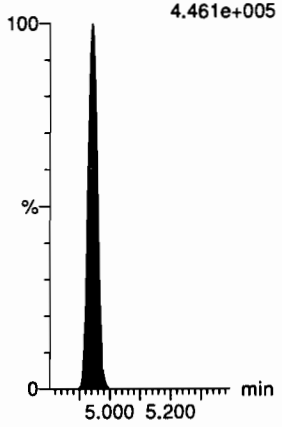
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
6.928e+004



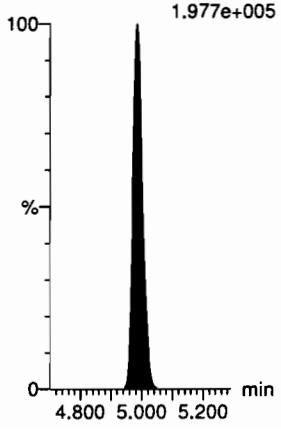
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
3.826e+004



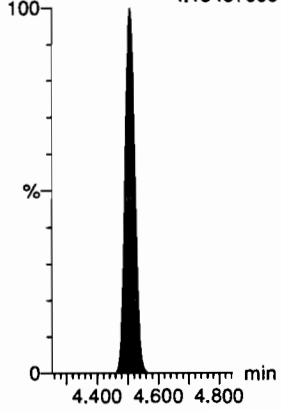
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.461e+005



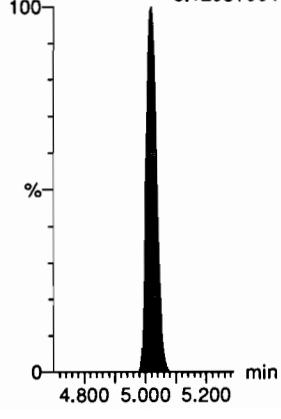
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
1.977e+005



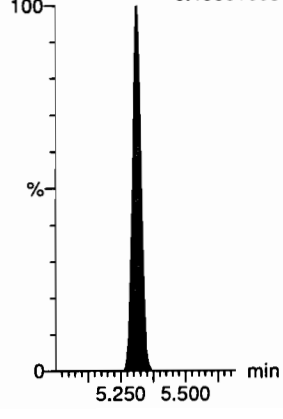
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
4.134e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
8.120e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.135e+005



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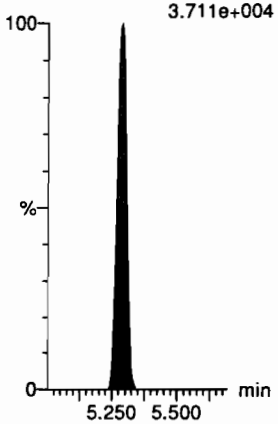
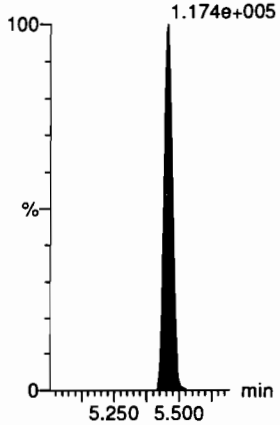
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

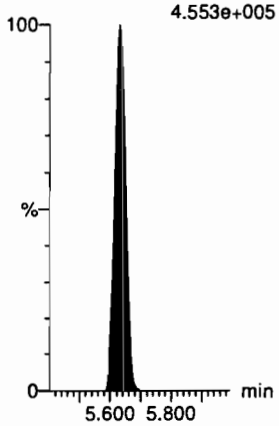
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.711e+004



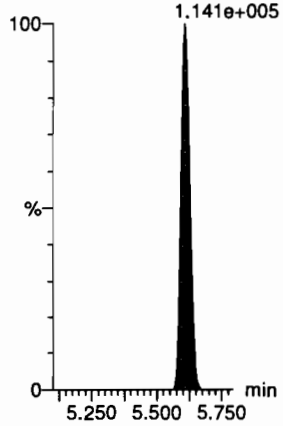
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.174e+005



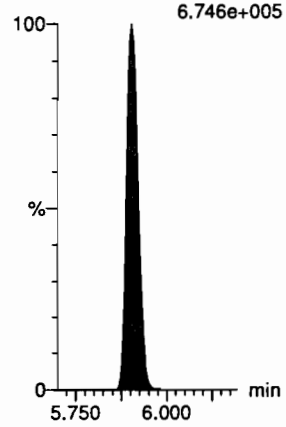
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.553e+005



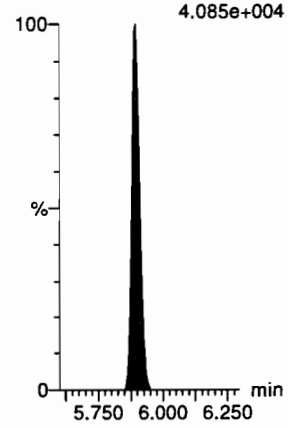
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.141e+005



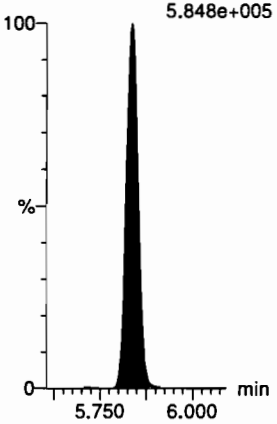
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.746e+005



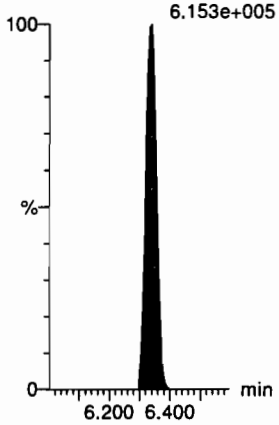
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
4.085e+004



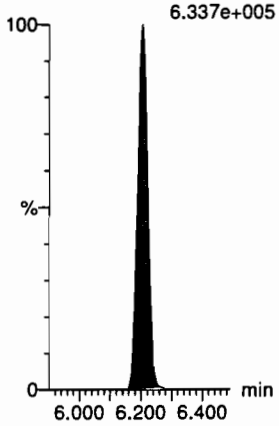
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.848e+005



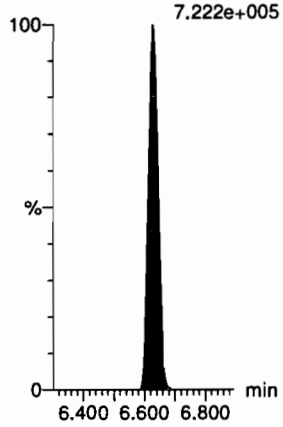
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.153e+005



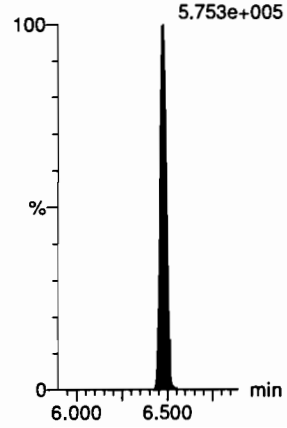
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.337e+005



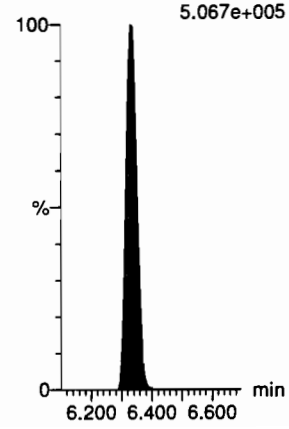
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.222e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.753e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.067e+005



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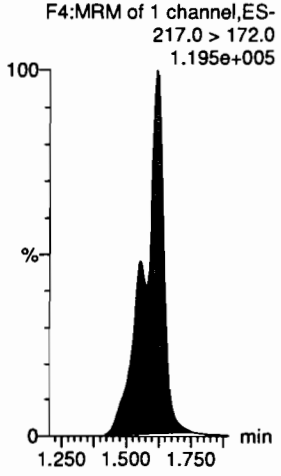
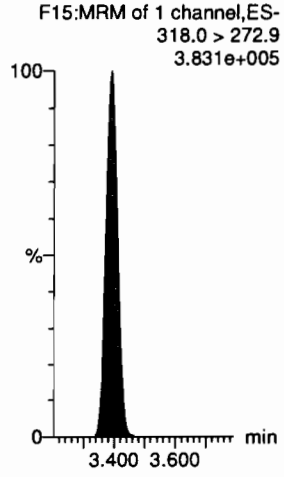
Name: 200706P1-21, Date: 06-Jul-2020, Time: 13:34:57, ID: ST200706P1-3 PFC CS0 20F1903, Description: PFC CS0 20F1903

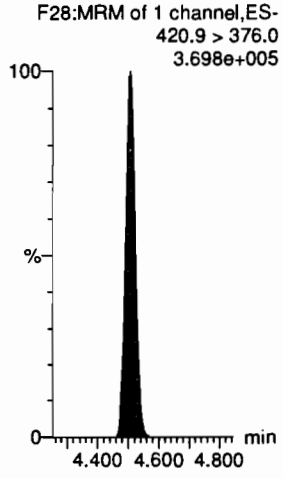
13C4-PFBA



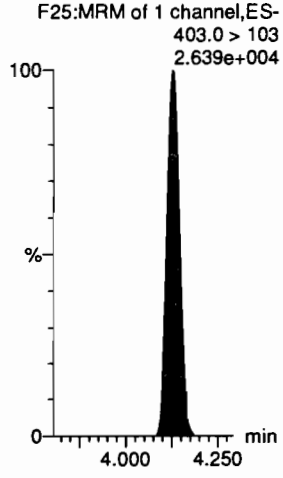
13C5-PFHxA



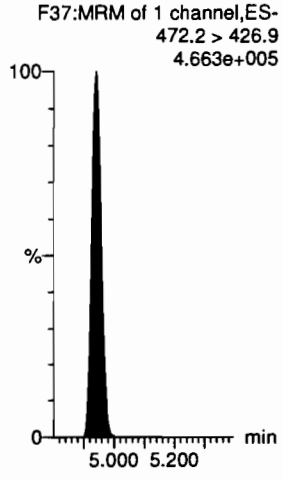
13C8-PFOA



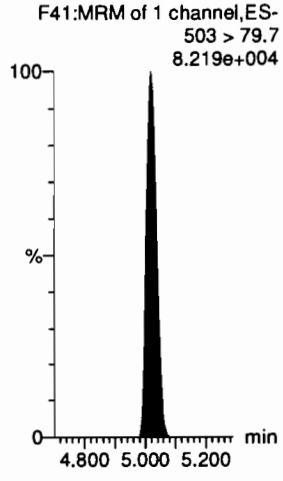
18O2-PFHxS



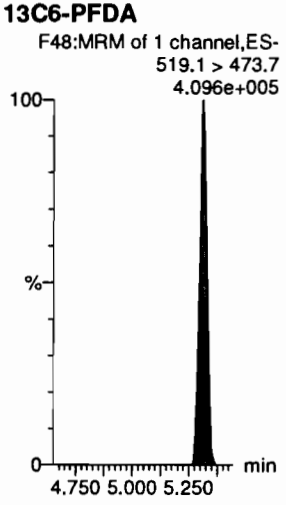
13C9-PFNA



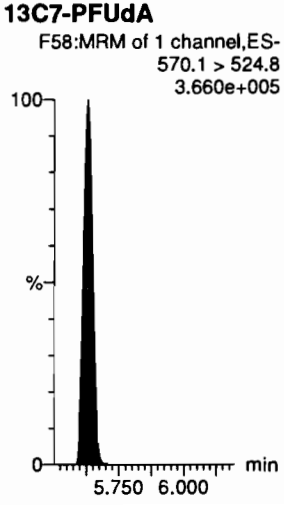
13C4-PFOS



13C6-PFDA



13C7-PFUdA

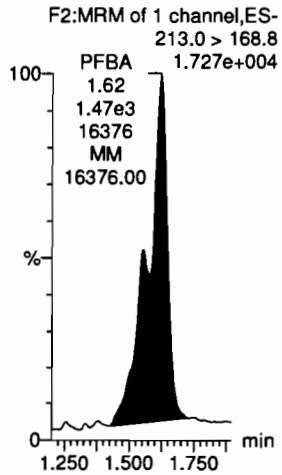


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

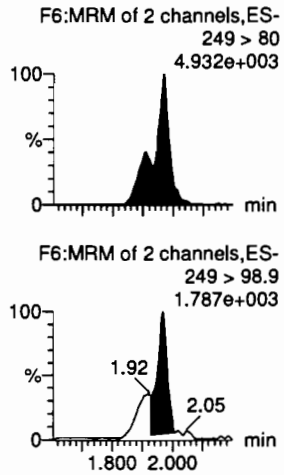
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

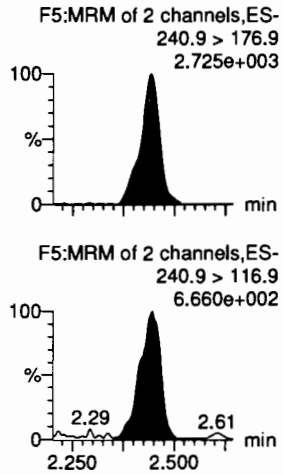
PFBA



PFPrS



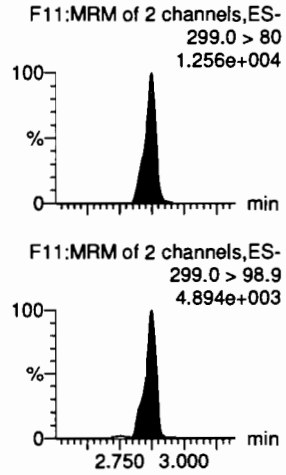
3:3 FTCA



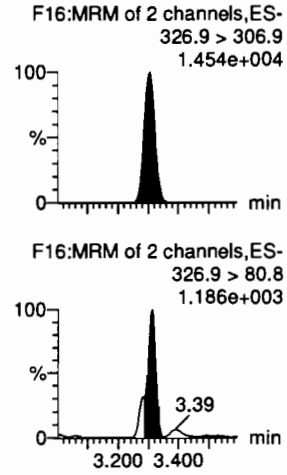
PFPeA



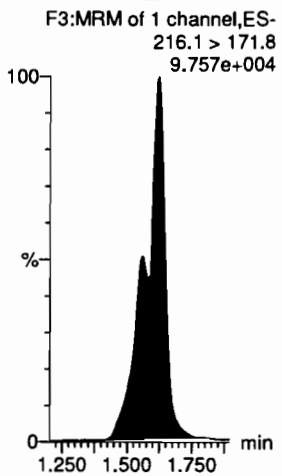
PFBS



4:2 FTS



13C3-PFBA-EIS



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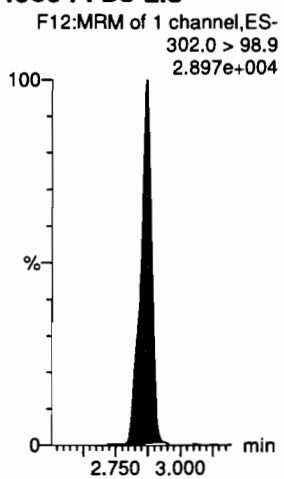

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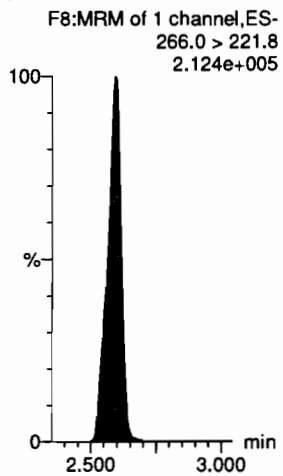

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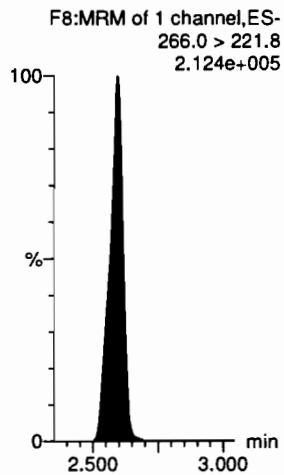

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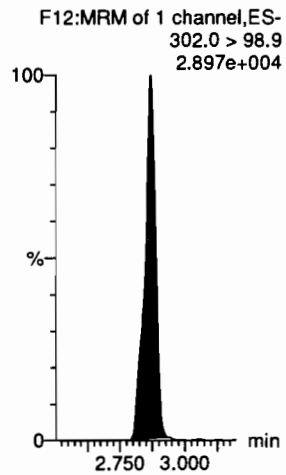
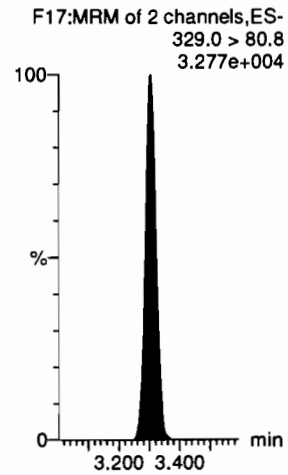


13C2-4:2 FTS-EIS



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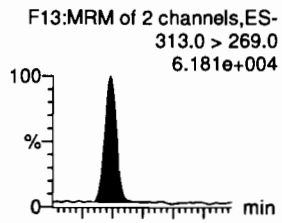
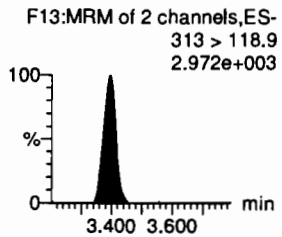
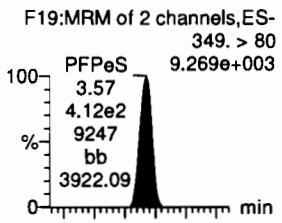
Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

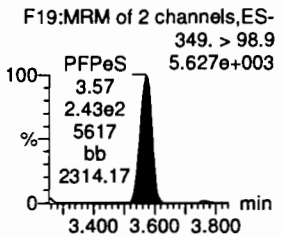
PFHxA



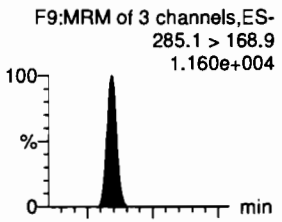


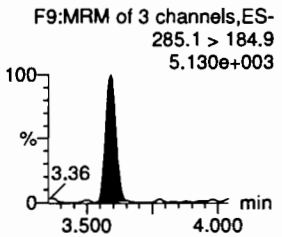
PFPeS



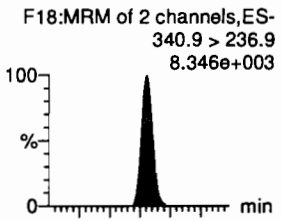


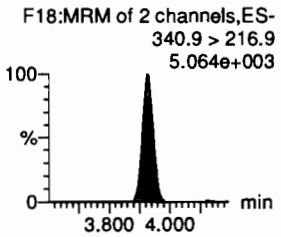
HFPO-DA



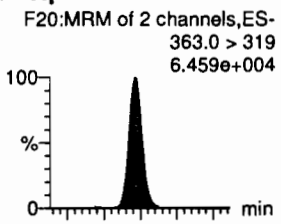


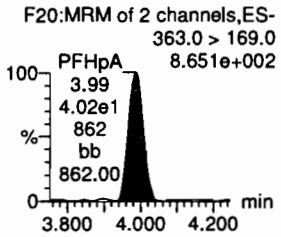
5:3 FTCA



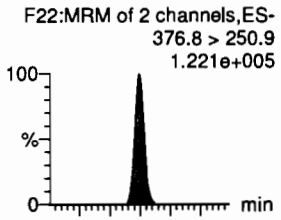


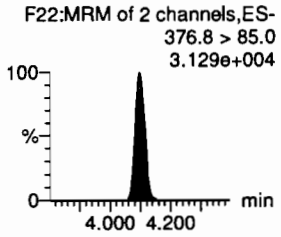
PFHpA



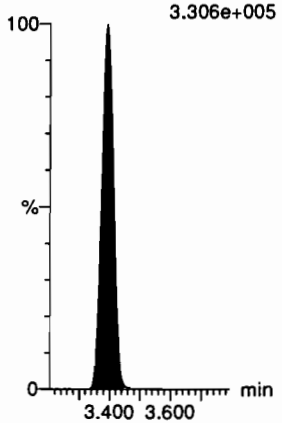


ADONA

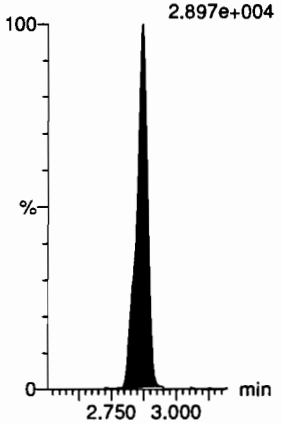




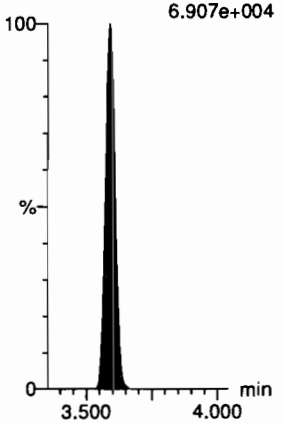
13C2-PFHxA-EIS



13C3-PFBS-EIS



13C3-HFPO-DA-EIS



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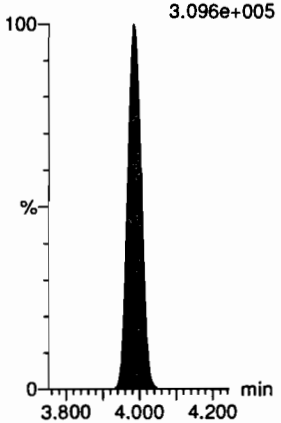

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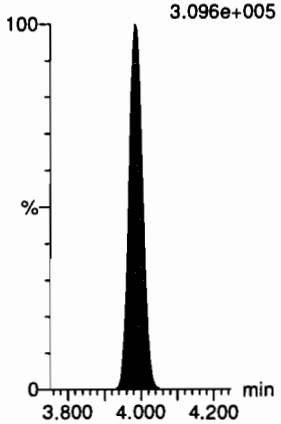

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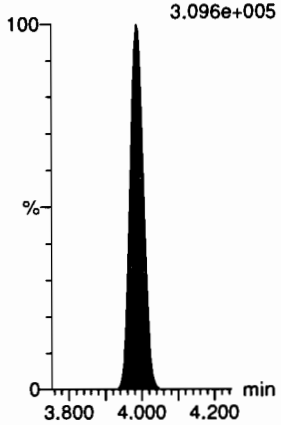

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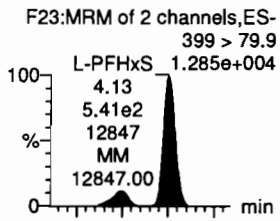
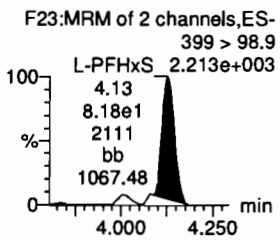
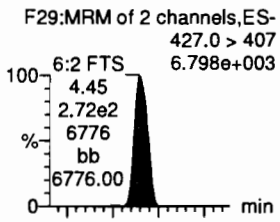
Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

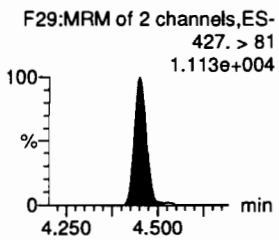
L-PFHxS



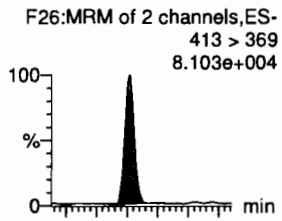


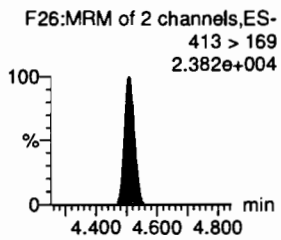
6:2 FTS



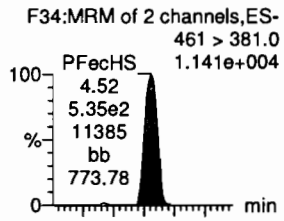


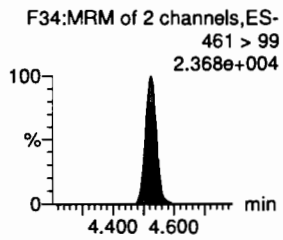
L-PFOA



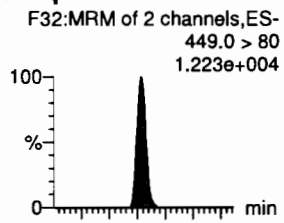


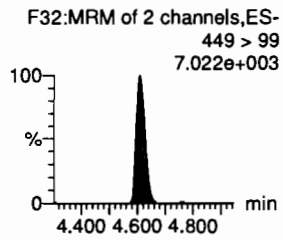
PFEChS



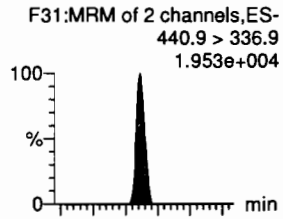


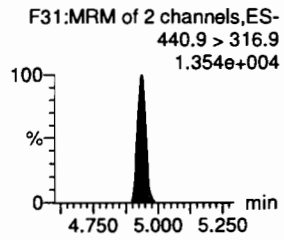
PFHpS



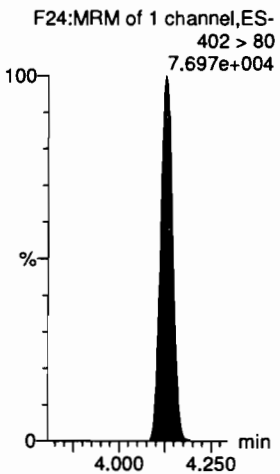


7:3 FTCA

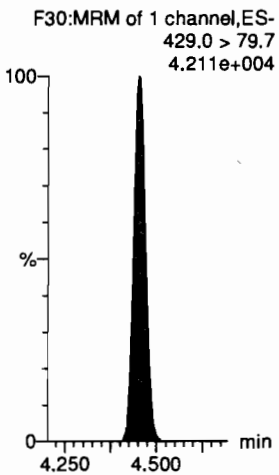




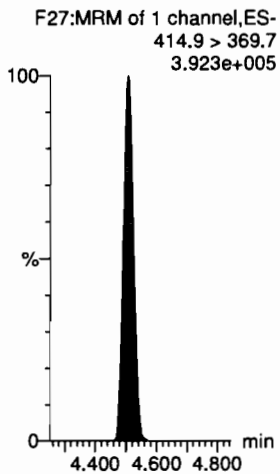
13C3-PFHxS-EIS



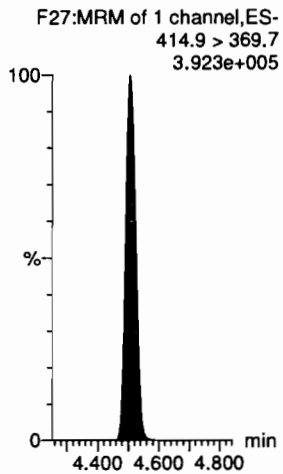
13C2-6:2 FTS-EIS



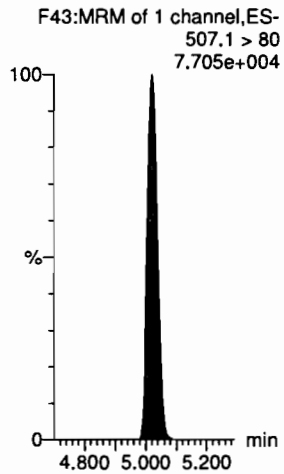
13C2-PFOA-EIS



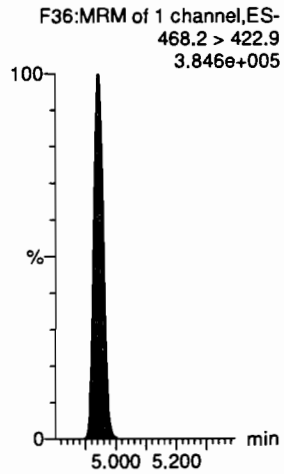
13C2-PFOA-EIS



13C8-PFOS-EIS



13C5-PFNA-EIS



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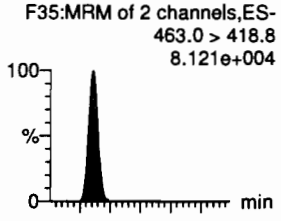
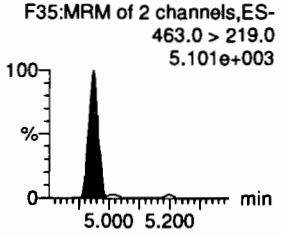
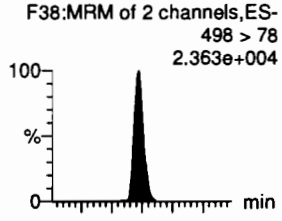
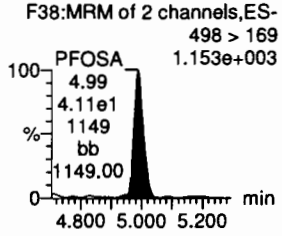
PFNA



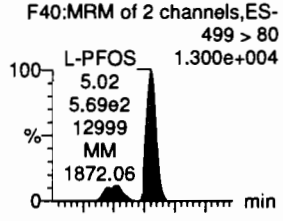


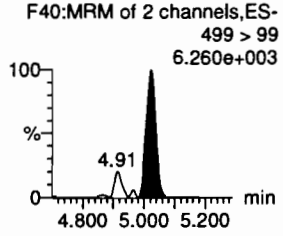
PFOSA





L-PFOS





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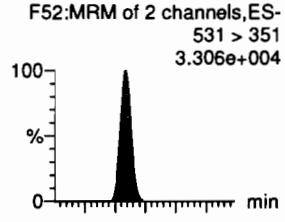

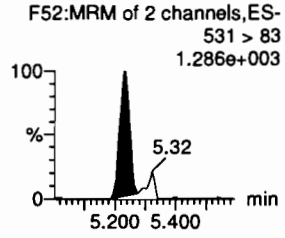

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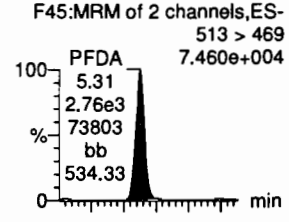
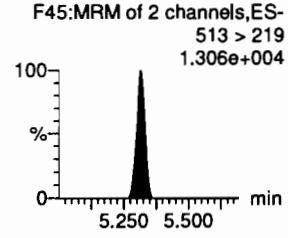
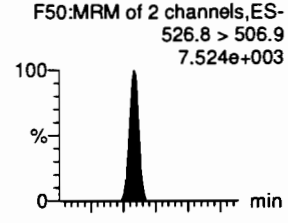
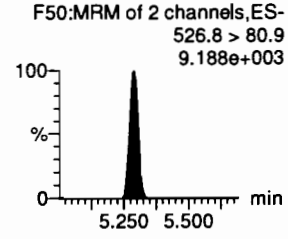


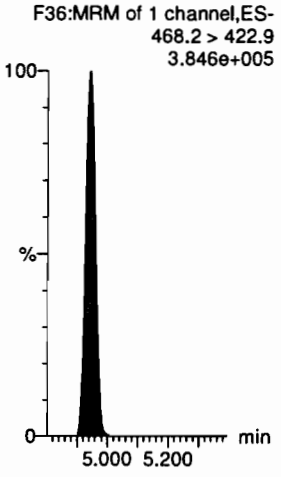


8:2 FTS

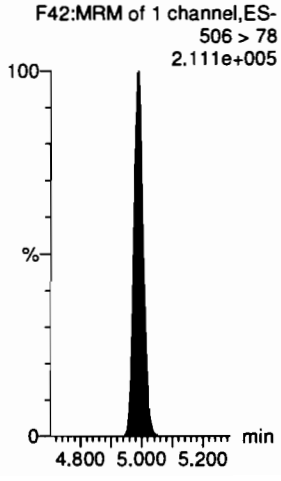




13C5-PFNA-EIS



13C8-PFOSA-EIS



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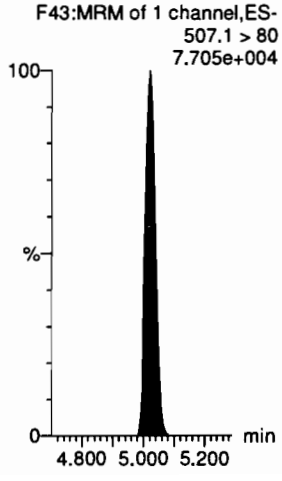

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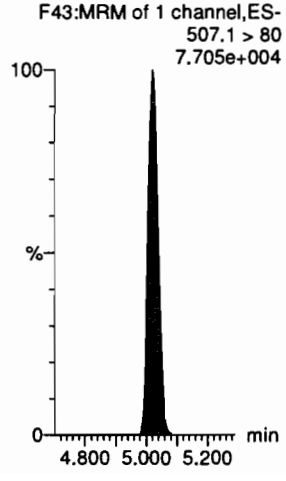

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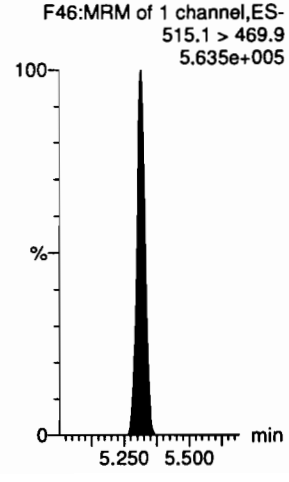

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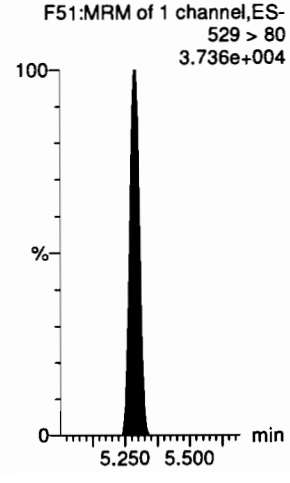

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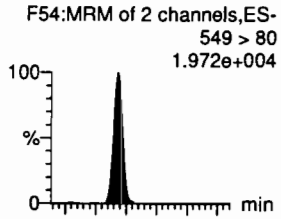
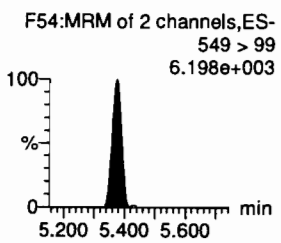
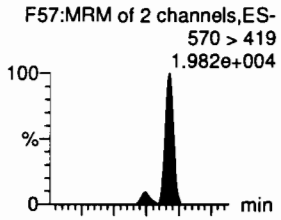
Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

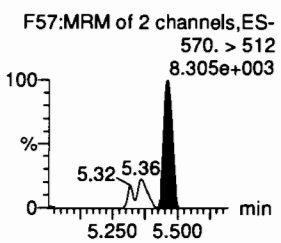
PFNS





L-MeFOSAA





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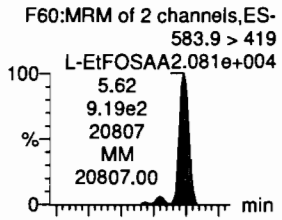

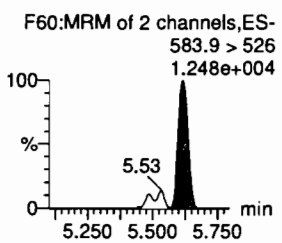

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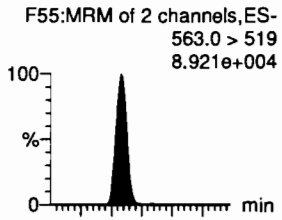

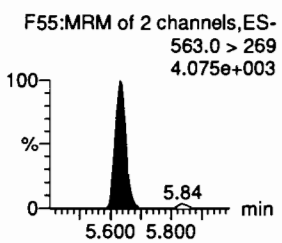

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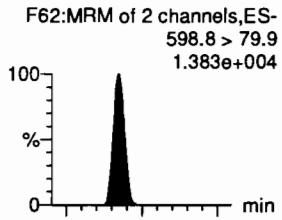

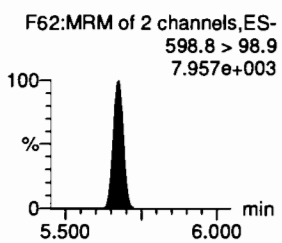

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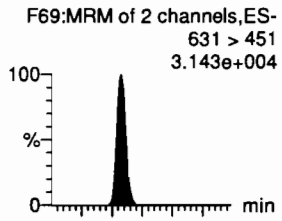
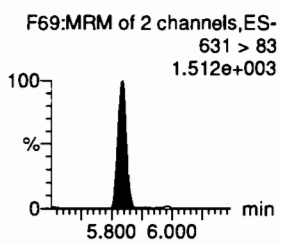
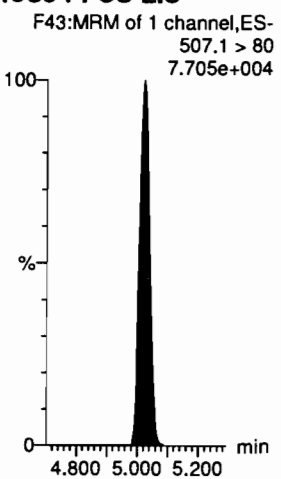




13C8-PFOS-EIS



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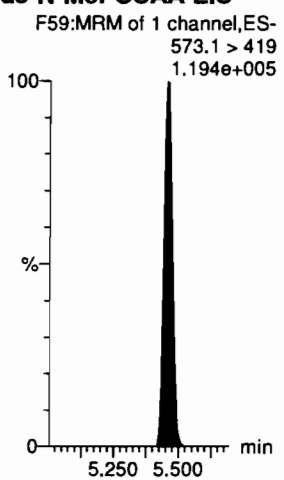

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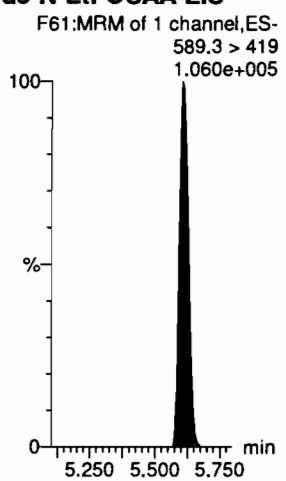

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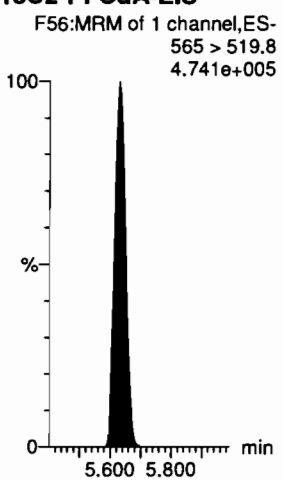

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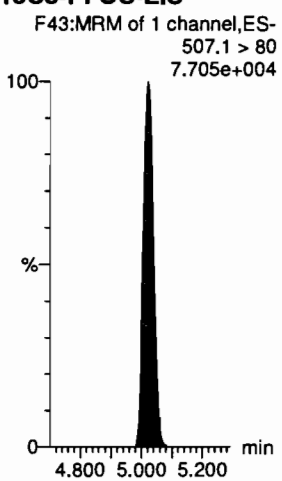

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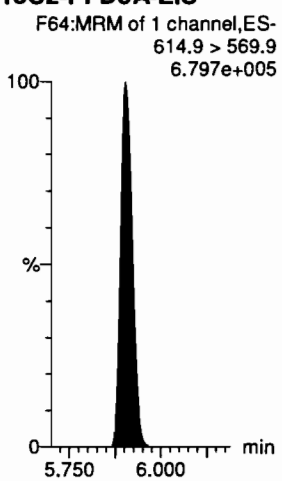

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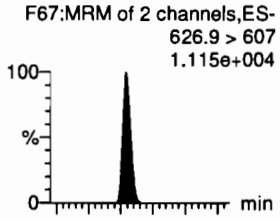
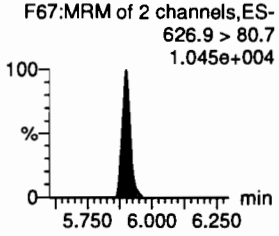
10:2 FTS





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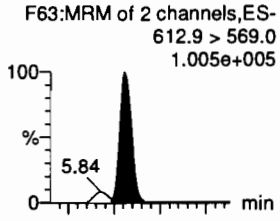
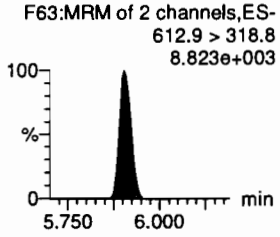
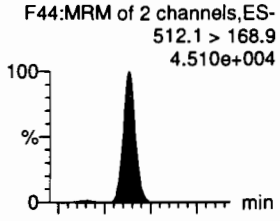
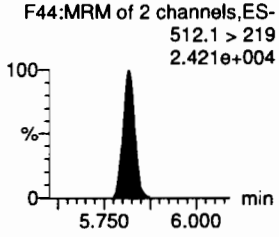




N-MeFOSA





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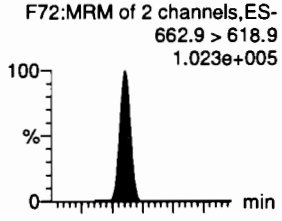

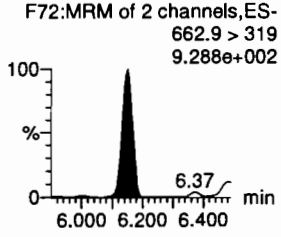

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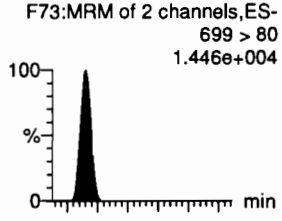

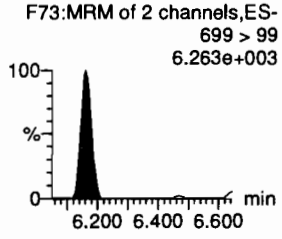

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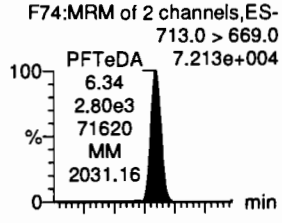

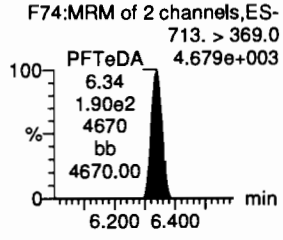

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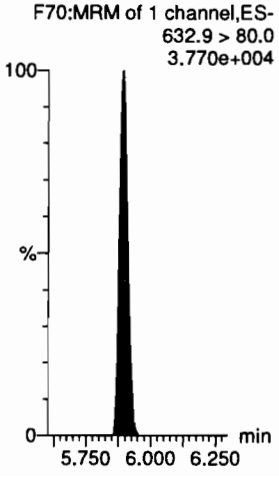
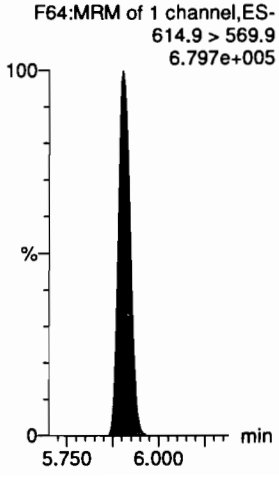
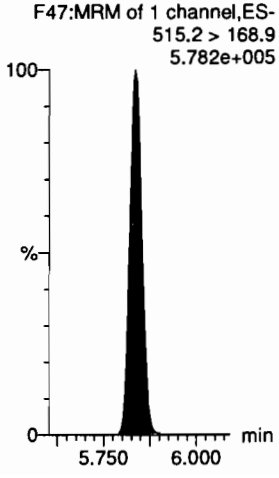


13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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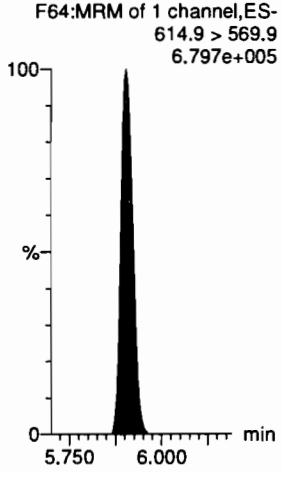

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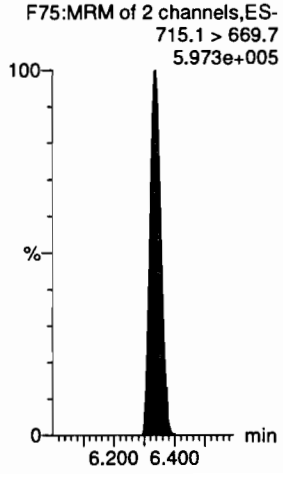

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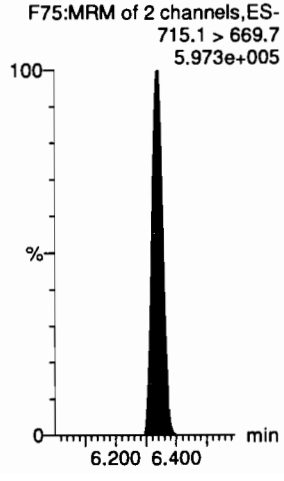

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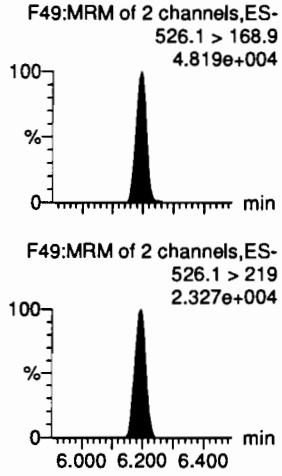
N-EtFOSA



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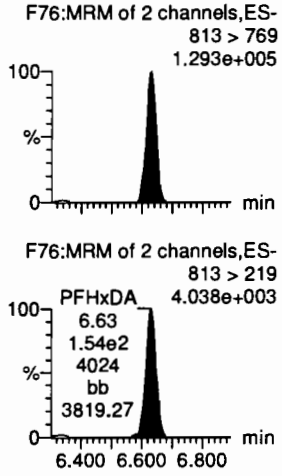

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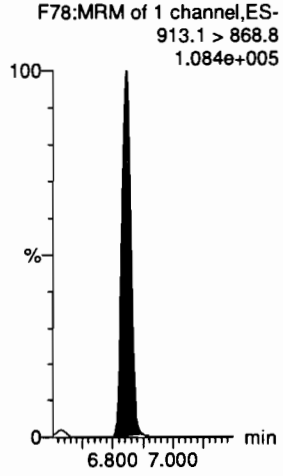
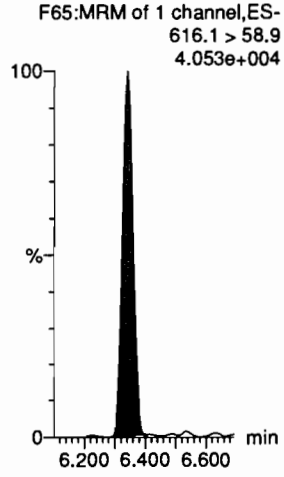
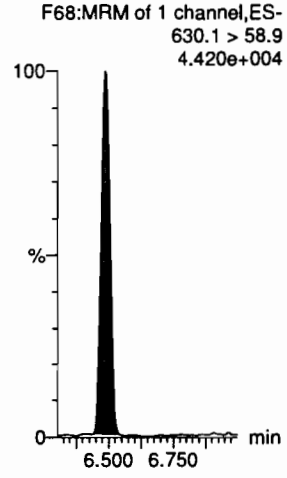


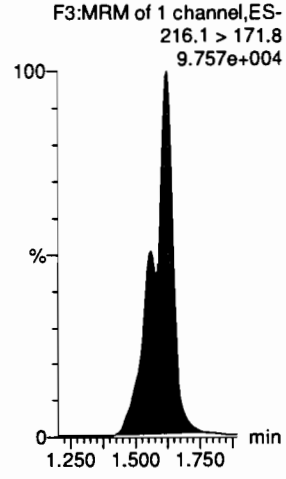
N-MeFOSE



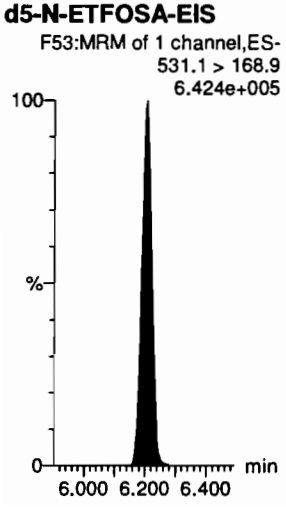
N-EtFOSE



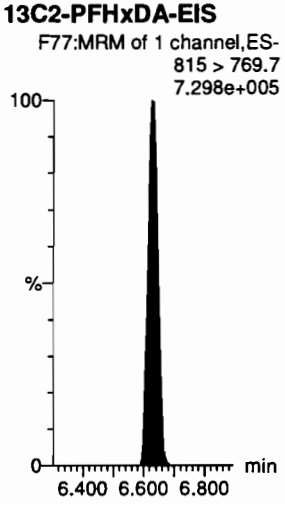
13C3-PFBA-RSD



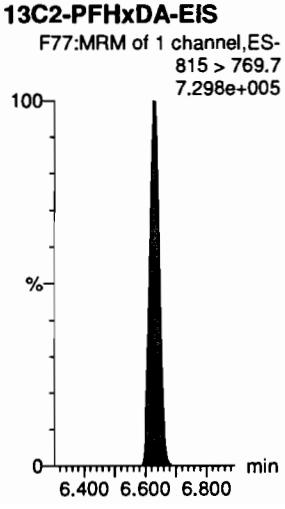
d5-N-ETFOSA-EIS



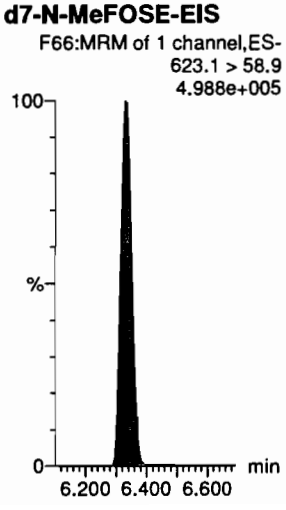
13C2-PFHxDA-EIS



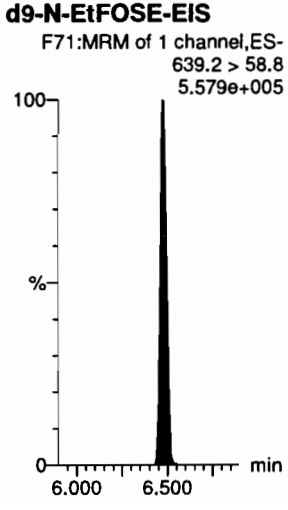
13C2-PFHxDA-EIS



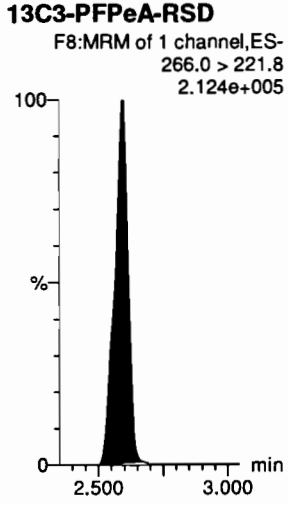
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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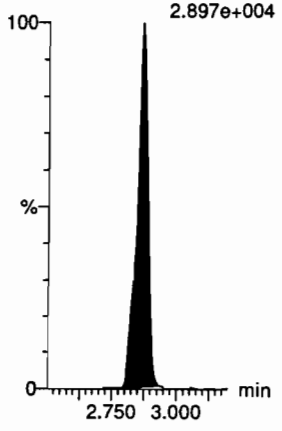
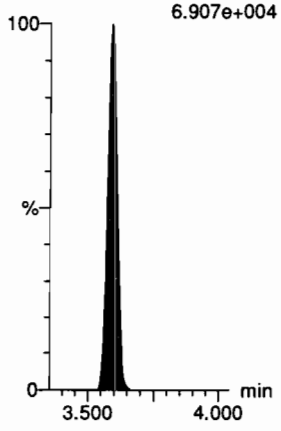
Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

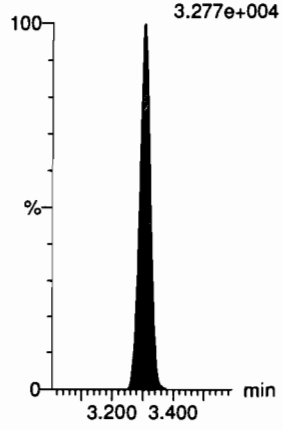
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.897e+004



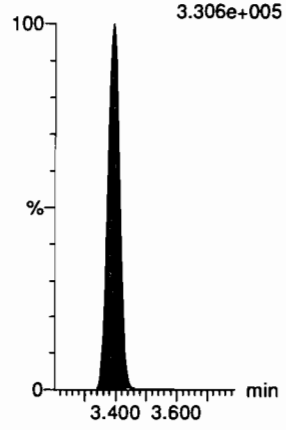
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
6.907e+004



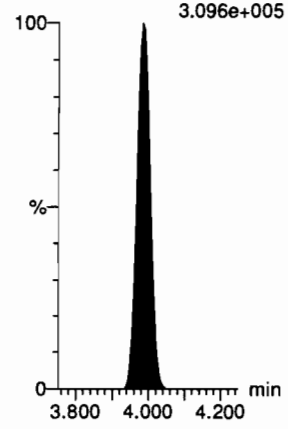
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.277e+004



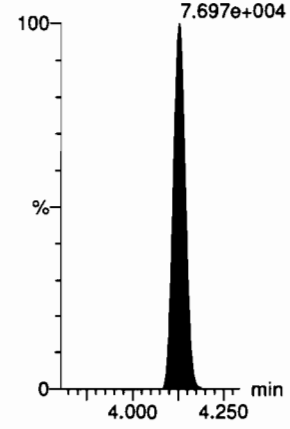
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.306e+005



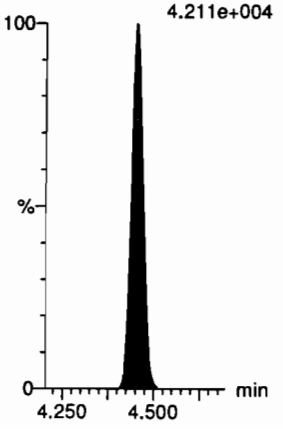
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.096e+005



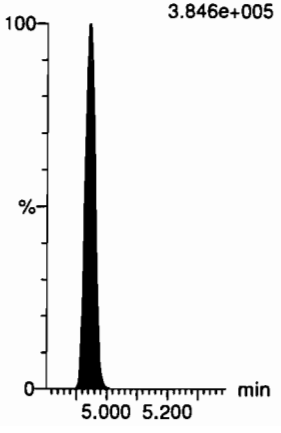
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
7.697e+004



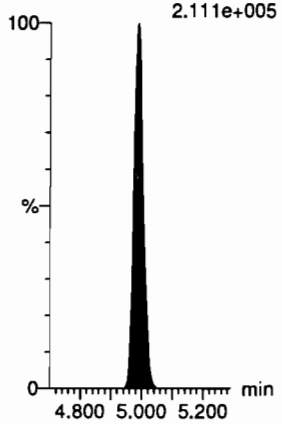
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.211e+004



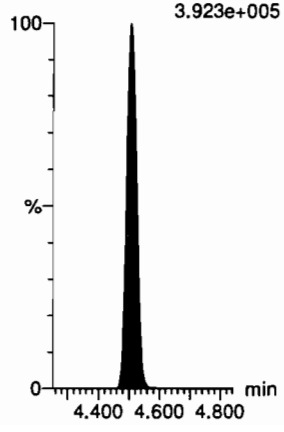
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
3.846e+005



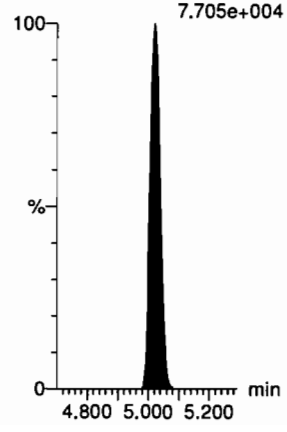
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.111e+005



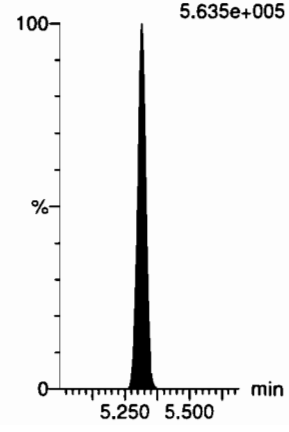
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.923e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.705e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.635e+005

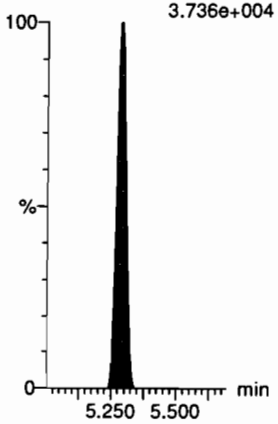


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

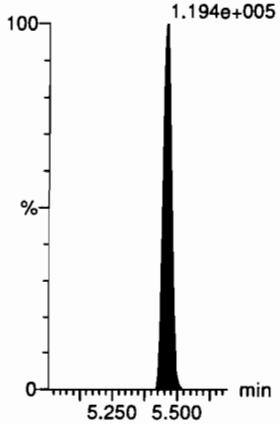
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

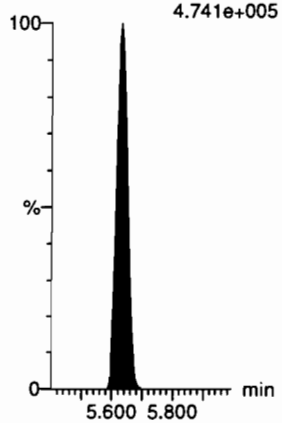
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.736e+004



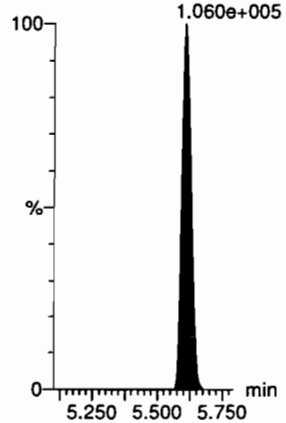
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.194e+005



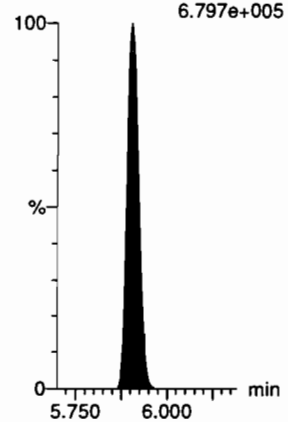
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.741e+005



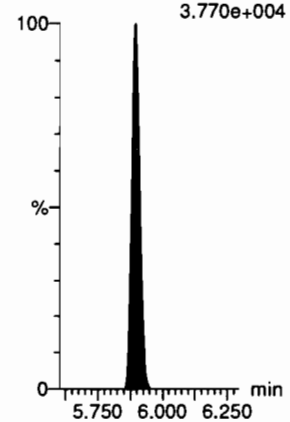
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.060e+005



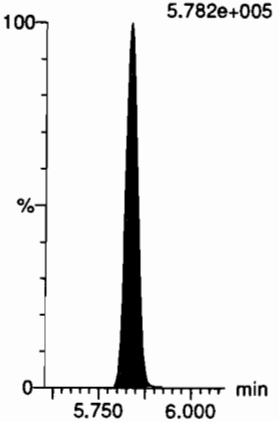
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.797e+005



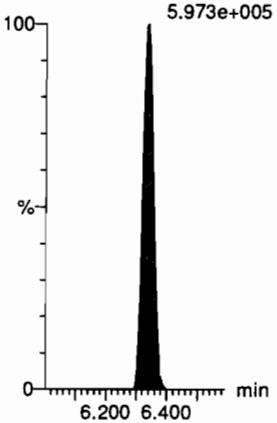
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.770e+004



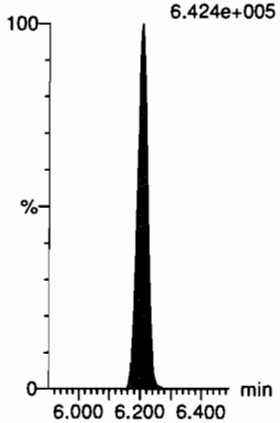
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.782e+005



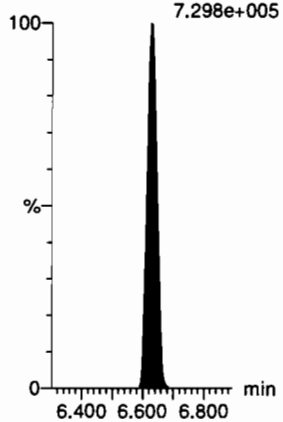
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
5.973e+005



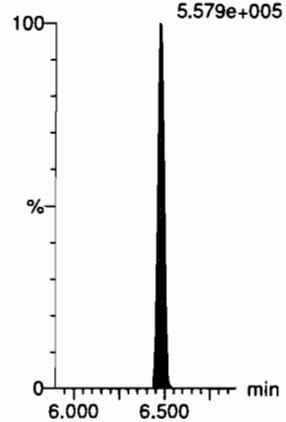
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.424e+005



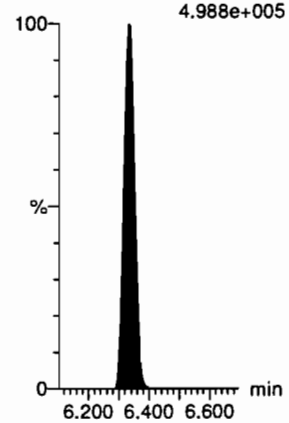
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.298e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.579e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
4.988e+005

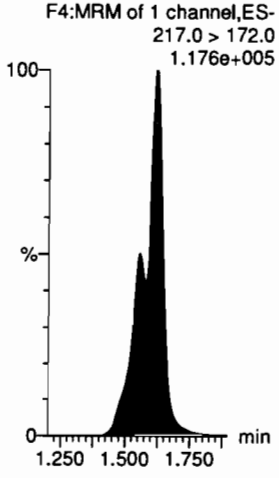


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

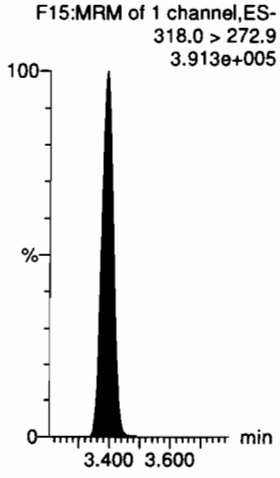
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-22, Date: 06-Jul-2020, Time: 13:45:26, ID: ST200706P1-4 PFC CS1 20F1904, Description: PFC CS1 20F1904

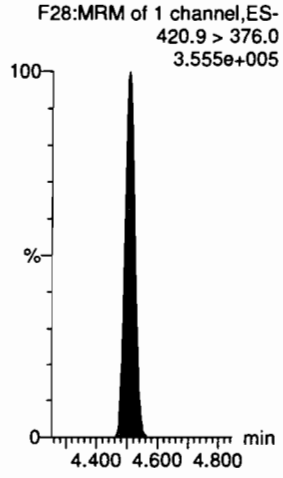
13C4-PFBA



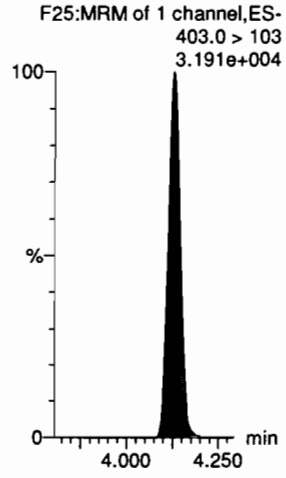
13C5-PFHxA



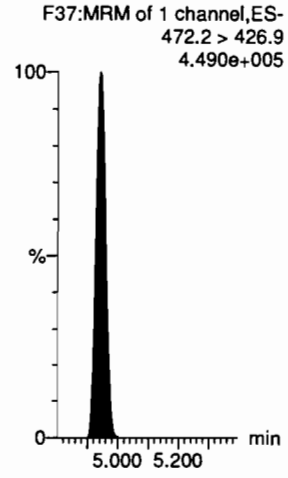
13C8-PFOA



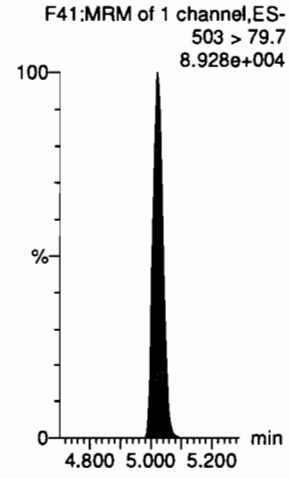
18O2-PFHxS



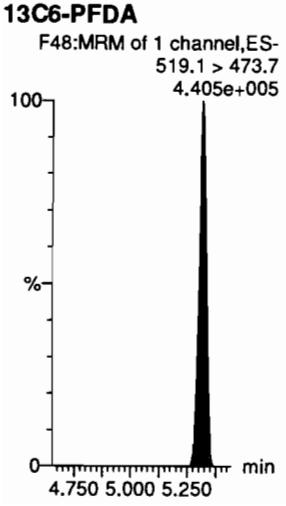
13C9-PFNA



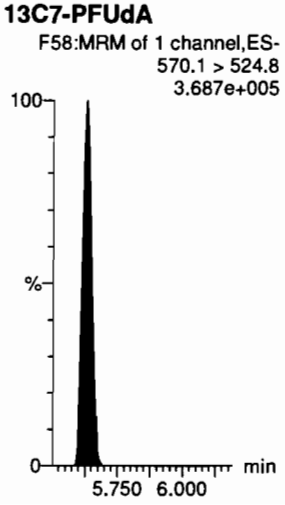
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

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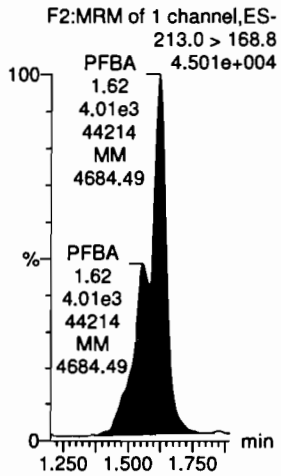
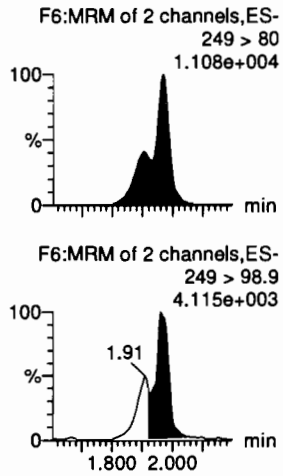
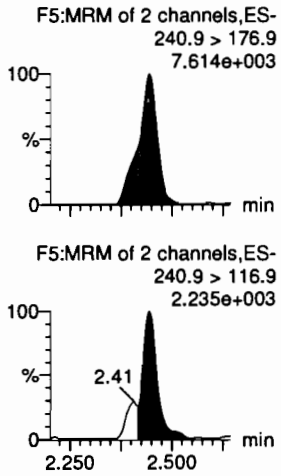
PFBA



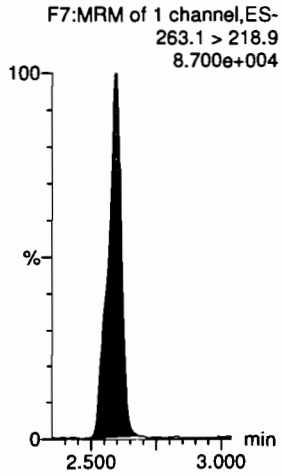
PFPrS



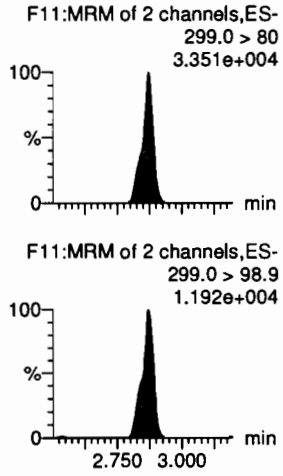
3:3 FTCA



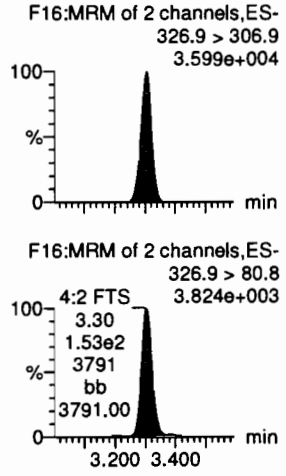
PFPeA



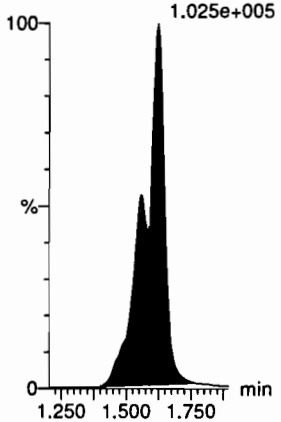
PFBS



4:2 FTS



13C3-PFBA-EIS



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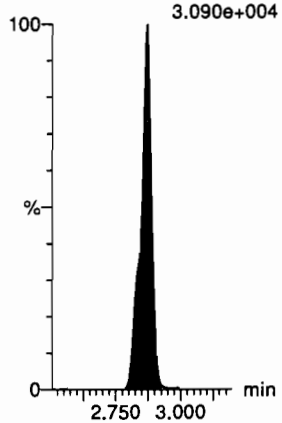
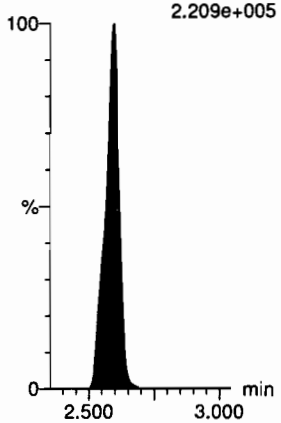


13C3-PFPeA-EIS



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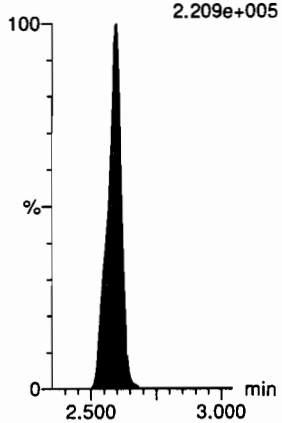

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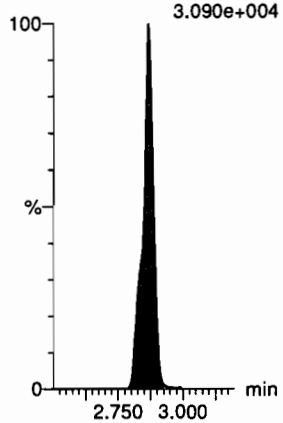

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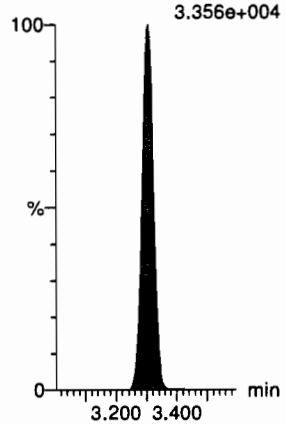

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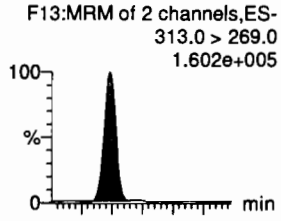
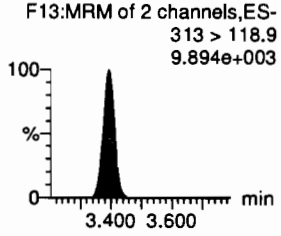
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

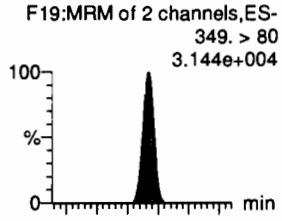
Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

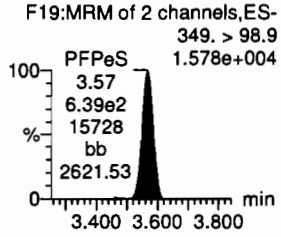
PFHxA



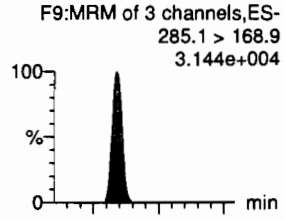


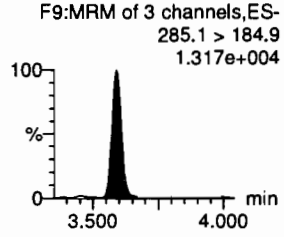
PFPeS



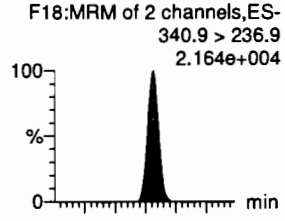


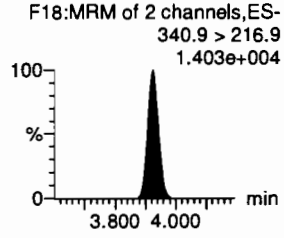
HFPO-DA





5:3 FTCA





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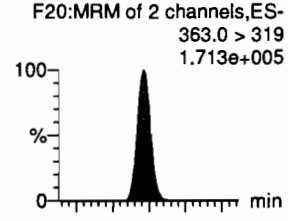

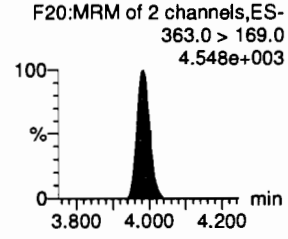

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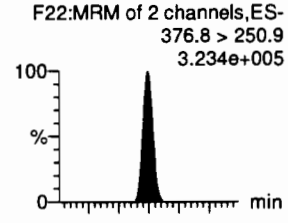

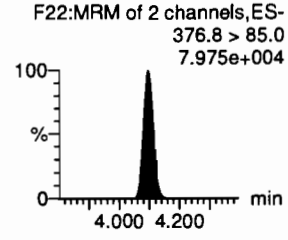

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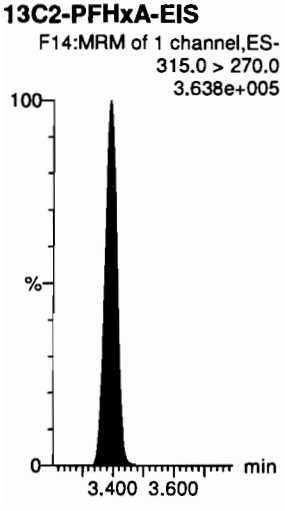
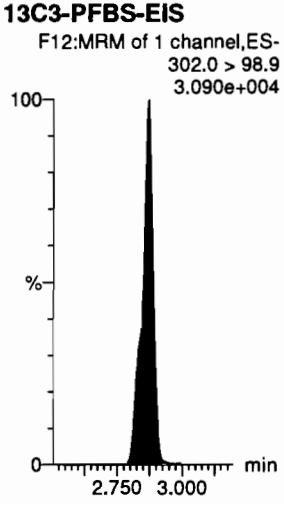


13C3-PFBS-EIS



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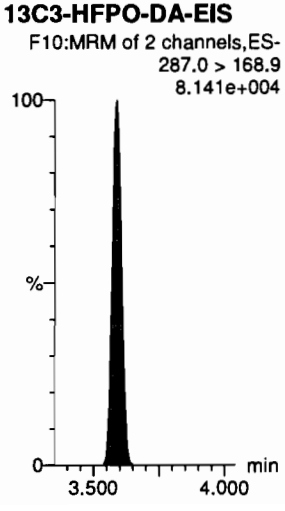

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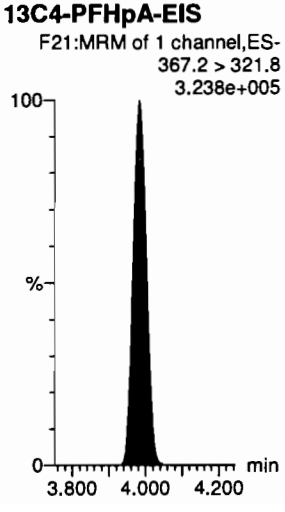

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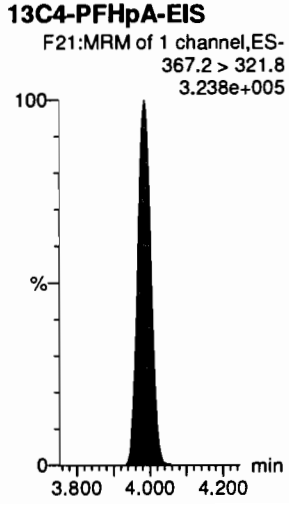

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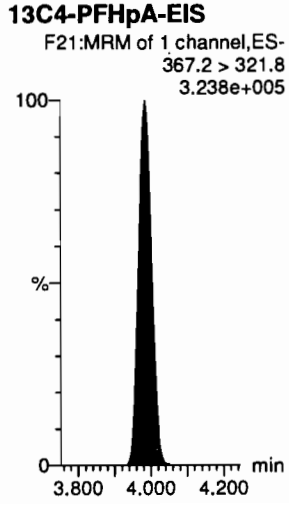

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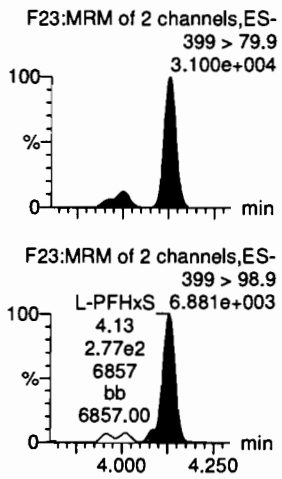
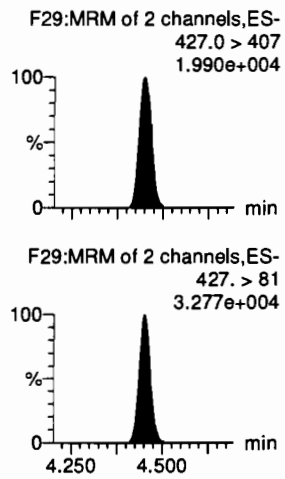
Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

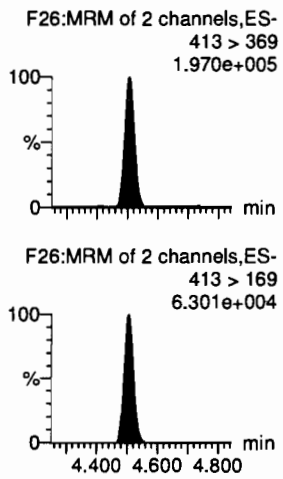
L-PFHxS



6:2 FTS



L-PFOA



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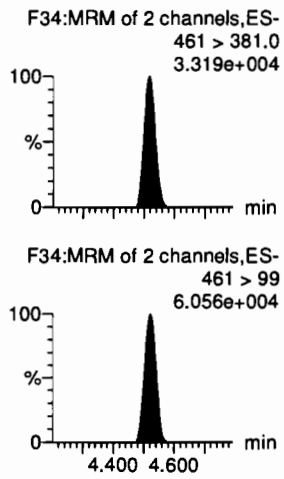

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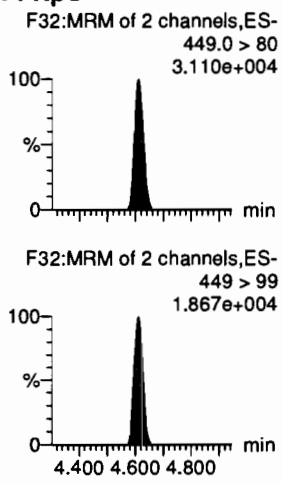
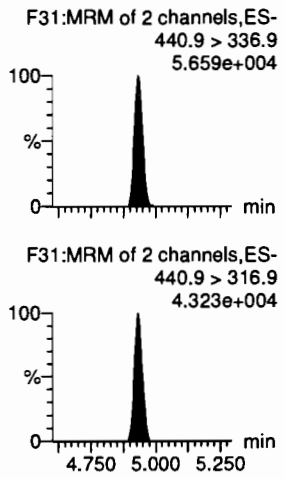


7:3 FTCA



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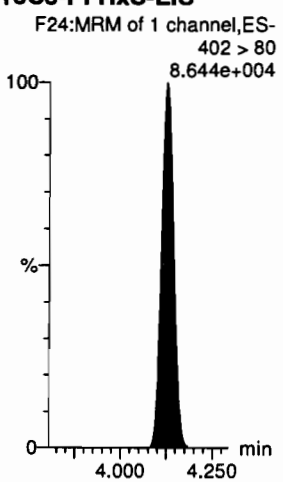

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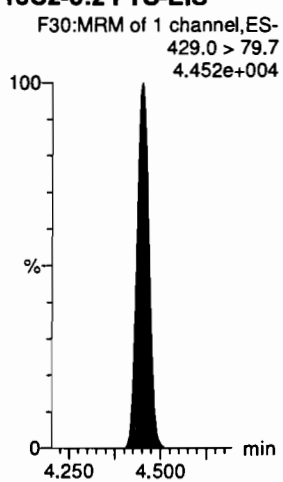

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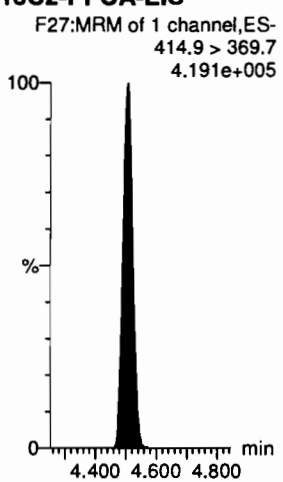

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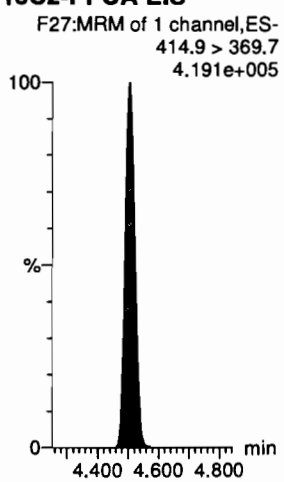

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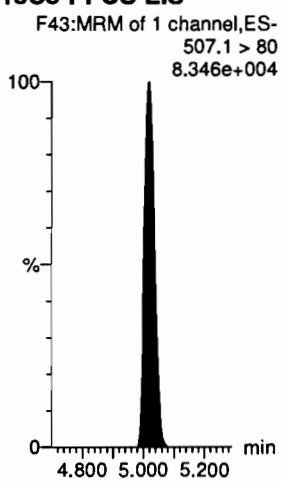
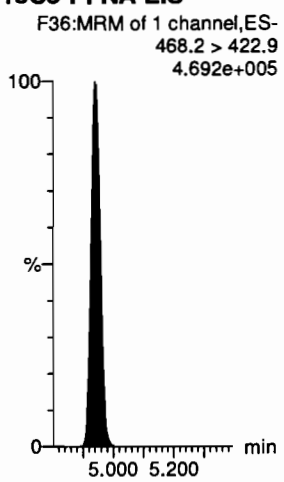


13C5-PFNA-EIS



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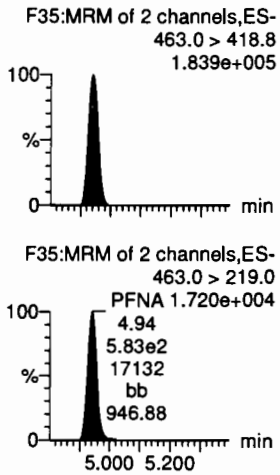

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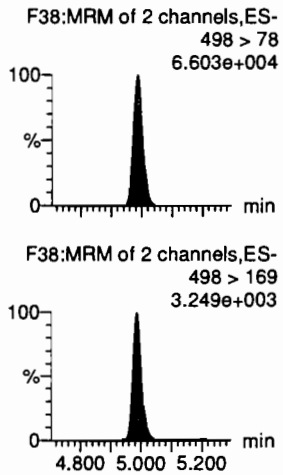
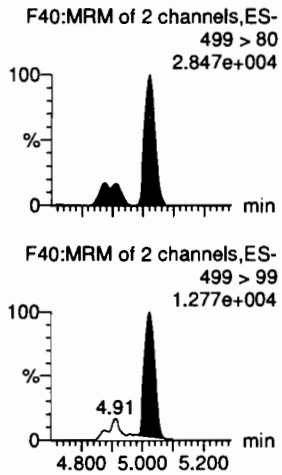
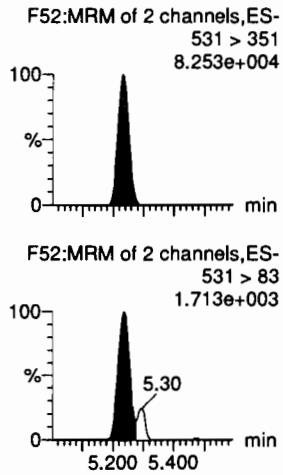


L-PFOS



9Cl-PF30NS



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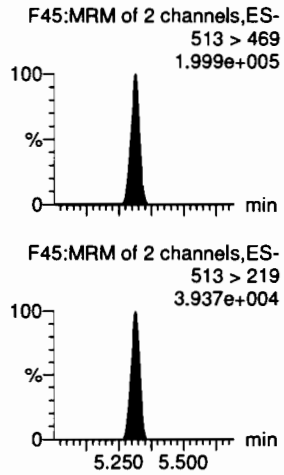
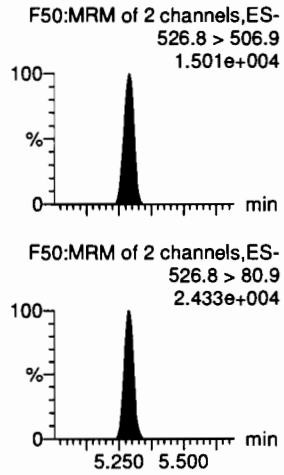


8:2 FTS



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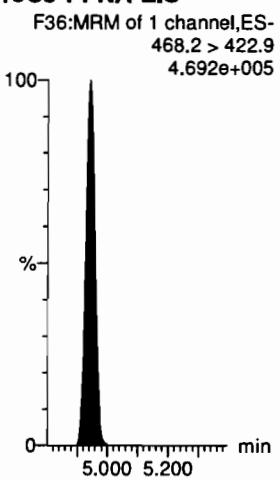

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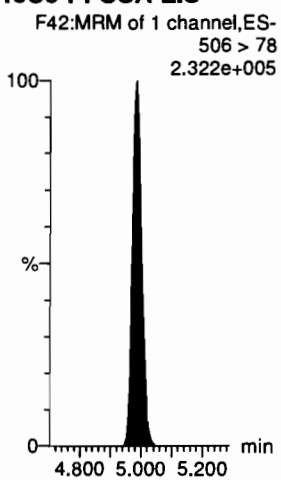

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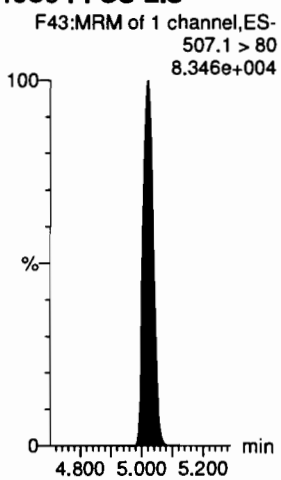

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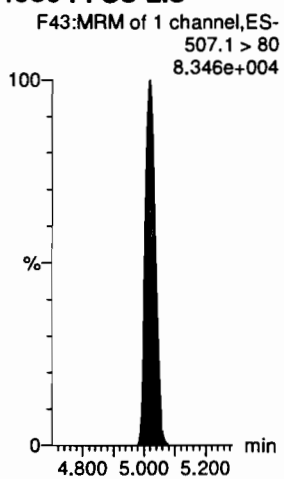
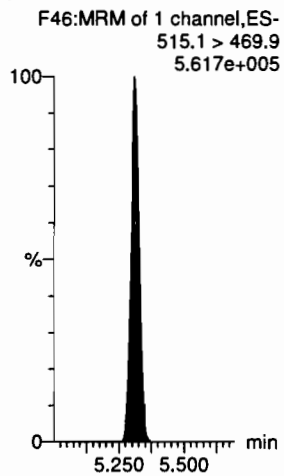
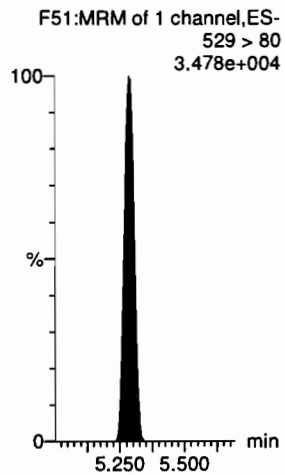


13C2-PFDA-EIS



13C2-8:2 FTS-EIS



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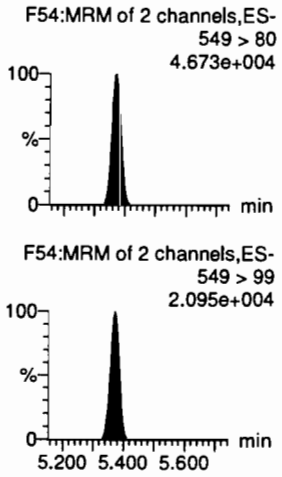
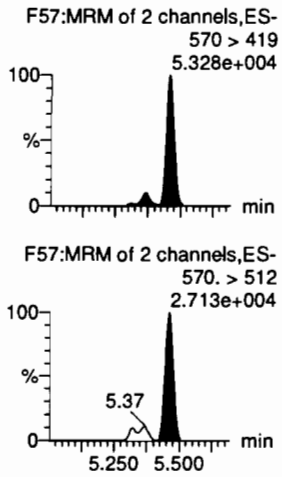
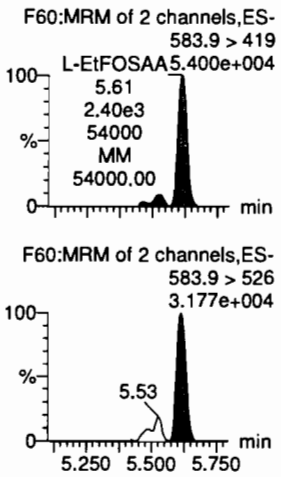
PFNS



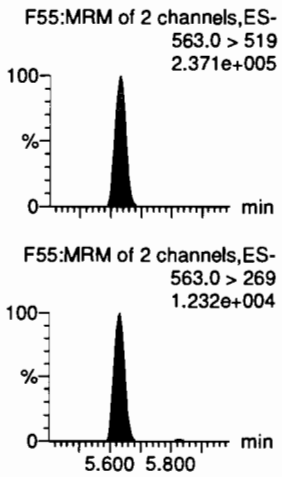
L-MeFOSAA



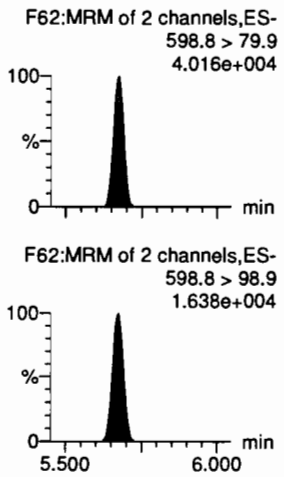
L-EtFOSAA



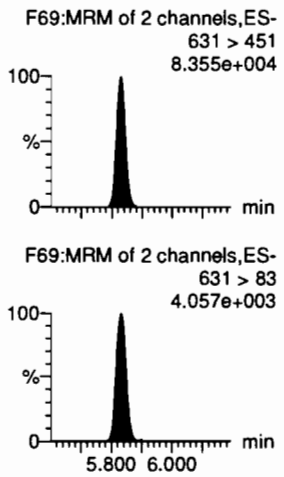
PFUdA



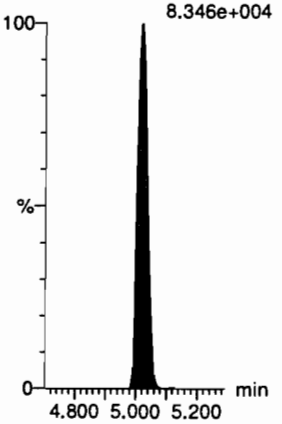
PFDS



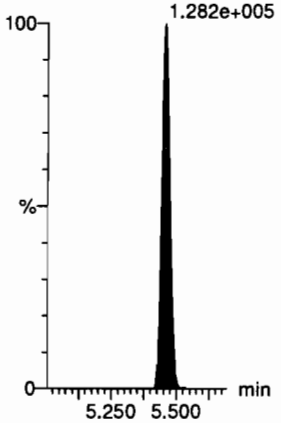
11Cl-PF30UdS



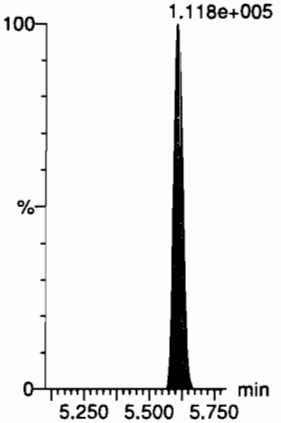
13C8-PFOS-EIS



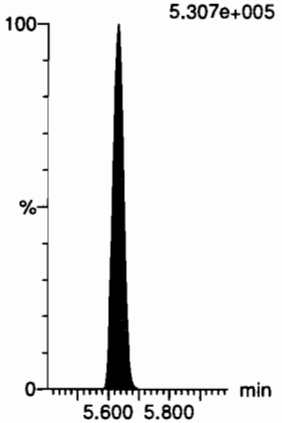
d3-N-MeFOSAA-EIS



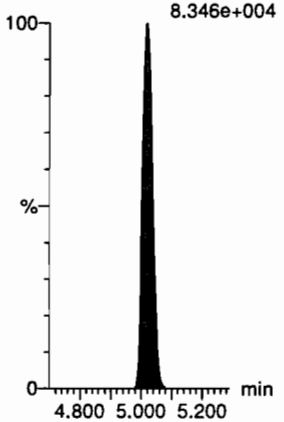
d5-N-EtFOSAA-EIS



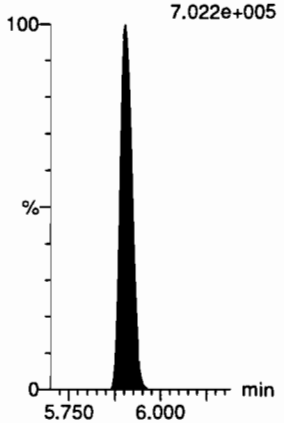
13C2-PFUdA-EIS



13C8-PFOS-EIS



13C2-PFDoA-EIS

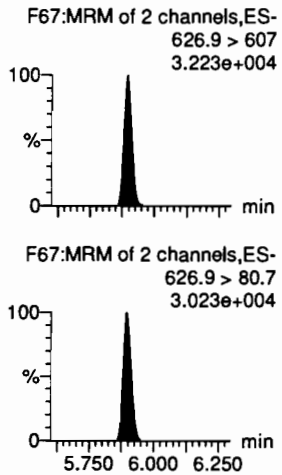


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

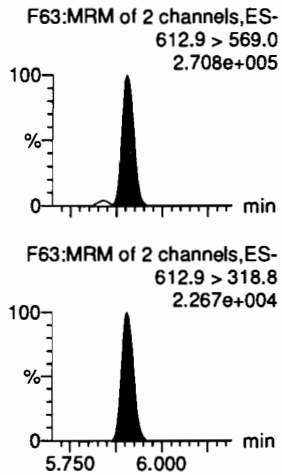
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

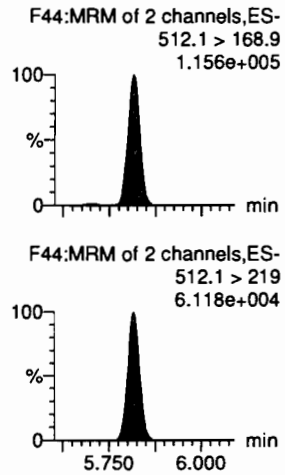
10:2 FTS



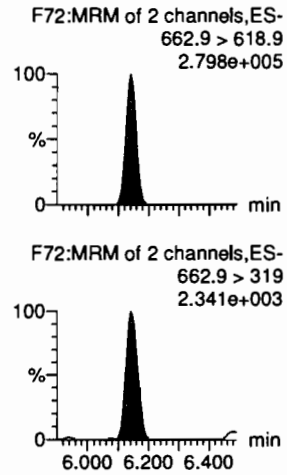
PFDoA



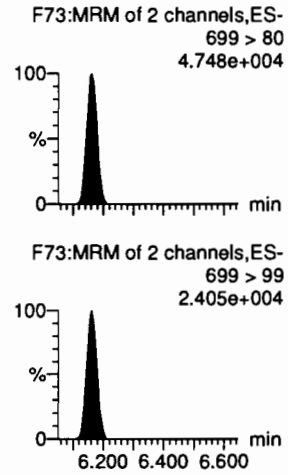
N-MeFOSA



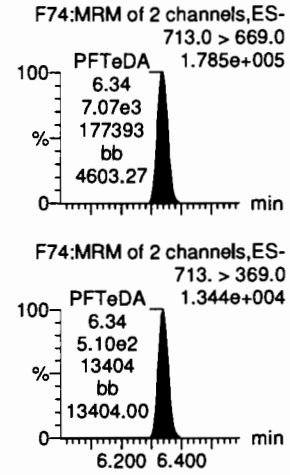
PFTrDA



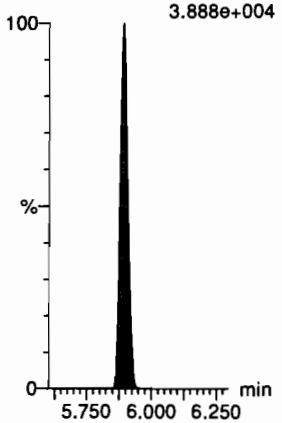
PFDoS



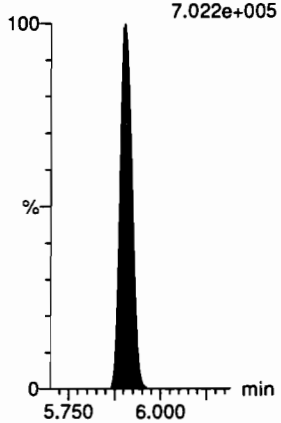
PFTeDA



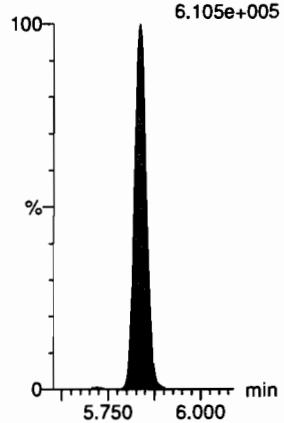
13C2-10:2 FTS-EIS



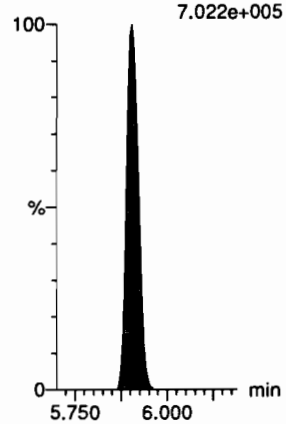
13C2-PFDoA-EIS



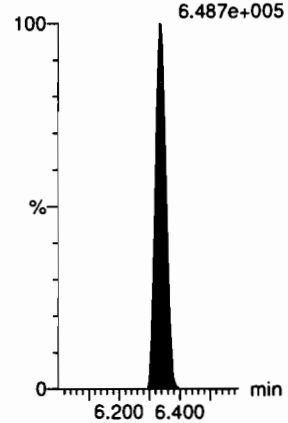
d3-N-MeFOSA-EIS



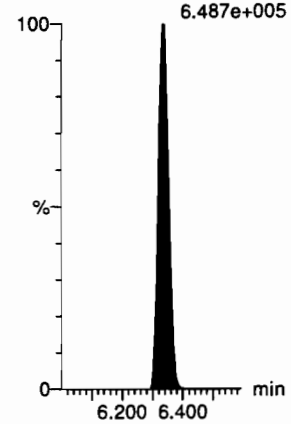
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



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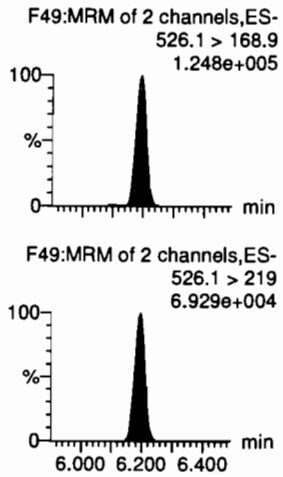
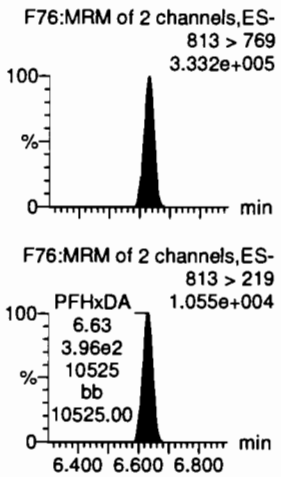
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

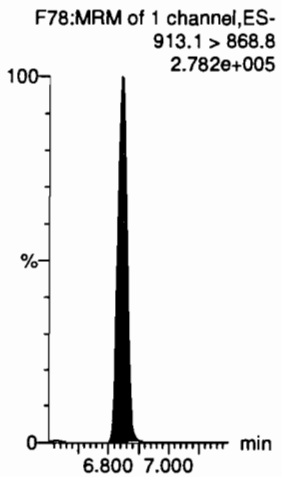
N-EtFOSA



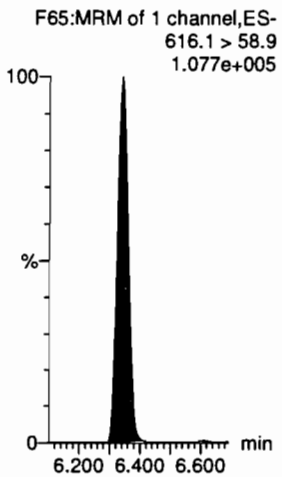
PFHxDA



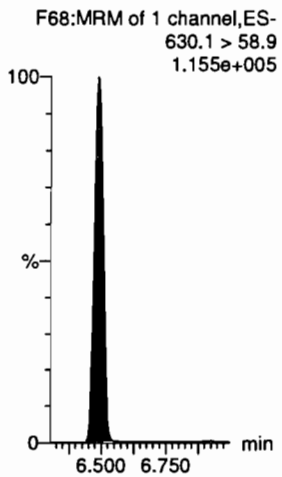
PFODA



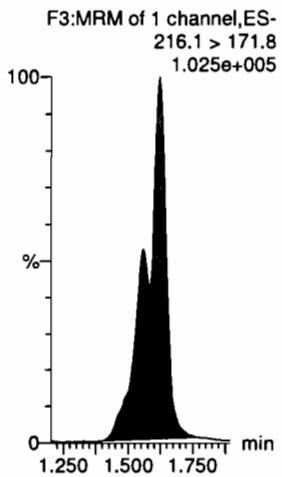
N-MeFOSE



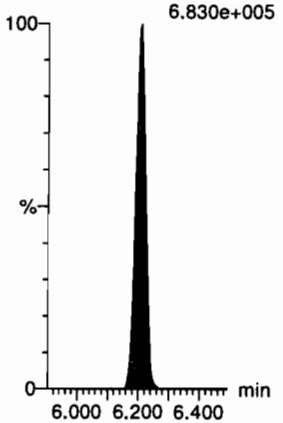
N-EtFOSE



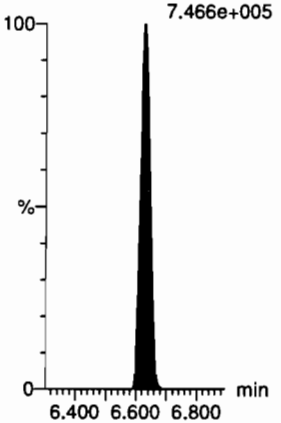
13C3-PFBA-RSD



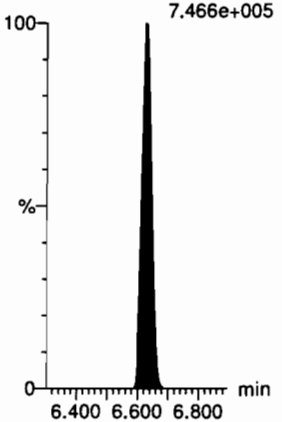
d5-N-ETFOSA-EIS



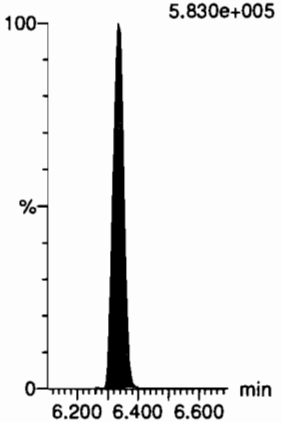
13C2-PFHxDA-EIS



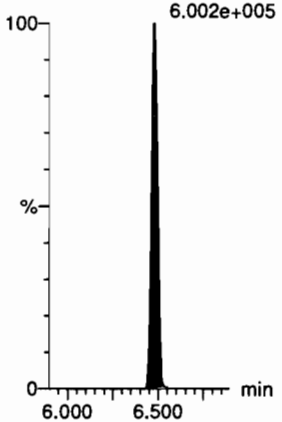
13C2-PFHxDA-EIS



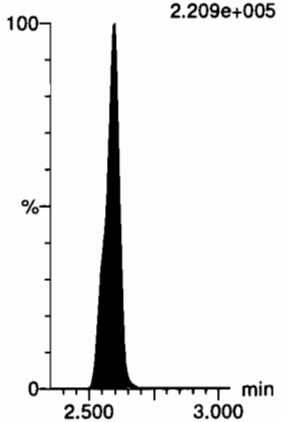
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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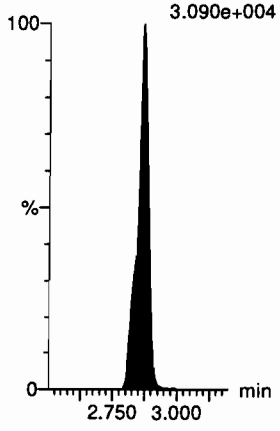
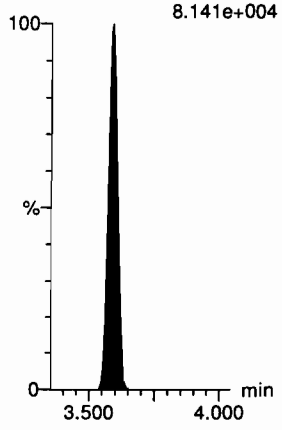
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

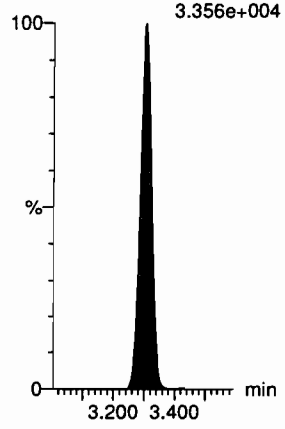
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.090e+004



13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.141e+004



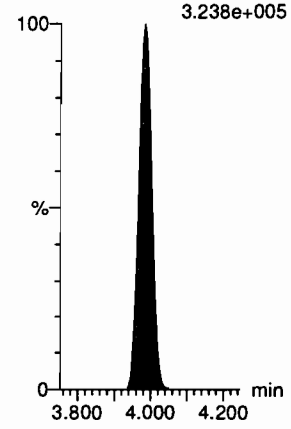
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.356e+004



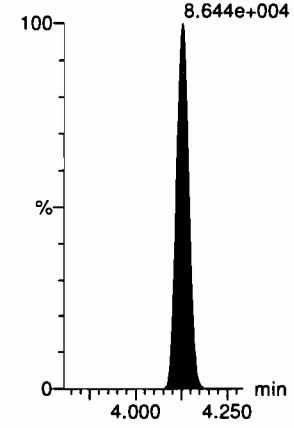
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.638e+005



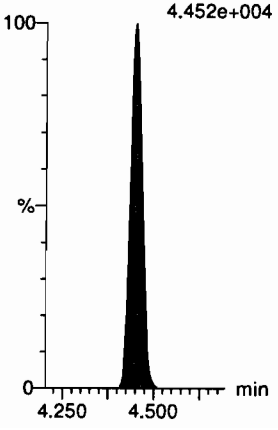
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.238e+005



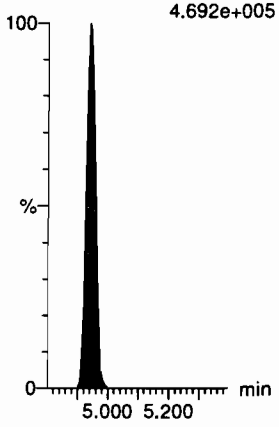
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
8.644e+004



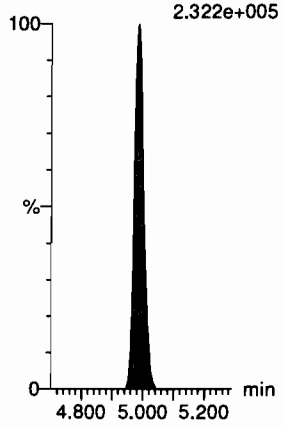
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.452e+004



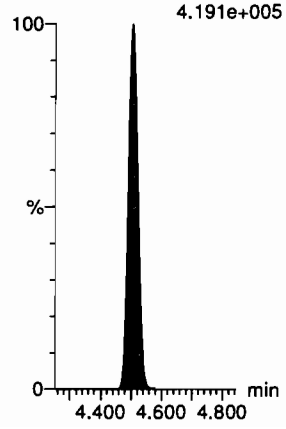
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.692e+005



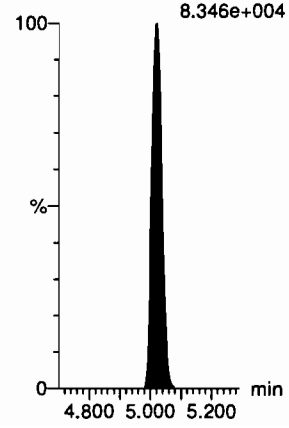
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.322e+005



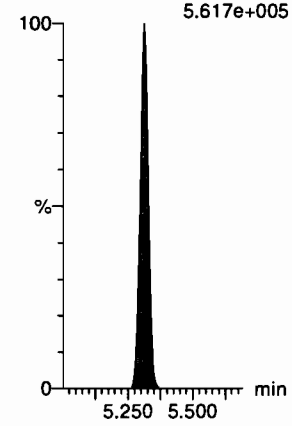
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
4.191e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
8.346e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.617e+005

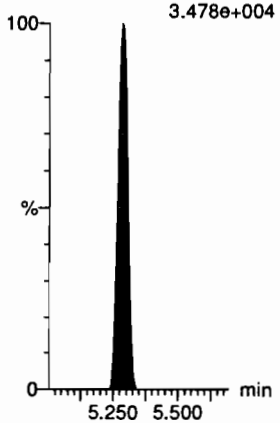


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

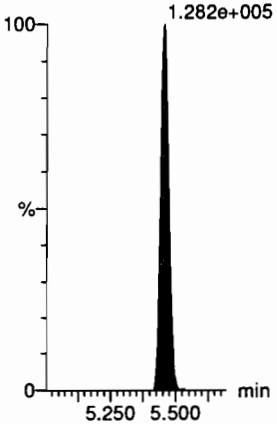
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.478e+004



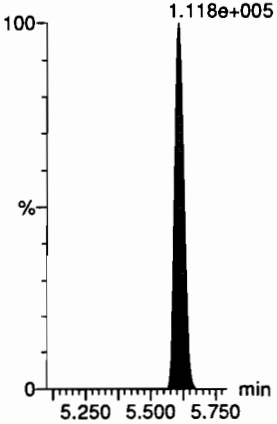
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.282e+005



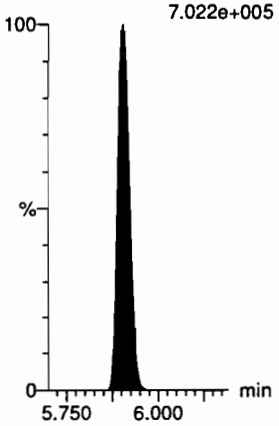
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
5.307e+005



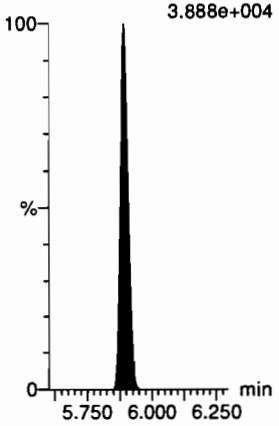
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.118e+005



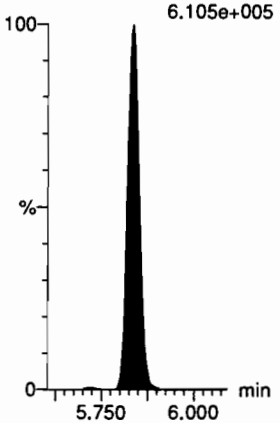
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
7.022e+005



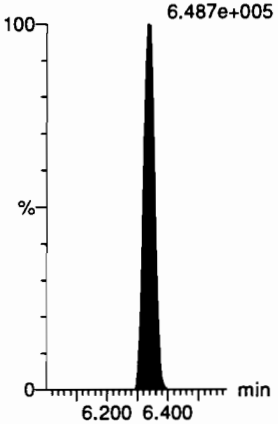
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.888e+004



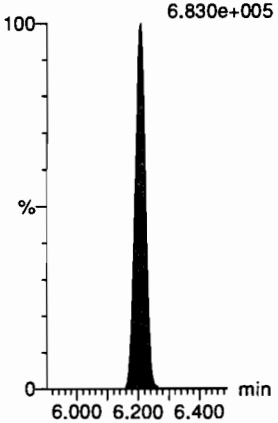
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
6.105e+005



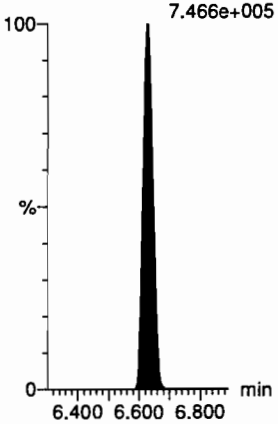
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.487e+005



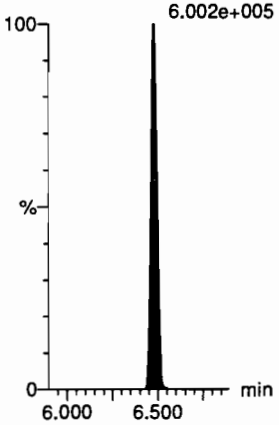
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.830e+005



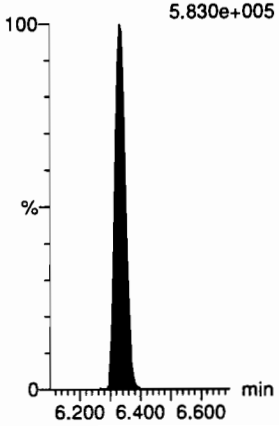
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.466e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
6.002e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.830e+005



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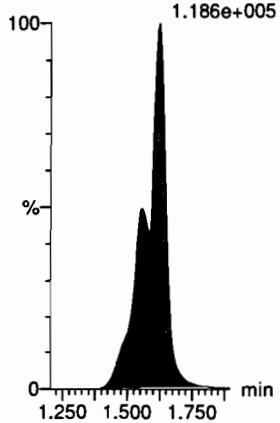
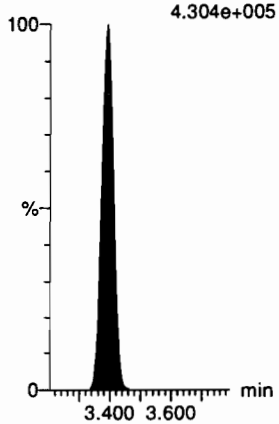
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-23, Date: 06-Jul-2020, Time: 13:55:58, ID: ST200706P1-5 PFC CS2 20F1905, Description: PFC CS2 20F1905

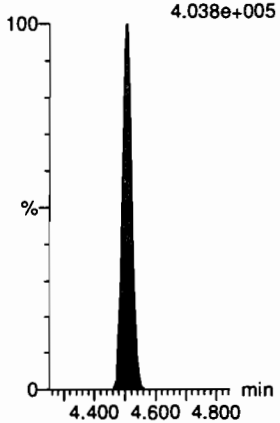
13C4-PFBA



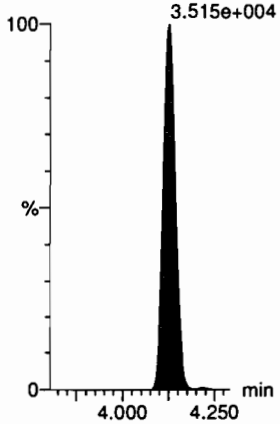
13C5-PFHxA



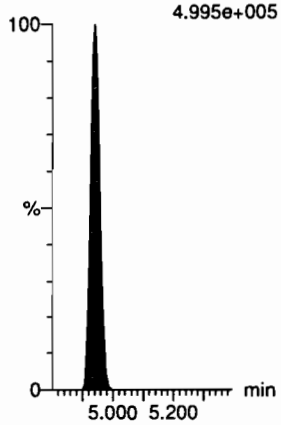
13C8-PFOA



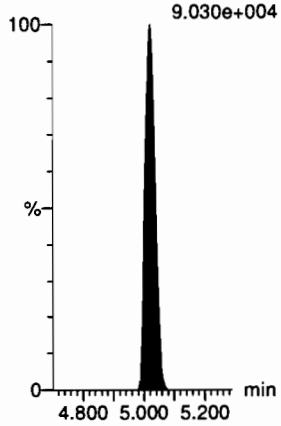
18O2-PFHxS



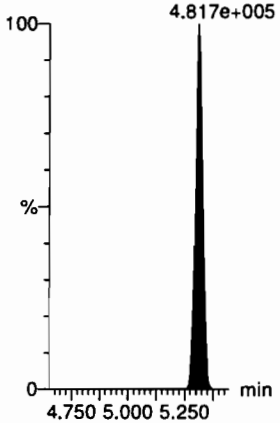
13C9-PFNA



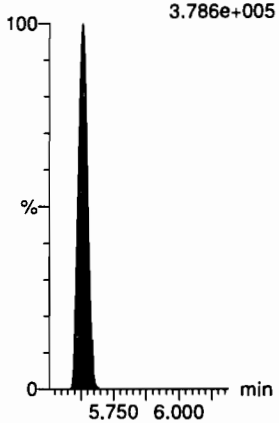
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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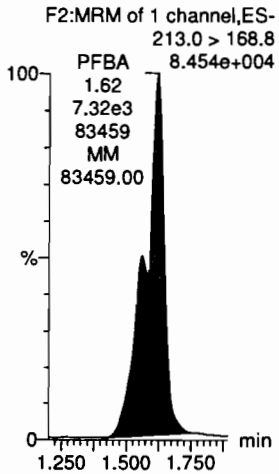
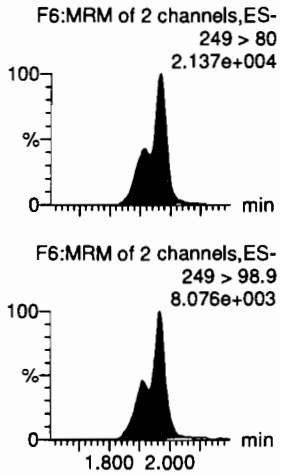
Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

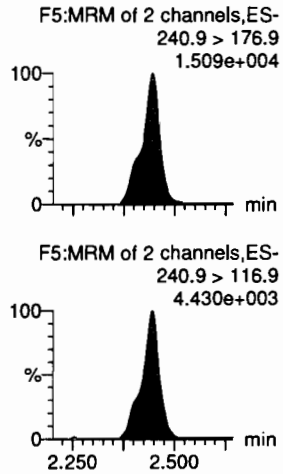
PFBA



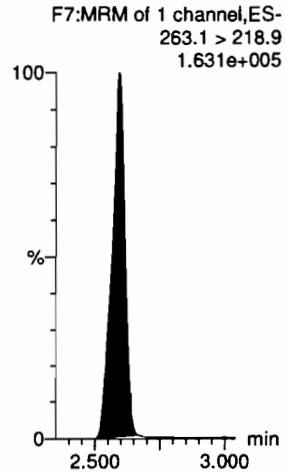
PFPrS



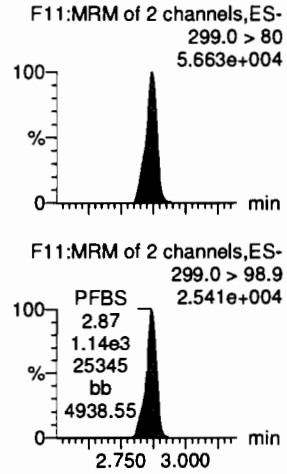
3:3 FTCA



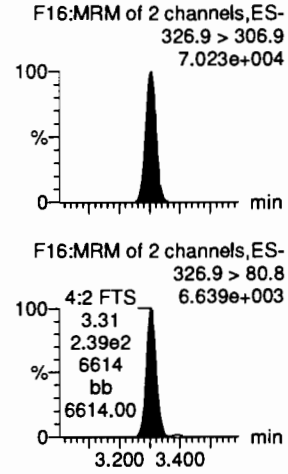
PFPeA



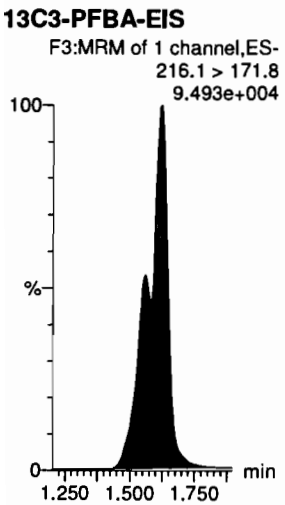
PFBS



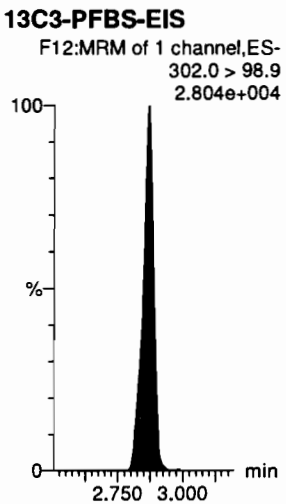
4:2 FTS



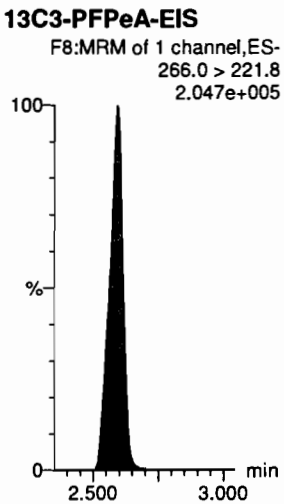
13C3-PFBA-EIS



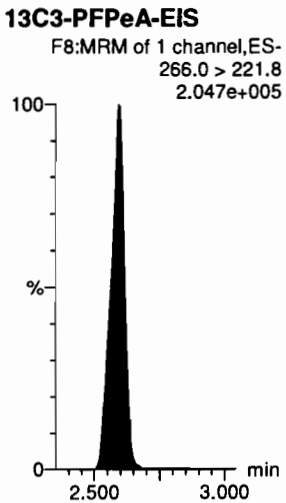
13C3-PFBS-EIS



13C3-PFPeA-EIS



13C3-PFPeA-EIS



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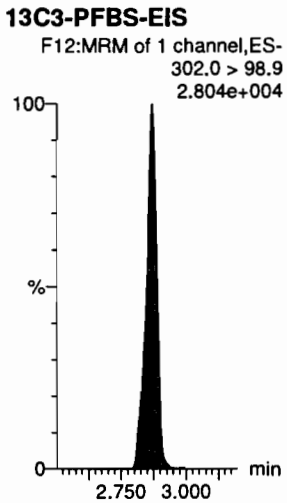
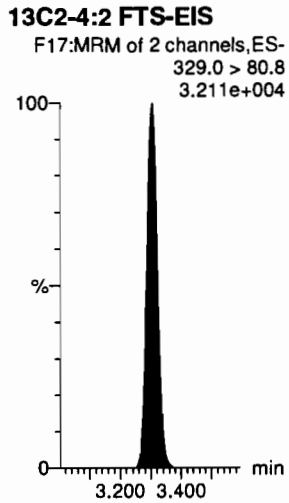


13C2-4:2 FTS-EIS



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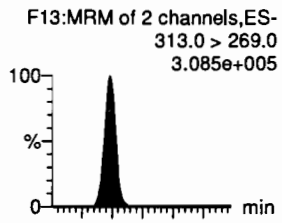
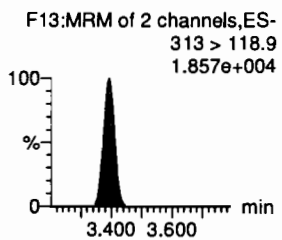
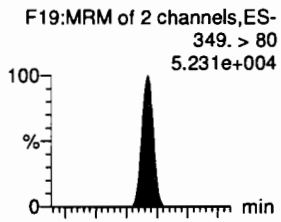
Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

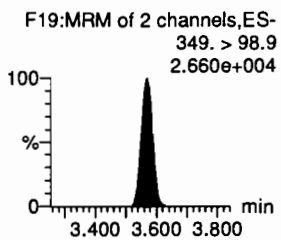
PFHxA



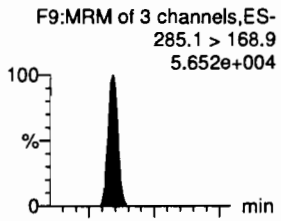


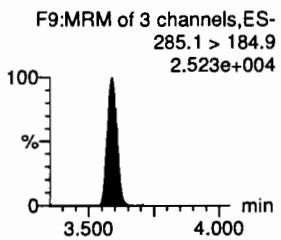
PFPeS



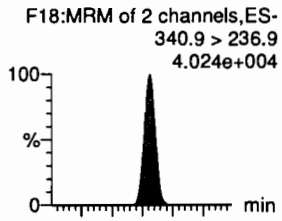


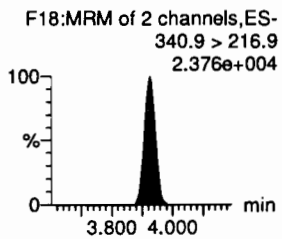
HFPO-DA



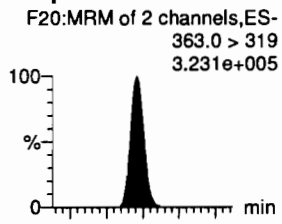


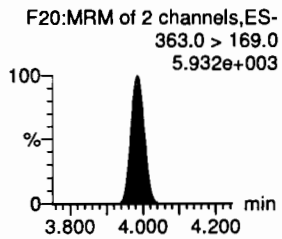
5:3 FTCA



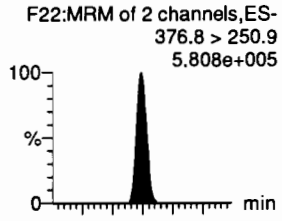


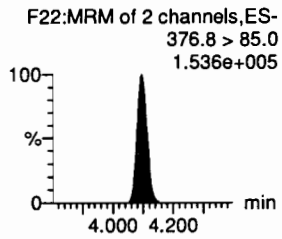
PFHpA



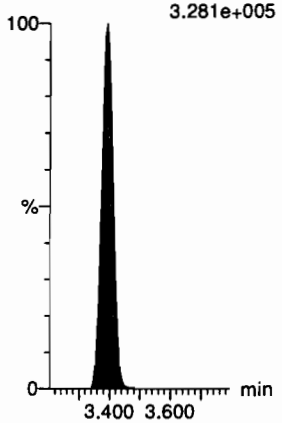


ADONA

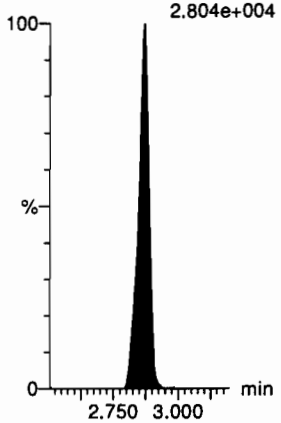




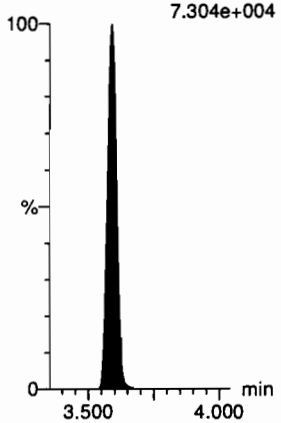
13C2-PFHxA-EIS



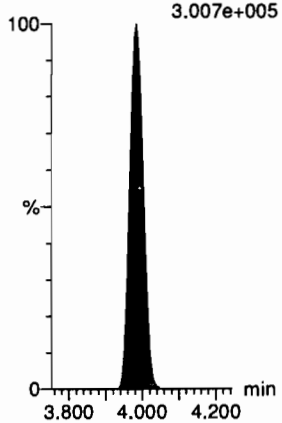
13C3-PFBS-EIS



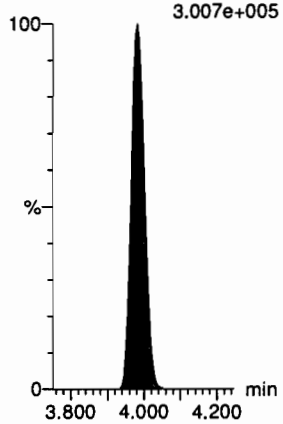
13C3-HFPO-DA-EIS



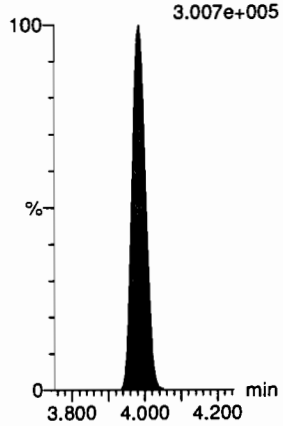
13C4-PFHpA-EIS



13C4-PFHpA-EIS



13C4-PFHpA-EIS



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Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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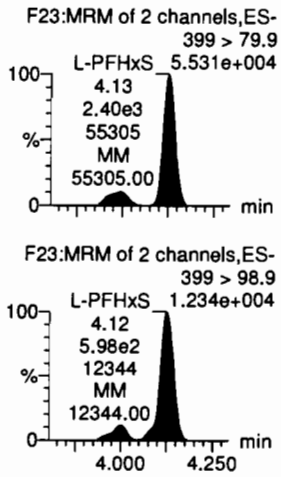
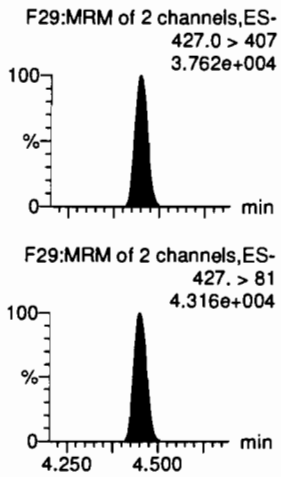
Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

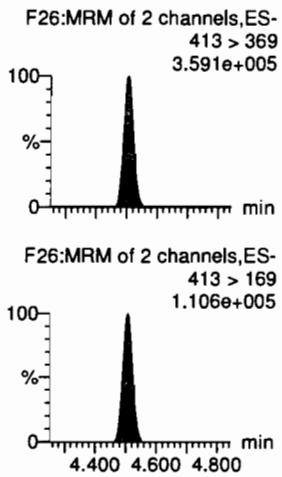
L-PFHxS



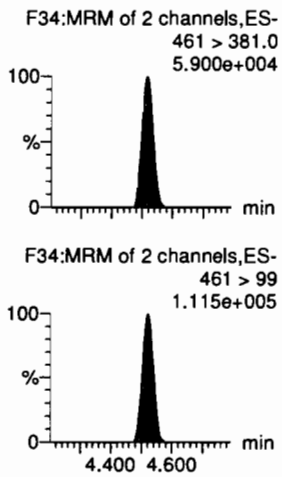
6:2 FTS



L-PFOA



PFEChS



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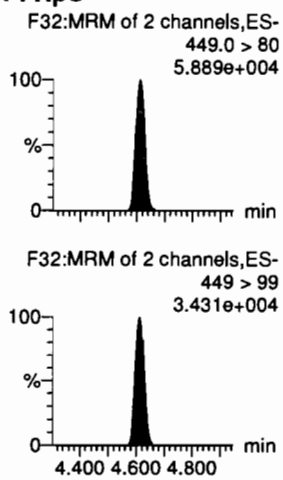
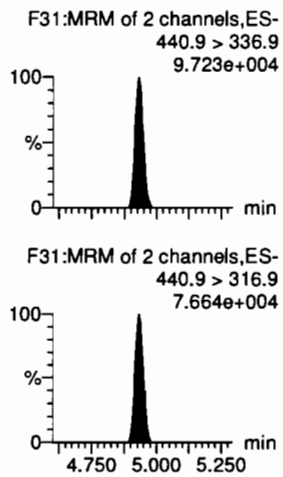
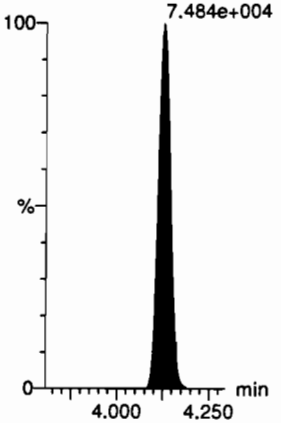


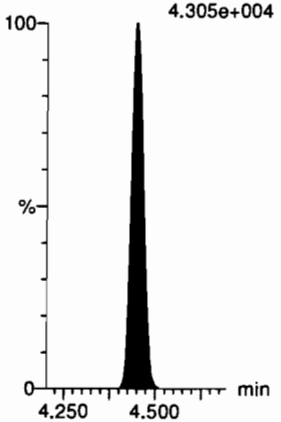
7:3 FTCA



13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



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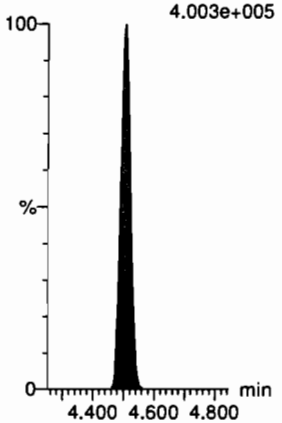

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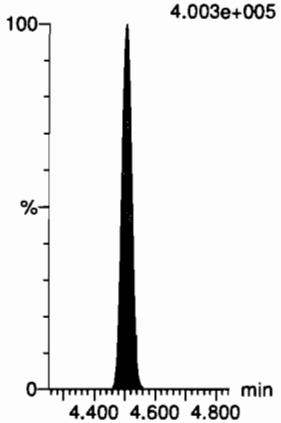
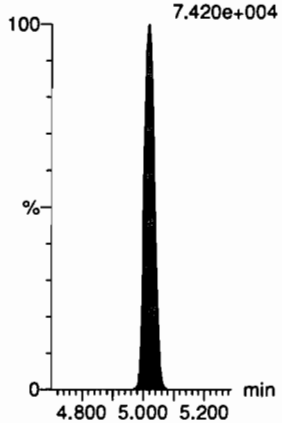
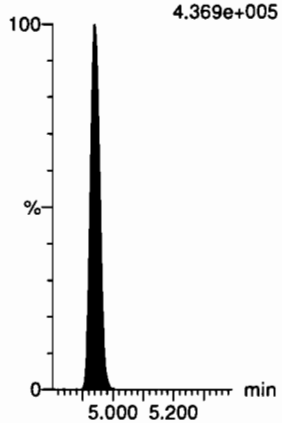


13C8-PFOS-EIS



13C5-PFNA-EIS



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Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

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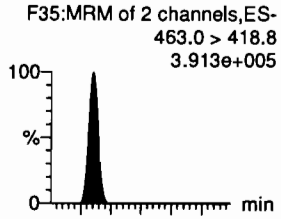

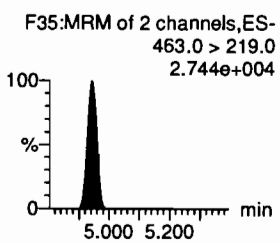

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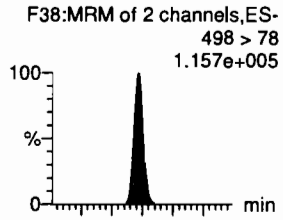
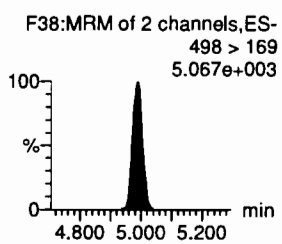
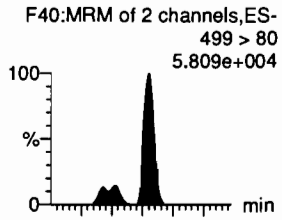
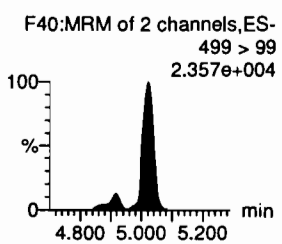


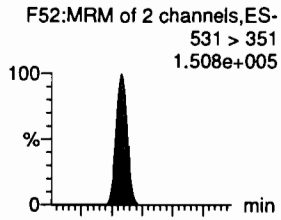


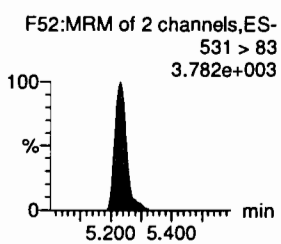
L-PFOS





9Cl-PF30NS





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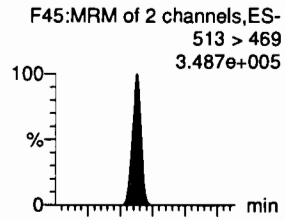
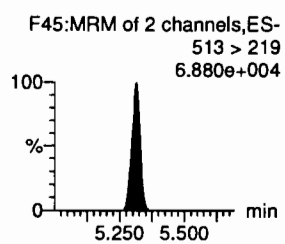
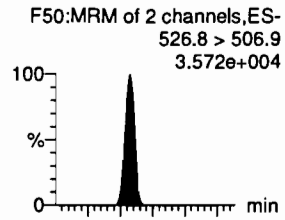
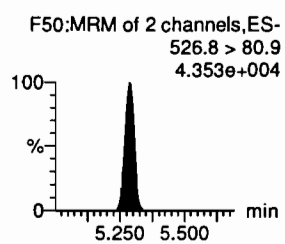


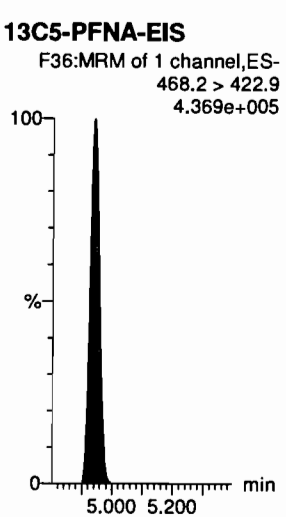


8:2 FTS

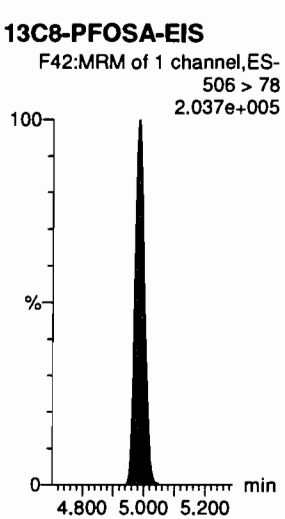




13C5-PFNA-EIS



13C8-PFOSA-EIS



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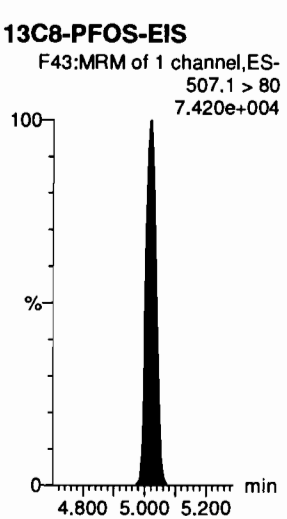

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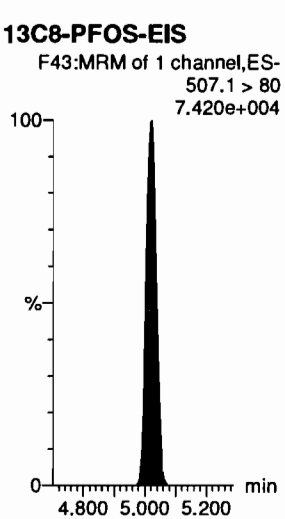
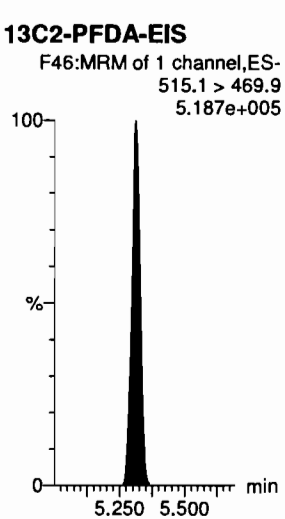


13C2-PFDA-EIS



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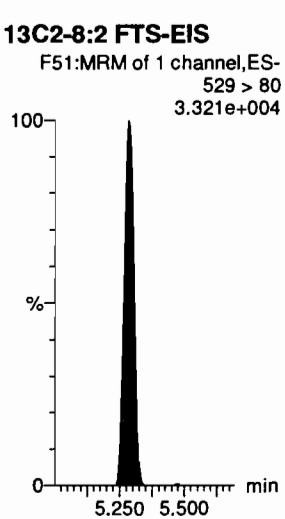

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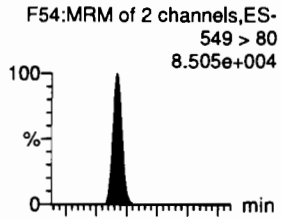
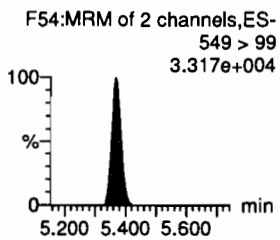
PFNS





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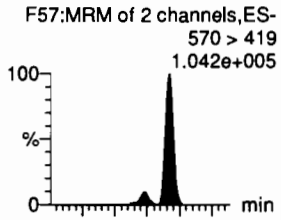

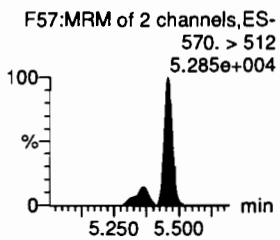

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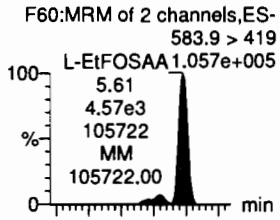
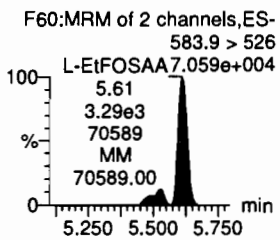
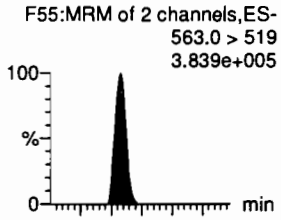
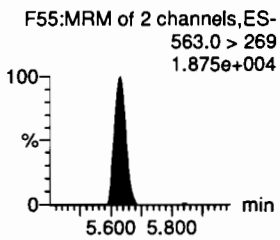




PFUdA





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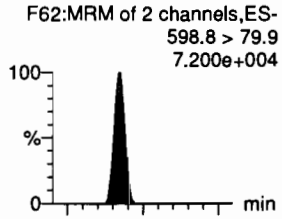

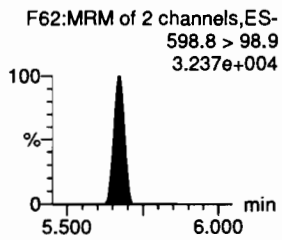

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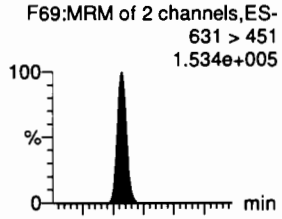
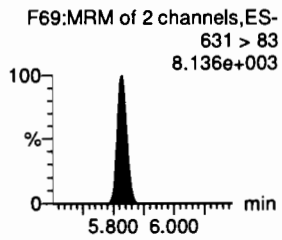
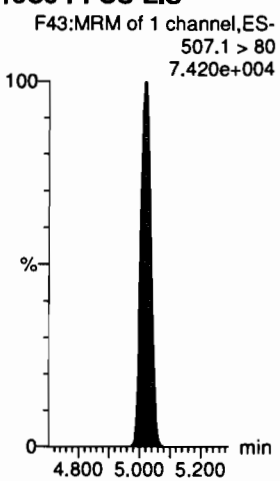




13C8-PFOS-EIS



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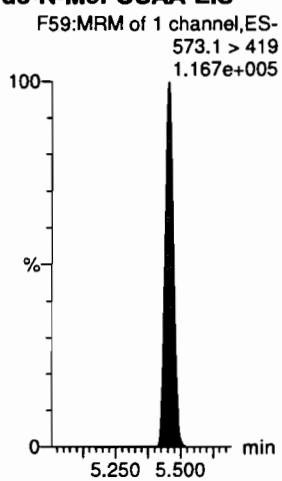

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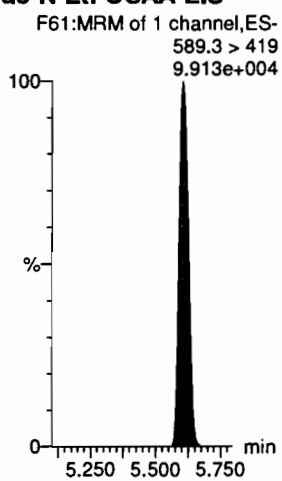

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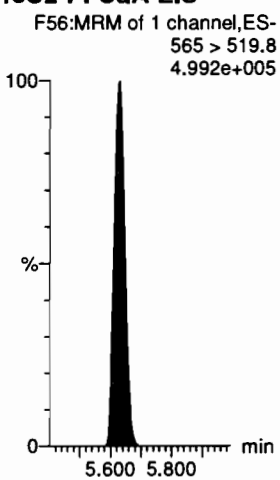

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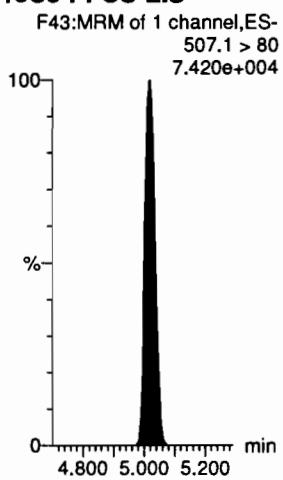

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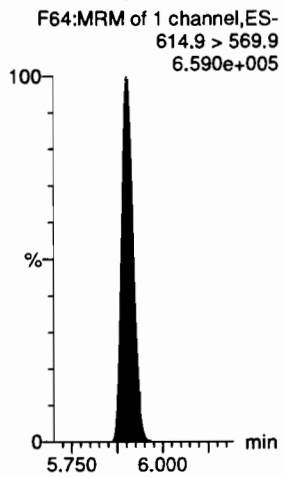

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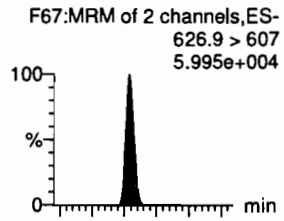
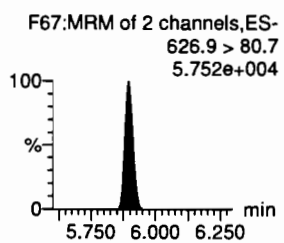
10:2 FTS





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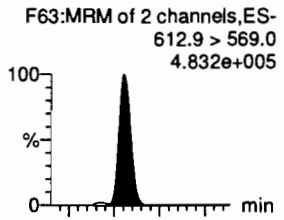
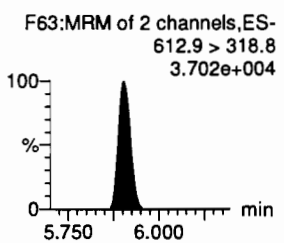
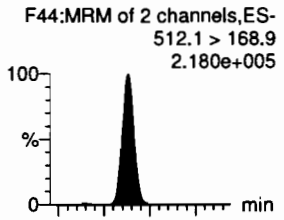
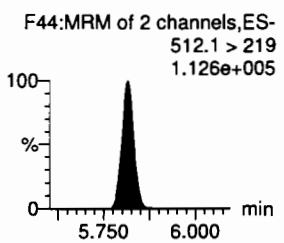




N-MeFOSA





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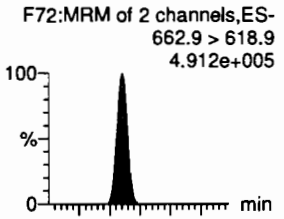
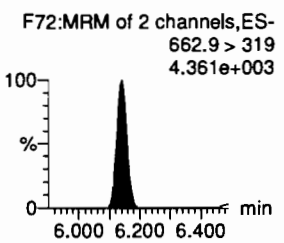
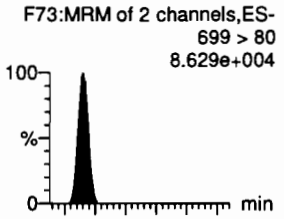
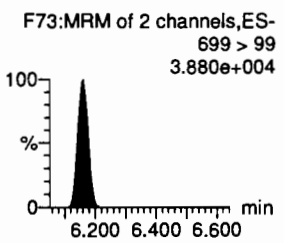


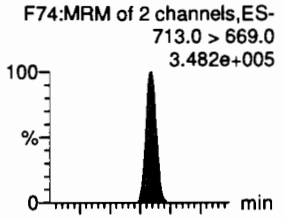


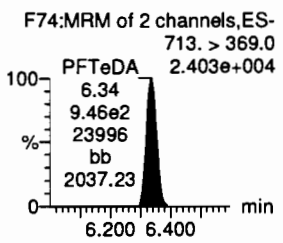
PFDoS



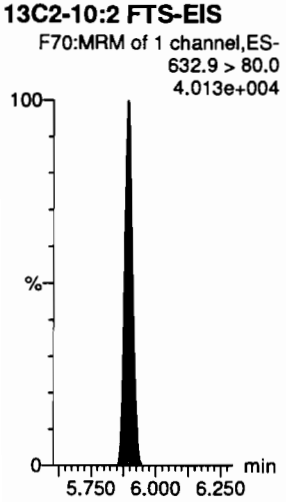


PFTeDA

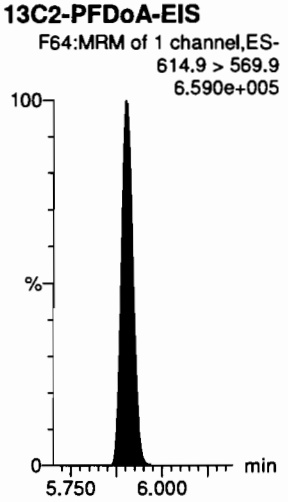




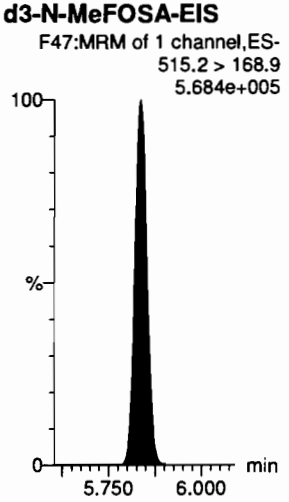
13C2-10:2 FTS-EIS



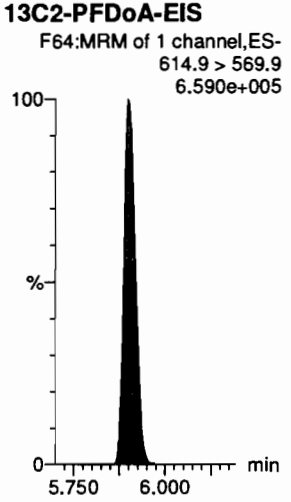
13C2-PFDoA-EIS



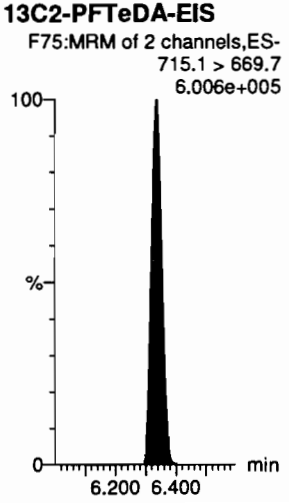
d3-N-MeFOSA-EIS



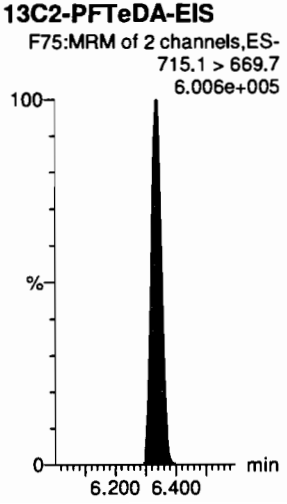
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



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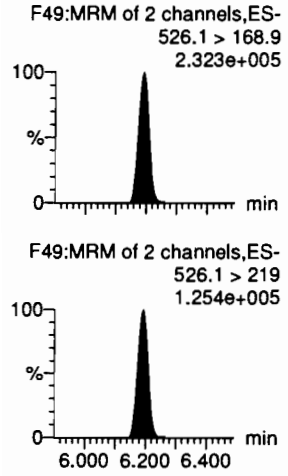
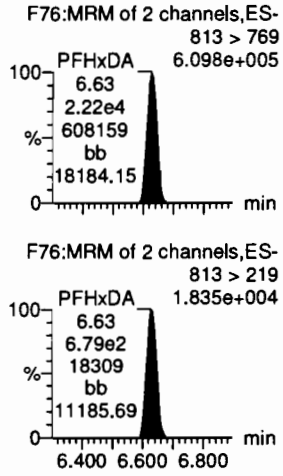
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

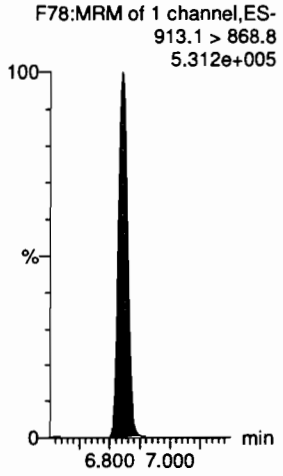
N-EtFOSA



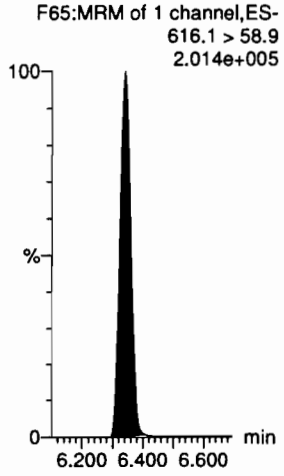
PFHxDA



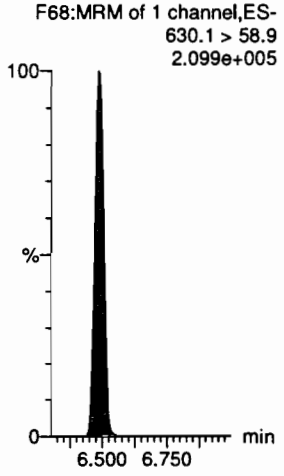
PFODA



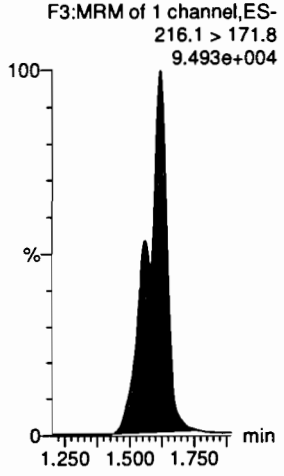
N-MeFOSE



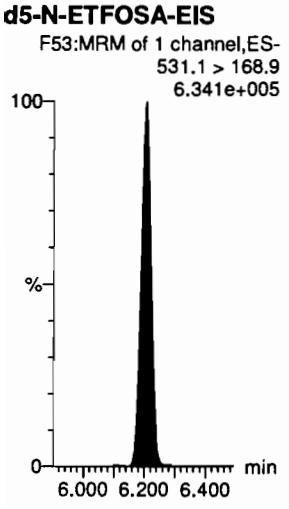
N-EtFOSE



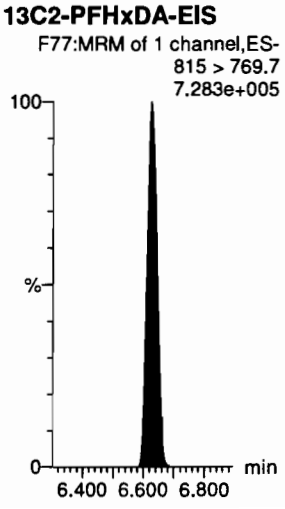
13C3-PFBA-RSD



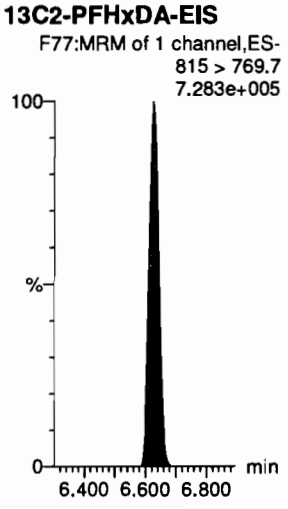
d5-N-ETFOSA-EIS



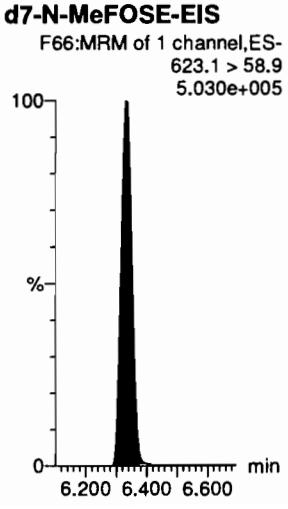
13C2-PFHxDA-EIS



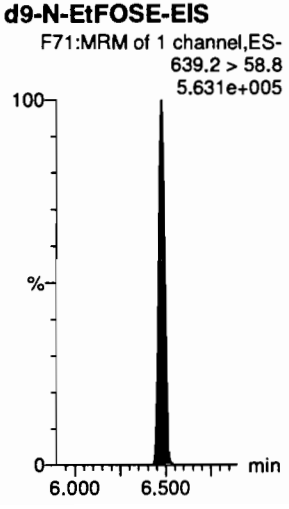
13C2-PFHxDA-EIS



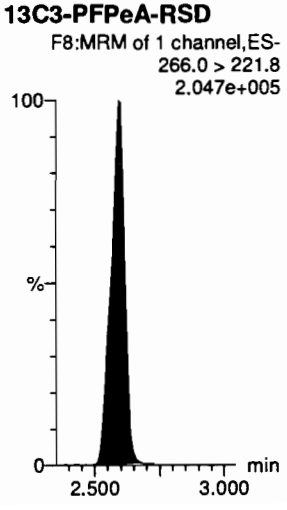
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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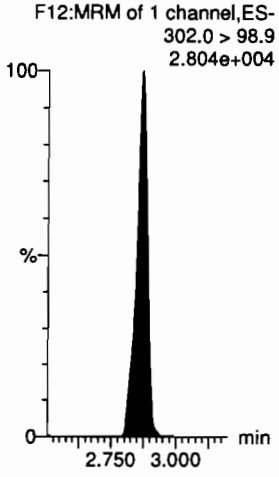
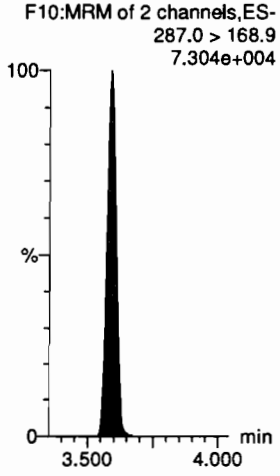
Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

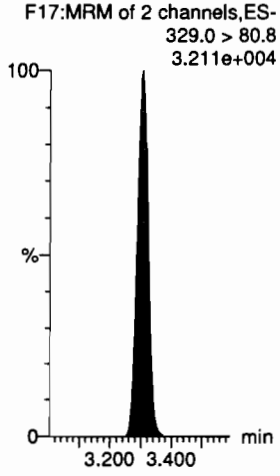
13C3-PFBS-RSD



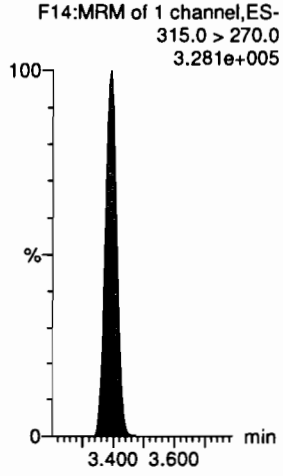
13C3-HFPO-DA-RSD



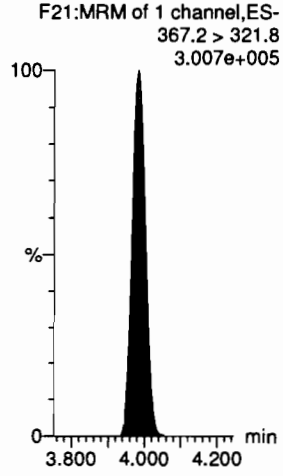
13C2-4:2 FTS-RSD



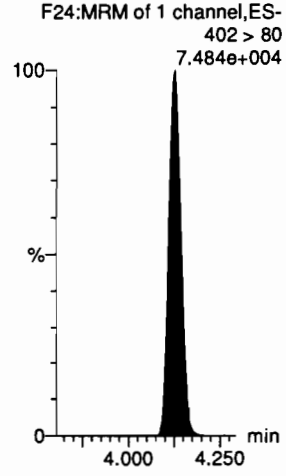
13C2-PFHxA-RSD



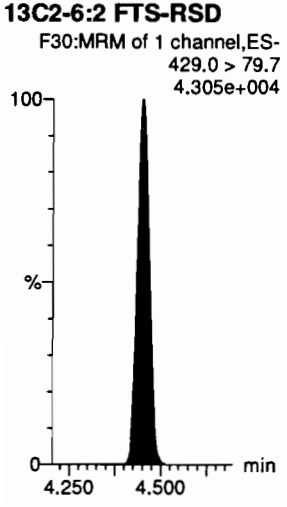
13C4-PFHpA-RSD



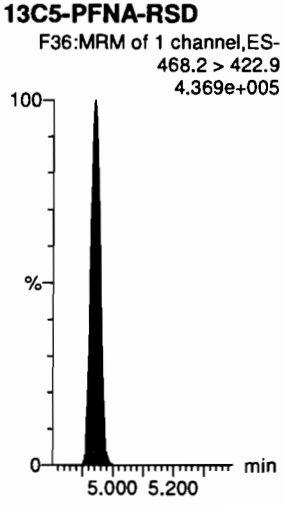
13C3-PFHxS-RSD



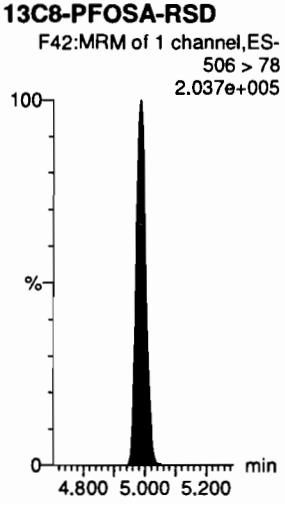
13C2-6:2 FTS-RSD



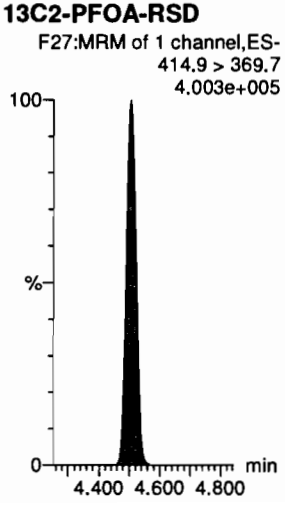
13C5-PFNA-RSD



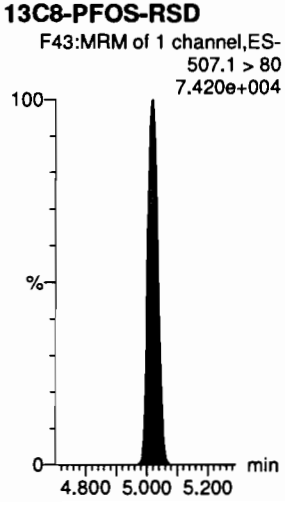
13C8-PFOSA-RSD



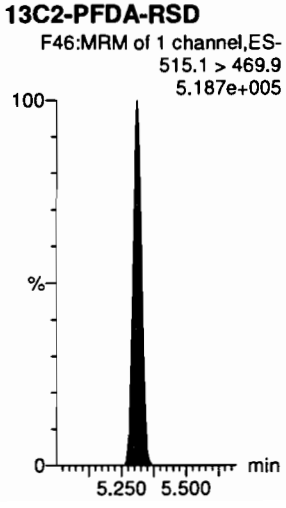
13C2-PFOA-RSD



13C8-PFOS-RSD



13C2-PFDA-RSD



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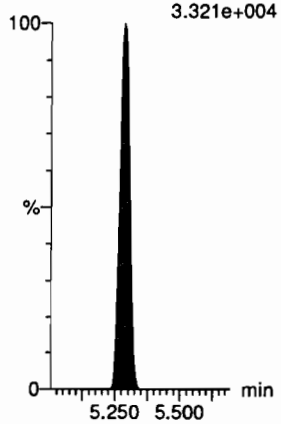
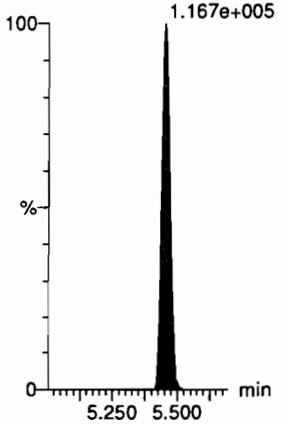
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.321e+004



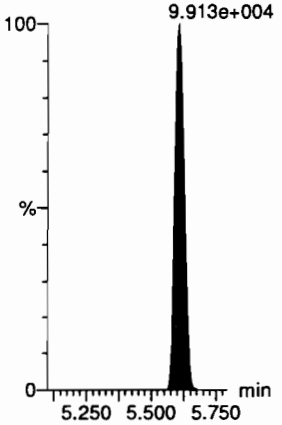
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.167e+005



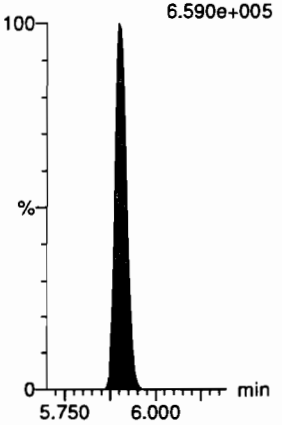
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.992e+005



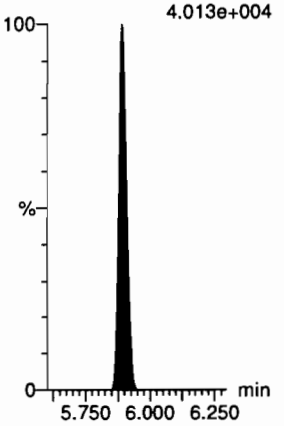
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
9.913e+004



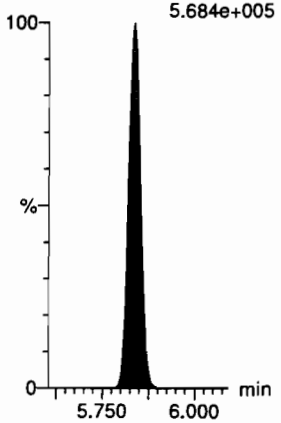
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.590e+005



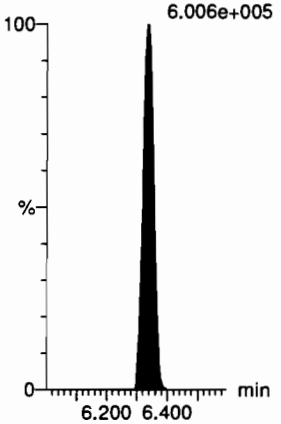
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
4.013e+004



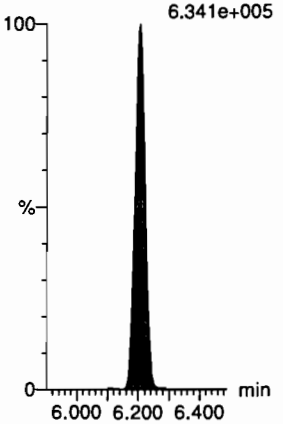
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.684e+005



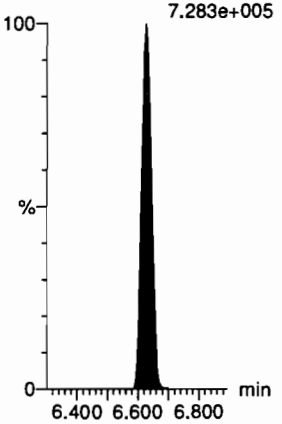
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.006e+005



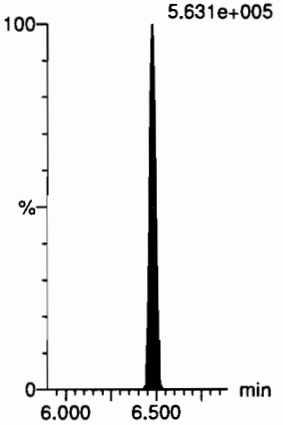
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.341e+005



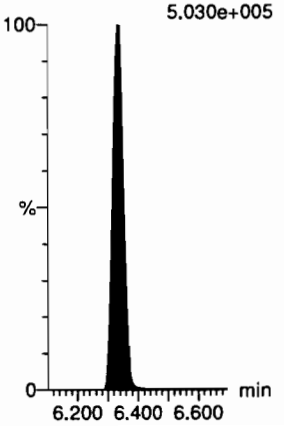
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.283e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.631e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.030e+005

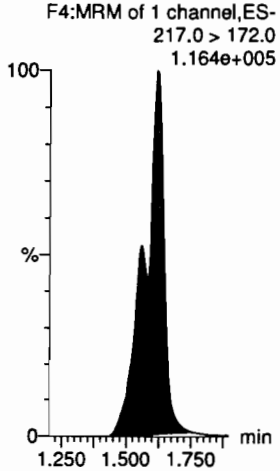


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

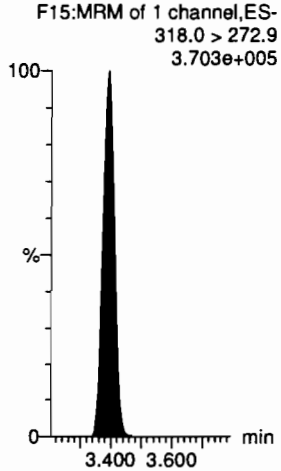
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-24, Date: 06-Jul-2020, Time: 14:06:27, ID: ST200706P1-6 PFC CS3 20F1906, Description: PFC CS3 20F1906

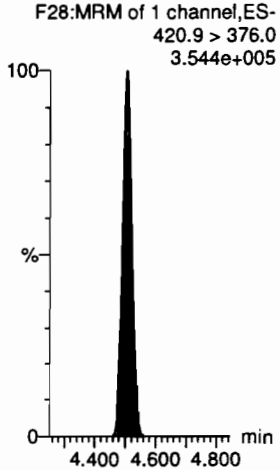
13C4-PFBA



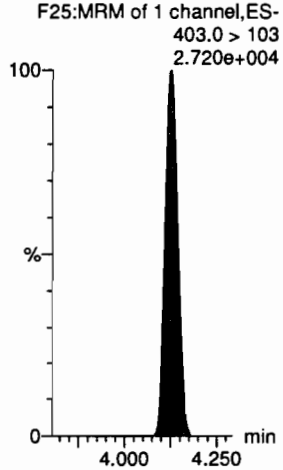
13C5-PFHxA



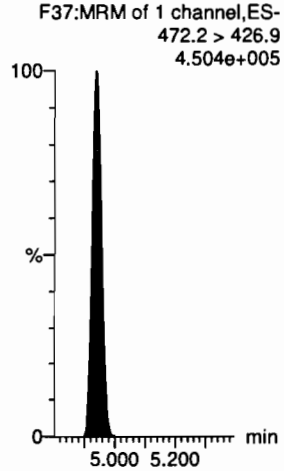
13C8-PFOA



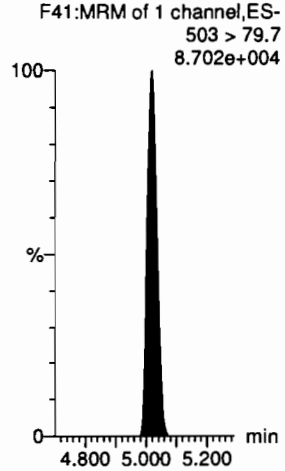
18O2-PFHxS



13C9-PFNA



13C4-PFOS



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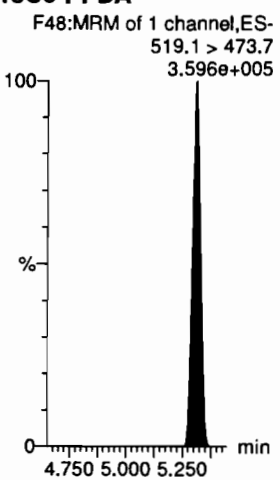

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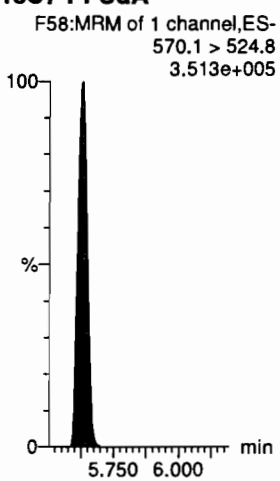

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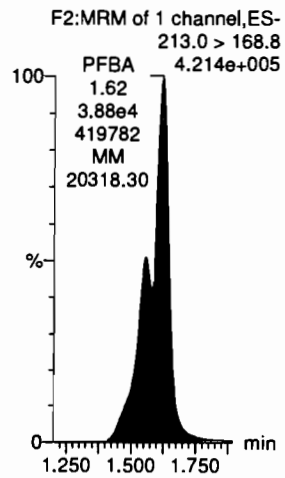
Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

PFBA



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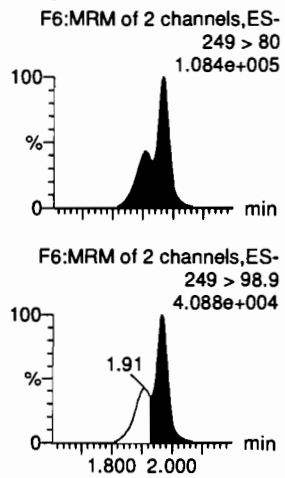
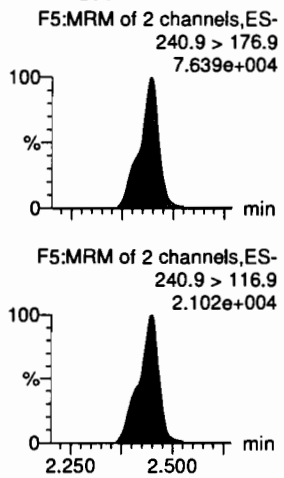


3:3 FTCA



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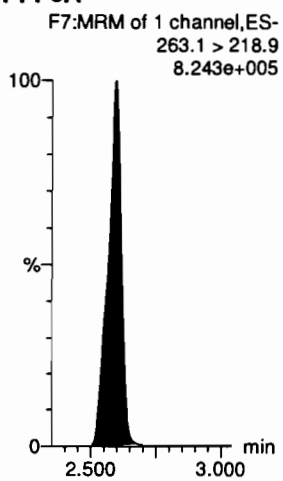

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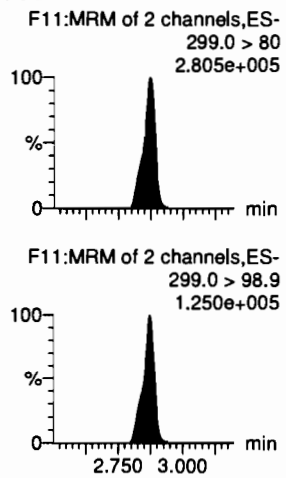
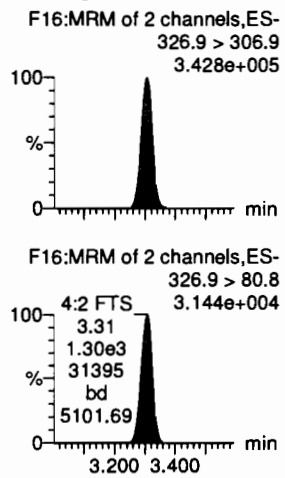
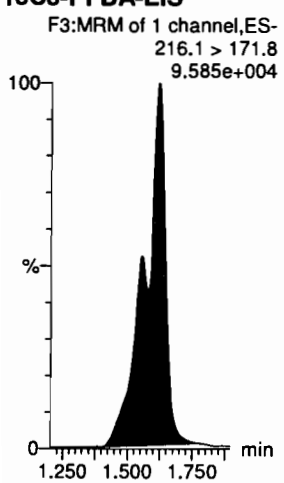


4:2 FTS



13C3-PFBA-EIS



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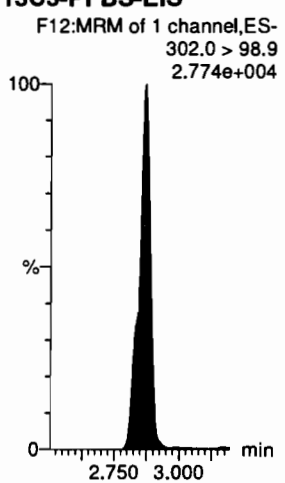

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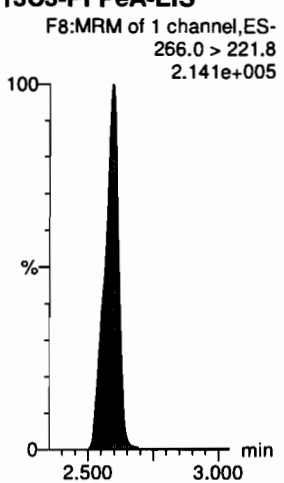

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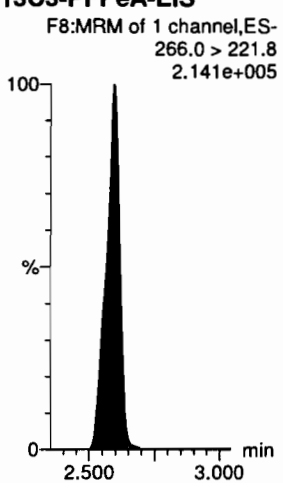

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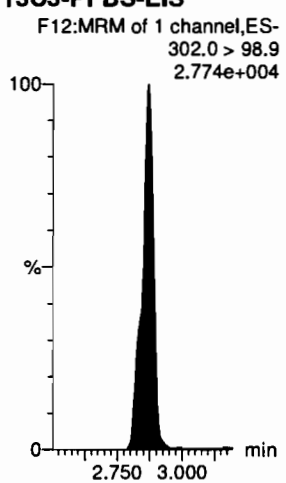
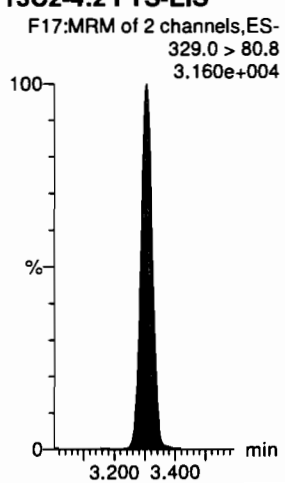


13C2-4:2 FTS-EIS



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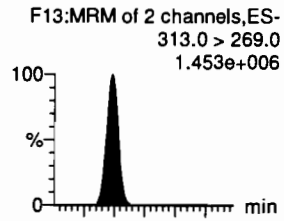
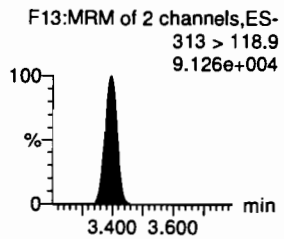
PFHxA





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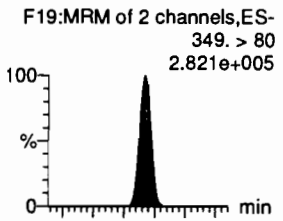
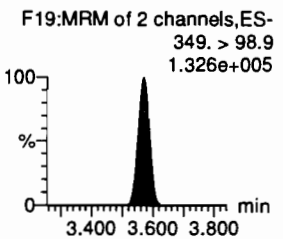
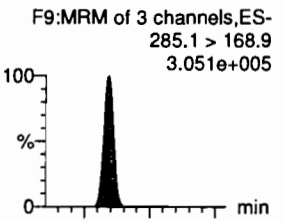
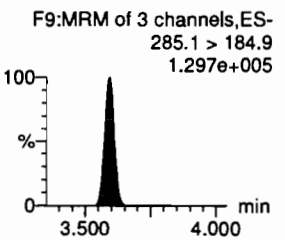




HFPO-DA





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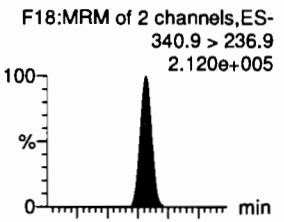

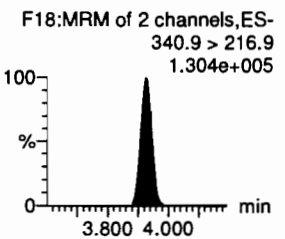

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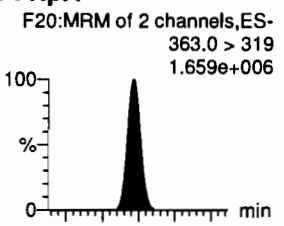
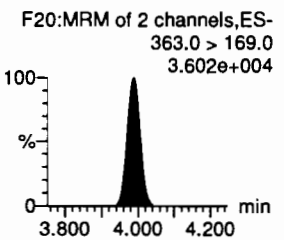
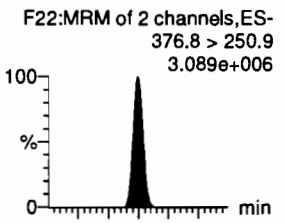
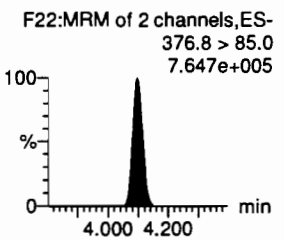




ADONA





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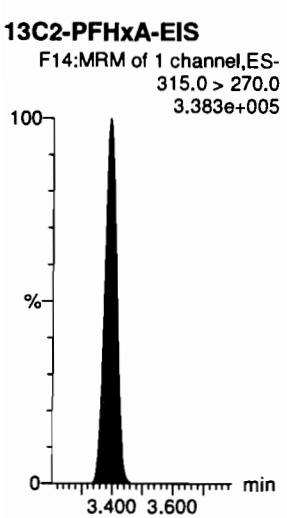
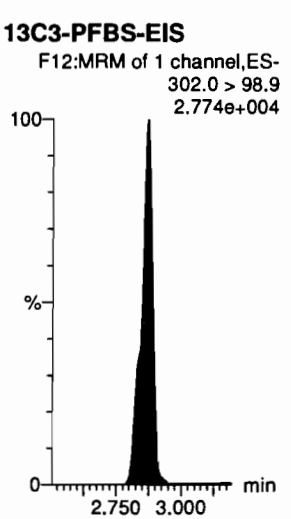
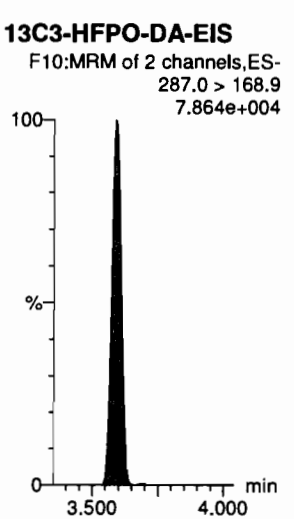


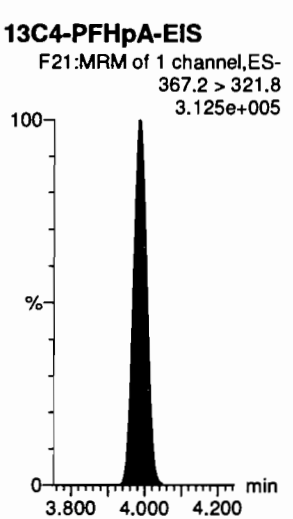
13C3-PFBS-EIS



13C3-HFPO-DA-EIS



13C4-PFHpA-EIS



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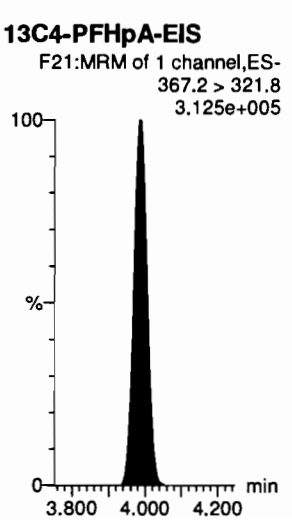

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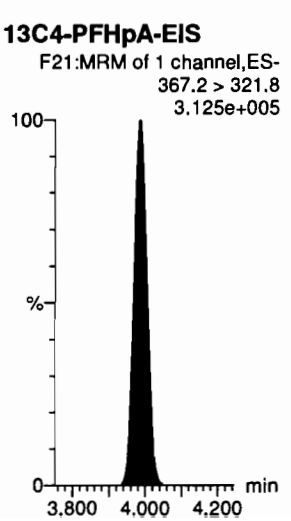

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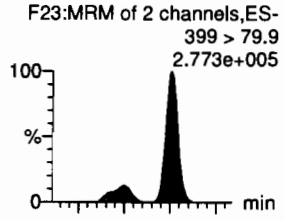
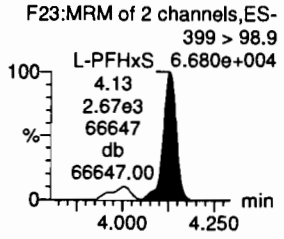
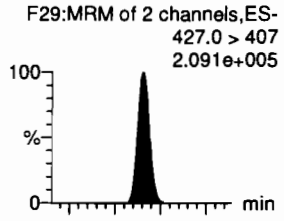
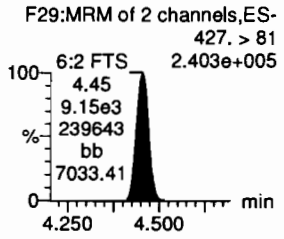
L-PFHxS



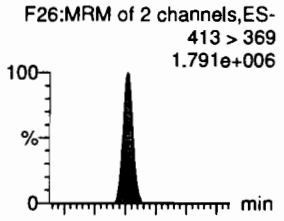


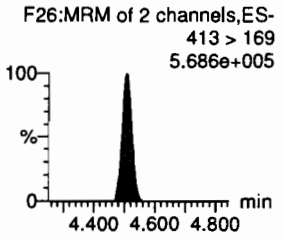
6:2 FTS





L-PFOA





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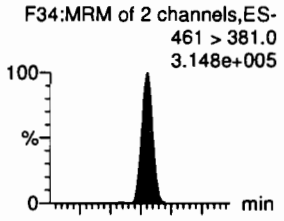
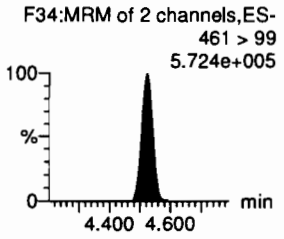
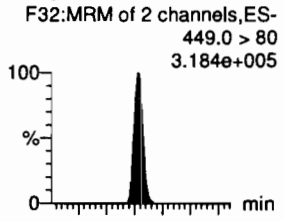
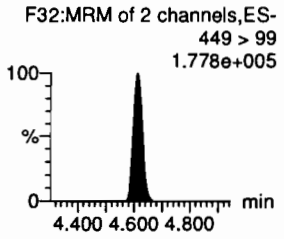


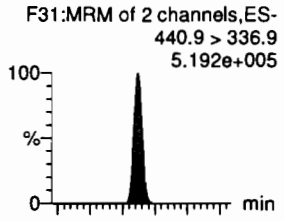


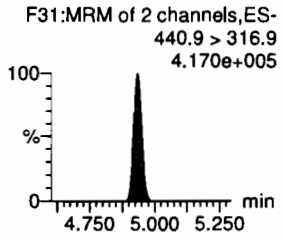
PFHpS



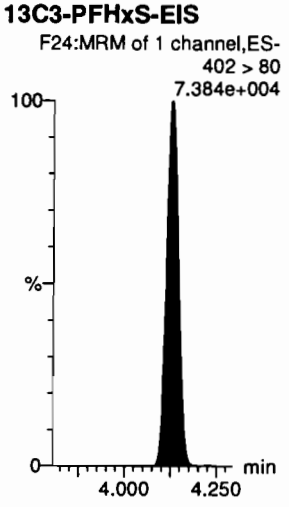


7:3 FTCA

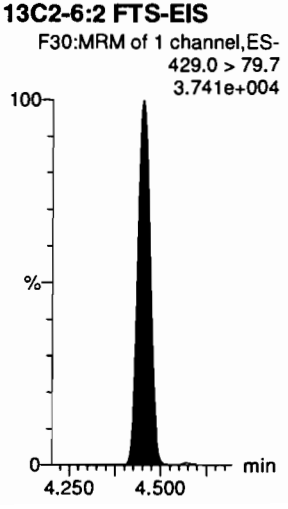




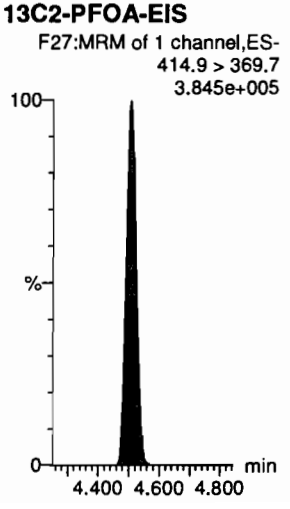
13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



13C2-PFOA-EIS



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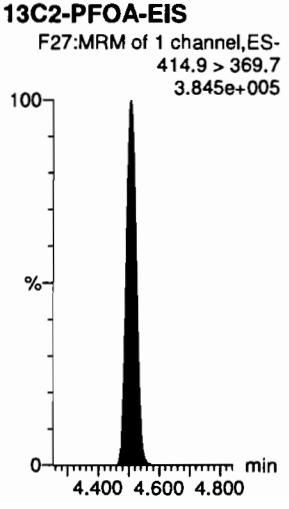
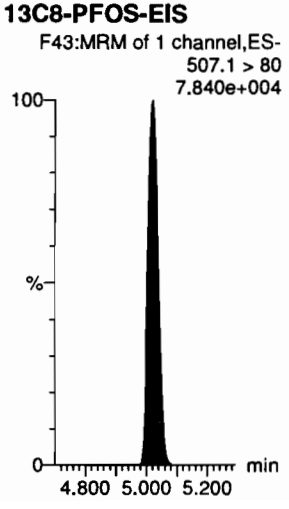
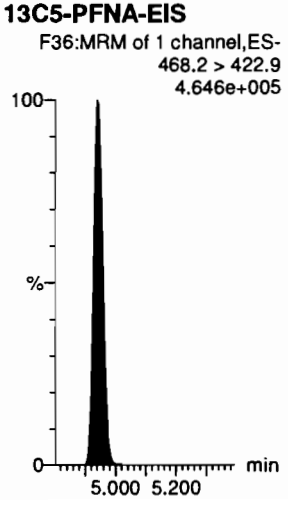


13C8-PFOS-EIS



13C5-PFNA-EIS



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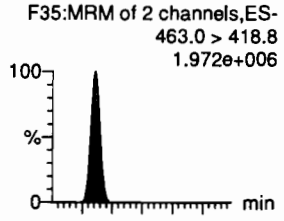
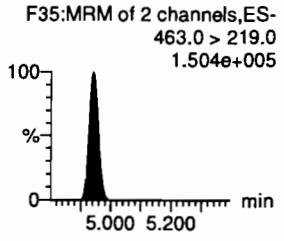
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

PFNA





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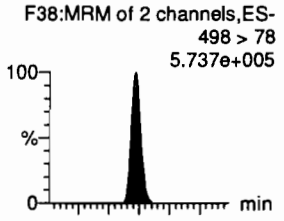

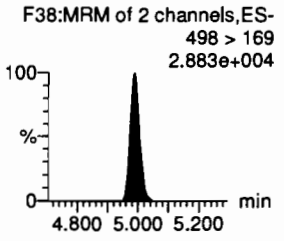

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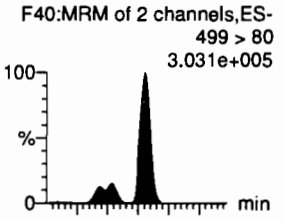
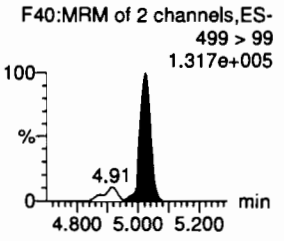
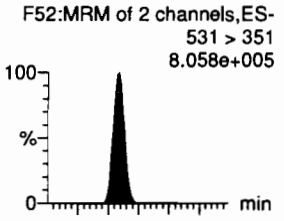
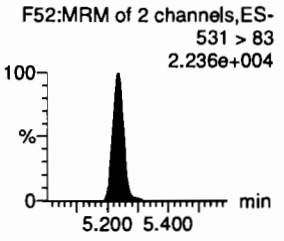




9Cl-PF30NS





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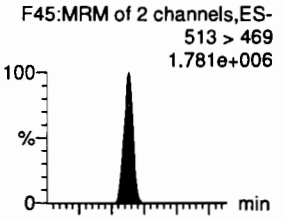
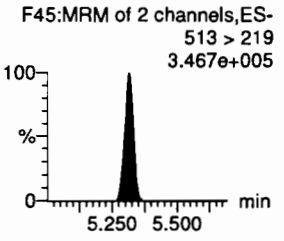
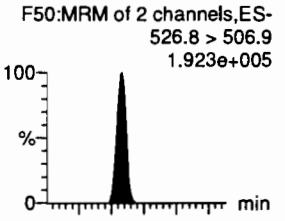
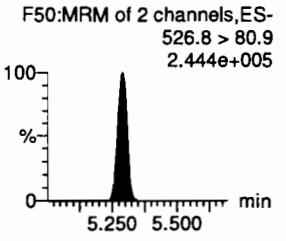


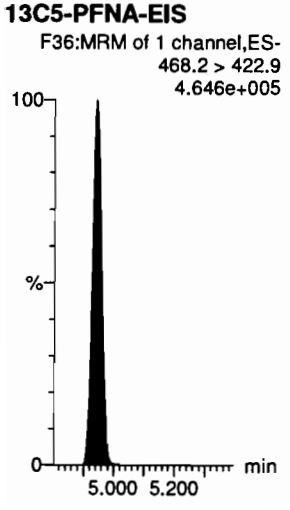


8:2 FTS

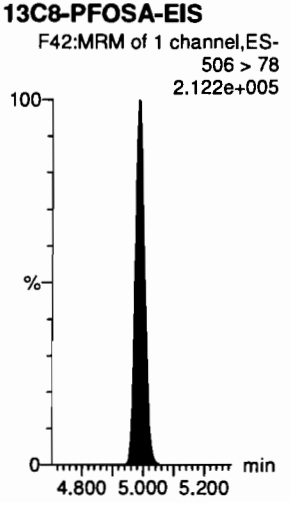




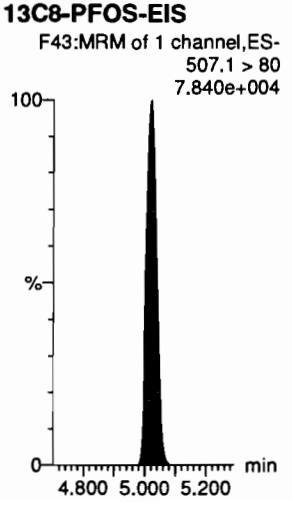
13C5-PFNA-EIS



13C8-PFOSA-EIS



13C8-PFOS-EIS



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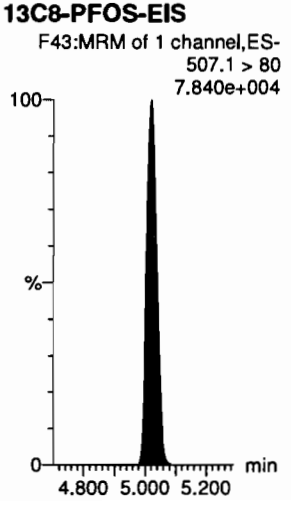

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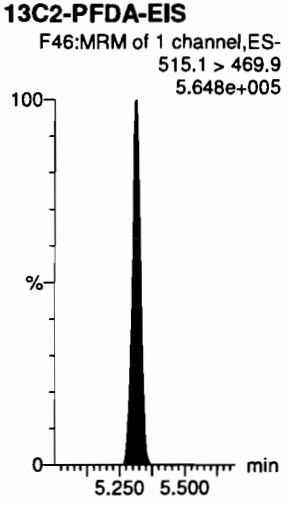

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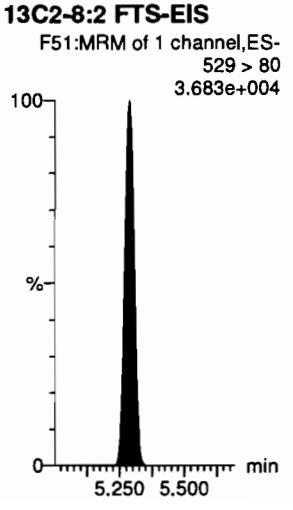

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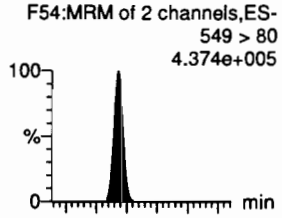
PFNS



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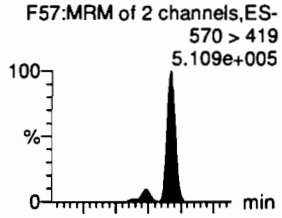

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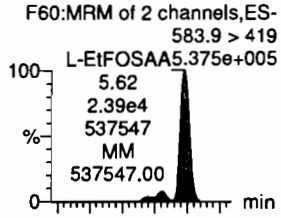

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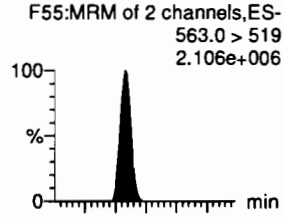

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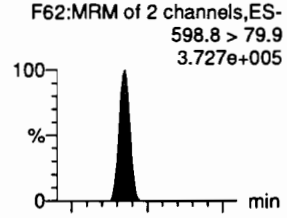

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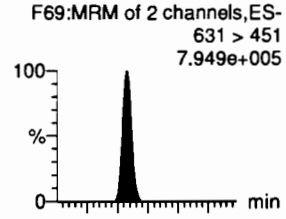
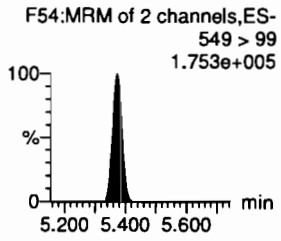
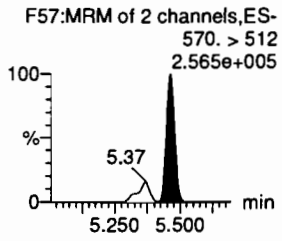
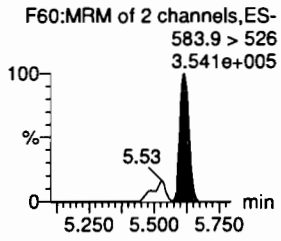
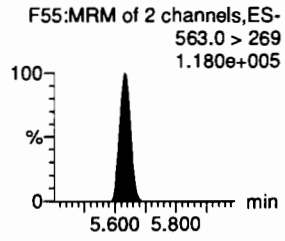
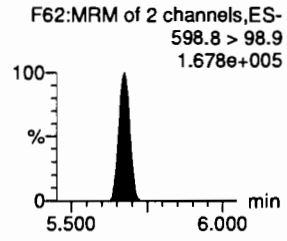


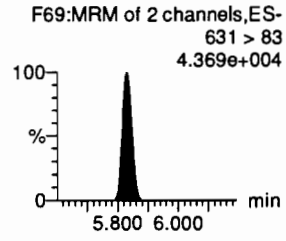




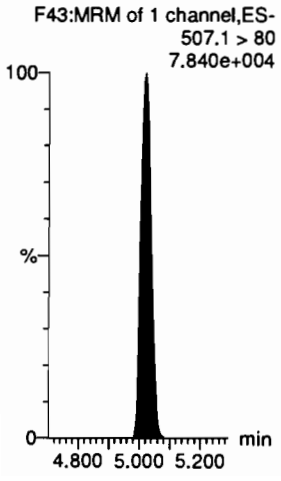








13C8-PFOS-EIS



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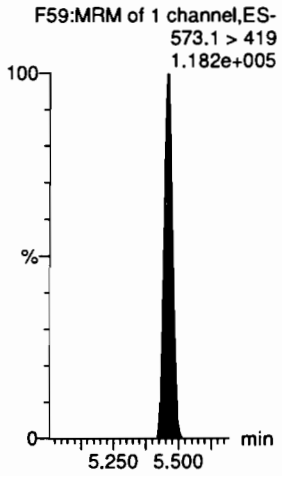

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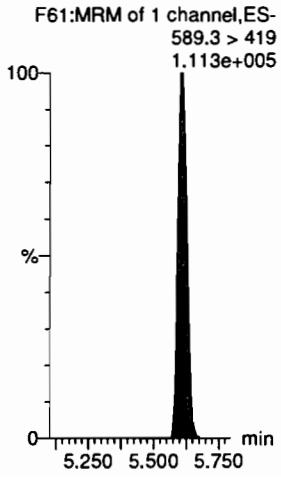

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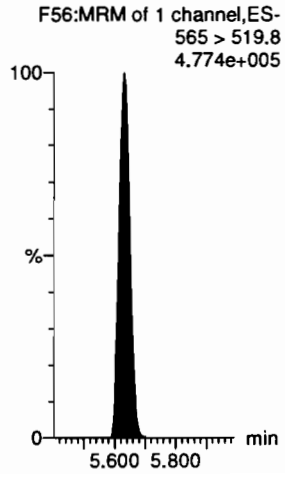

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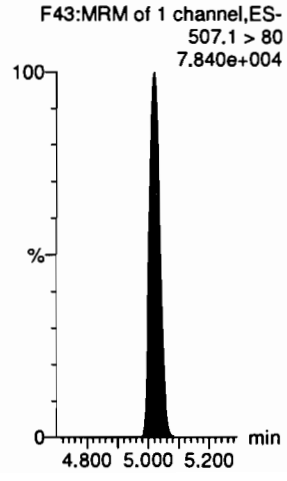

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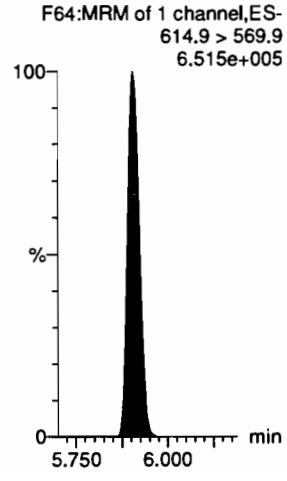

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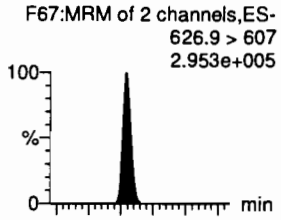
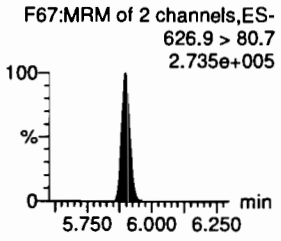
10:2 FTS





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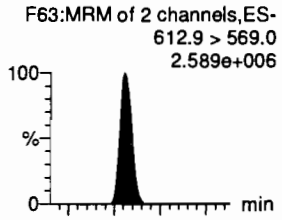
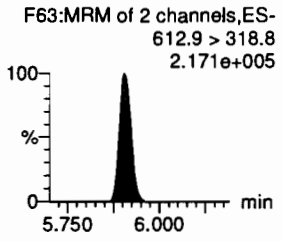
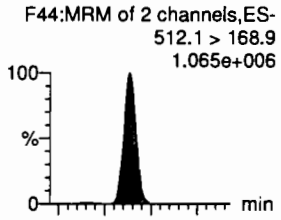
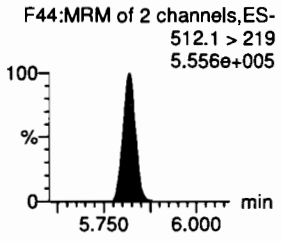




N-MeFOSA





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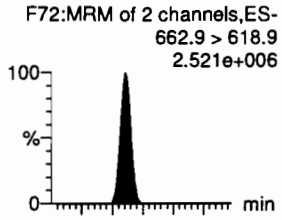

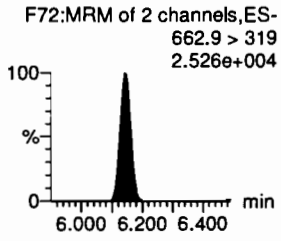

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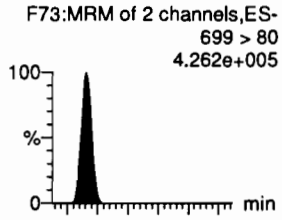

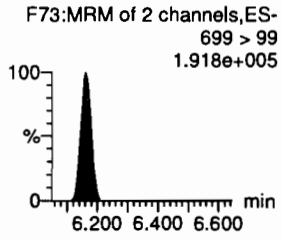

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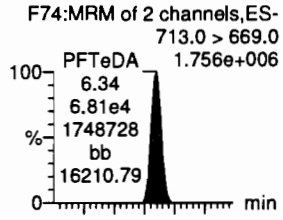

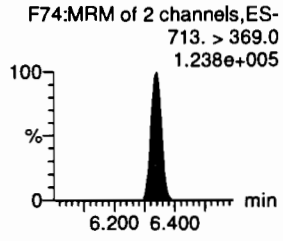

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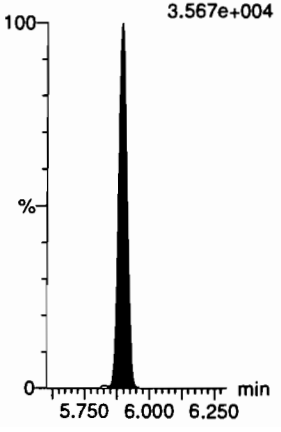
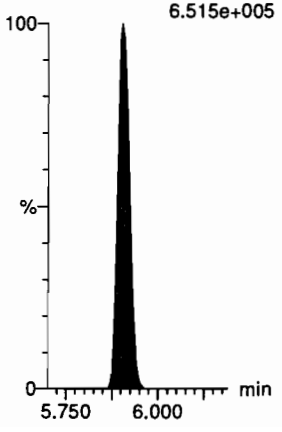
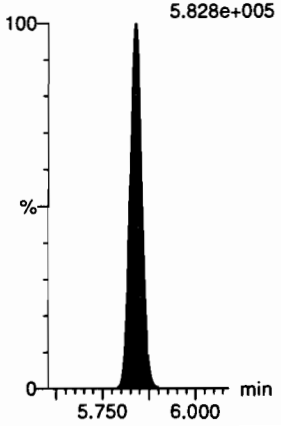


13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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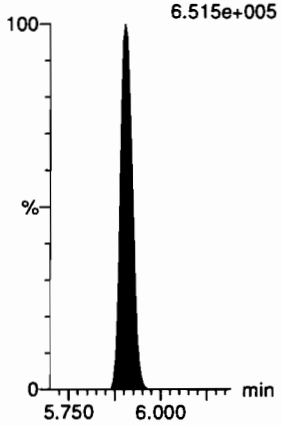
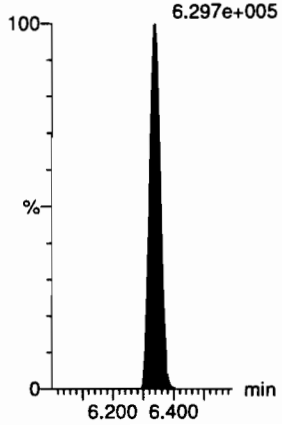
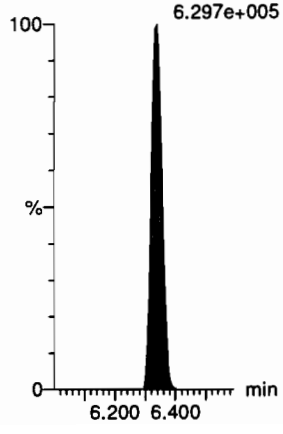


13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



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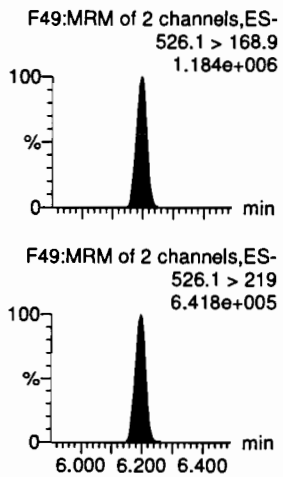
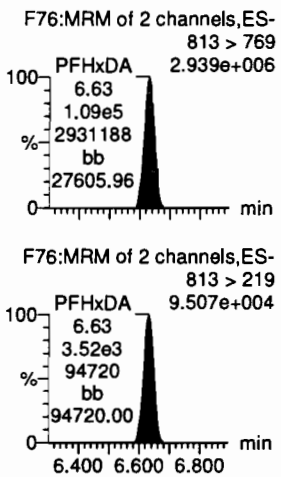
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

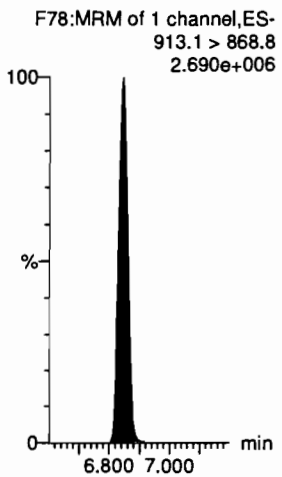
N-EtFOSA



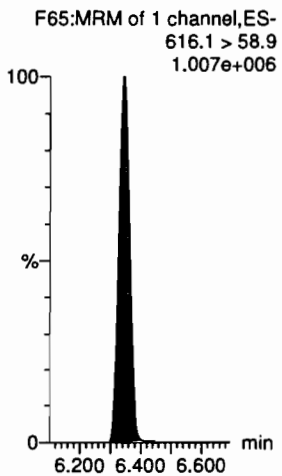
PFHxDA



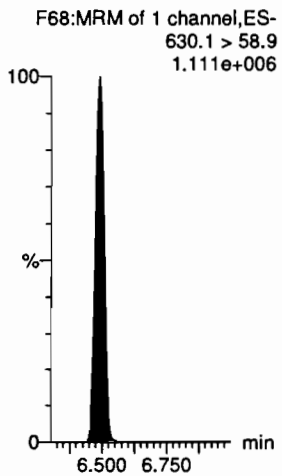
PFODA



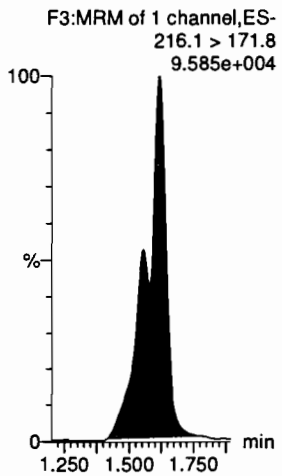
N-MeFOSE



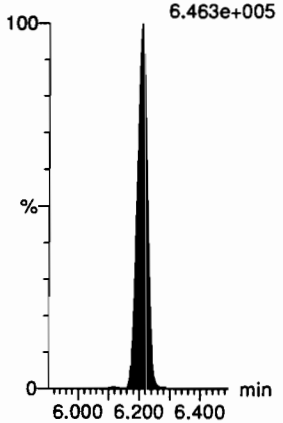
N-EtFOSE



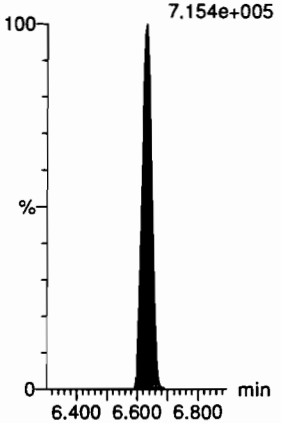
13C3-PFBA-RSD



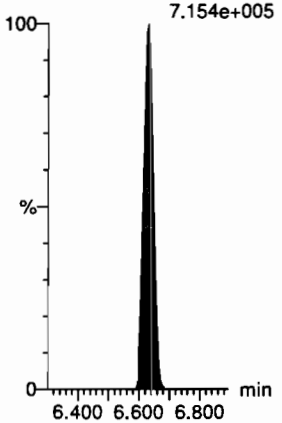
d5-N-ETFOSA-EIS



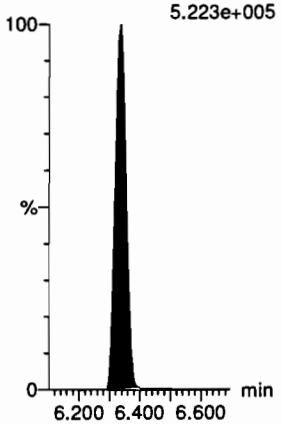
13C2-PFHxDA-EIS



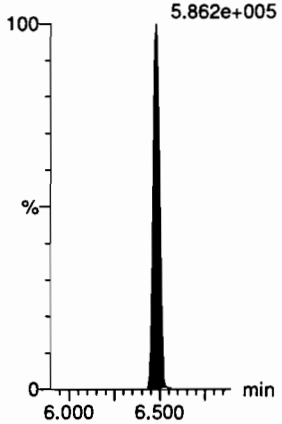
13C2-PFHxDA-EIS



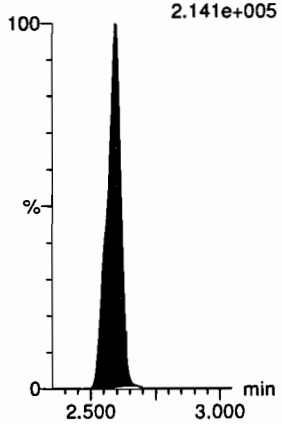
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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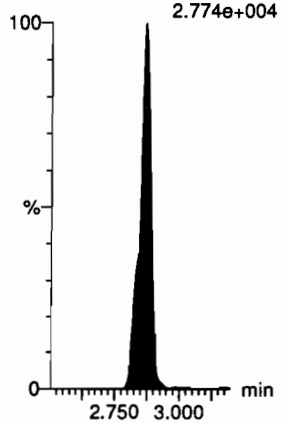
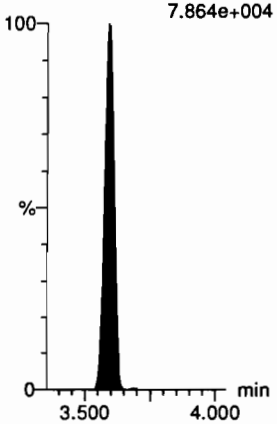
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

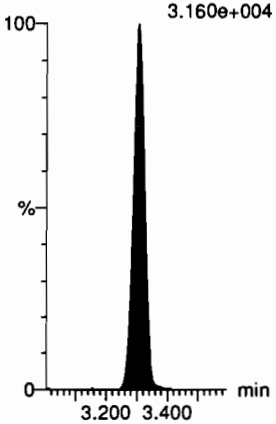
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.774e+004



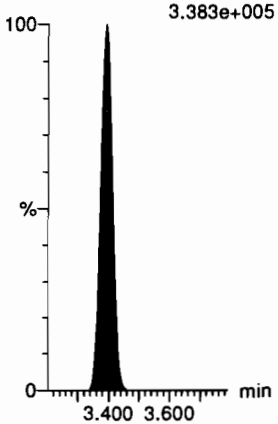
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.864e+004



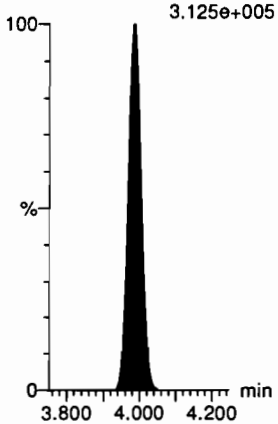
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
3.160e+004



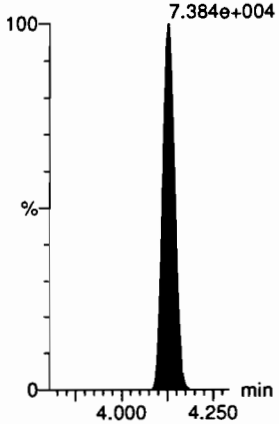
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.383e+005



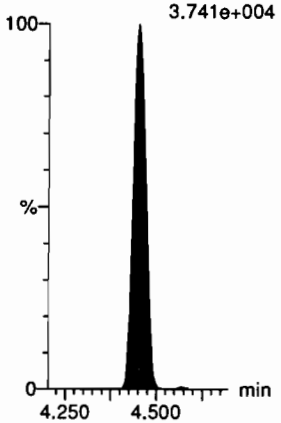
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.125e+005



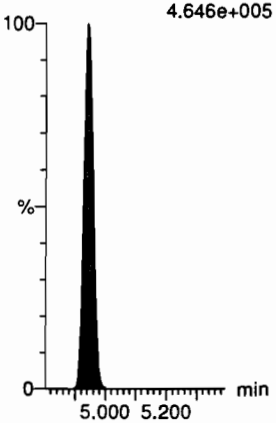
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
7.384e+004



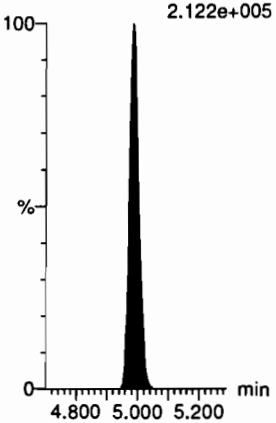
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
3.741e+004



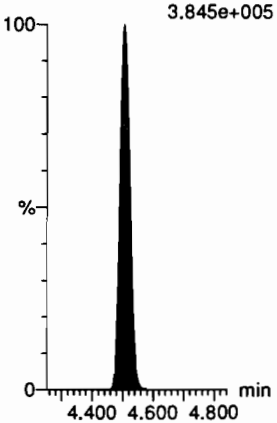
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.646e+005



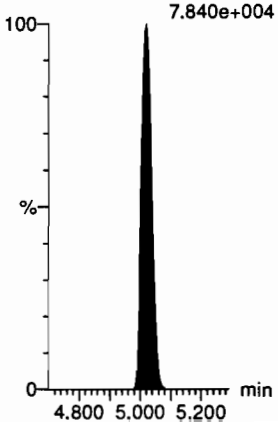
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.122e+005



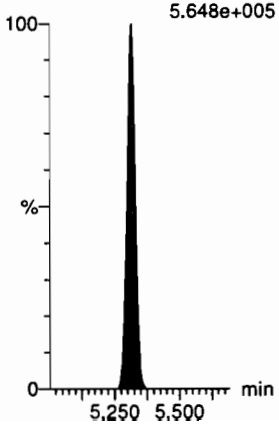
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.845e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.840e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.648e+005



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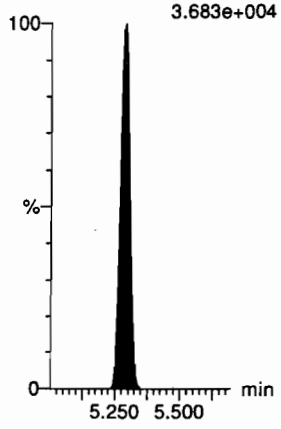
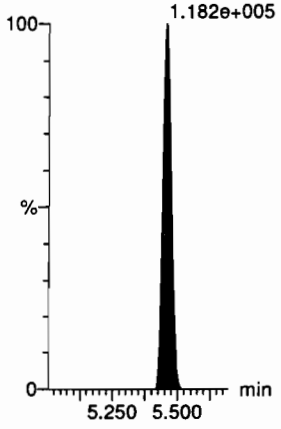
Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

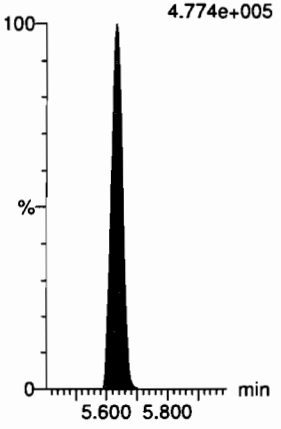
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.683e+004



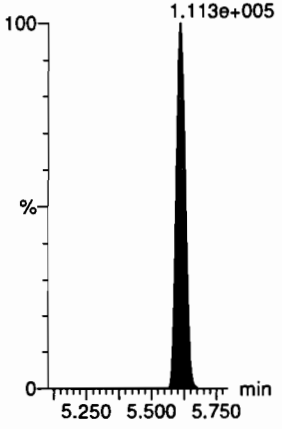
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.182e+005



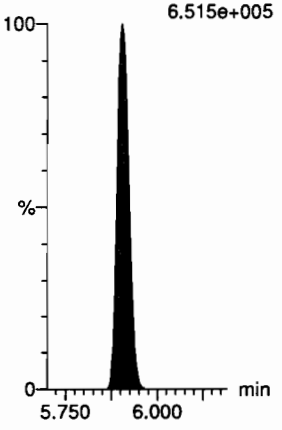
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.774e+005



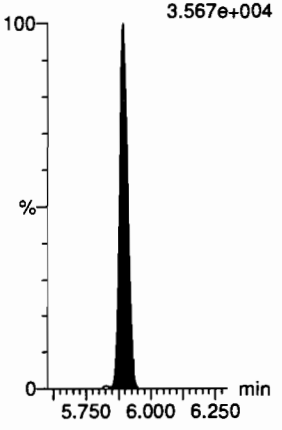
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.113e+005



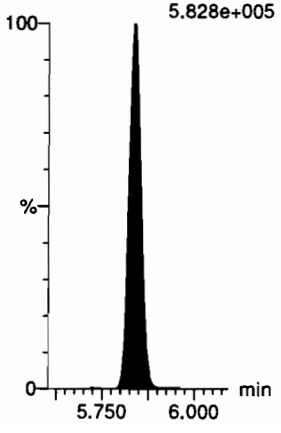
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.515e+005



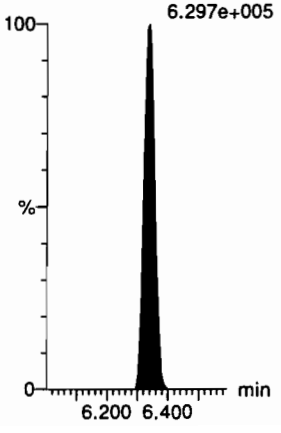
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.567e+004



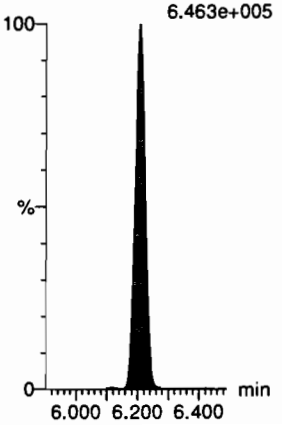
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.828e+005



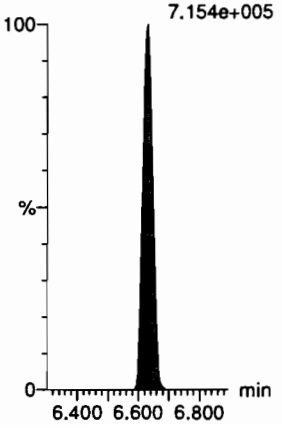
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.297e+005



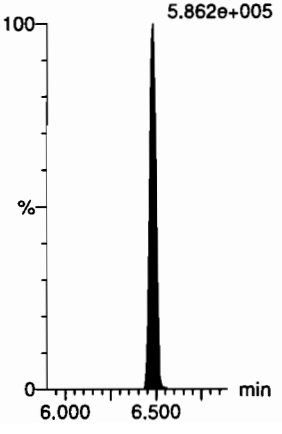
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.463e+005



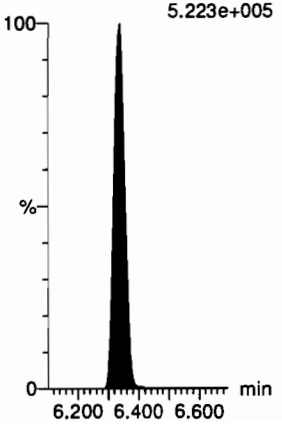
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.154e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.862e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.223e+005



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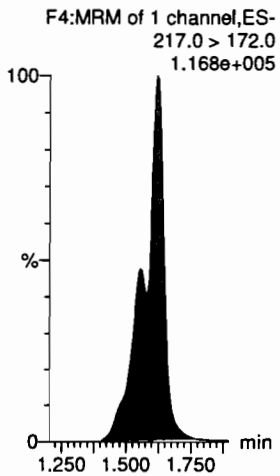
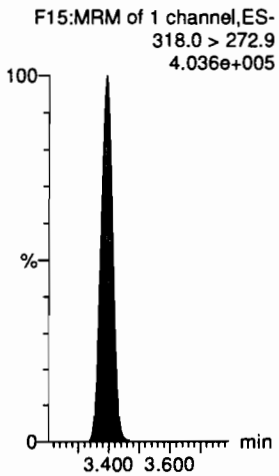
Name: 200706P1-25, Date: 06-Jul-2020, Time: 14:16:59, ID: ST200706P1-7 PFC CS4 20F1907, Description: PFC CS4 20F1907

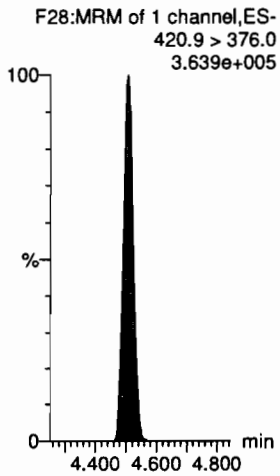
13C4-PFBA



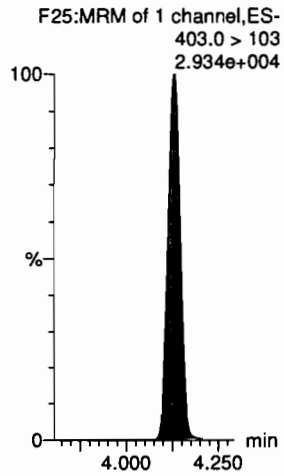
13C5-PFHxA



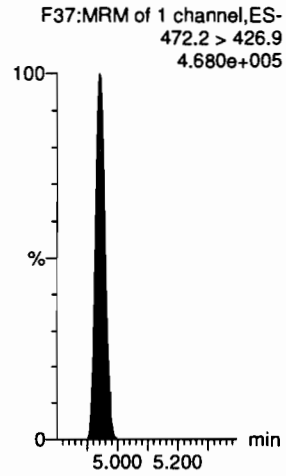
13C8-PFOA



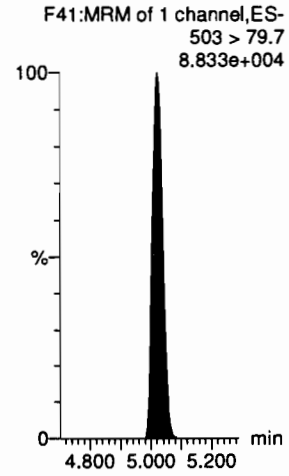
18O2-PFHxS



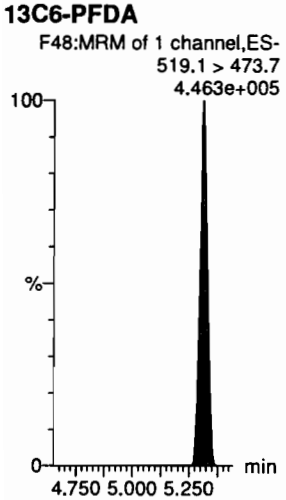
13C9-PFNA



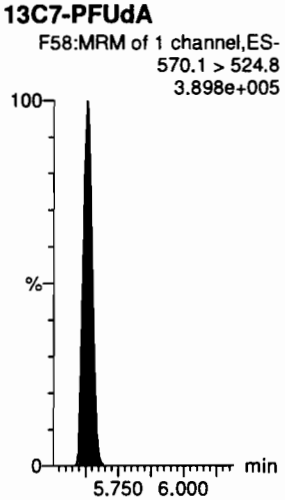
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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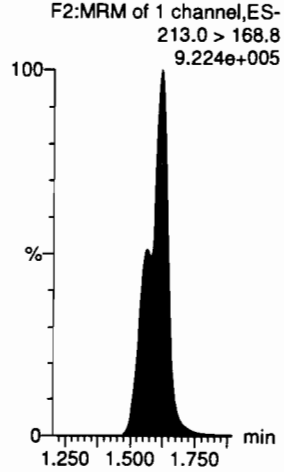
Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

PFBA



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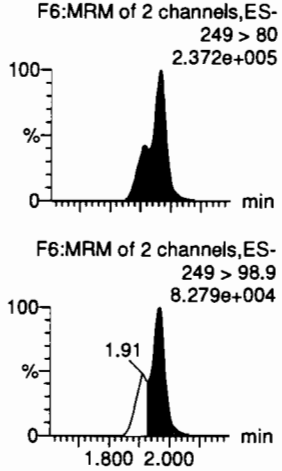
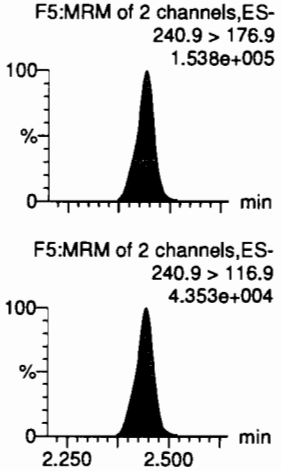


3:3 FTCA



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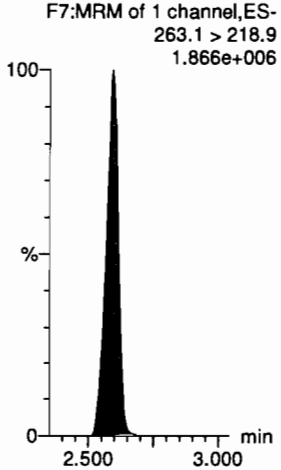

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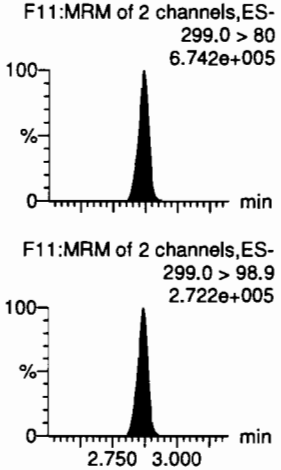
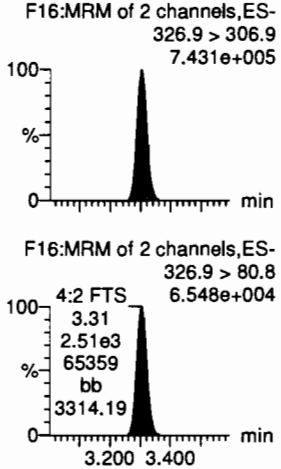


4:2 FTS



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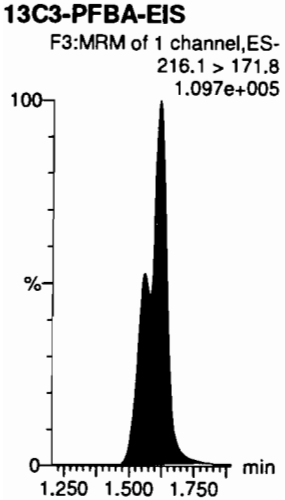

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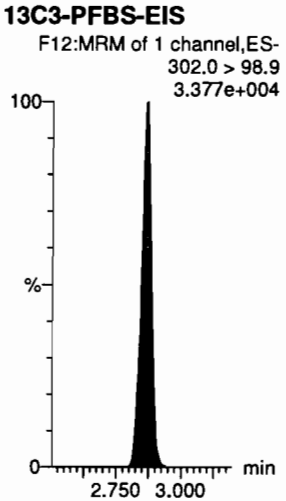

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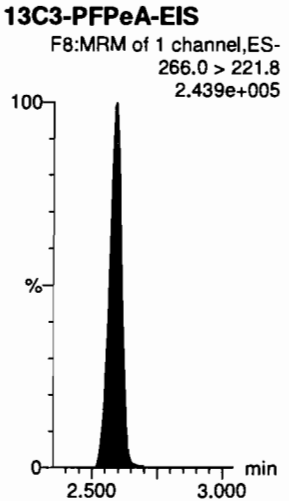

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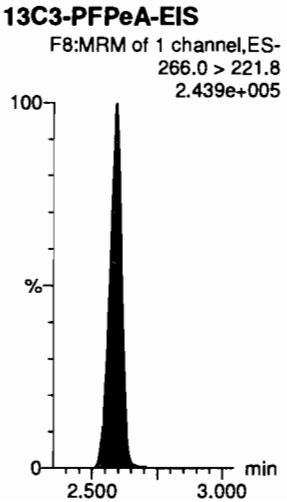

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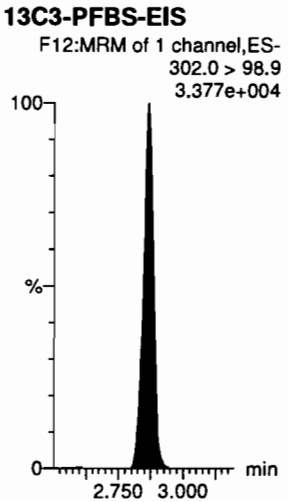
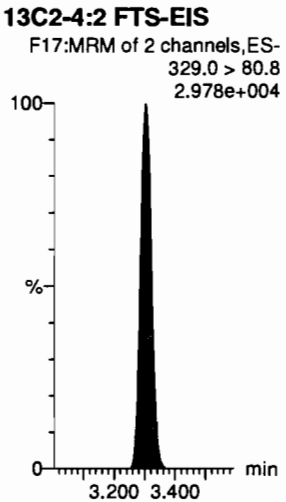


13C2-4:2 FTS-EIS



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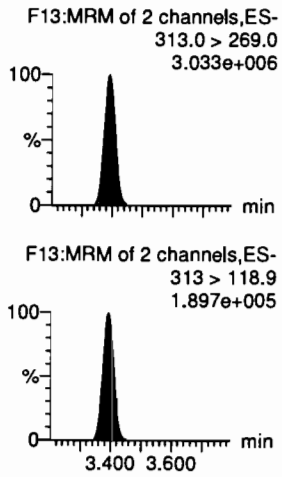
PFHxA



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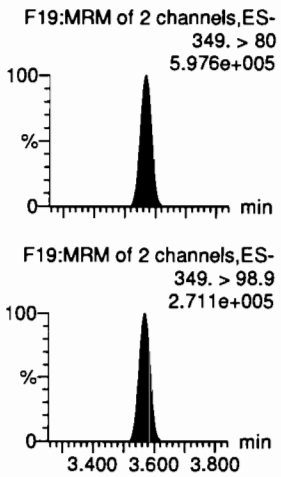
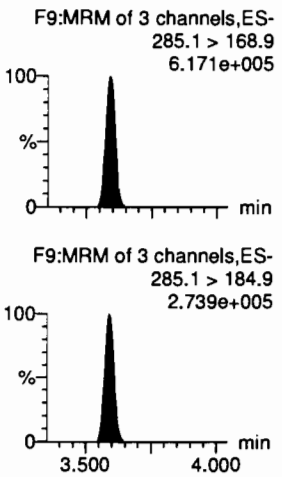
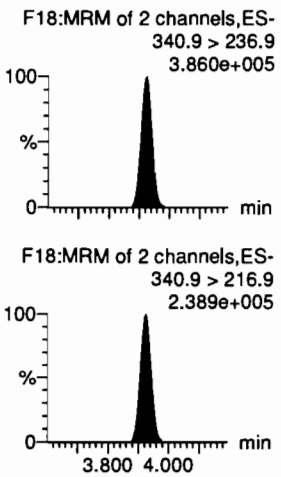


HFPO-DA



5:3 FTCA



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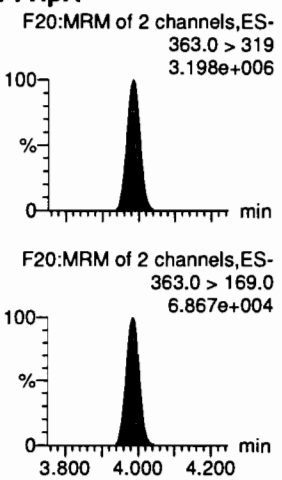
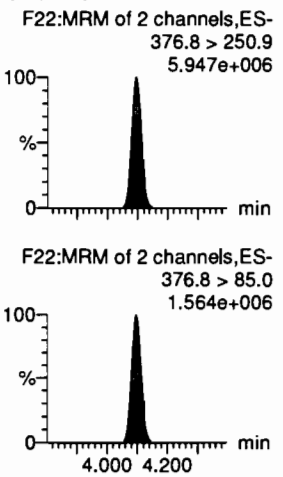


ADONA



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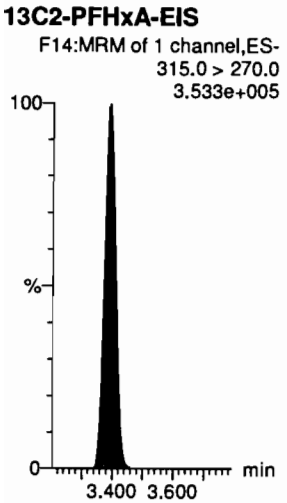

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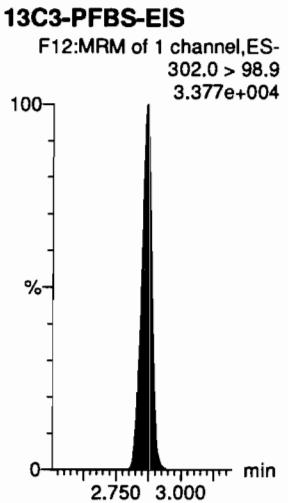

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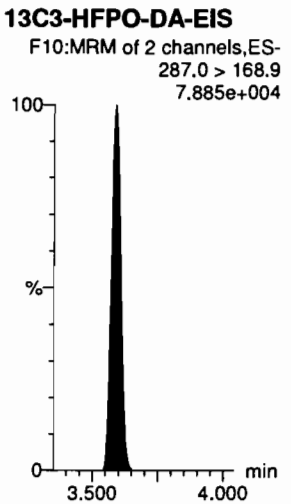

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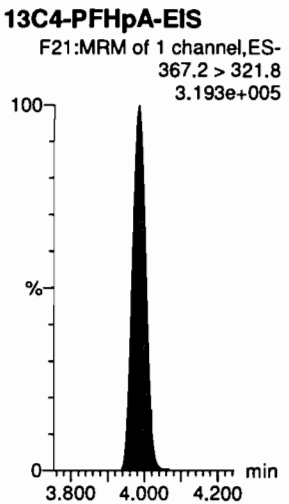

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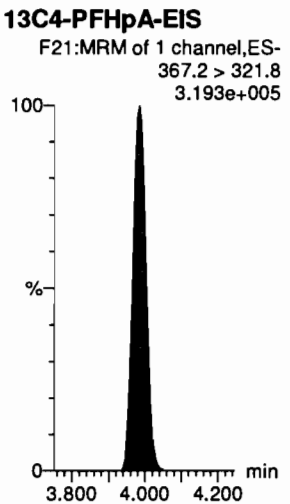

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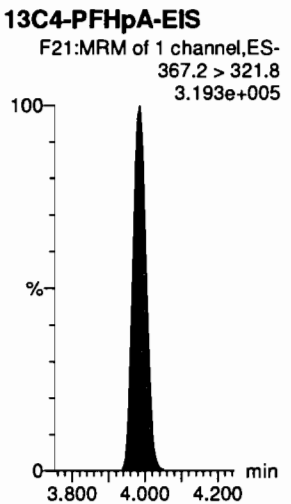

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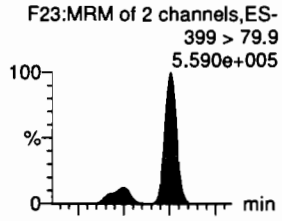
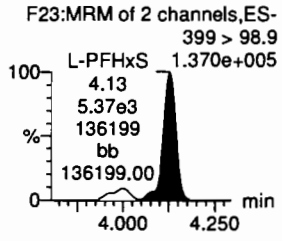
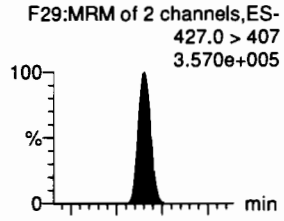
Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

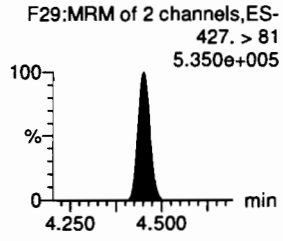
L-PFHxS



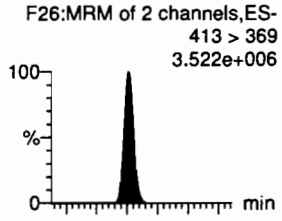


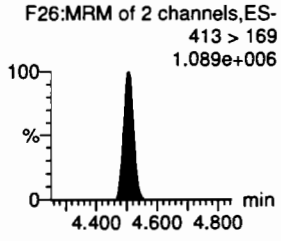
6:2 FTS



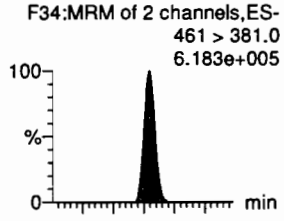


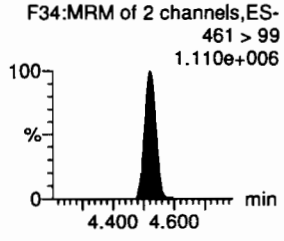
L-PFOA





PFEChS





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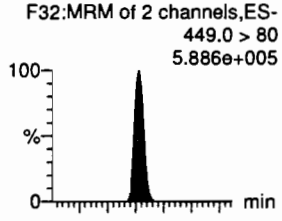
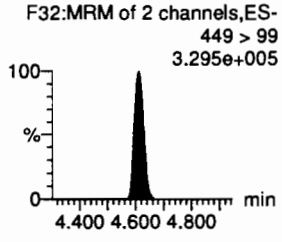
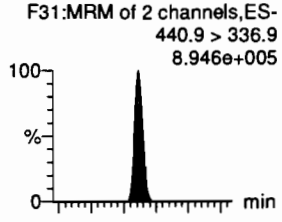
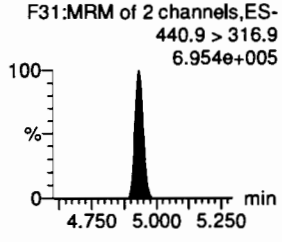




7:3 FTCA





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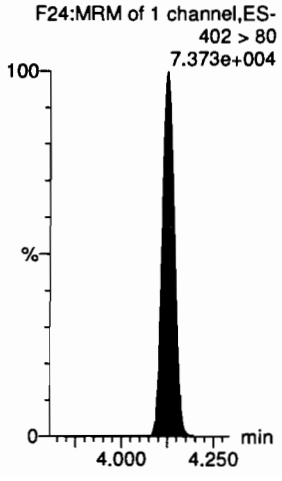
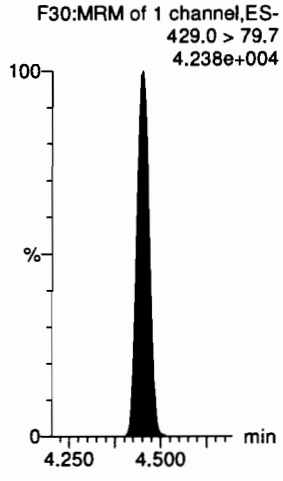


13C2-6:2 FTS-EIS



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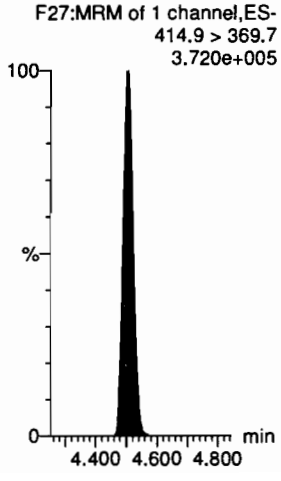

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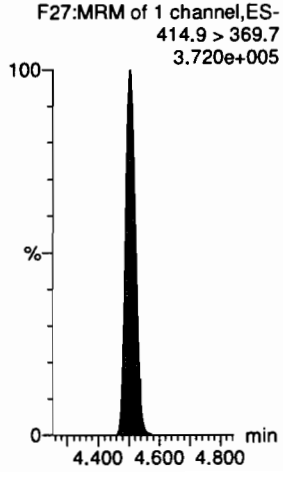
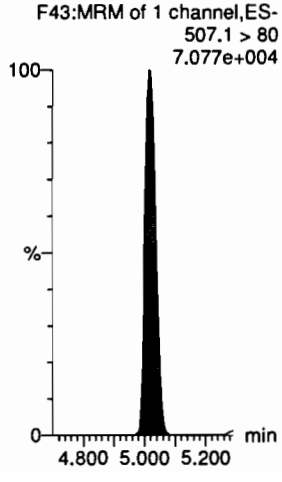
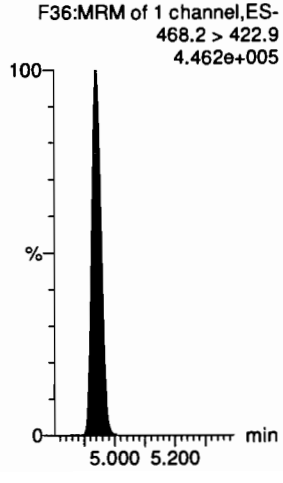


13C8-PFOS-EIS



13C5-PFNA-EIS



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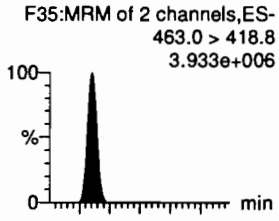
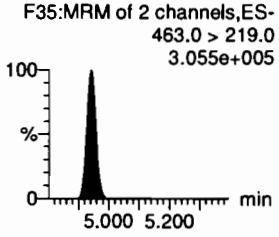
PFNA





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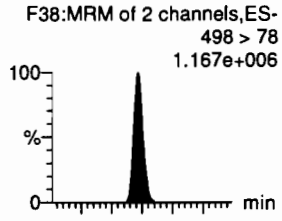
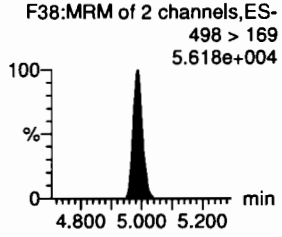
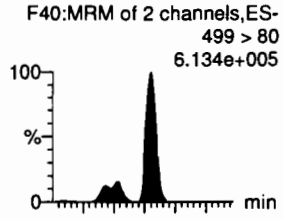
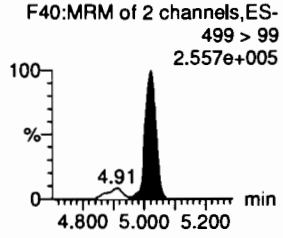




L-PFOS





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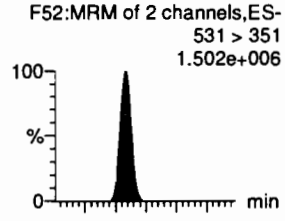

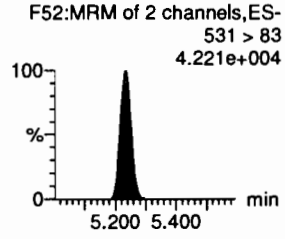

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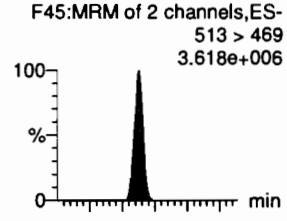
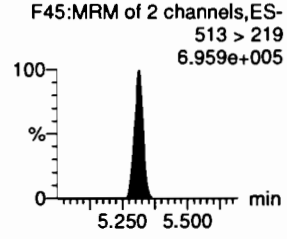
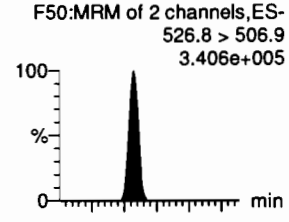
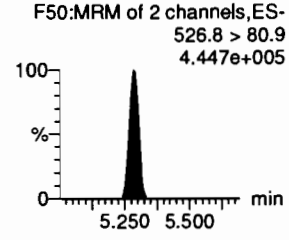


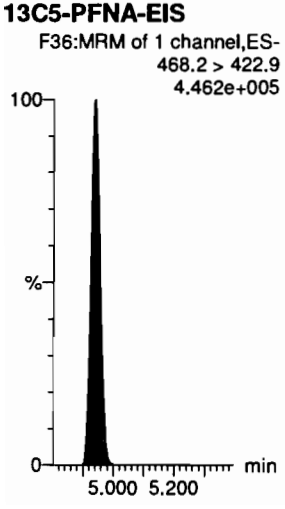


8:2 FTS

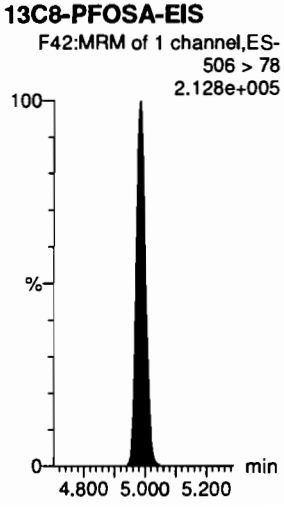




13C5-PFNA-EIS



13C8-PFOSA-EIS



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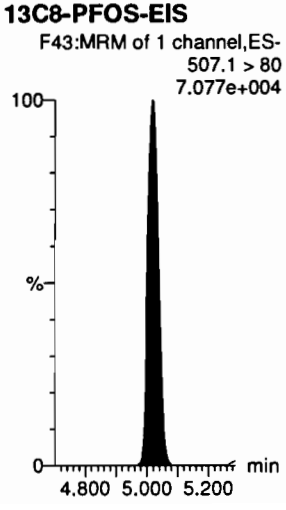

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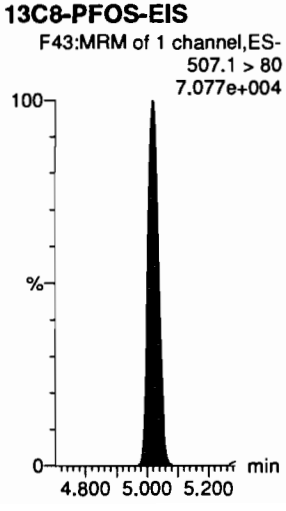

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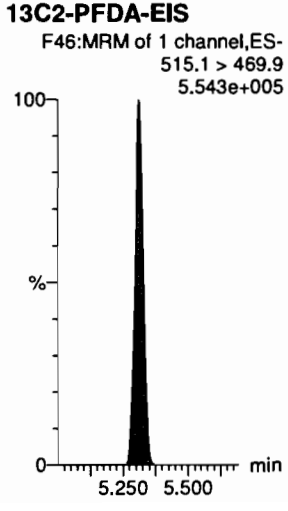

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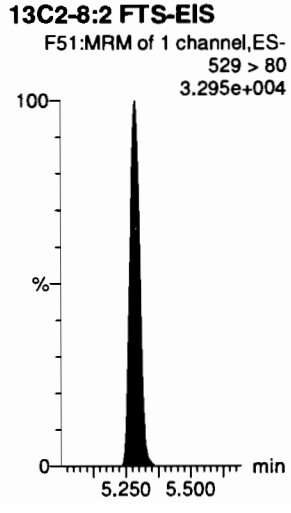

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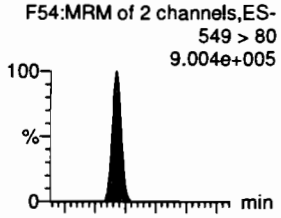
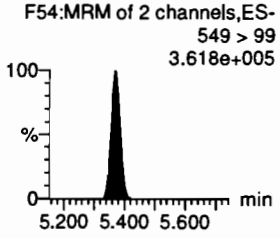
Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

PFNS





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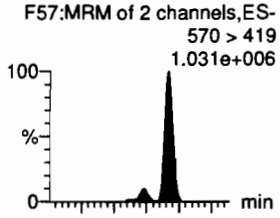

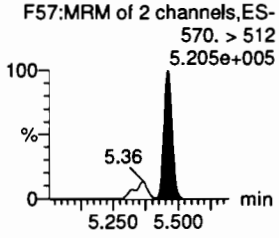

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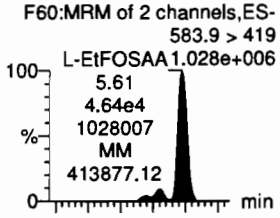
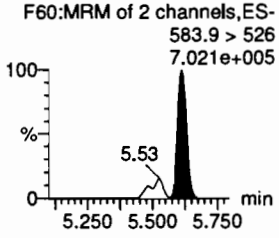
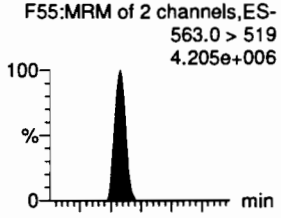
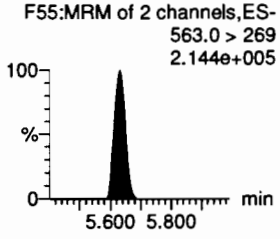




PFUdA





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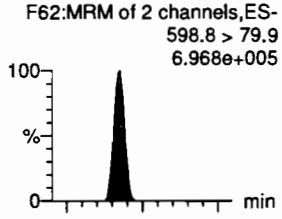

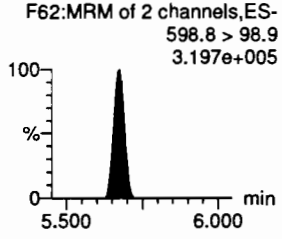

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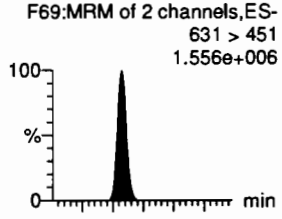
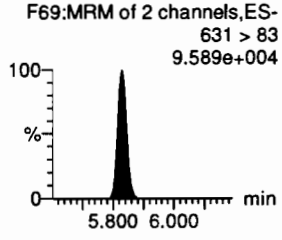
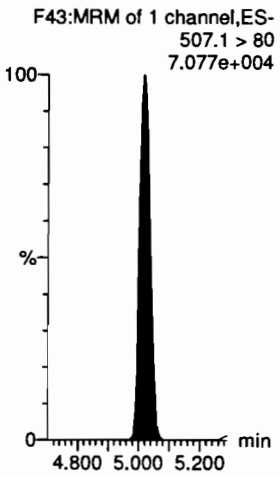
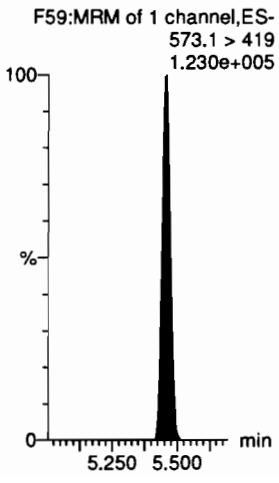




13C8-PFOS-EIS



d3-N-MeFOSAA-EIS



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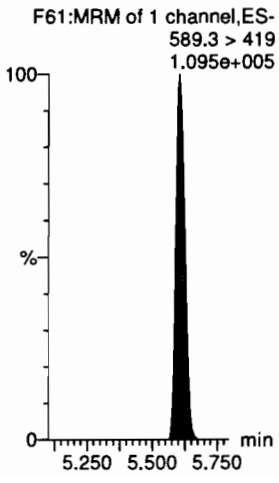

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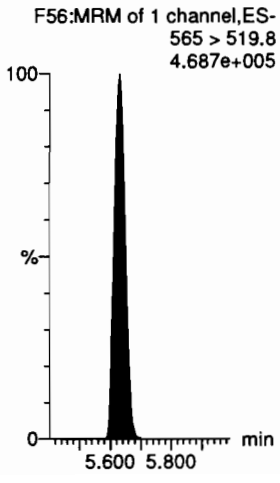

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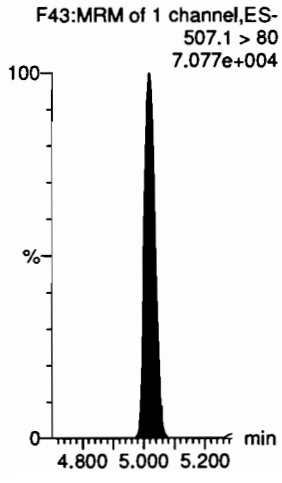

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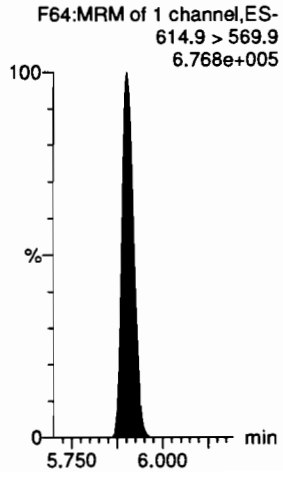

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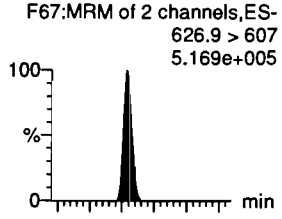
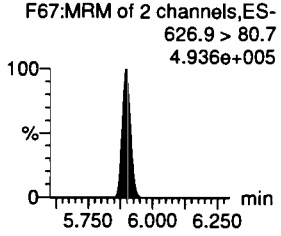
10:2 FTS





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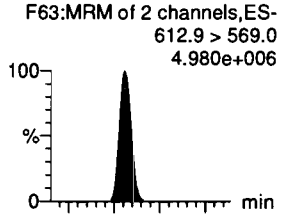

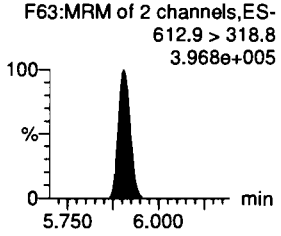

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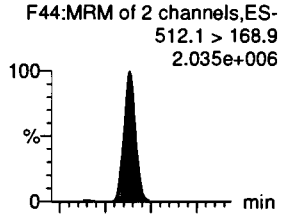

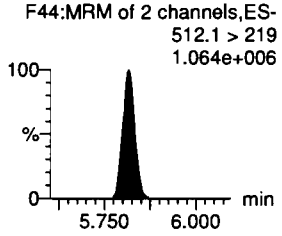

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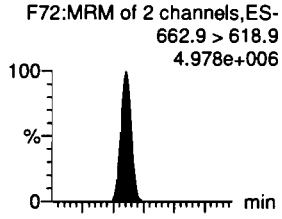

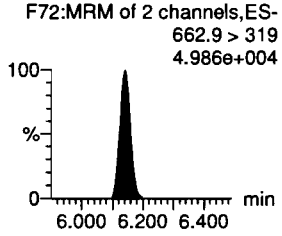

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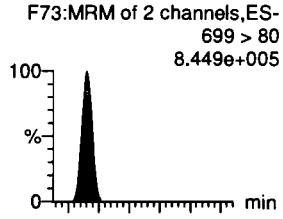
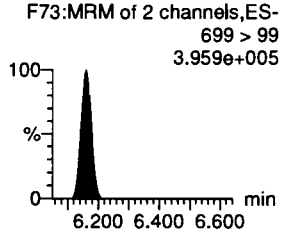
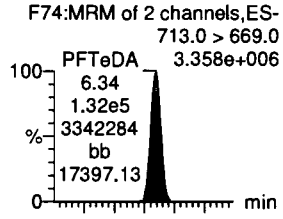
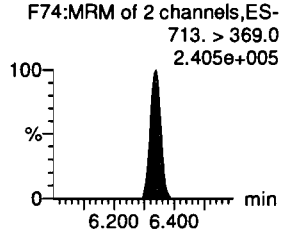




PFTeDA





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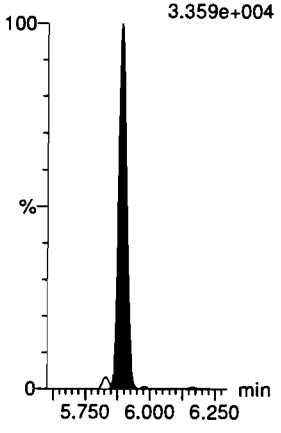
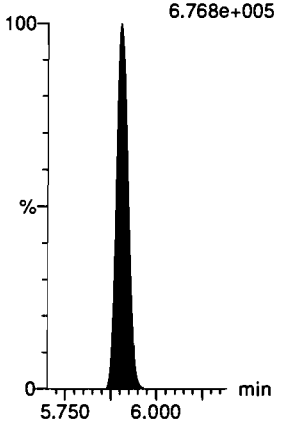
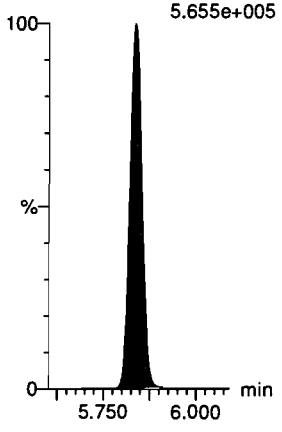


13C2-PFDoA-EIS



d3-N-MeFOSA-EIS



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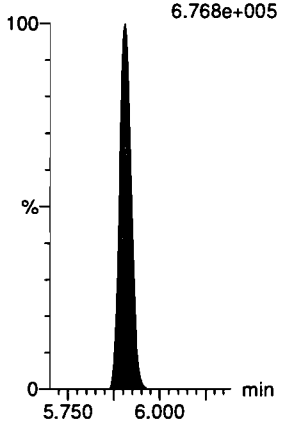

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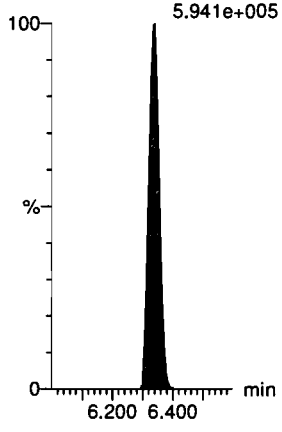

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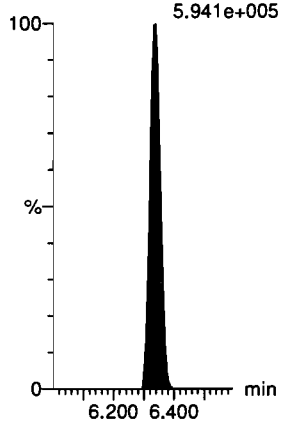

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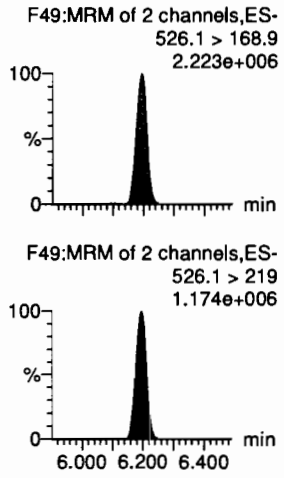
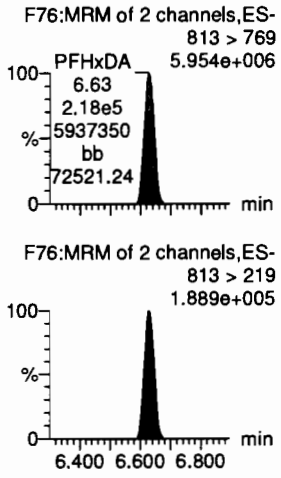
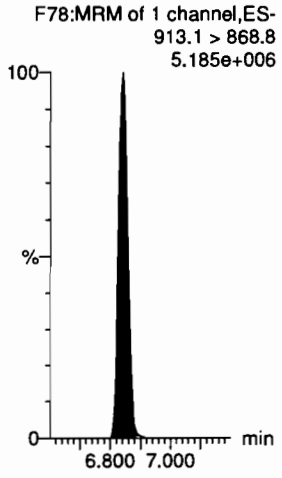
N-EtFOSA



PFHxDA



PFODA



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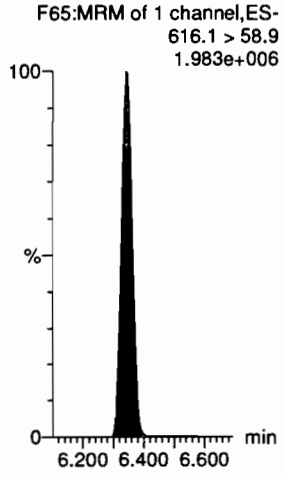

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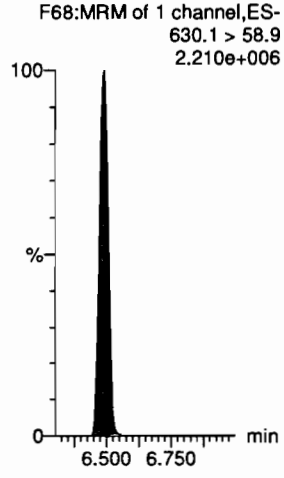

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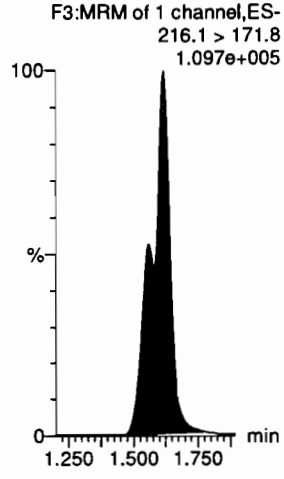
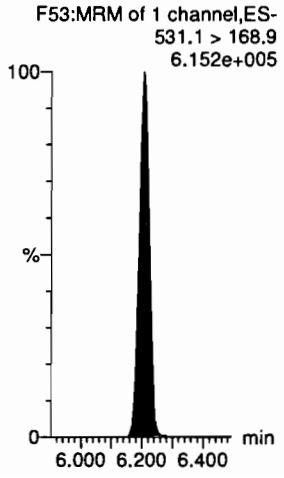
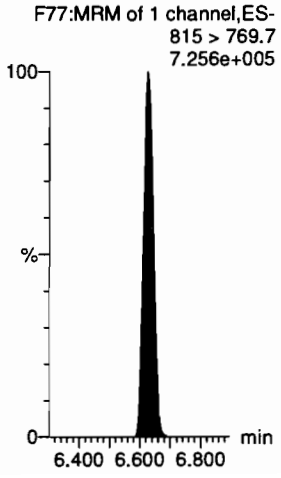


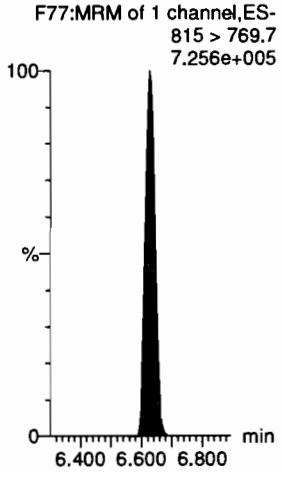
d5-N-ETFOSA-EIS



13C2-PFHxDA-EIS



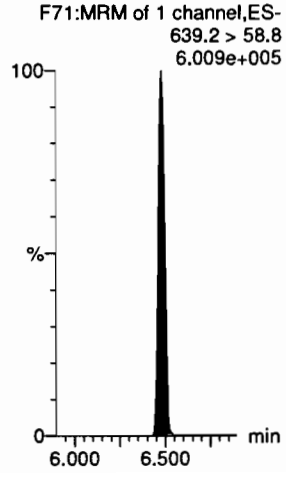
13C2-PFHxDA-EIS



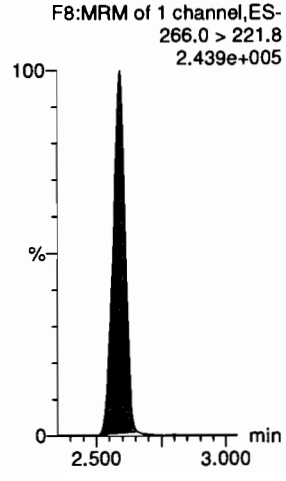
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD

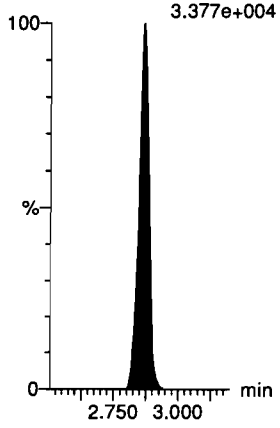


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

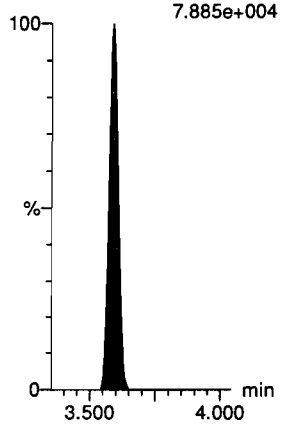
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

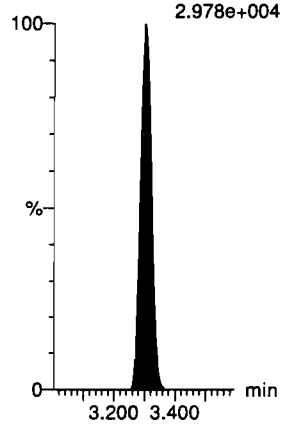
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.377e+004



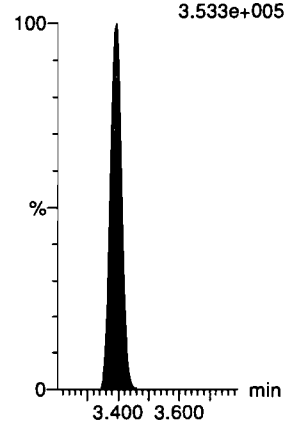
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.885e+004



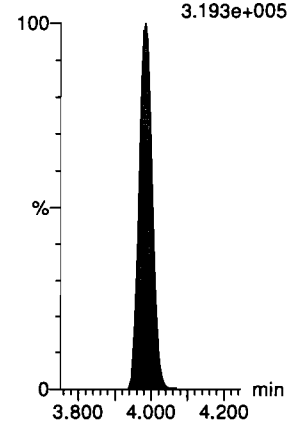
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
2.978e+004



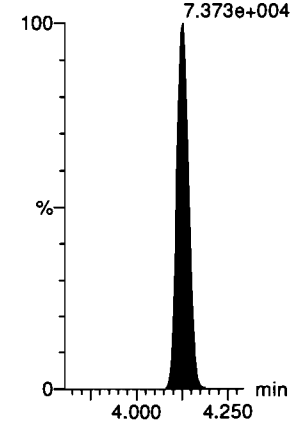
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.533e+005



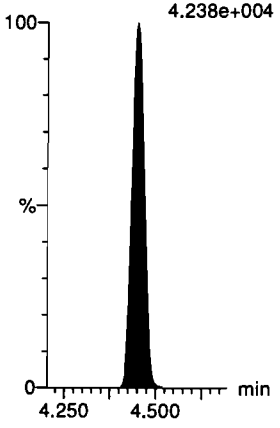
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.193e+005



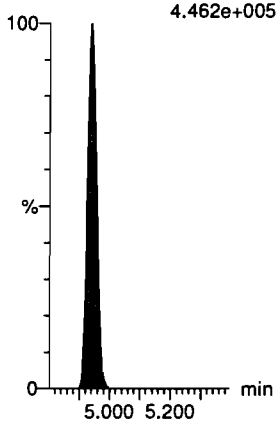
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
7.373e+004



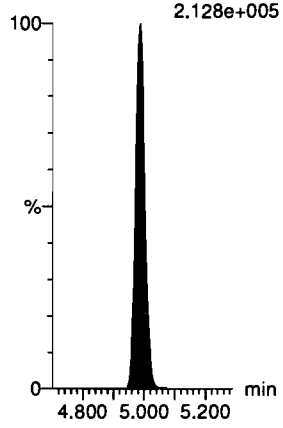
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.238e+004



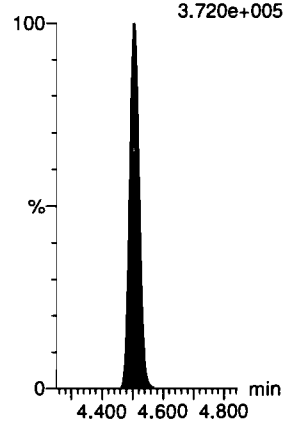
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.462e+005



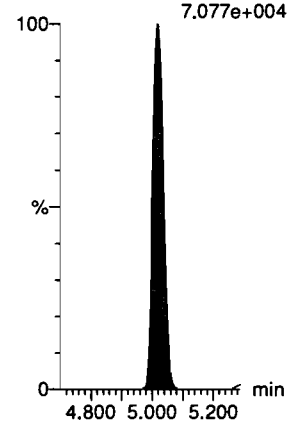
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.128e+005



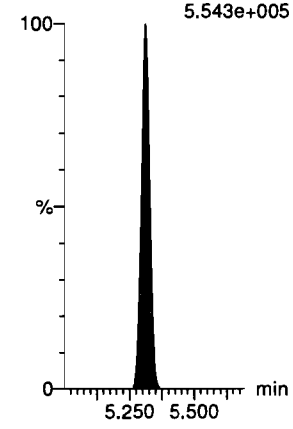
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.720e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.077e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.543e+005



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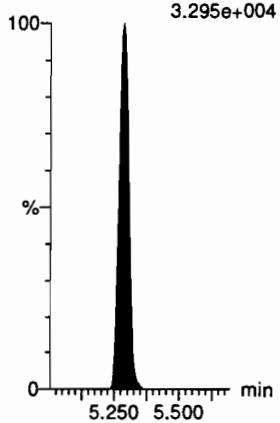
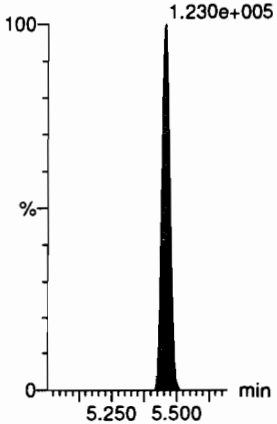
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.295e+004



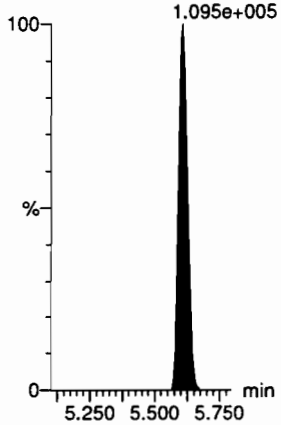
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.230e+005



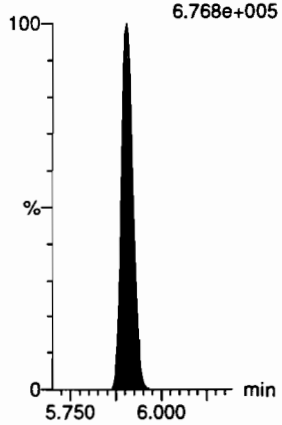
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.687e+005



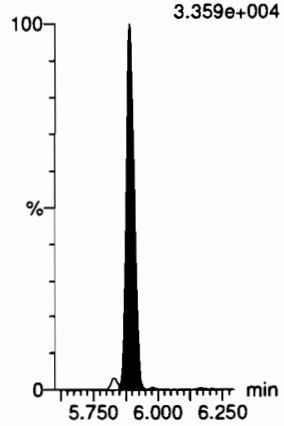
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.095e+005



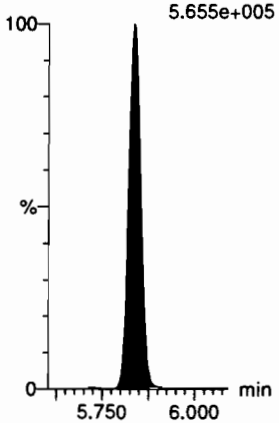
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.768e+005



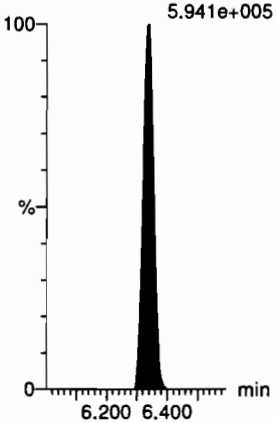
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.359e+004



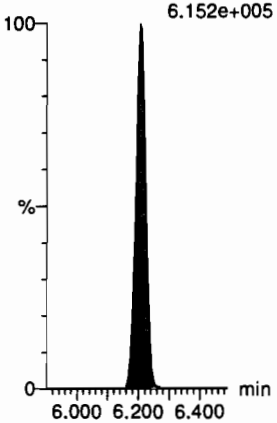
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.655e+005



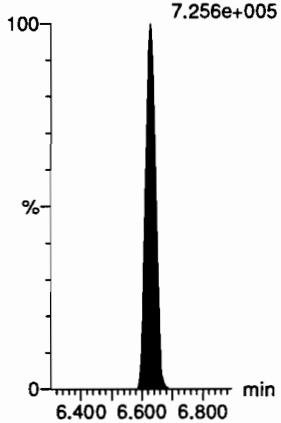
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
5.941e+005



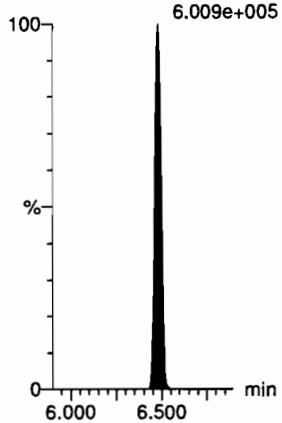
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.152e+005



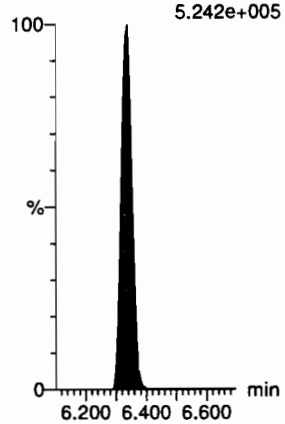
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.256e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
6.009e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.242e+005

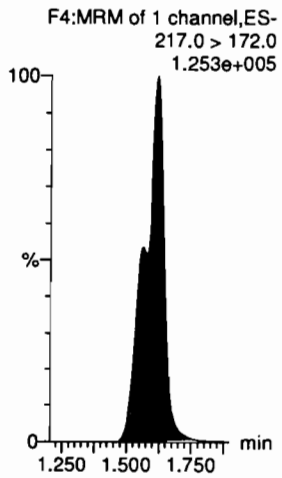


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

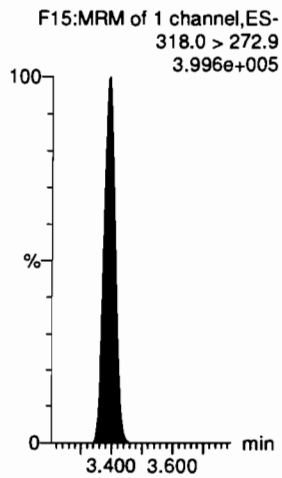
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-26, Date: 06-Jul-2020, Time: 14:27:27, ID: ST200706P1-8 PFC CS5 20F1908, Description: PFC CS5 20F1908

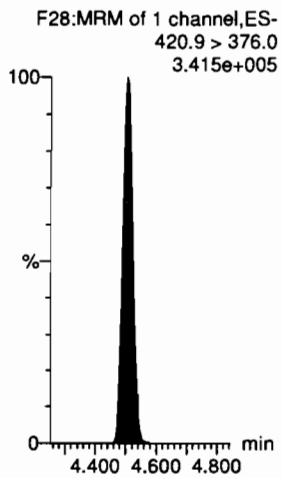
13C4-PFBA



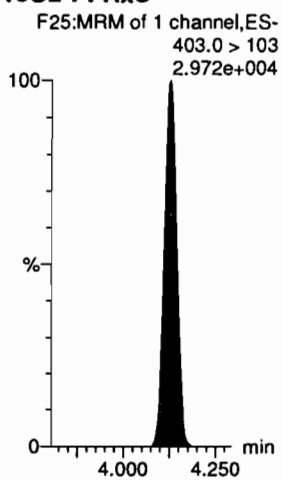
13C5-PFHxA



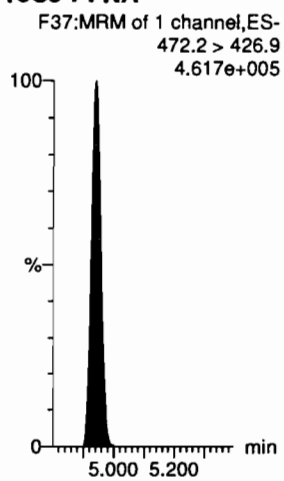
13C8-PFOA



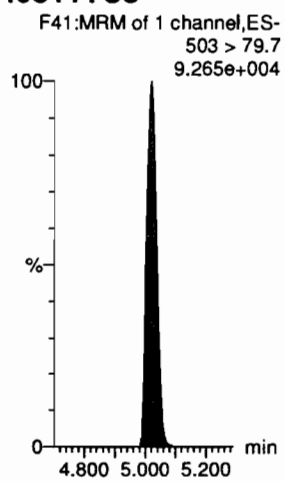
18O2-PFHxS



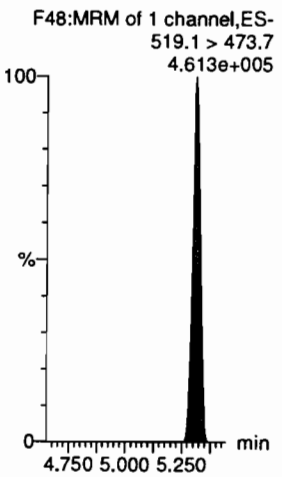
13C9-PFNA



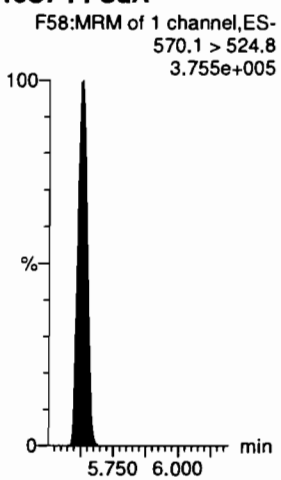
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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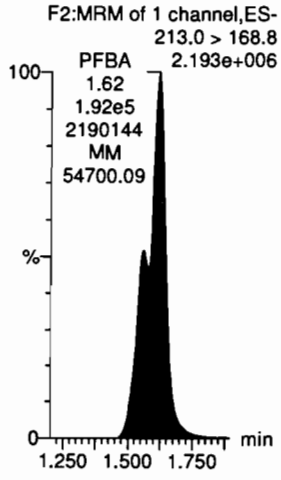
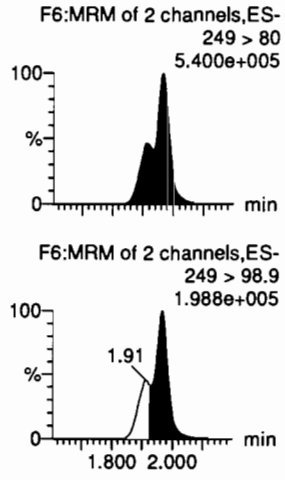
Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

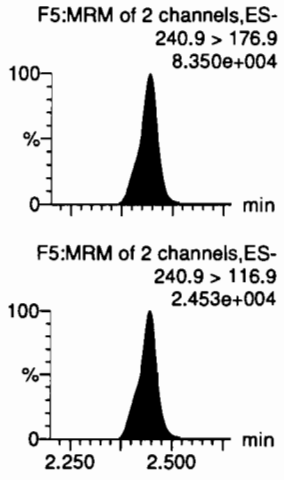
PFBA



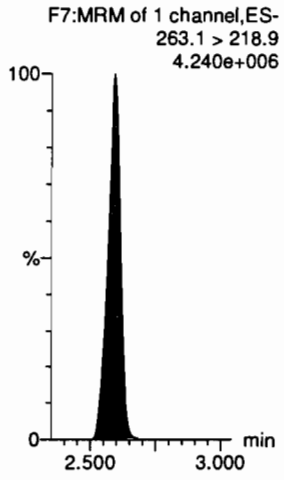
PFPrS



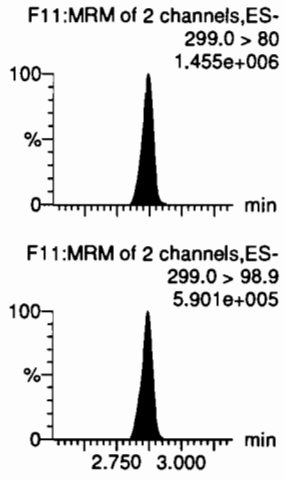
3:3 FTCA



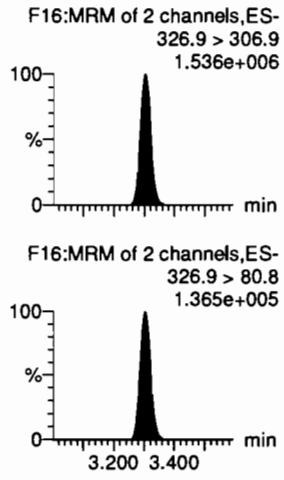
PFPeA



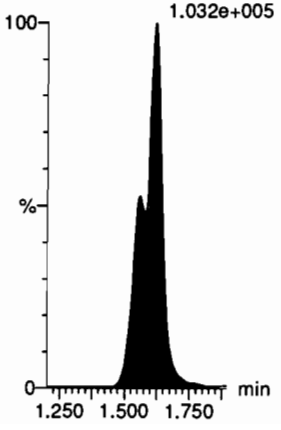
PFBS



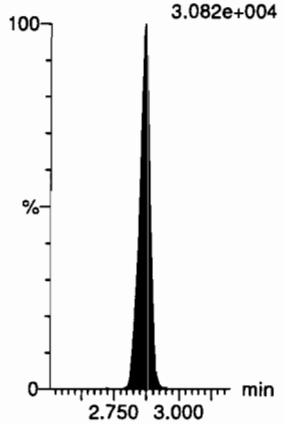
4:2 FTS



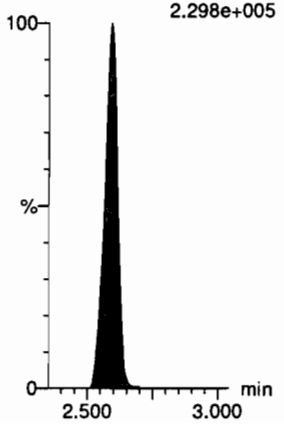
13C3-PFBA-EIS



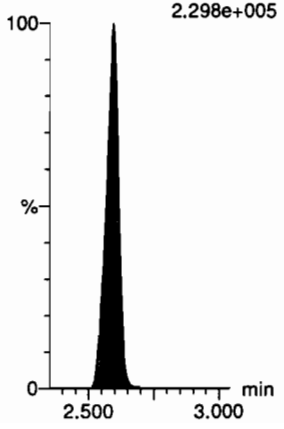
13C3-PFBS-EIS



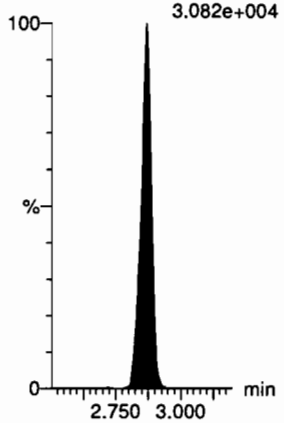
13C3-PFPeA-EIS



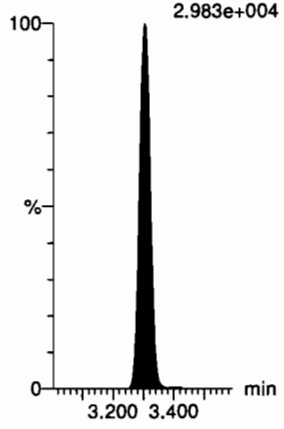
13C3-PFPeA-EIS



13C3-PFBS-EIS



13C2-4:2 FTS-EIS



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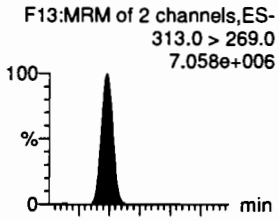
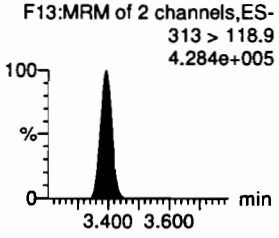
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

PFHxA





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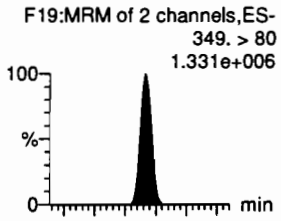
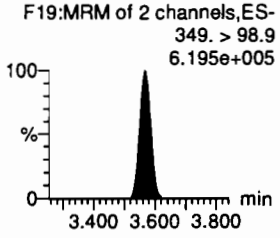
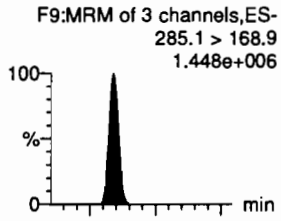
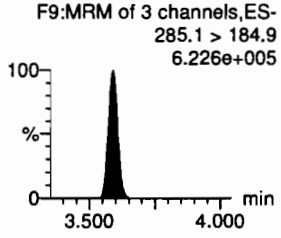




HFPO-DA





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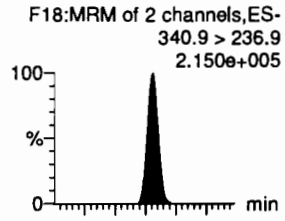

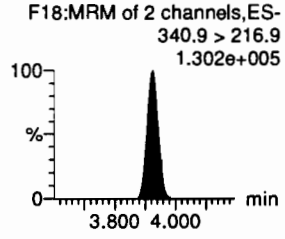

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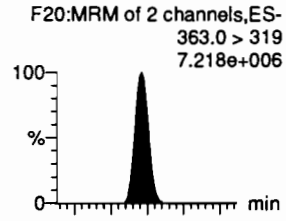

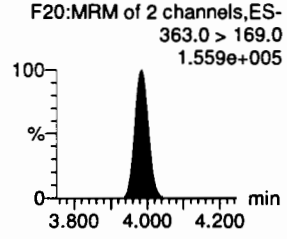

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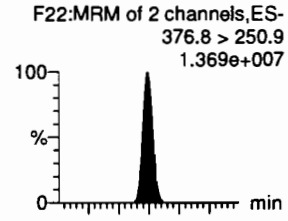
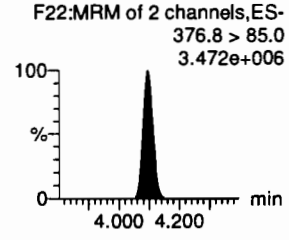
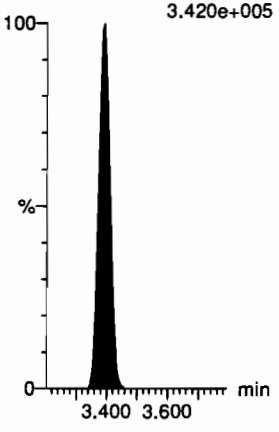
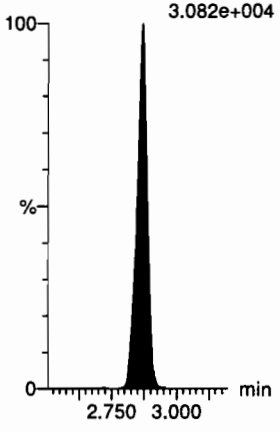




13C2-PFHxA-EIS



13C3-PFBS-EIS



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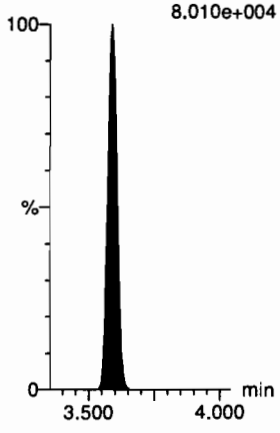

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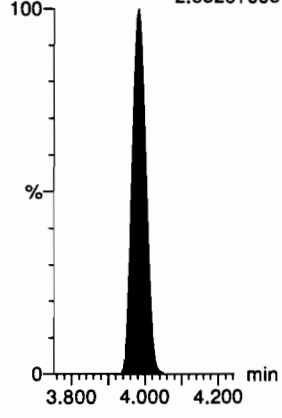

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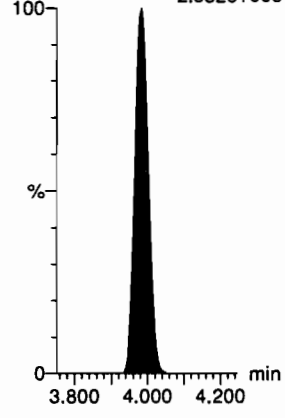

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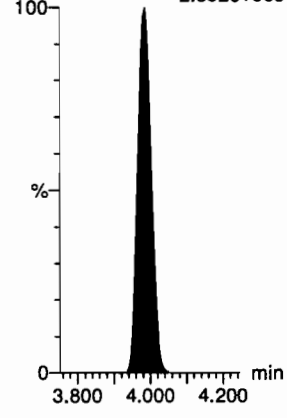

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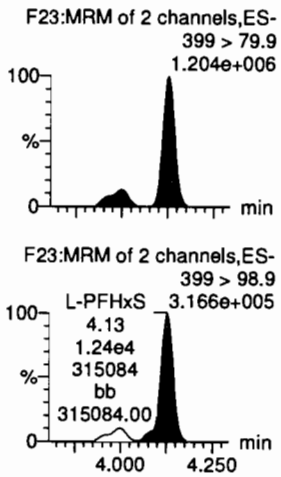
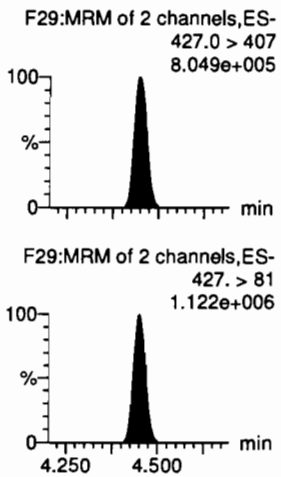
Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

L-PFHxS



6:2 FTS



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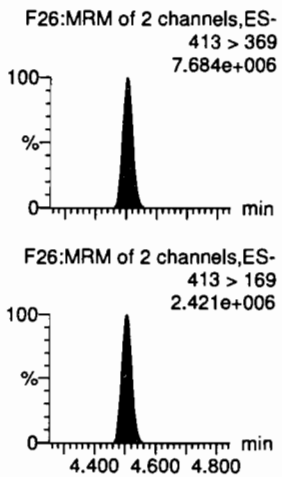

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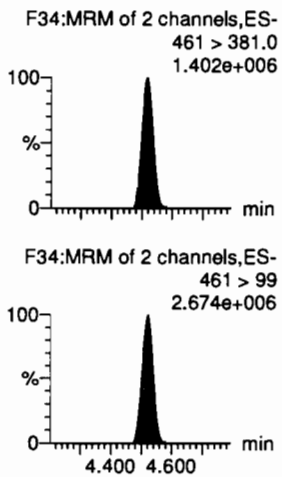

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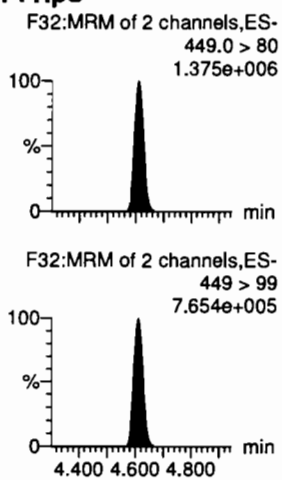
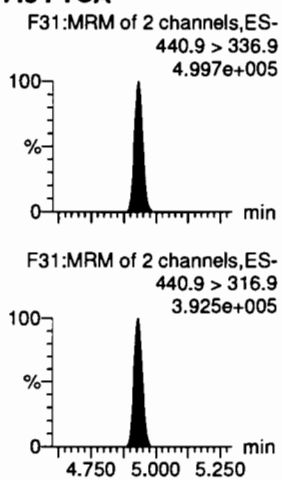


7:3 FTCA



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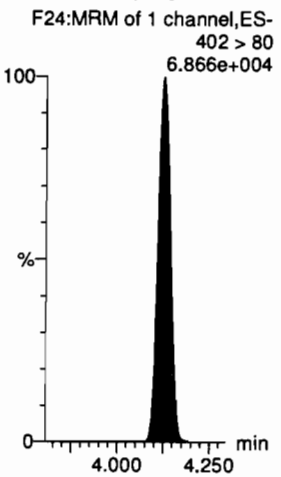

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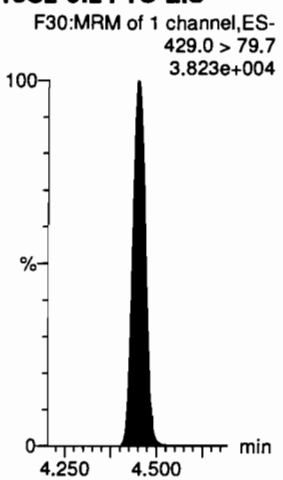

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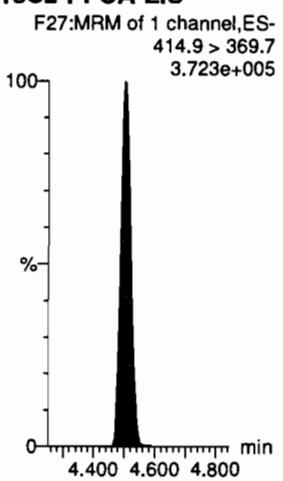

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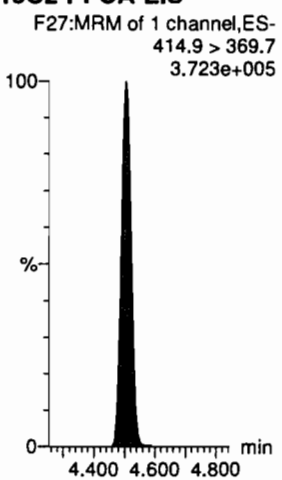
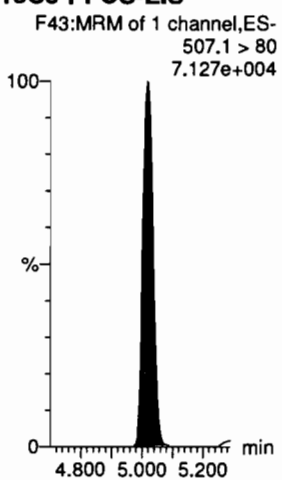
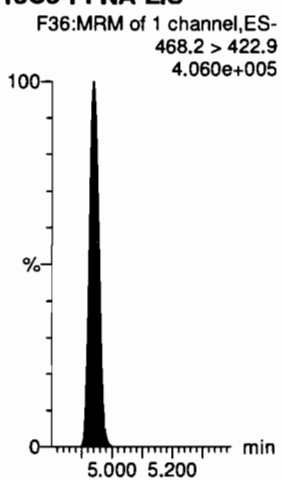


13C8-PFOS-EIS



13C5-PFNA-EIS



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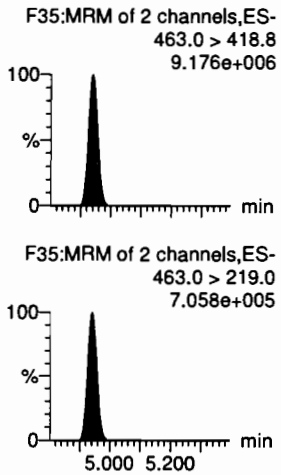

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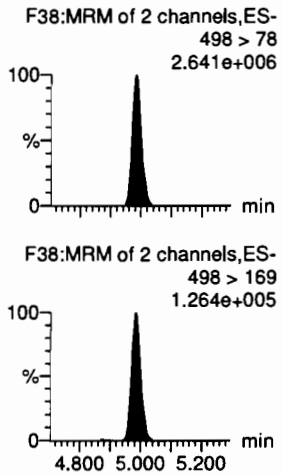
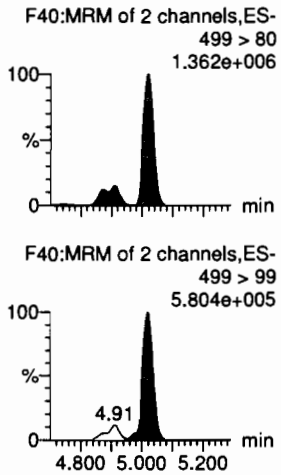
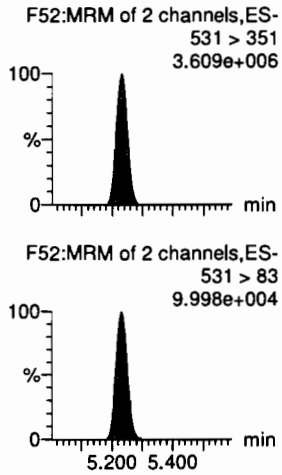


L-PFOS



9Cl-PF30NS



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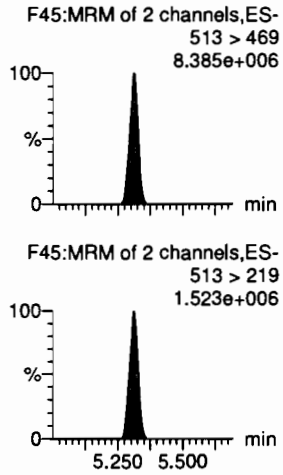
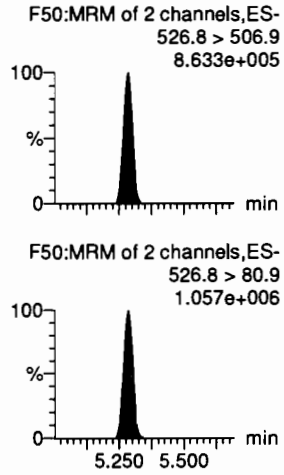


8:2 FTS



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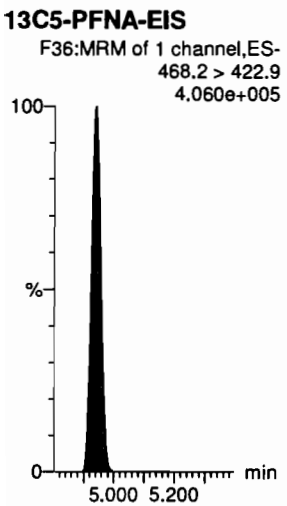

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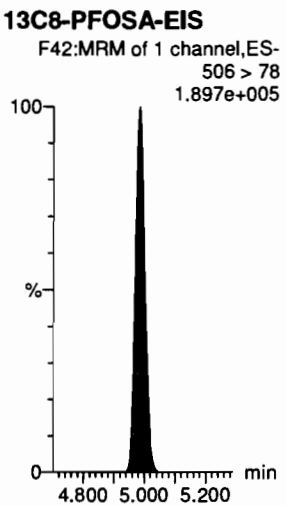

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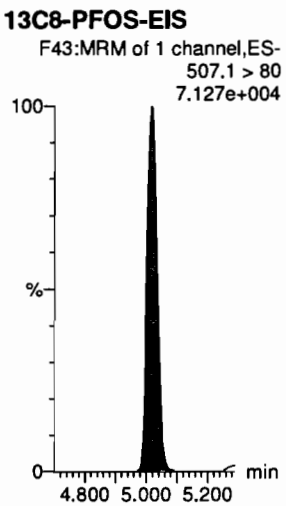

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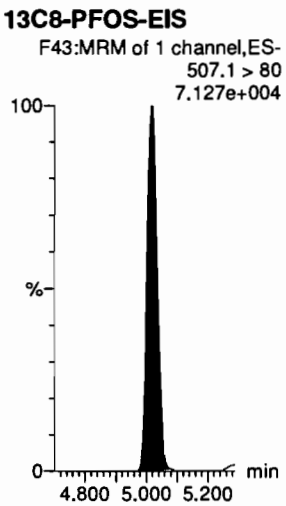

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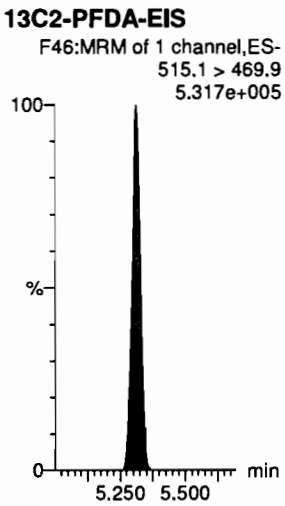
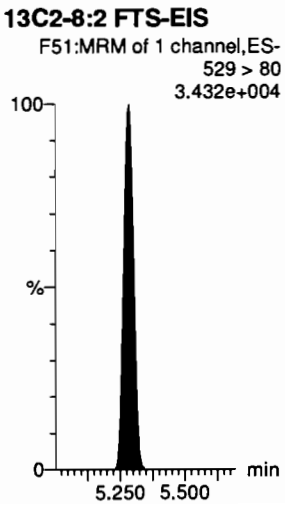


13C2-8:2 FTS-EIS



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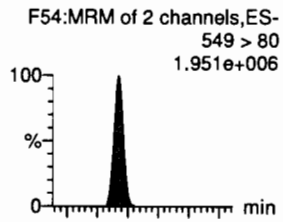
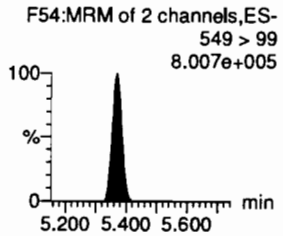
PFNS





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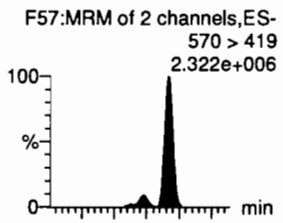
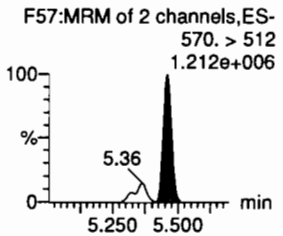
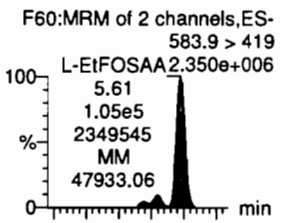
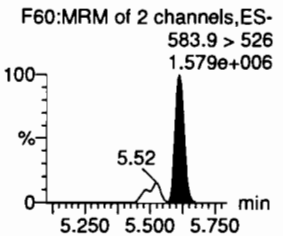




L-EtFOSAA





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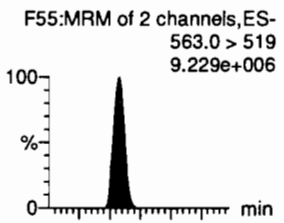
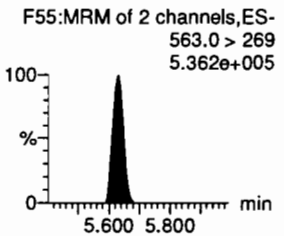
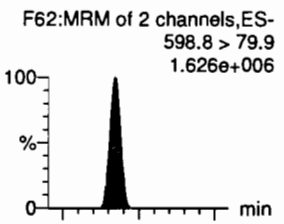
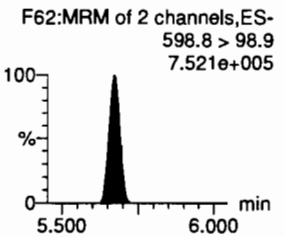


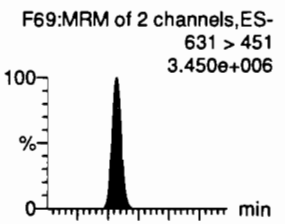


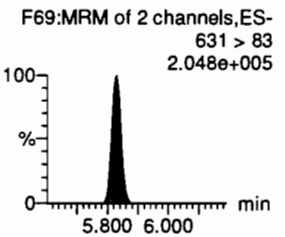
PFDS



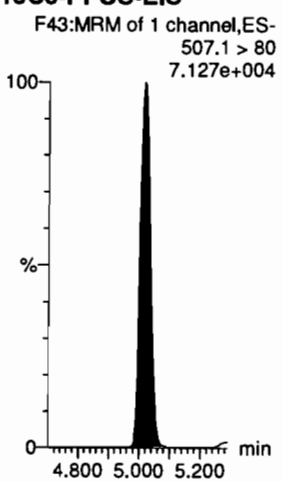


11Cl-PF30UdS

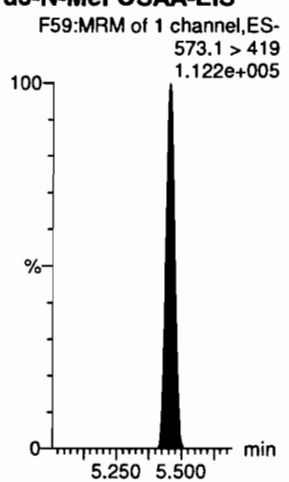




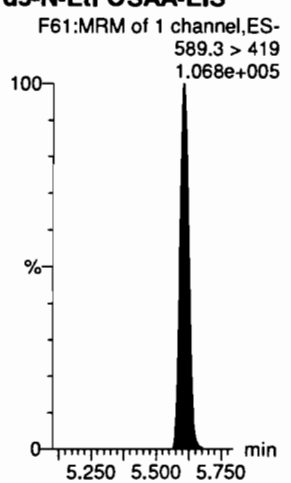
13C8-PFOS-EIS



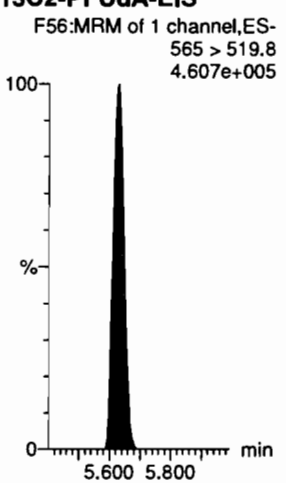
d3-N-MeFOSAA-EIS



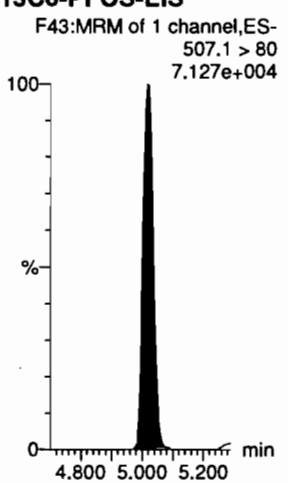
d5-N-EtFOSAA-EIS



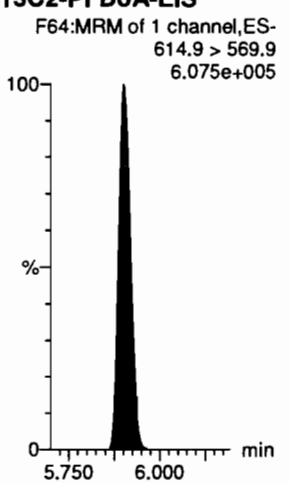
13C2-PFUdA-EIS



13C8-PFOS-EIS



13C2-PFDoA-EIS



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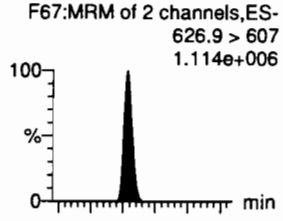
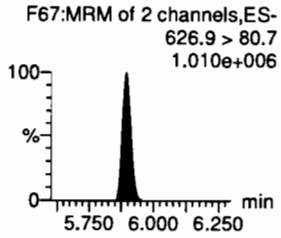
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

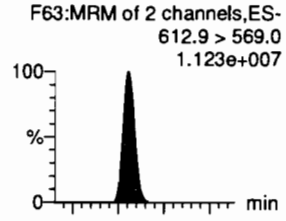
Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

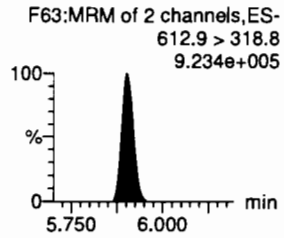
10:2 FTS



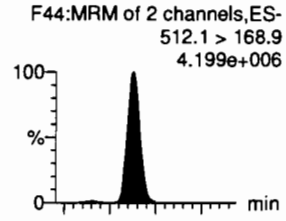


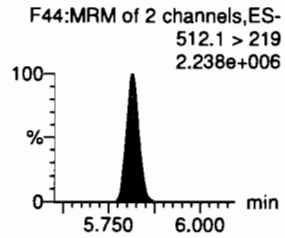
PFDoA



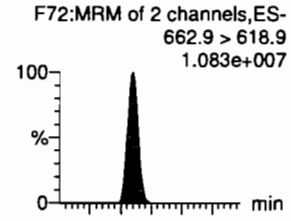


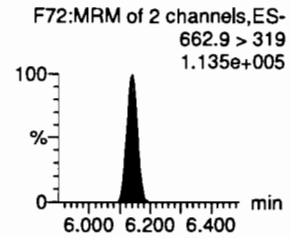
N-MeFOSA



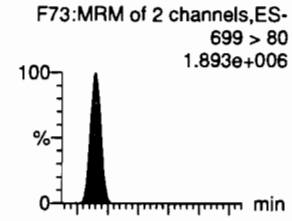


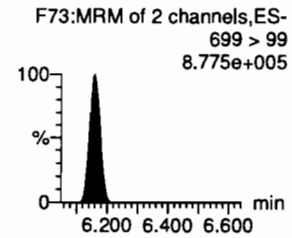
PFTrDA





PFDoS





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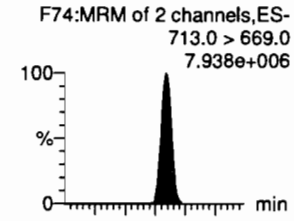
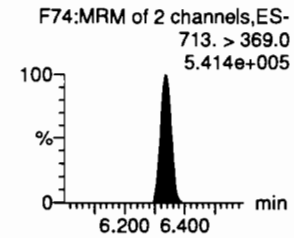
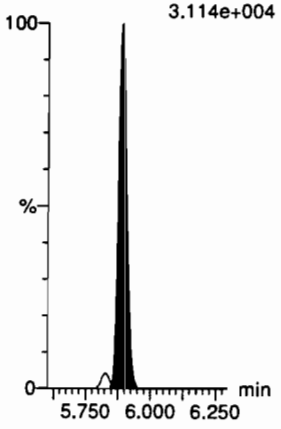
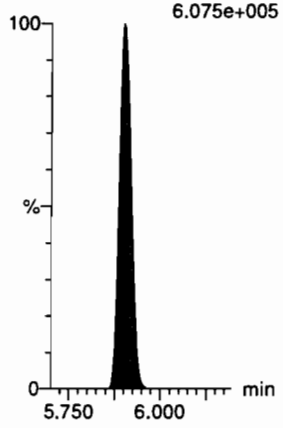




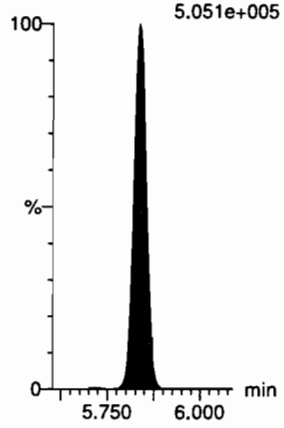
13C2-10:2 FTS-EIS



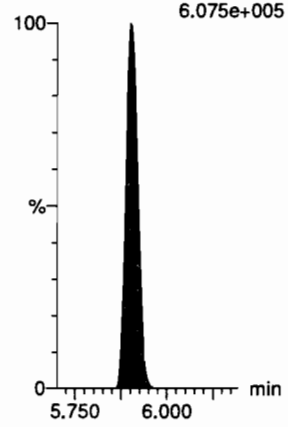
13C2-PFDoA-EIS



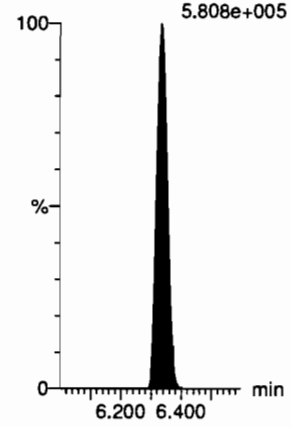
d3-N-MeFOSA-EIS



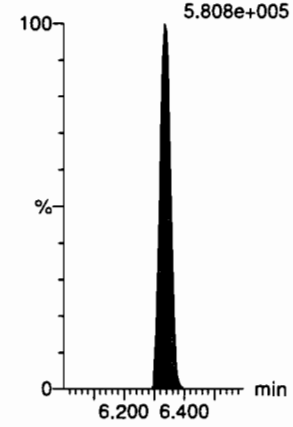
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



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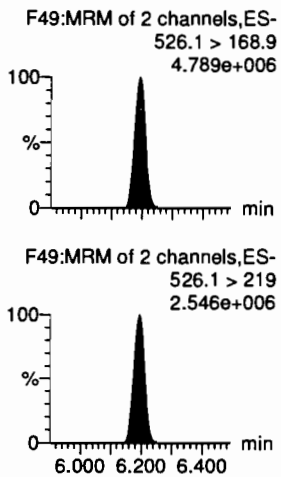
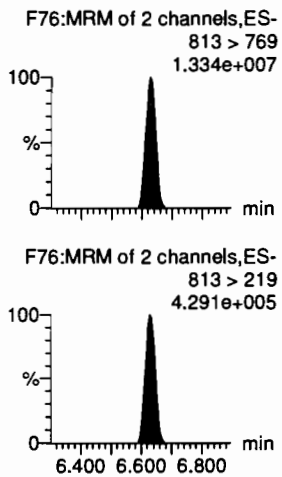
Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

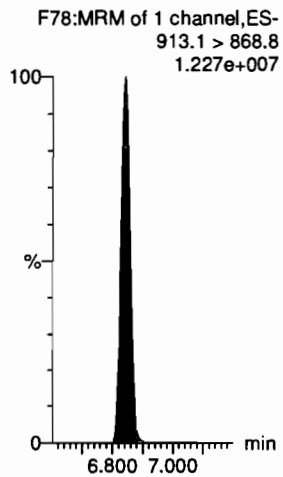
N-EtFOSA



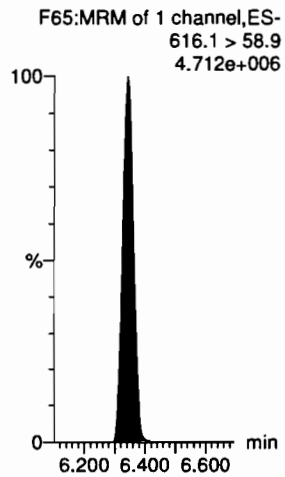
PFHxDA



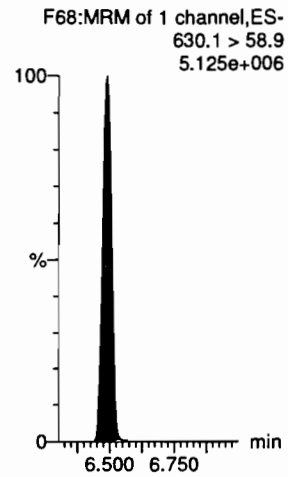
PFODA



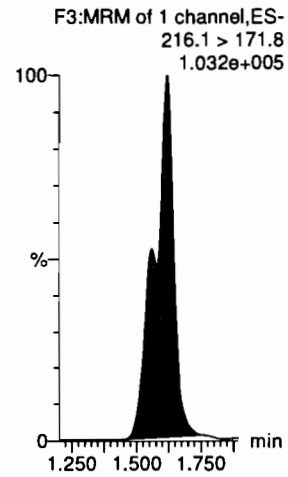
N-MeFOSE



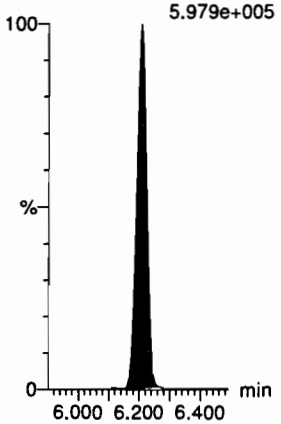
N-EtFOSE



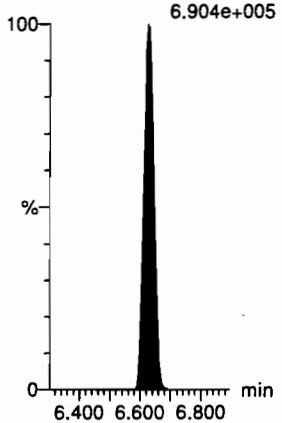
13C3-PFBA-RSD



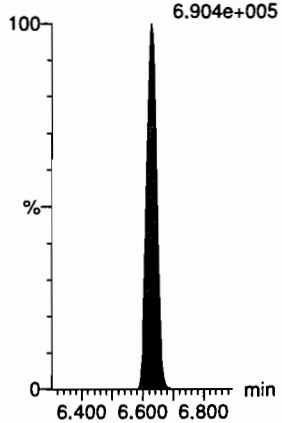
d5-N-ETFOSA-EIS



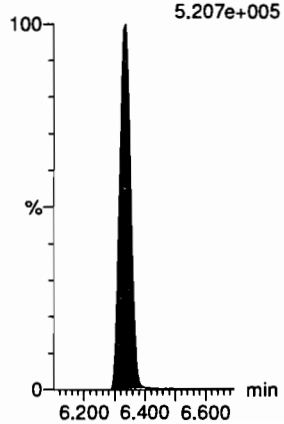
13C2-PFHxDA-EIS



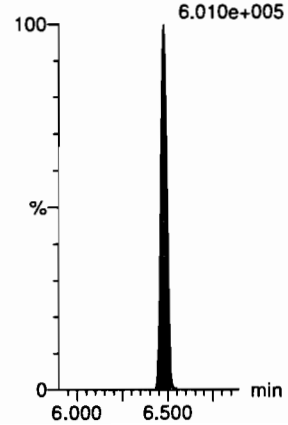
13C2-PFHxDA-EIS



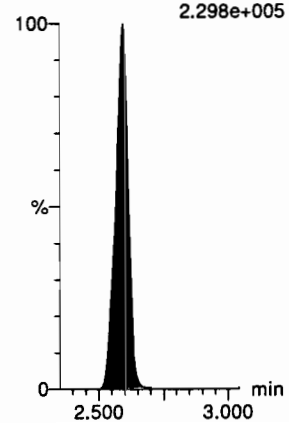
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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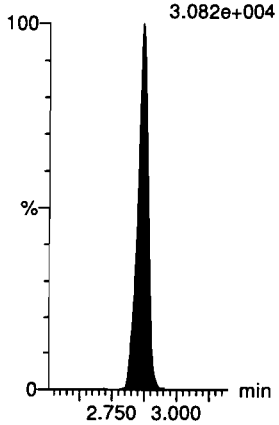
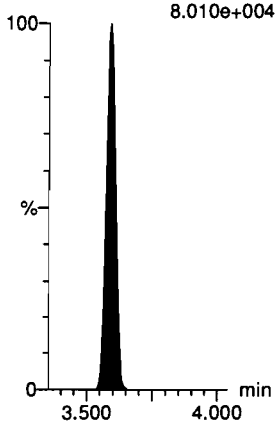
Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

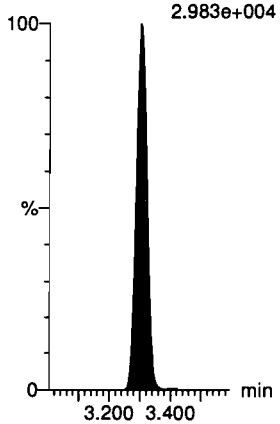
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.082e+004



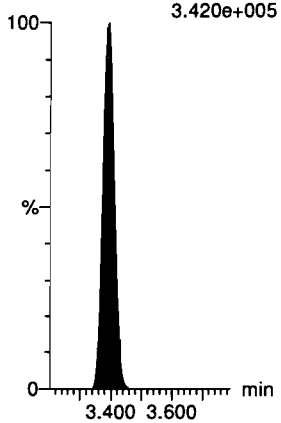
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.010e+004



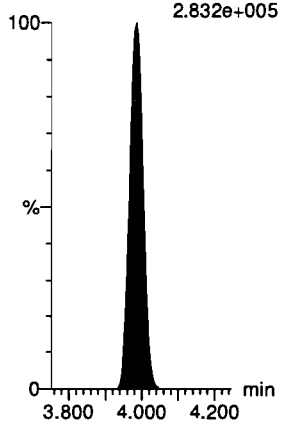
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
2.983e+004



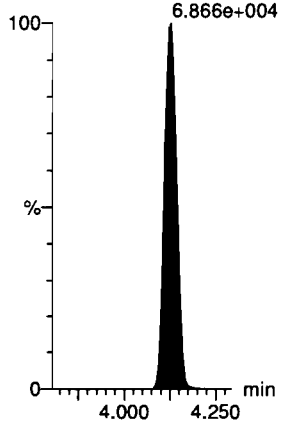
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.420e+005



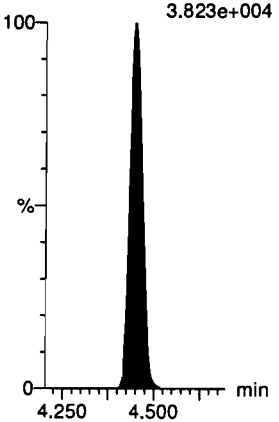
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.832e+005



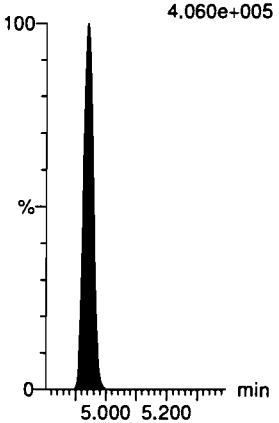
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
6.866e+004



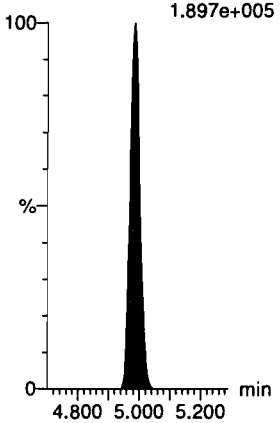
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
3.823e+004



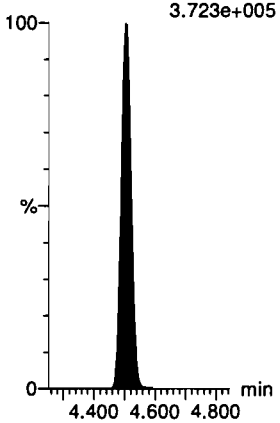
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.060e+005



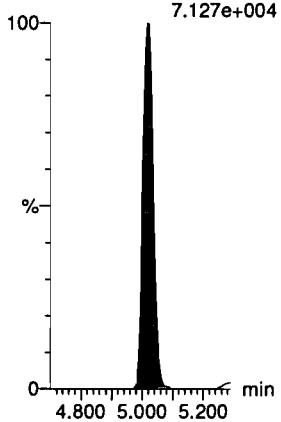
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
1.897e+005



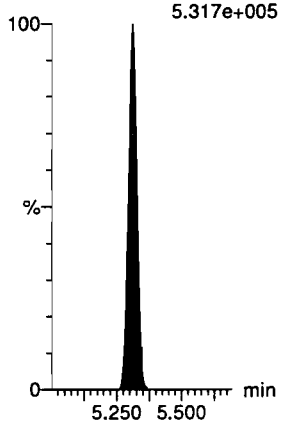
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.723e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.127e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.317e+005

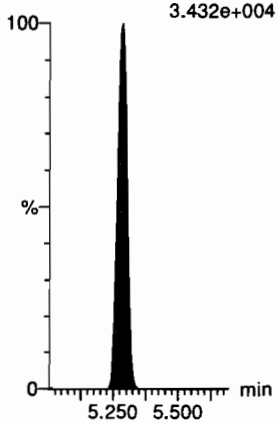


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

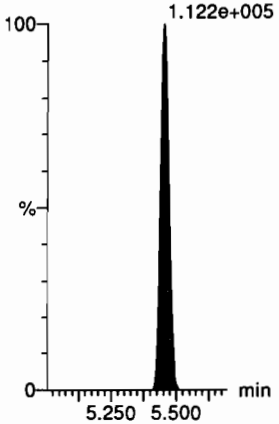
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

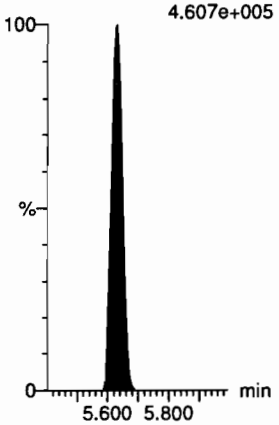
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.432e+004



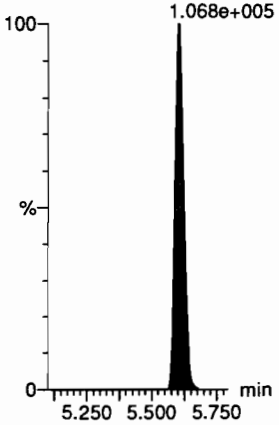
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.122e+005



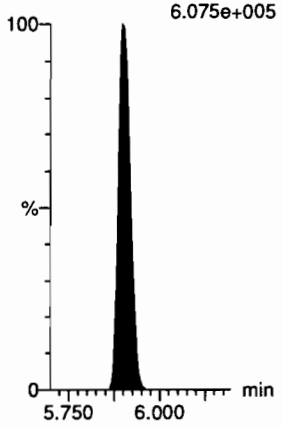
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.607e+005



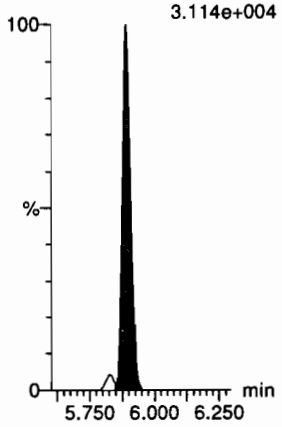
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.068e+005



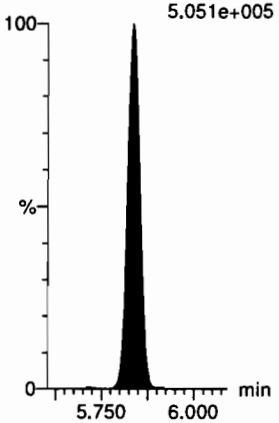
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.075e+005



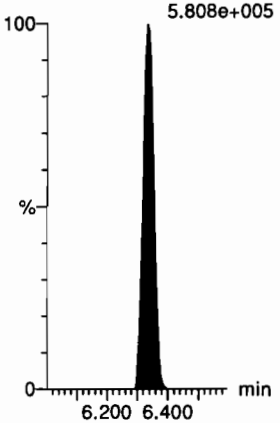
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.114e+004



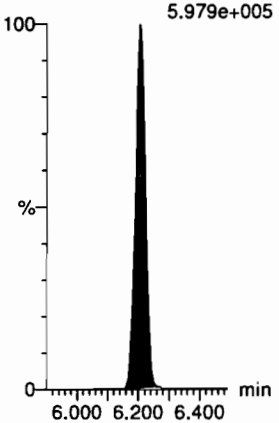
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.051e+005



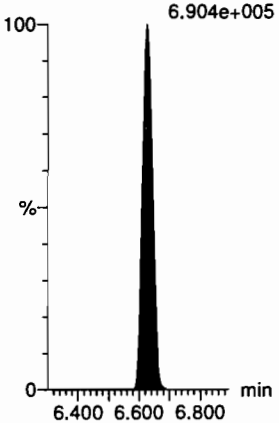
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
5.808e+005



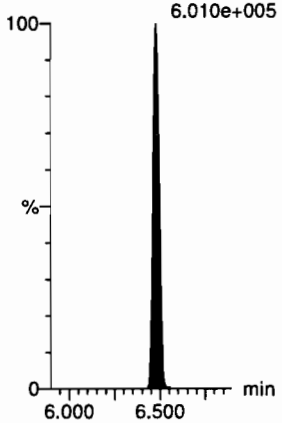
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
5.979e+005



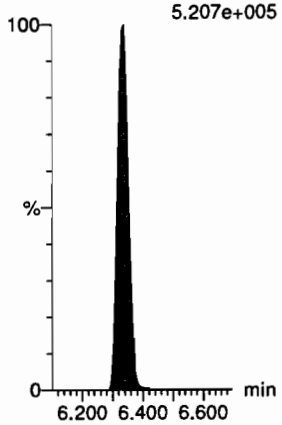
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
6.904e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
6.010e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.207e+005

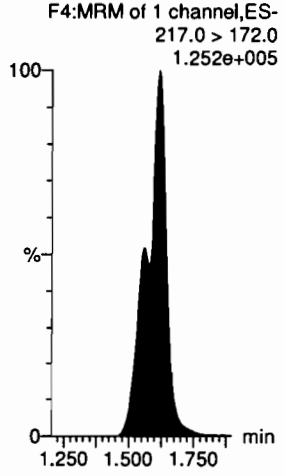


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

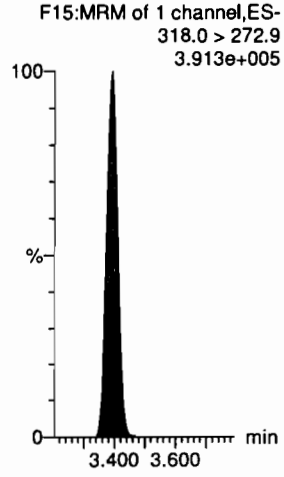
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-27, Date: 06-Jul-2020, Time: 14:37:59, ID: ST200706P1-9 PFC CS6 20F1909, Description: PFC CS6 20F1909

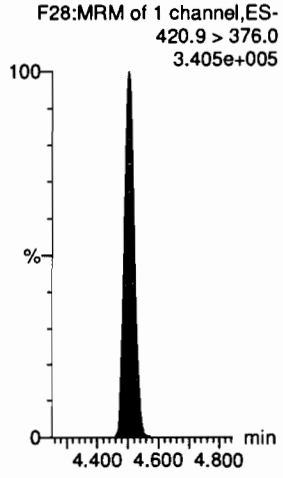
13C4-PFBA



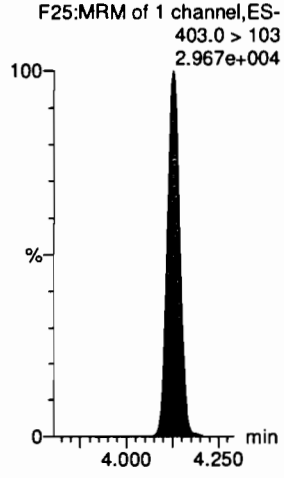
13C5-PFHxA



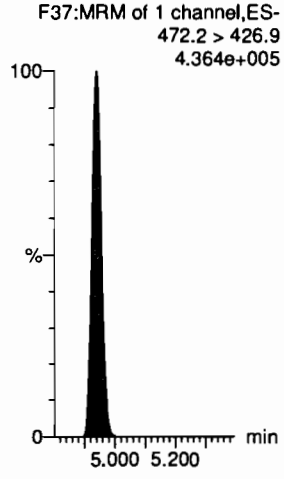
13C8-PFOA



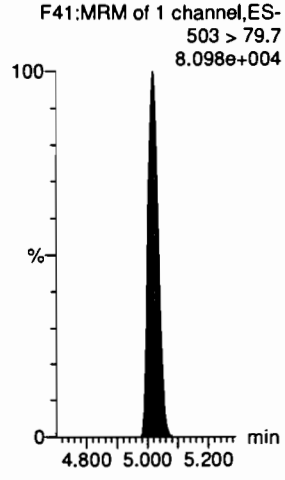
18O2-PFHxS



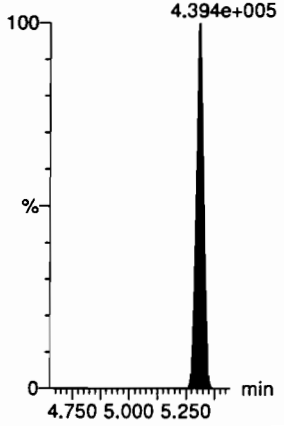
13C9-PFNA



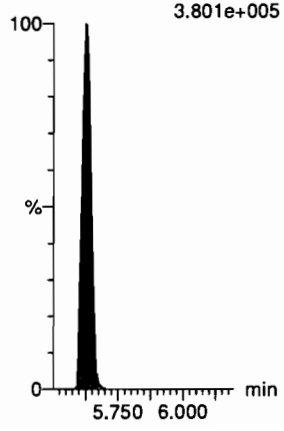
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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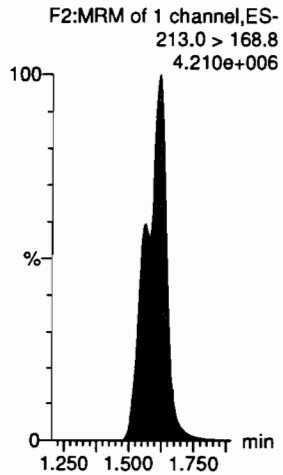
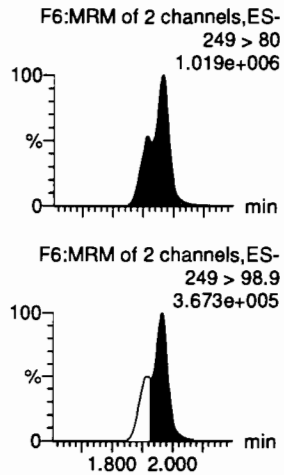
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

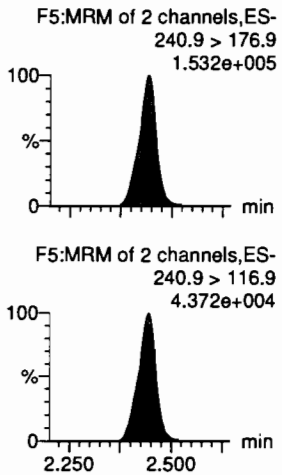
PFBA



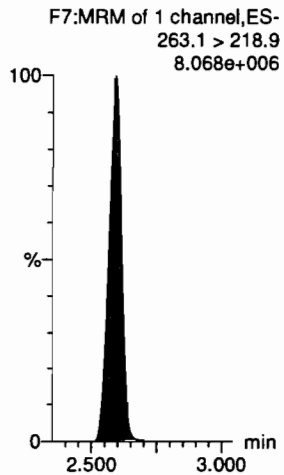
PFPrS



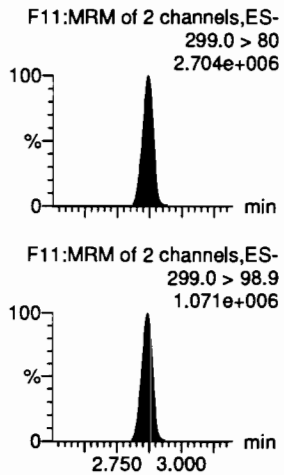
3:3 FTCA



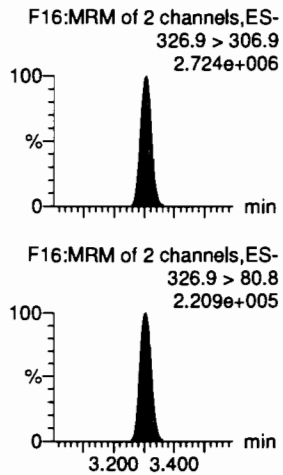
PFPeA



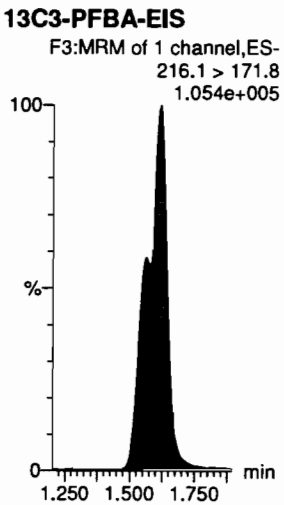
PFBS



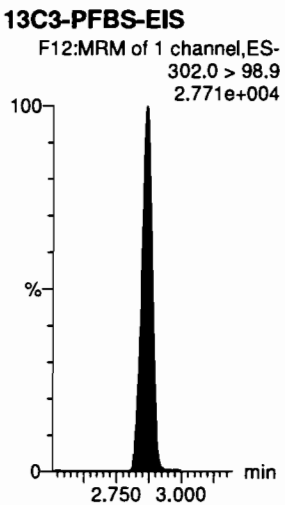
4:2 FTS



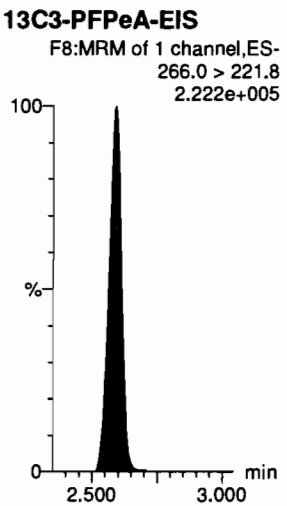
13C3-PFBA-EIS



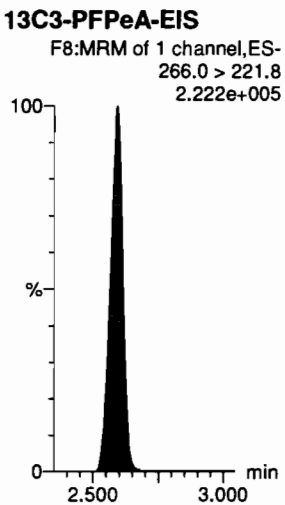
13C3-PFBS-EIS



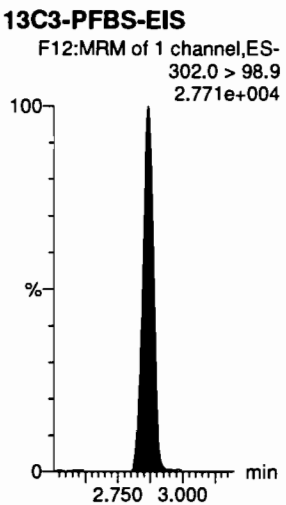
13C3-PFPeA-EIS



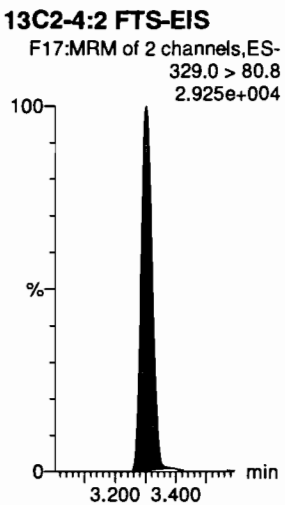
13C3-PFPeA-EIS



13C3-PFBS-EIS



13C2-4:2 FTS-EIS



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Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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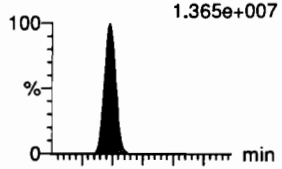
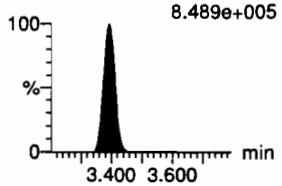
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

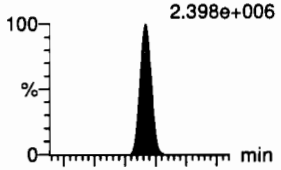
PFHxA
F13:MRM of 2 channels,ES-
313.0 > 269.0
1.365e+007



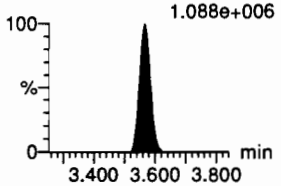
F13:MRM of 2 channels,ES-
313 > 118.9
8.489e+005



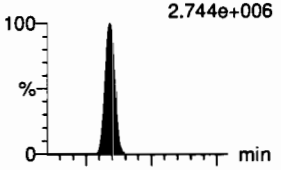
PFPeS
F19:MRM of 2 channels,ES-
349. > 80
2.398e+006



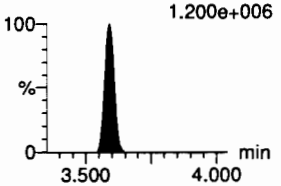
F19:MRM of 2 channels,ES-
349. > 98.9
1.088e+006



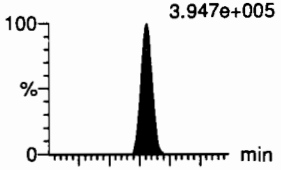
HFPO-DA
F9:MRM of 3 channels,ES-
285.1 > 168.9
2.744e+006



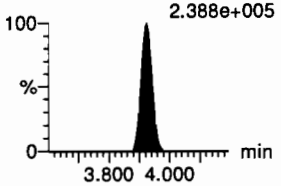
F9:MRM of 3 channels,ES-
285.1 > 184.9
1.200e+006



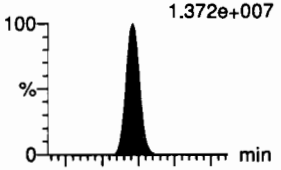
5:3 FTCA
F18:MRM of 2 channels,ES-
340.9 > 236.9
3.947e+005



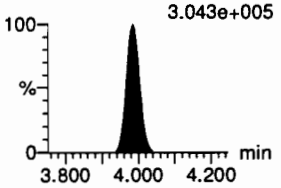
F18:MRM of 2 channels,ES-
340.9 > 216.9
2.388e+005



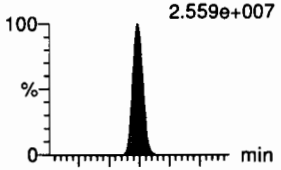
PFHpA
F20:MRM of 2 channels,ES-
363.0 > 319
1.372e+007



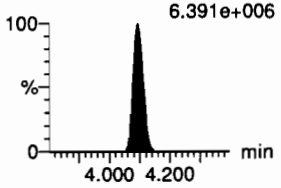
F20:MRM of 2 channels,ES-
363.0 > 169.0
3.043e+005



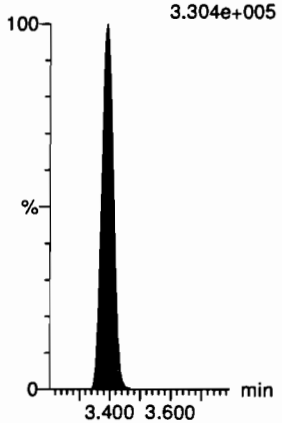
ADONA
F22:MRM of 2 channels,ES-
376.8 > 250.9
2.559e+007



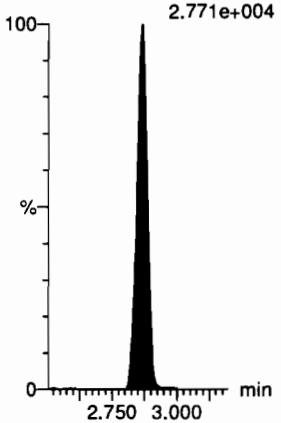
F22:MRM of 2 channels,ES-
376.8 > 85.0
6.391e+006



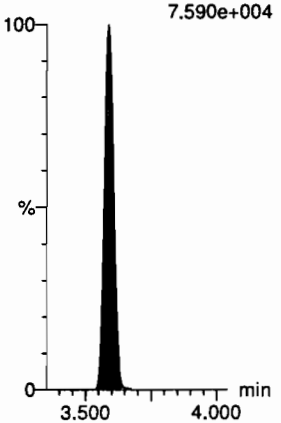
13C2-PFHxA-EIS
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.304e+005



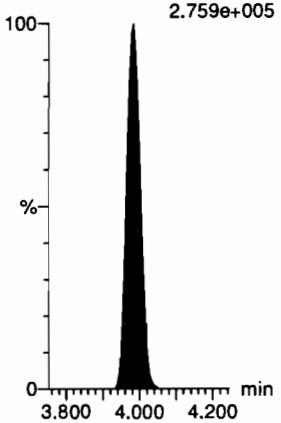
13C3-PFBS-EIS
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.771e+004



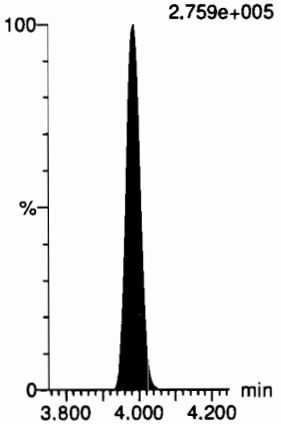
13C3-HFPO-DA-EIS
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.590e+004



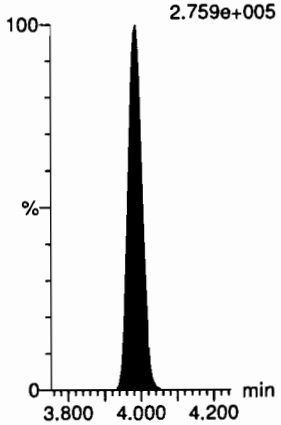
13C4-PFHpA-EIS
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.759e+005



13C4-PFHpA-EIS
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.759e+005



13C4-PFHpA-EIS
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.759e+005



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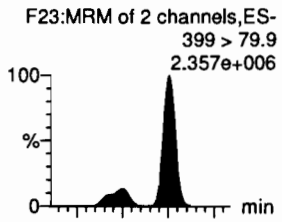
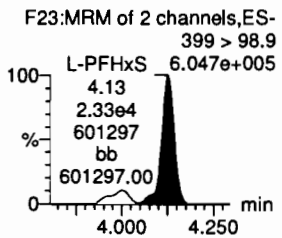
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

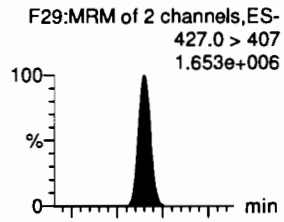
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

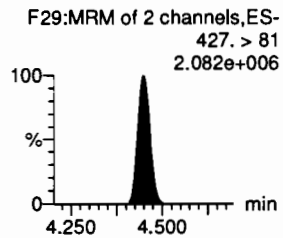
L-PFHxS



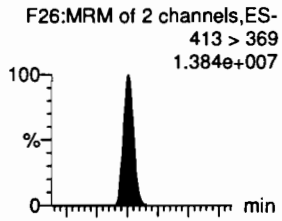


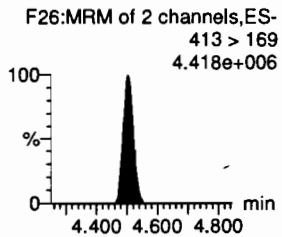
6:2 FTS



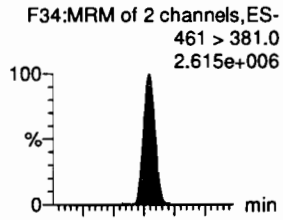


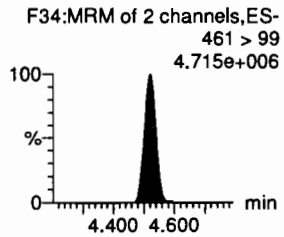
L-PFOA



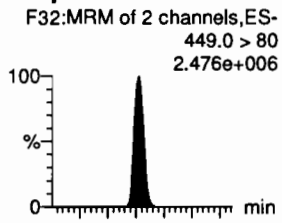


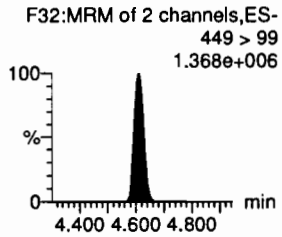
PFEChS



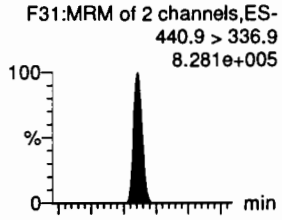


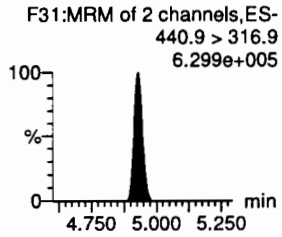
PFHpS



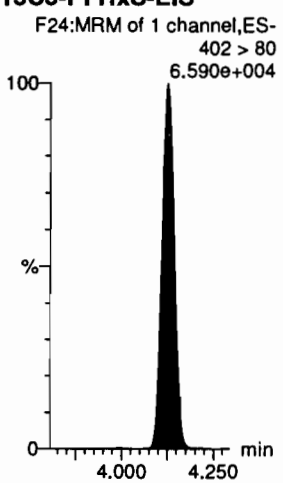


7:3 FTCA

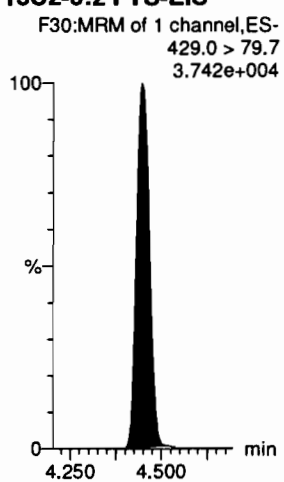




13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



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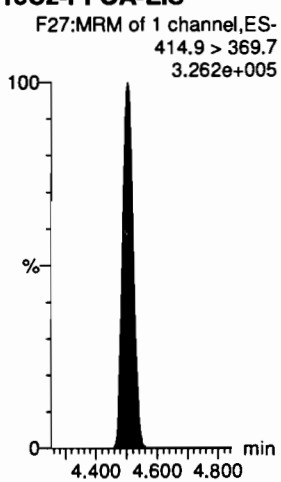

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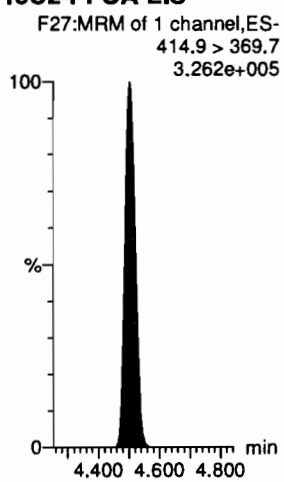
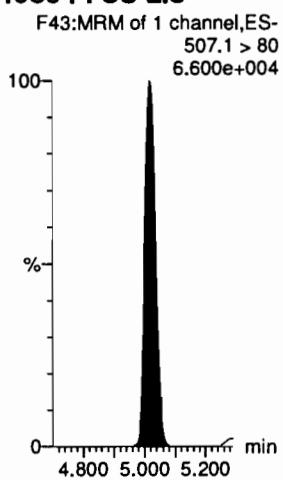
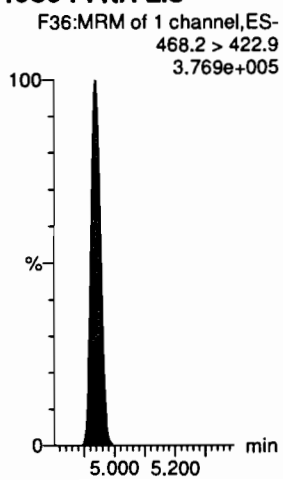


13C8-PFOS-EIS



13C5-PFNA-EIS



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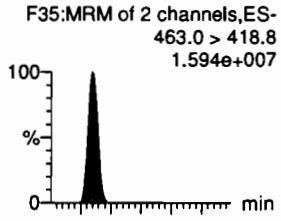
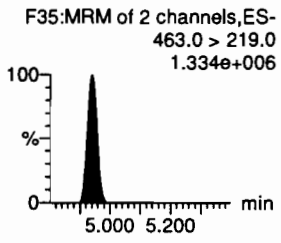
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

PFNA





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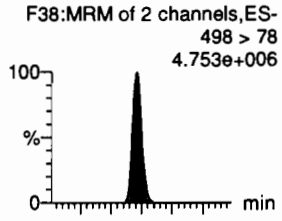
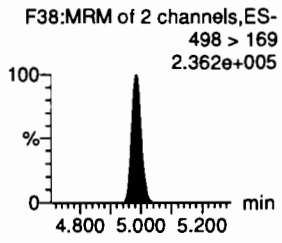
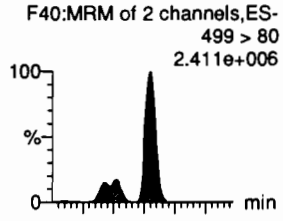
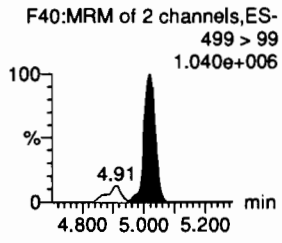


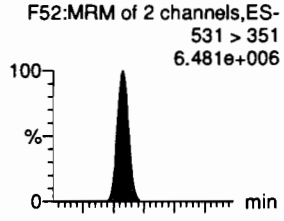


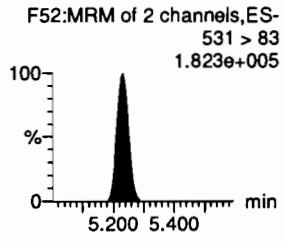
L-PFOS





9Cl-PF30NS





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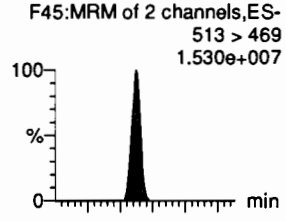
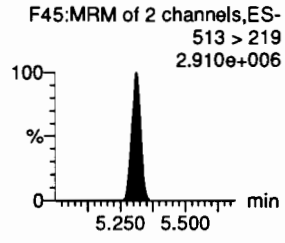
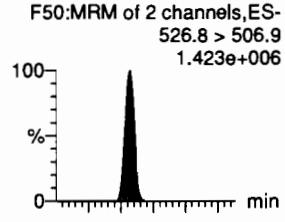
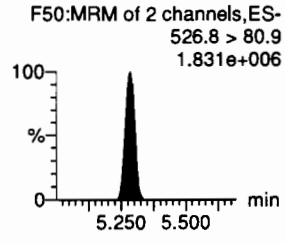




8:2 FTS





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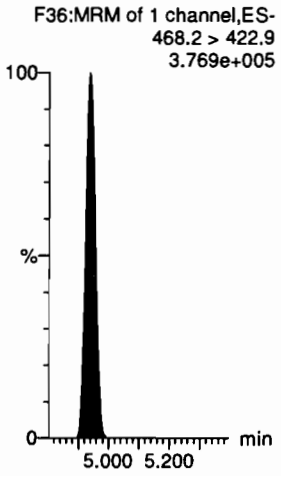

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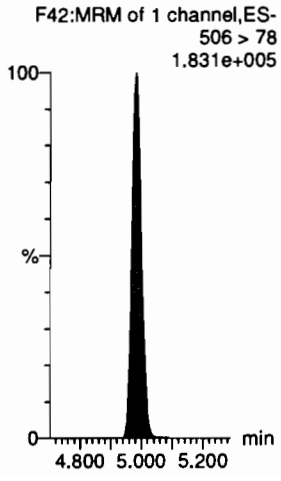
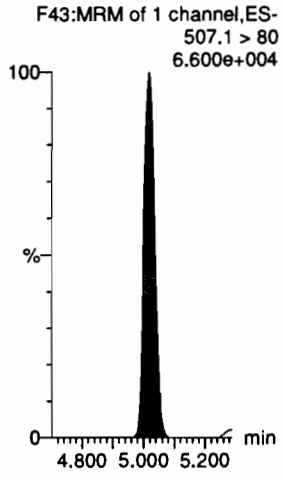


13C8-PFOS-EIS



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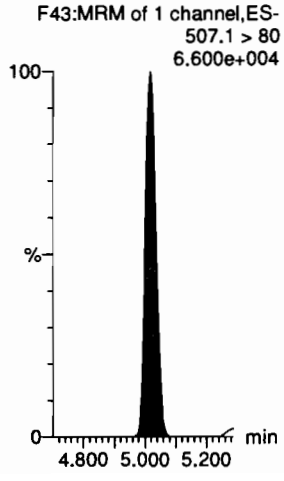
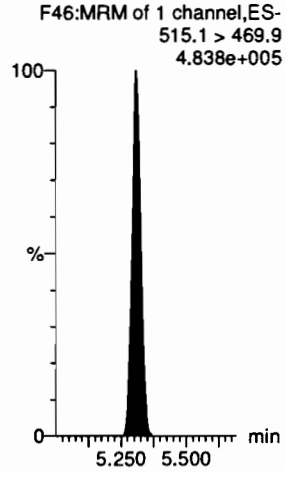
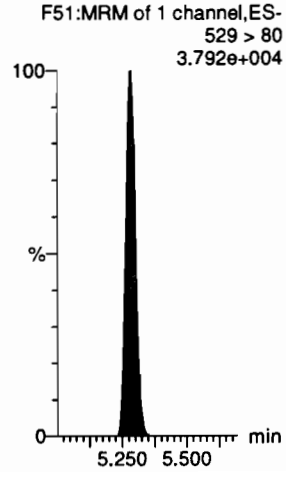


13C2-PFDA-EIS



13C2-8:2 FTS-EIS



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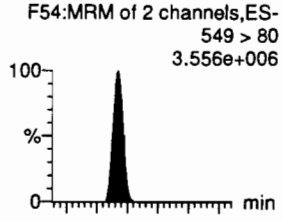
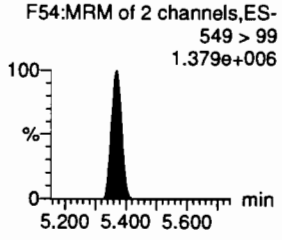
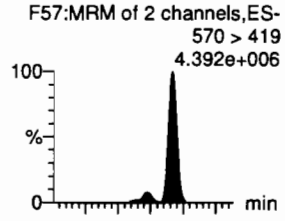
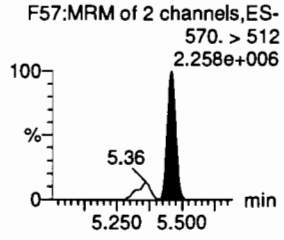
PFNS



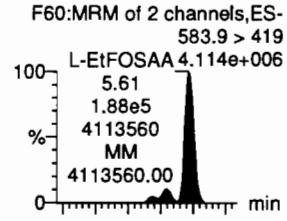


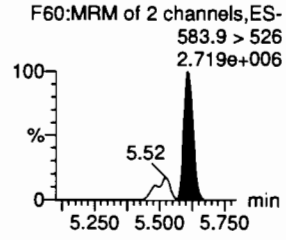
L-MeFOSAA



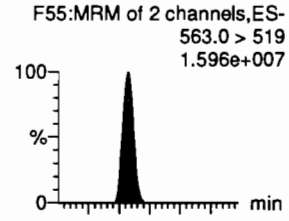


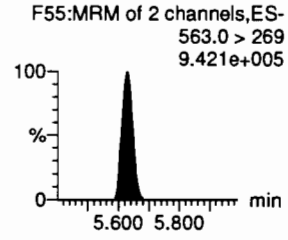
L-EtFOSAA





PFUdA





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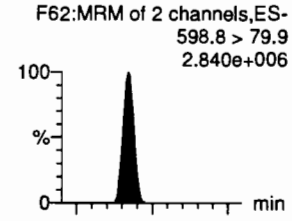

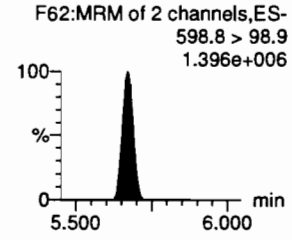

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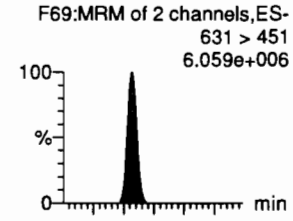
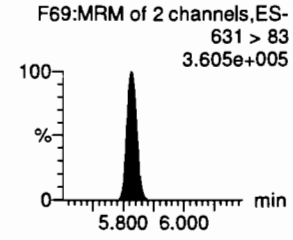
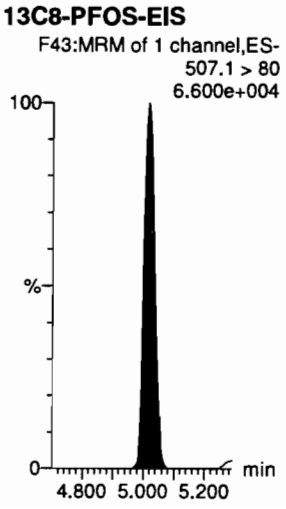
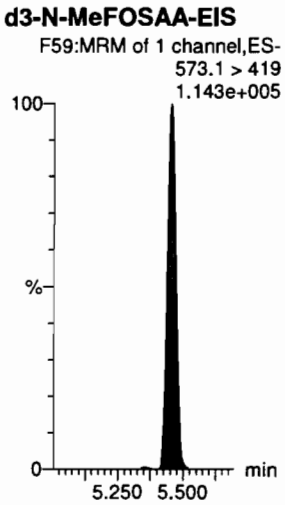




13C8-PFOS-EIS



d3-N-MeFOSAA-EIS



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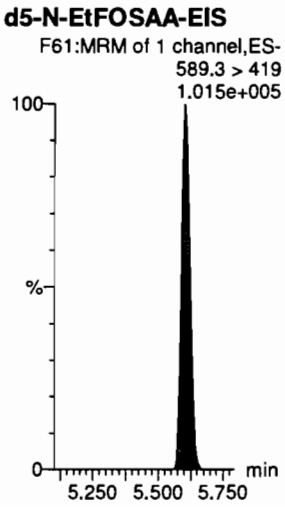
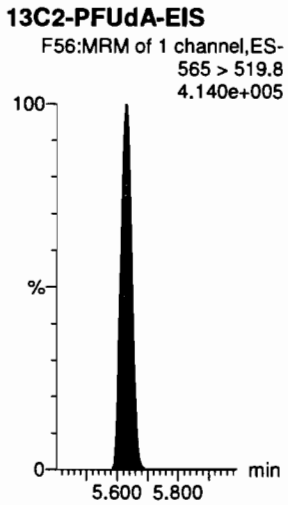
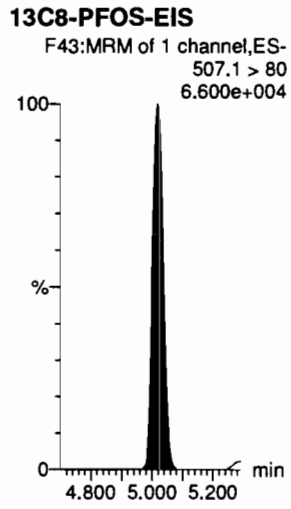


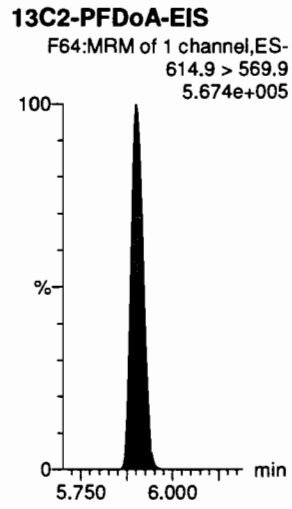
13C2-PFUdA-EIS



13C8-PFOS-EIS



13C2-PFDoA-EIS

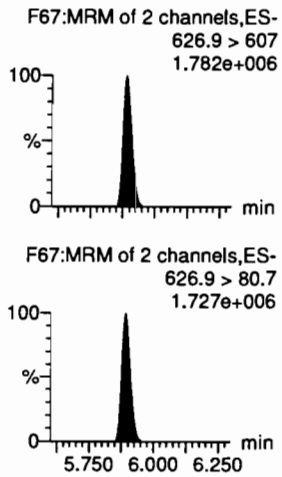


Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

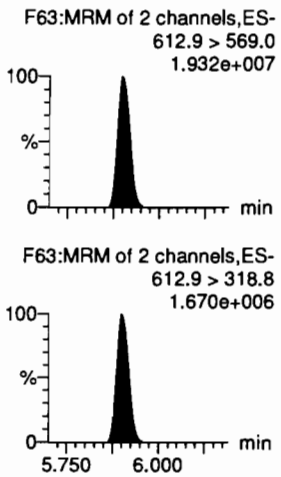
Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 08:34:06 Pacific Daylight Time

Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

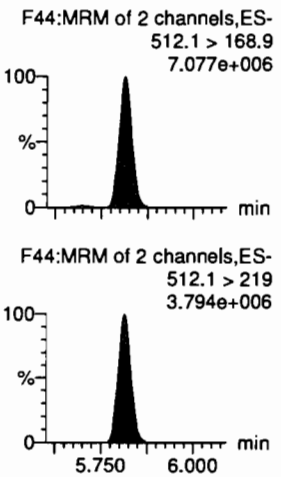
10:2 FTS



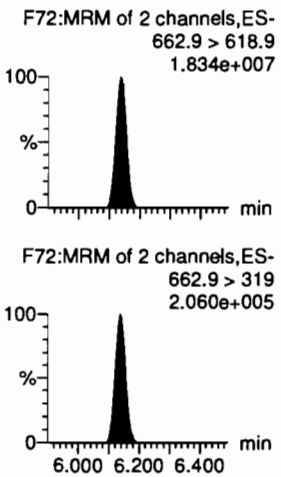
PFDoA



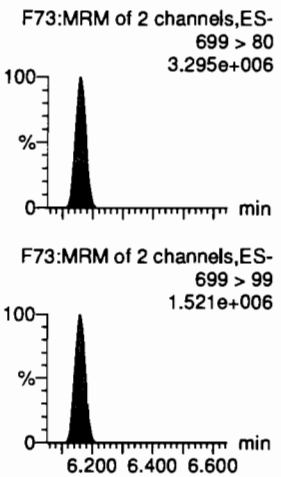
N-MeFOSA



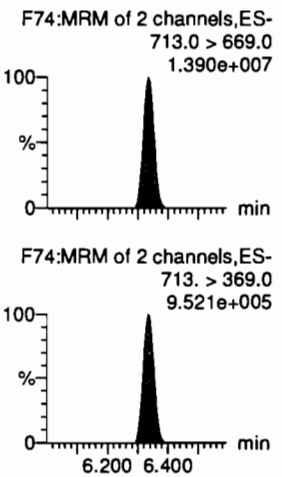
PFTrDA



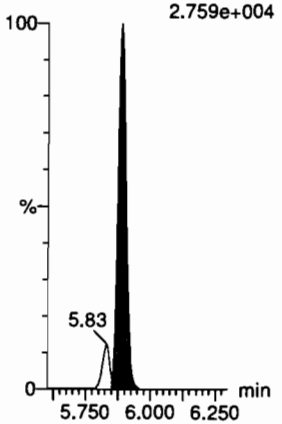
PFDoS



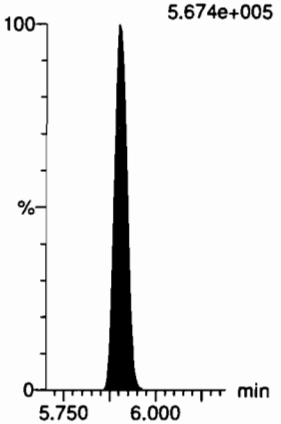
PFTeDA



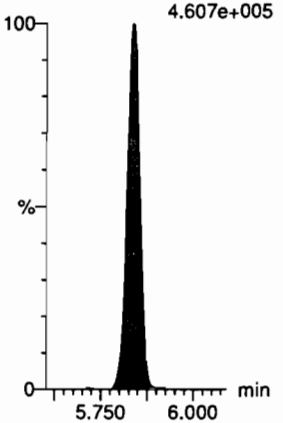
13C2-10:2 FTS-EIS



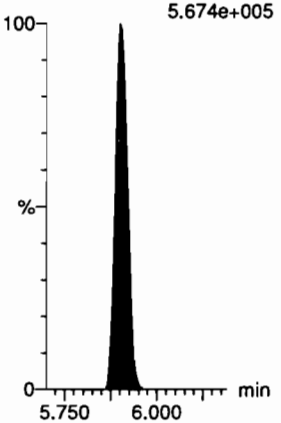
13C2-PFDoA-EIS



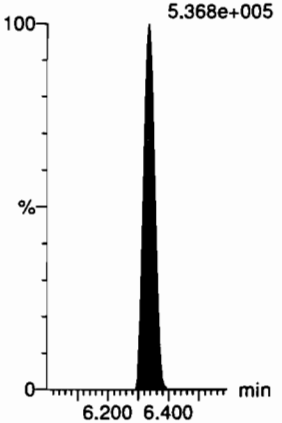
d3-N-MeFOSA-EIS



13C2-PFDoA-EIS



13C2-PFTeDA-EIS



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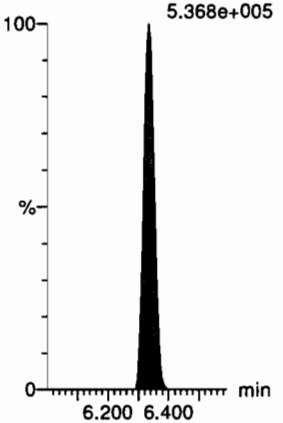

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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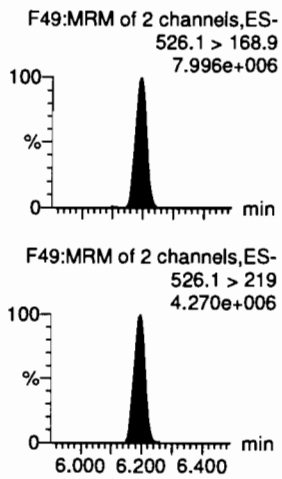
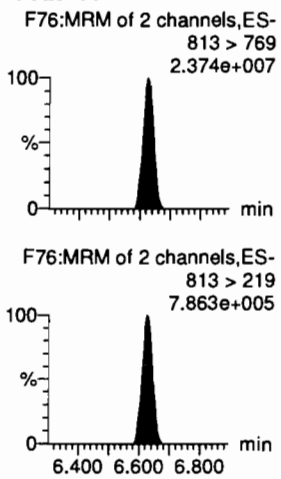
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

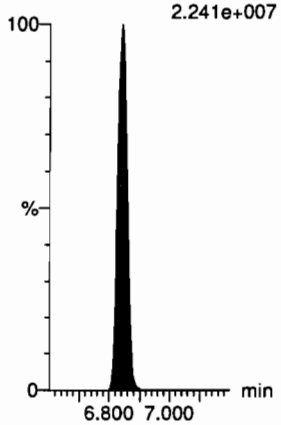
N-EtFOSA



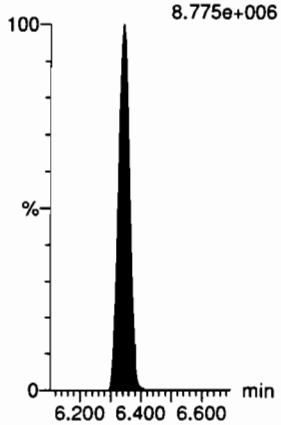
PFHxDA



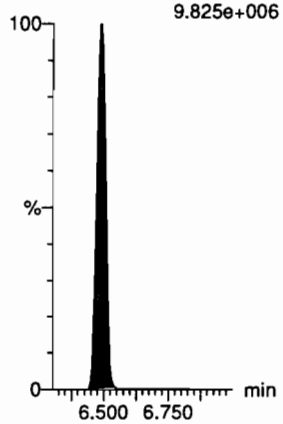
PFODA



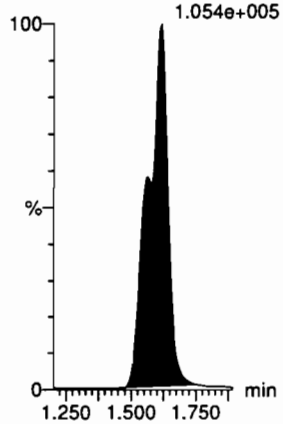
N-MeFOSE



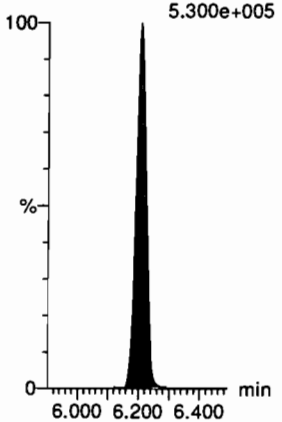
N-EtFOSE



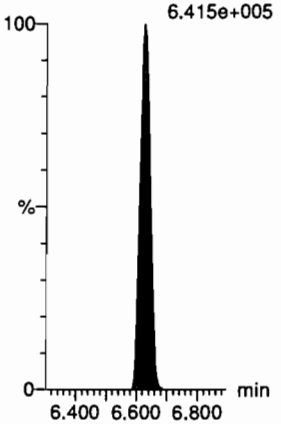
13C3-PFBA-RSD



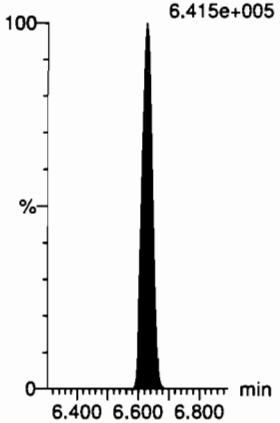
d5-N-ETFOSA-EIS



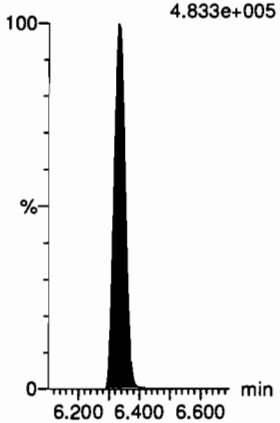
13C2-PFHxDA-EIS



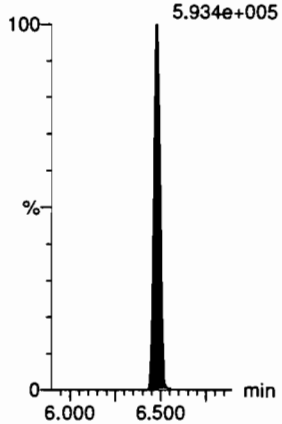
13C2-PFHxDA-EIS



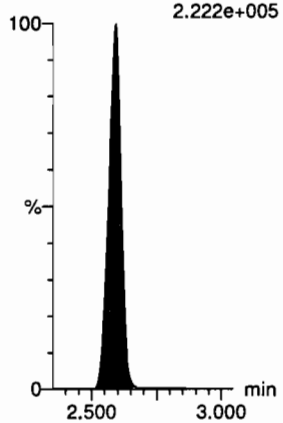
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

Last Altered: Tuesday, July 07, 2020 08:33:52 Pacific Daylight Time
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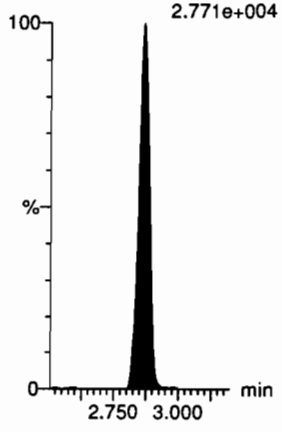
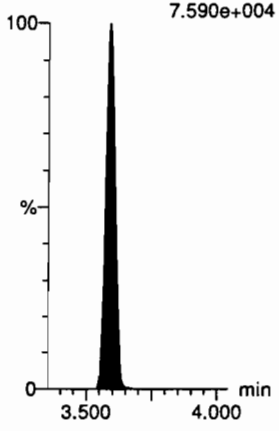
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

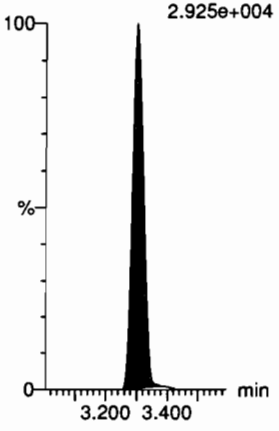
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
2.771e+004



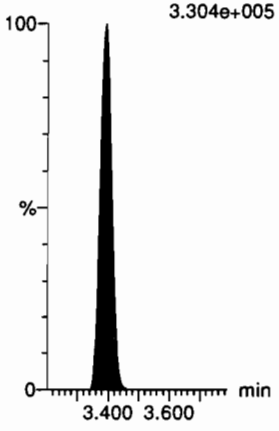
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
7.590e+004



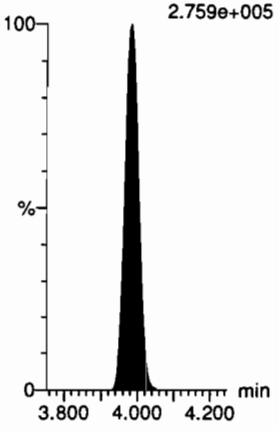
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
2.925e+004



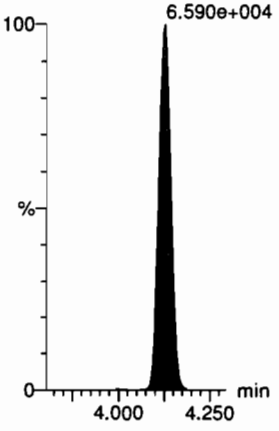
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.304e+005



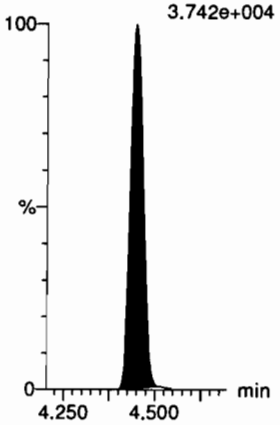
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
2.759e+005



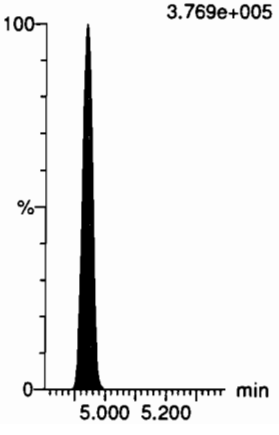
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
6.590e+004



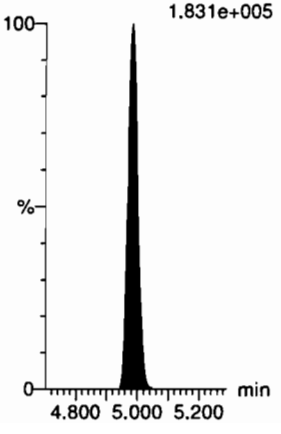
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
3.742e+004



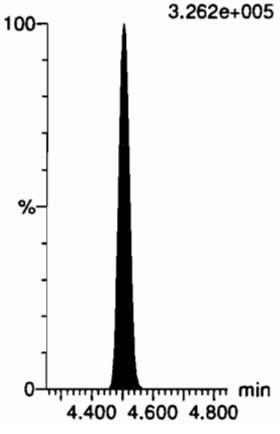
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
3.769e+005



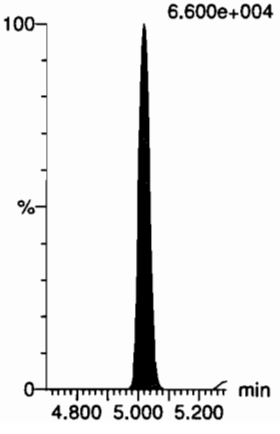
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
1.831e+005



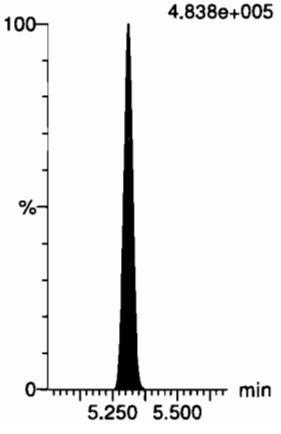
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.262e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
6.600e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
4.838e+005



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-CRV.qld

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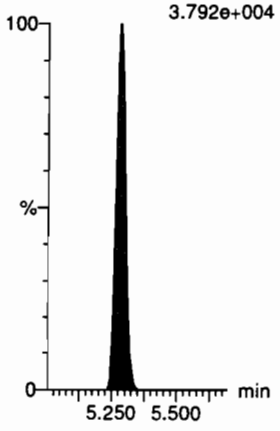
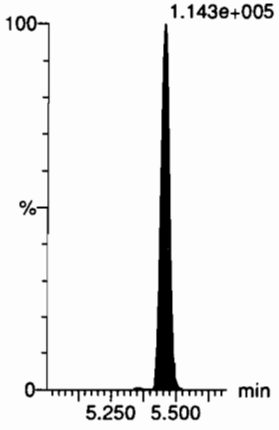
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

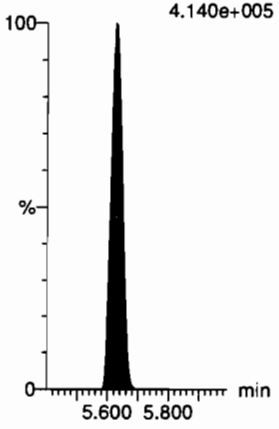
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.792e+004



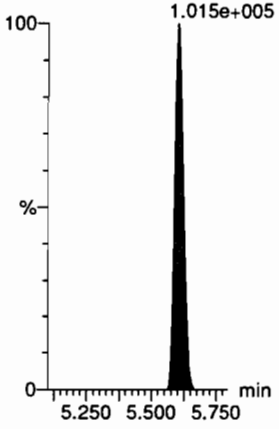
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.143e+005



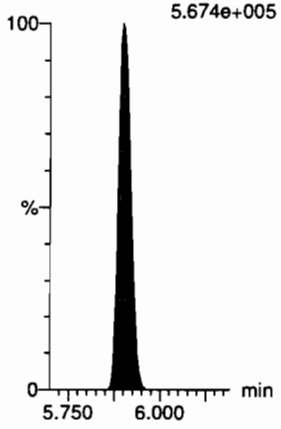
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.140e+005



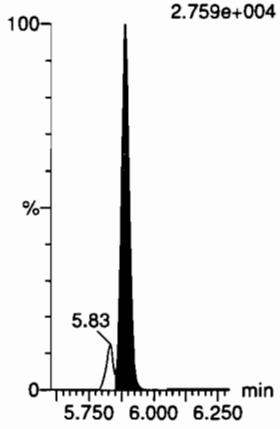
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.015e+005



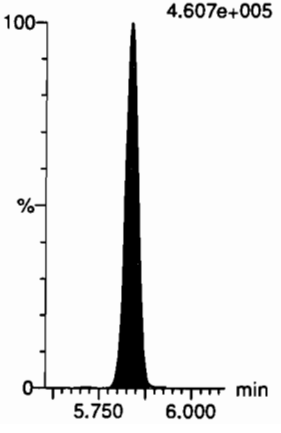
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
5.674e+005



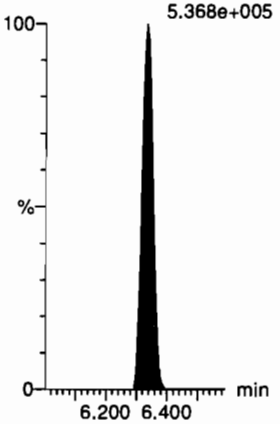
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
2.759e+004



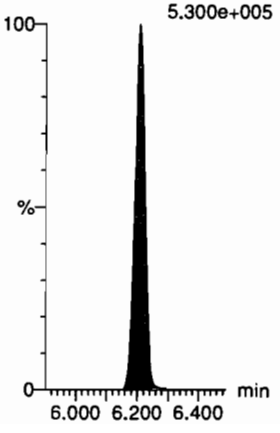
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
4.607e+005



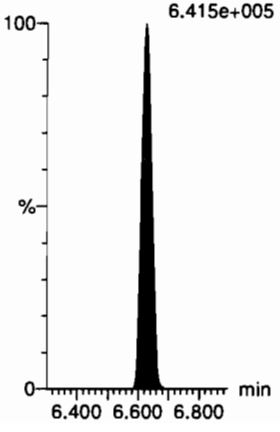
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
5.368e+005



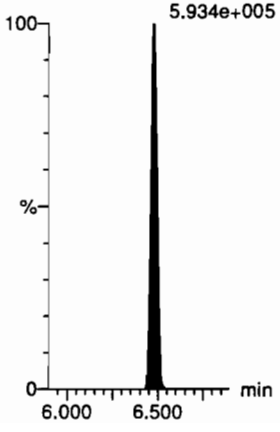
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
5.300e+005



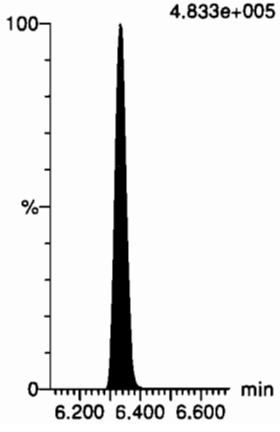
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
6.415e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
5.934e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
4.833e+005



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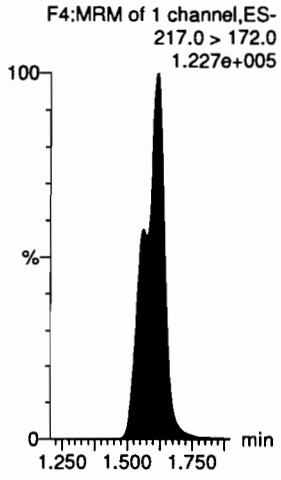
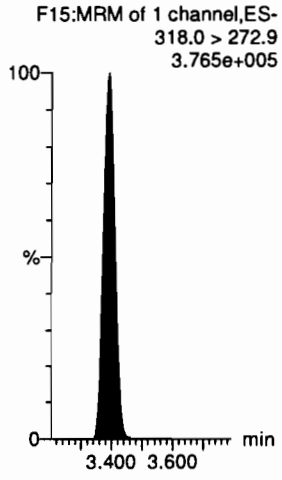
Name: 200706P1-28, Date: 06-Jul-2020, Time: 14:48:28, ID: ST200706P1-10 PFC CS7 20F1910, Description: PFC CS7 20F1910

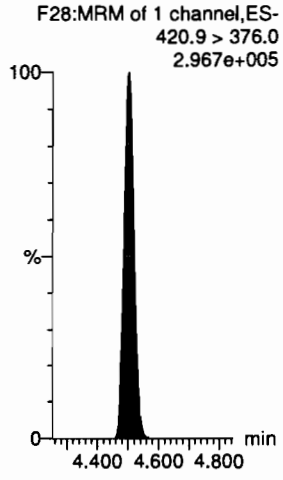
13C4-PFBA



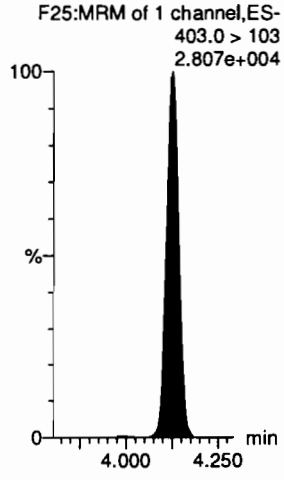
13C5-PFHxA



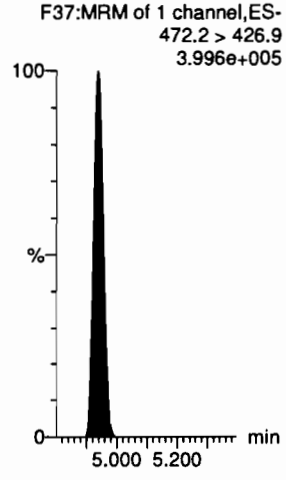
13C8-PFOA



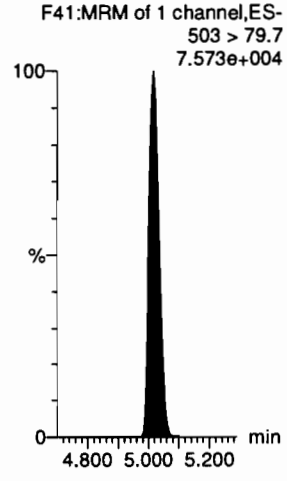
18O2-PFHxS



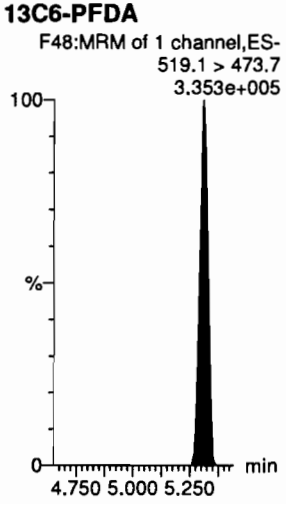
13C9-PFNA



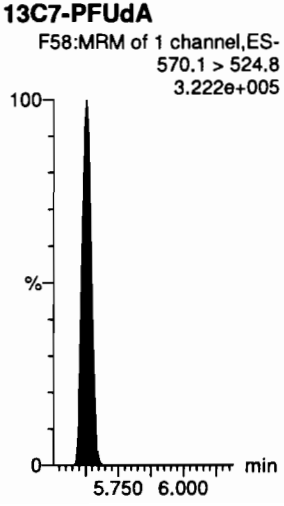
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-ICV.qld

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(A) Not in ICV

✓ JR 07/07/2020

Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

1 PFBA	213.0 > 168.8	7637.761	9273.287	1.00	1.62	10.295	10.000	9.94	99.4	NO		
2 PFPrS	249 > 80		1400.722	1.00			10.000		(B)	NO		YES
3 3:3 FTCA	240.9 > 176.9		12917.687	1.00			10.000		↓	NO		YES
4 PFPeA	263.1 > 218.9	9448.687	12917.687	1.00	2.59	9.143	10.000	9.87	98.7	NO		
5 PFBS	299.0 > 80	2542.181	1400.722	1.00	2.87	22.686	8.840	8.86	100.3	NO	2.562	NO
6 4:2 FTS	326.9 > 306.9	2732.158	1249.773	1.00	3.30	27.327	9.360	9.60	102.5	NO	12.644	YES
47 13C3-PFBA-EIS	216.1 > 171.8	9273.287		1.00	1.62	9273.287	12.500	13.4	107.6	NO		
51 13C3-PFBS-EIS	302.0 > 98.9	1400.722		1.00	2.87	1400.722	12.500	13.5	107.7	NO		
49 13C3-PFPeA-EIS	266.0 > 221.8	12917.687		1.00	2.59	12917.687	12.500	13.4	107.5	NO		
49 13C3-PFPeA-EIS	266.0 > 221.8	12917.687		1.00	2.59	12917.687	12.500	13.4	107.5	NO		
51 13C3-PFBS-EIS	302.0 > 98.9	1400.722		1.00	2.87	1400.722	12.500	13.5	107.7	NO		
55 13C2-4:2 FTS-EIS	329.0 >80.8	1249.773		1.00	3.30	1249.773	12.500	12.4	99.1	NO		
-1												
7 PFHxA	313.0 > 269.0	13120.925	15191.044	1.00	3.39	10.797	10.000	10.4	103.5	NO	16.937	NO
8 PFPeS	349.>80	2075.482	1400.722	1.00	3.57	18.522	9.360	8.88	94.8	NO	2.131	NO
9 HFPO-DA	285.1 > 168.9	2366.653	3122.345	1.00	3.59	9.475	10.000	9.42	94.2	NO	2.344	NO
10 5:3 FTCA	340.9 > 236.9		13511.702	1.00			10.000		(A)	NO		YES
11 PFHpA	363.0 > 319	12932.703	13511.702	1.00	3.98	11.964	10.000	9.19	91.9	NO	49.714	YES
12 ADONA	376.8 > 250.9	21905.752	13511.702	1.00	4.09	20.266	9.440	9.32	98.7	NO	3.932	NO
57 13C2-PFHxA-EIS	315.0 > 270.0	15191.044		1.00	3.39	15191.044	12.500	13.9	111.5	NO		
51 13C3-PFBS-EIS	302.0 > 98.9	1400.722		1.00	2.87	1400.722	12.500	13.5	107.7	NO		
53 13C3-HFPO-DA-EIS	287.0 > 168.9	3122.345		1.00	3.59	3122.345	12.500	13.7	109.4	NO		
59 13C4-PFHpA-EIS	367.2 > 321.8	13511.702		1.00	3.98	13511.702	12.500	13.7	109.9	NO		
59 13C4-PFHpA-EIS	367.2 > 321.8	13511.702		1.00	3.98	13511.702	12.500	13.7	109.9	NO		
59 13C4-PFHpA-EIS	367.2 > 321.8	13511.702		1.00	3.98	13511.702	12.500	13.7	109.9	NO		
-1												
13 L-PFHxS	399 > 79.9	2123.308	2940.244	1.00	4.13	9.027	9.120	8.19	89.8	NO	4.427	YES
15 6:2 FTS	427.0 > 407	1446.478	1628.024	1.00	4.45	11.106	9.480	9.71	102.4	NO	0.797	NO
16 L-PFOA	413 > 369	13363.650	14523.533	1.00	4.50	11.502	10.000	10.1	101.5	NO	3.241	NO
18 PFecHS	461 > 381.0		14523.533	1.00			10.000		(A)	NO		YES
19 PFHpS	449.0 > 80	2116.452	2891.132	1.00	4.61	9.151	9.520	9.40	98.7	NO	1.727	NO
20 7:3 FTCA	440.9 > 336.9		15540.856	1.00			10.000		(A)	NO		YES
61 13C3-PFHxS-EIS	402 >80	2940.244		1.00	4.13	2940.244	12.500	13.4	106.9	NO		
63 13C2-6:2 FTS-EIS	429.0 >79.7	1628.024		1.00	4.45	1628.024	12.500	12.6	101.2	NO		
69 13C2-PFOA-EIS	414.9 > 369.7	14523.533		1.00	4.50	14523.533	12.500	12.6	100.6	NO		
69 13C2-PFOA-EIS	414.9 > 369.7	14523.533		1.00	4.50	14523.533	12.500	12.6	100.6	NO		

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Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

71 13C8-PFOS-EIS	507.1 > 80	2891.132		1.00	5.02	2891.132	12.500	12.8	102.6	NO		
65 13C5-PFNA-EIS	468.2 > 422.9	15540.856		1.00	4.94	15540.856	12.500	12.8	102.5	NO		
-1												
21 PFNA	463.0 > 418.8	14000.723	15540.856	1.00	4.94	11.261	10.000	10.1	100.7	NO	12.466	YES
22 PFOSA	498 > 78	4099.178	7420.505	1.00	4.99	6.905	10.000	10.0	100.0	NO	21.394	NO
23 L-PFOS	499 > 80	2687.035	2891.132	1.00	5.02	11.618	9.280	9.17	98.8	NO	2.714	NO
25 9Cl-PF30NS	531 > 351	6303.713	2891.132	1.00	5.23	27.255	9.320	9.57	102.7	NO	48.336	YES
26 PFDA	513 > 469	14017.704	19932.547	1.00	5.31	8.791	10.000	10.3	103.5	NO	5.237	NO
27 8:2 FTS	526.8> 506.9	1555.169	1598.607	1.00	5.29	12.160	9.600	8.99	93.6	NO	0.874	NO
65 13C5-PFNA-EIS	468.2 > 422.9	15540.856		1.00	4.94	15540.856	12.500	12.8	102.5	NO		
67 13C8-PFOSA-EIS	506 > 78	7420.505		1.00	4.98	7420.505	12.500	13.0	103.9	NO		
71 13C8-PFOS-EIS	507.1 > 80	2891.132		1.00	5.02	2891.132	12.500	12.8	102.6	NO		
71 13C8-PFOS-EIS	507.1 > 80	2891.132		1.00	5.02	2891.132	12.500	12.8	102.6	NO		
73 13C2-PFDA-EIS	515.1 > 469.9	19932.547		1.00	5.31	19932.547	12.500	13.4	106.9	NO		
75 13C2-8:2 FTS-EIS	529 > 80	1598.607		1.00	5.29	1598.607	12.500	14.5	115.9	NO		
-1												
28 PFNS	549 > 80	2828.414	2891.132	1.00	5.36	12.229	9.600	9.24	96.3	NO	2.459	NO
29 L-MeFOSAA	570 > 419	4003.342	4460.954	1.00	5.46	11.218	10.000	9.23	92.3	NO	1.898	NO
31 L-EtFOSAA	583.9 > 419	4751.072	4230.890	1.00	5.61	14.037	10.000	10.1	101.2	NO	1.276	NO
33 PFUdA	563.0 > 519	17390.951	19378.582	1.00	5.63	11.218	10.000	10.2	102.0	NO	19.374	NO
34 PFDS	598.8 > 79.9	2700.801	2891.132	1.00	5.67	11.677	9.640	9.15	95.0	NO	2.404	NO
35 11Cl-PF30UdS	631 > 451	4975.652	23715.557	1.00	5.82	2.623	9.440	10.2	107.5	NO	15.431	NO
71 13C8-PFOS-EIS	507.1 > 80	2891.132		1.00	5.02	2891.132	12.500	12.8	102.6	NO		
77 d3-N-MeFOSAA-EIS	573.1 > 419	4460.954		1.00	5.45	4460.954	12.500	13.5	107.8	NO		
81 d5-N-EtFOSAA-EIS	589.3 > 419	4230.890		1.00	5.60	4230.890	12.500	13.5	107.8	NO		
79 13C2-PFUdA-EIS	565 > 519.8	19378.582		1.00	5.63	19378.582	12.500	12.3	98.0	NO		
71 13C8-PFOS-EIS	507.1 > 80	2891.132		1.00	5.02	2891.132	12.500	12.8	102.6	NO		
83 13C2-PFDoA-EIS	614.9 > 569.9	23715.557		1.00	5.90	23715.557	12.500	12.7	101.5	NO		
-1												
36 10:2 FTS	626.9 > 607		1332.675	1.00			10.000		(K)	NO		YES
37 PFDoA	612.9 > 569.0	17418.283	23715.557	1.00	5.90	9.181	10.000	9.36	93.6	NO	11.504	NO
38 N-MeFOSA	512.1 > 168.9		21351.840	1.00			9.600		(K)	NO		YES
39 PFTrDA	662.9 > 618.9	19418.045	23715.557	1.00	6.13	10.235	10.000	9.84	98.4	NO	108.370	YES
40 PFDoS	699 > 80		24306.963	1.00			10.000		(K)	NO		YES
41 PFTeDA	713.0 > 669.0	13569.787	24306.963	1.00	6.33	6.978	10.000	10.5	105.0	NO	14.243	NO
85 13C2-10:2 FTS-EIS	632.9 > 80.0	1332.675		1.00	5.89	1332.675	12.500	12.3	98.1	NO		

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Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

83	13C2-PFDoA-EIS	614.9 > 569.9	23715.557		1.00	5.90	23715.557	12.500	12.7	101.5	NO	
87	d3-N-MeFOSA-EIS	515.2 > 168.9	21351.840		1.00	5.84	21351.840	149.200	154	103.4	NO	
83	13C2-PFDoA-EIS	614.9 > 569.9	23715.557		1.00	5.90	23715.557	12.500	12.7	101.5	NO	
89	13C2-PFTeDA-EIS	715.1 > 669.7	24306.963		1.00	6.33	24306.963	12.500	12.8	102.0	NO	
89	13C2-PFTeDA-EIS	715.1 > 669.7	24306.963		1.00	6.33	24306.963	12.500	12.8	102.0	NO	
-1												
42	N-EtFOSA	526.1 > 168.9		23592.137	1.00			9.600			NO	YES
43	PFHxDA	813 > 769		26509.676	1.00			10.000			NO	YES
44	PFODA	913.1 > 868.8		26509.676	1.00			10.000			NO	
45	N-MeFOSE	616.1 > 58.9		21004.094	1.00			9.600			NO	
46	N-EtFOSE	630.1 > 58.9		24464.982	1.00			9.600			NO	
48	13C3-PFBA-RSD	216.1 > 171.8	9272.683	10752.734	1.00	1.62	10.779	12.500	12.6	100.9	NO	
91	d5-N-ETFOSA-EIS	531.1 > 168.9	23592.137		1.00	6.21	23592.137	149.200	152	101.9	NO	
93	13C2-PFHxDA-EIS	815 > 769.7	26509.676		1.00	6.63	26509.676	12.500	12.6	100.5	NO	
93	13C2-PFHxDA-EIS	815 > 769.7	26509.676		1.00	6.63	26509.676	12.500	12.6	100.5	NO	
95	d7-N-MeFOSE-EIS	623.1 > 58.9	21004.094		1.00	6.34	21004.094	149.200	156	104.5	NO	
97	d9-N-EtFOSE-EIS	639.2 > 58.8	24464.982		1.00	6.48	24464.982	149.200	165	110.3	NO	
50	13C3-PFPeA-RSD	266.0 > 221.8	13089.568	15683.965	1.00	2.59	10.432	12.500	13.9	111.0	NO	
-1												
52	13C3-PFBS-RSD	302.0 > 98.9	1400.722	1063.464	1.00	2.87	16.464	12.500	13.4	107.4	NO	
54	13C3-HFPO-DA-RSD	287.0 > 168.9	3122.345	15683.965	1.00	3.59	2.488	12.500	13.2	105.2	NO	
56	13C2-4:2 FTS-RSD	329.0 >80.8	1249.773	1063.464	1.00	3.30	14.690	12.500	13.0	103.8	NO	
58	13C2-PFHxA-RSD	315.0 > 270.0	15191.044	15683.965	1.00	3.39	12.107	12.500	13.8	110.2	NO	
60	13C4-PFHpA-RSD	367.2 > 321.8	13511.702	15683.965	1.00	3.98	10.769	12.500	14.2	113.4	NO	
62	13C3-PFHxS-RSD	402 > 80	2940.244	1063.464	1.00	4.13	34.560	12.500	14.0	112.3	NO	
64	13C2-6:2 FTS-RSD	429.0 >79.7	1628.024	3325.066	1.00	4.45	6.120	12.500	12.9	103.6	NO	
66	13C5-PFNA-RSD	468.2 > 422.9	15540.856	16546.383	1.00	4.94	11.740	12.500	12.5	99.8	NO	
68	13C8-PFOSA-RSD	506 > 78	7420.505	15619.884	1.00	4.98	5.938	12.500	12.2	97.7	NO	
70	13C2-PFOA-RSD	414.9 > 369.7	14523.533	13675.684	1.00	4.50	13.275	12.500	12.1	97.1	NO	
72	13C8-PFOS-RSD	507.1 > 80	2884.835	3325.066	1.00	5.02	10.845	12.500	12.4	99.2	NO	
74	13C2-PFDA-RSD	515.1 > 469.9	19932.547	16557.969	1.00	5.31	15.048	12.500	12.0	96.0	NO	
-1												
76	13C2-8:2 FTS-RSD	529 > 80	1598.607	3325.066	1.00	5.29	6.010	12.500	13.2	105.3	NO	
78	d3-N-MeFOSAA-RSD	573.1 > 419	4460.954	15619.884	1.00	5.45	3.570	12.500	12.2	97.4	NO	
80	13C2-PFUdA-RSD	565 > 519.8	19378.582	15619.884	1.00	5.63	15.508	12.500	12.0	95.8	NO	
82	d5-N-EtFOSAA-RSD	589.3 > 419	4230.890	15619.884	1.00	5.60	3.386	12.500	12.0	95.7	NO	

OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-ICV.qld

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Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

	Name	Trace	Area	IS Area	Wt/vol	RT	Response	Std Conc	Conc	Rec	Recovery	Ion Ratio	Ratio Out
84	13C2-PFDoA-RSD	614.9 > 569.9	23715.557	16557.969	1.00	5.90	17.903	12.500	11.6	92.4	NO		
86	13C2-10:2 FTS-RSD	632.9 > 80.0	1332.675	3325.066	1.00	5.89	5.010	12.500	13.0	104.4	NO		
88	d3-N-MeFOSA-RSD	515.2 > 168.9	21351.840	15619.884	1.00	5.84	17.087	149.200	148	98.9	NO		
90	13C2-PFTeDA-RSD	715.1 > 669.7	24306.963	15619.884	1.00	6.33	19.452	12.500	11.9	95.3	NO		
92	d5-N-ETFOSA-RSD	531.1 > 168.9	23592.137	15619.884	1.00	6.21	18.880	149.200	145	97.1	NO		
94	13C2-PFHxDA-RSD	815 > 769.7	26509.676	15619.884	1.00	6.63	21.215	12.500	11.9	95.5	NO		
96	d7-N-MeFOSE-RSD	623.1 > 58.9	21004.094	15619.884	1.00	6.34	16.809	149.200	141	94.7	NO		
98	d9-N-EtFOSE-RSD	639.2 > 58.8	24464.982	15619.884	1.00	6.48	19.578	149.200	149	99.6	NO		
-1													
99	13C4-PFBA	217.0 > 172.0	10752.734	10752.734	1.00	1.62	12.500	12.500	12.5	100.0	NO		
1...	13C5-PFHxA	318.0 > 272.9	15683.965	15683.965	1.00	3.39	12.500	12.500	12.5	100.0	NO		
1...	13C8-PFOA	420.9 > 376.0	13675.684	13675.684	1.00	4.50	12.500	12.500	12.5	100.0	NO		
1...	18O2-PFHxS	403.0 > 103	1063.464	1063.464	1.00	4.12	12.500	12.500	12.5	100.0	NO		
1...	13C9-PFNA	472.2 > 426.9	16546.383	16546.383	1.00	4.94	12.500	12.500	12.5	100.0	NO		
1...	13C4-PFOS	503 > 79.7	3325.066	3325.066	1.00	5.02	12.500	12.500	12.5	100.0	NO		
1...	13C6-PFDA	519.1 > 473.7	16557.969	16557.969	1.00	5.31	12.500	12.500	12.5	100.0	NO		
1...	13C7-PFUdA	570.1 > 524.8	15619.884	15619.884	1.00	5.63	12.500	12.500	12.5	100.0	NO		

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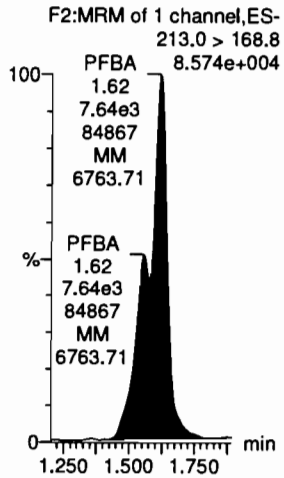
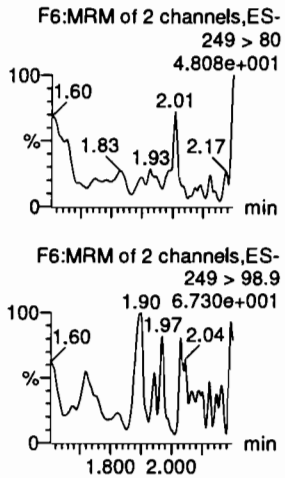
Calibration: D:\PFAS5.PRO\CurveDB\C18_VAL-PFAS_Q5_07-06-20.cdb 07 Jul 2020 09:00:31

Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

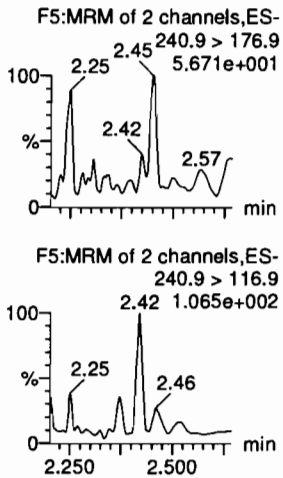
PFBA



PFPrS



3:3 FTCA



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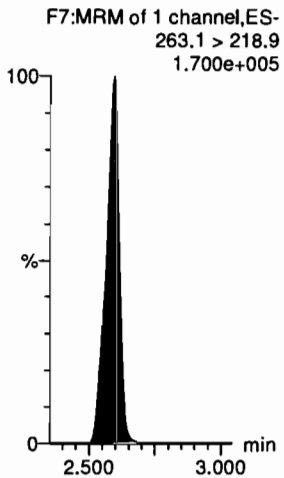

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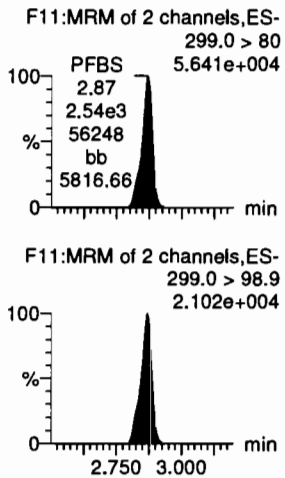
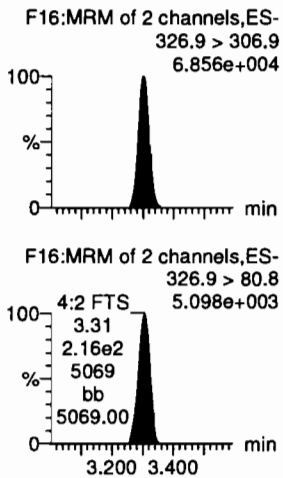
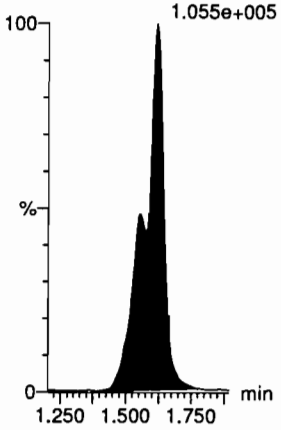


4:2 FTS



13C3-PFBA-EIS



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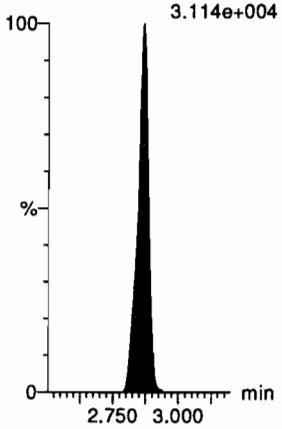

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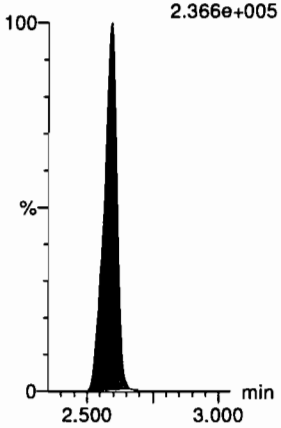

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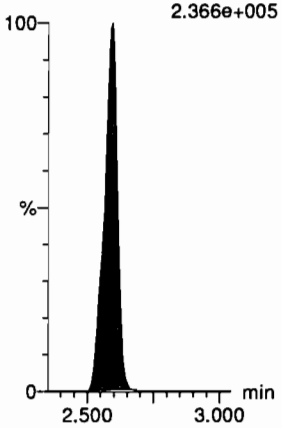

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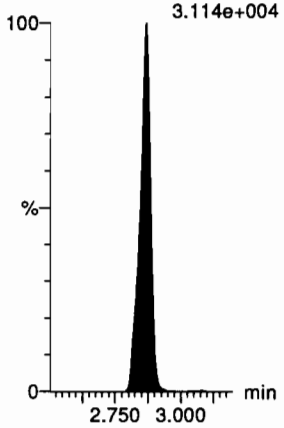
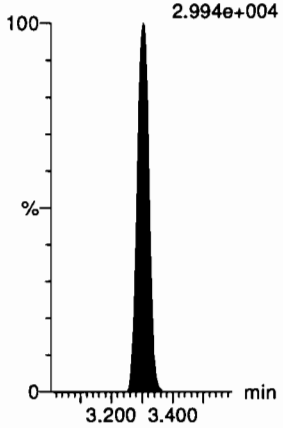


13C2-4:2 FTS-EIS



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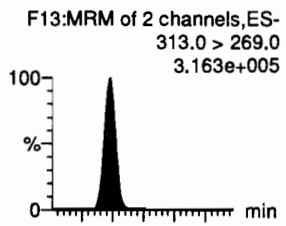
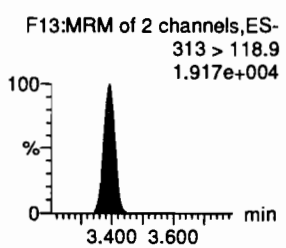
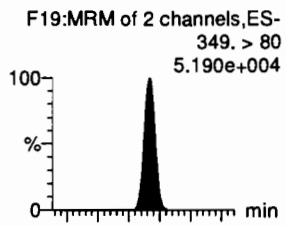
Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

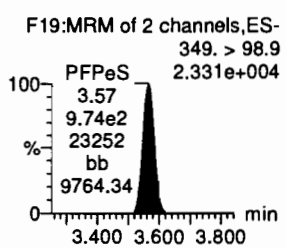
PFHxA



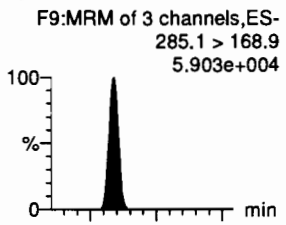


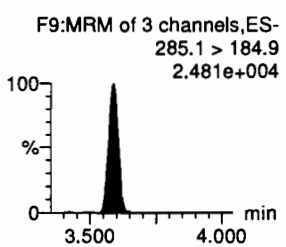
PFPeS



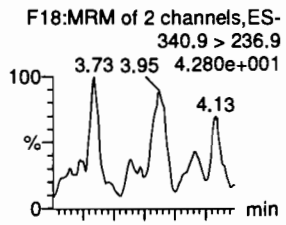


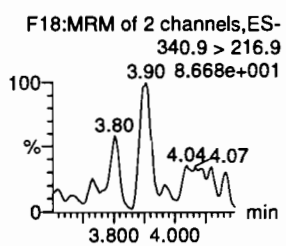
HFPO-DA





5:3 FTCA





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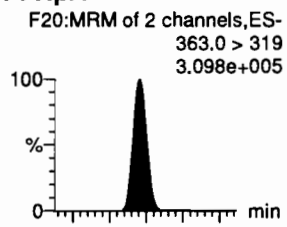
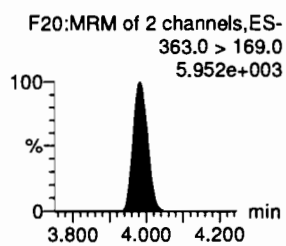
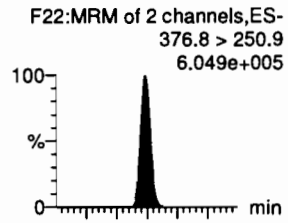
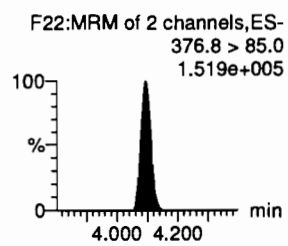


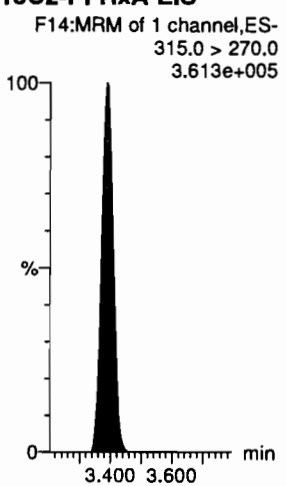


ADONA





13C2-PFHxA-EIS



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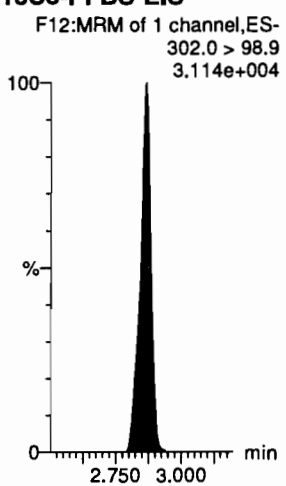
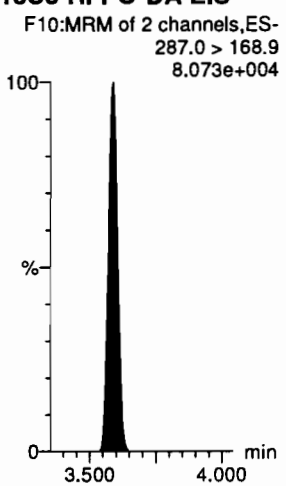
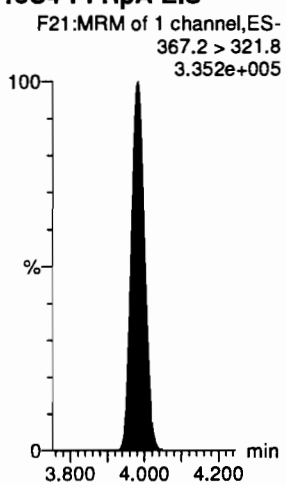


13C3-HFPO-DA-EIS



13C4-PFHpA-EIS



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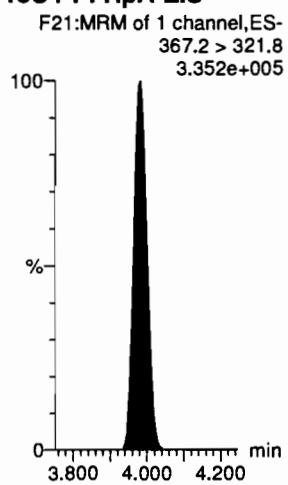

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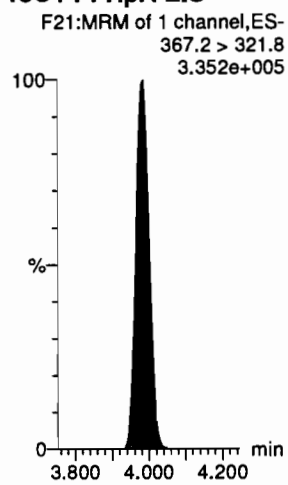

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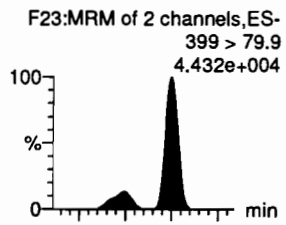
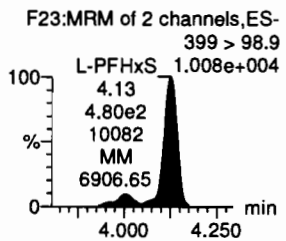
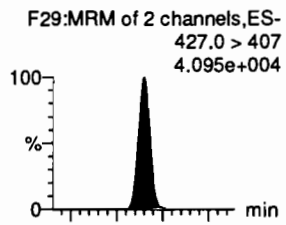
Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

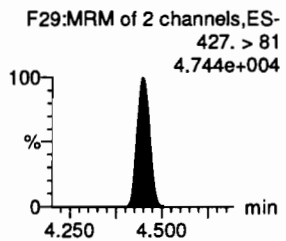
L-PFHxS



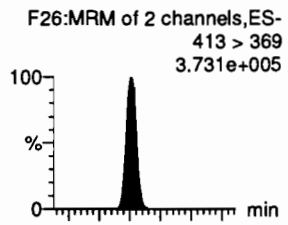


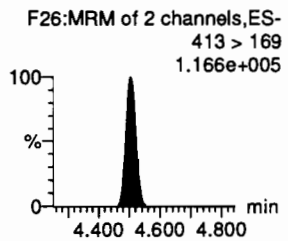
6:2 FTS





L-PFOA





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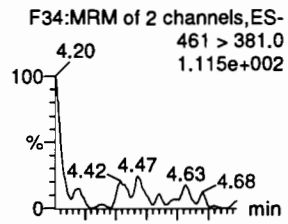
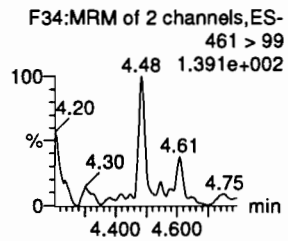
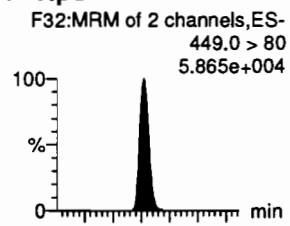
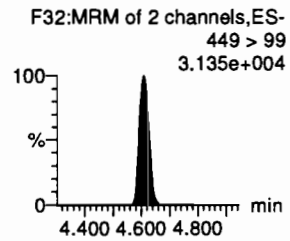


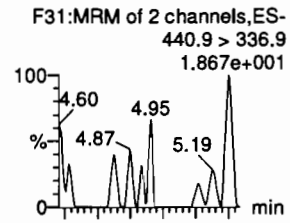


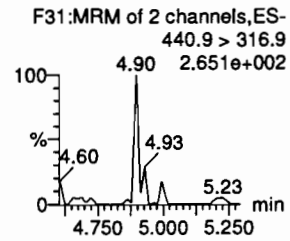
PFHpS



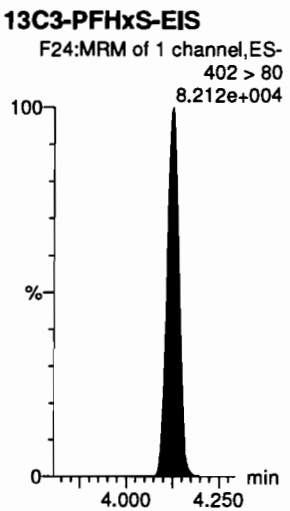


7:3 FTCA

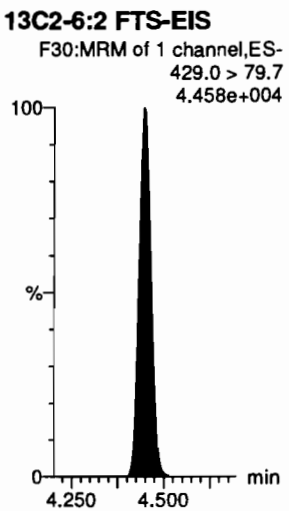




13C3-PFHxS-EIS



13C2-6:2 FTS-EIS



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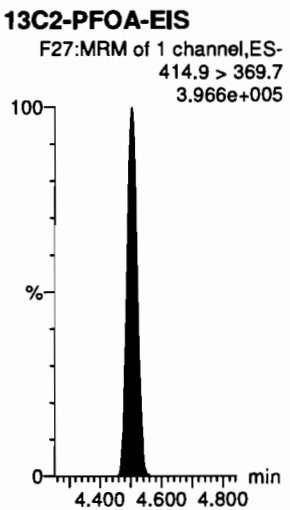

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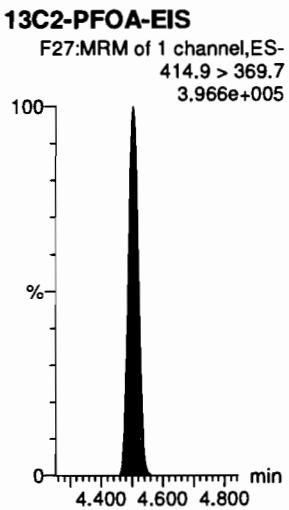
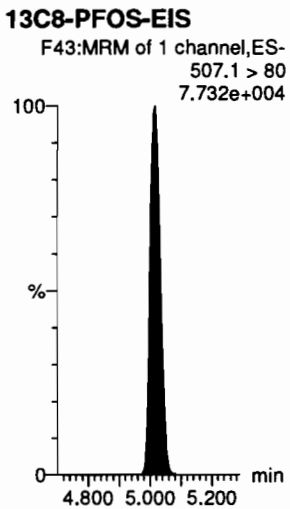
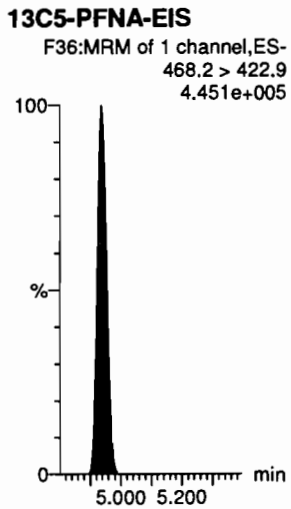


13C8-PFOS-EIS



13C5-PFNA-EIS



OPV 7/7/2020

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Printed: Tuesday, July 07, 2020 09:42:05 Pacific Daylight Time

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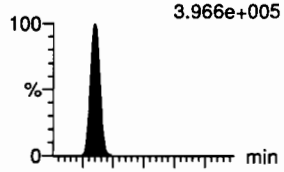

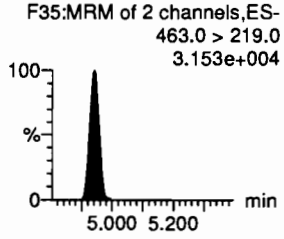

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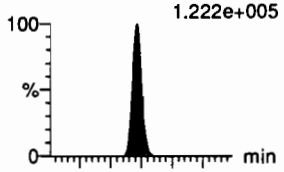

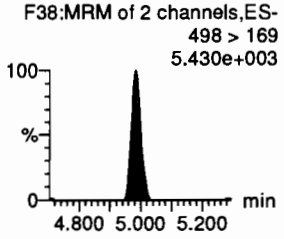

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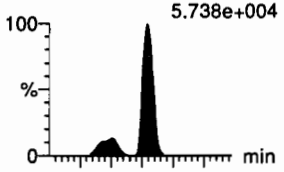

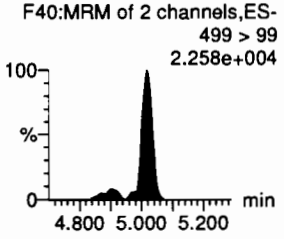

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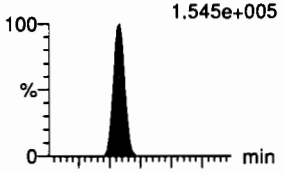

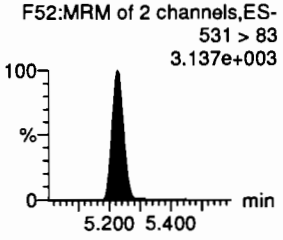

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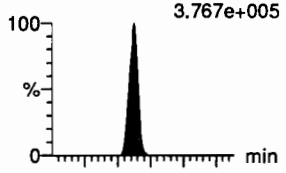
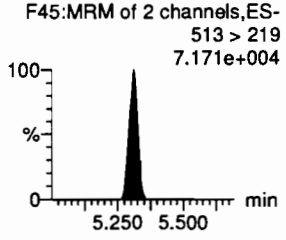
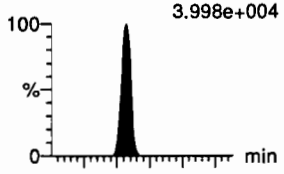
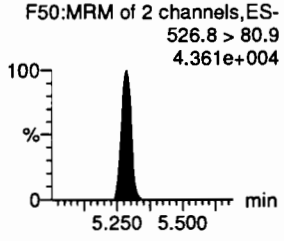


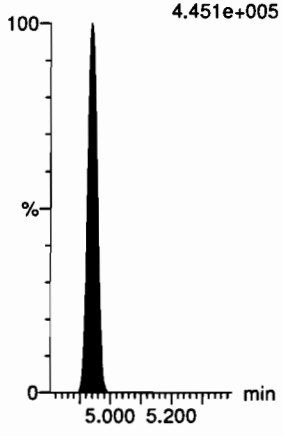


8:2 FTS





13C5-PFNA-EIS



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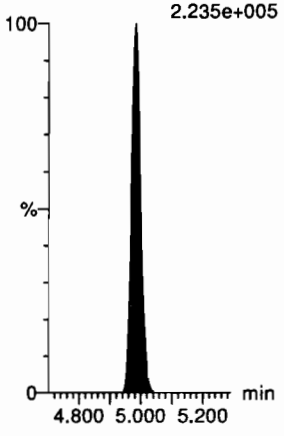

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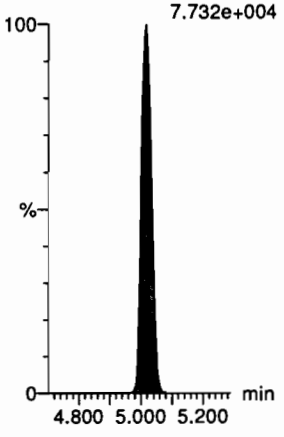

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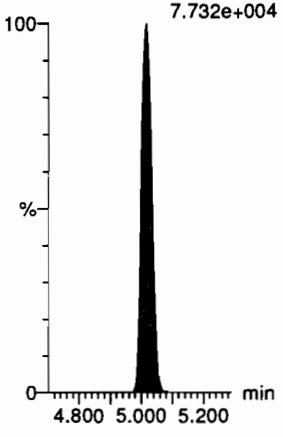

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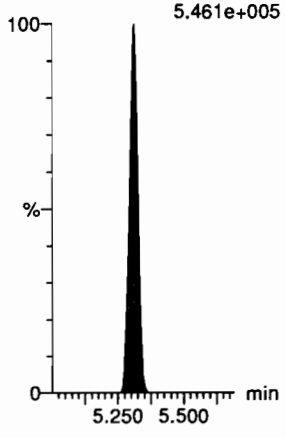

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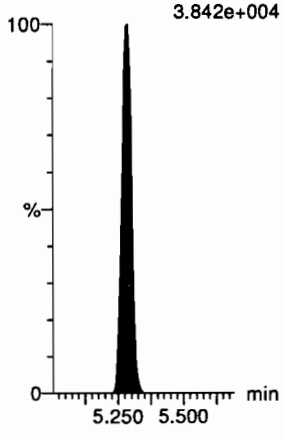

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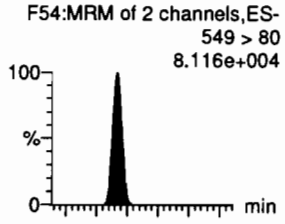
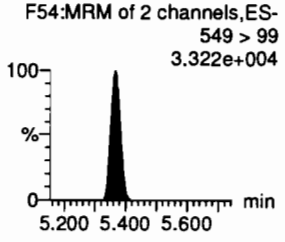
PFNS





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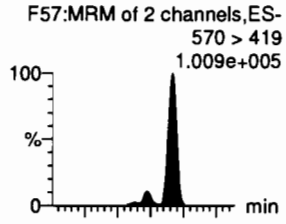

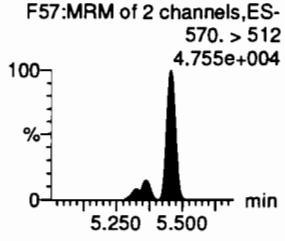

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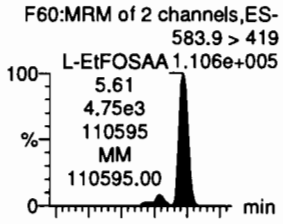

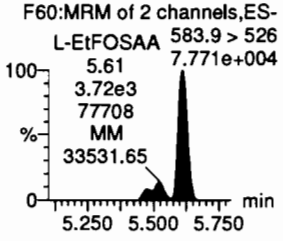

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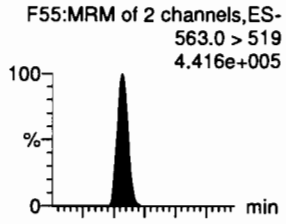

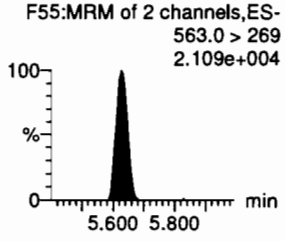

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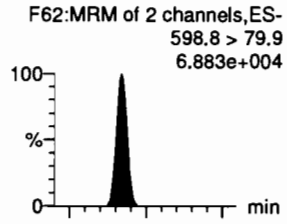

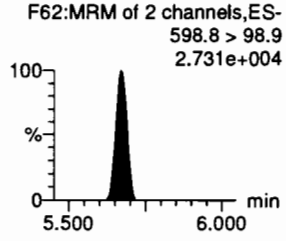

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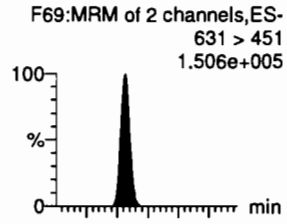
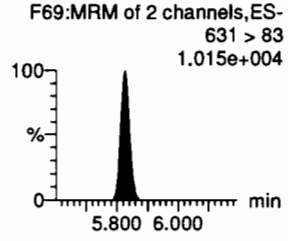
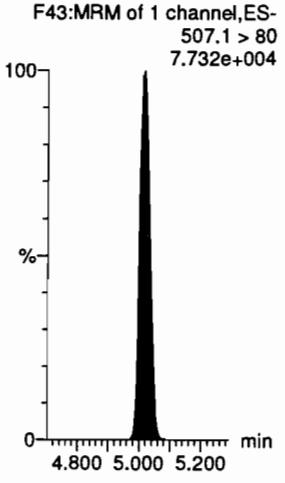




13C8-PFOS-EIS



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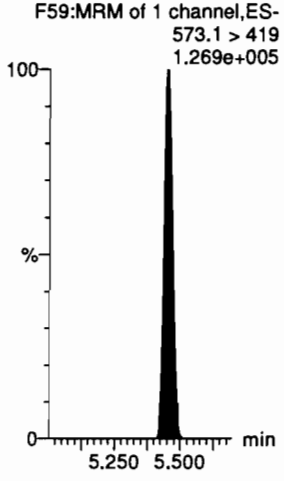

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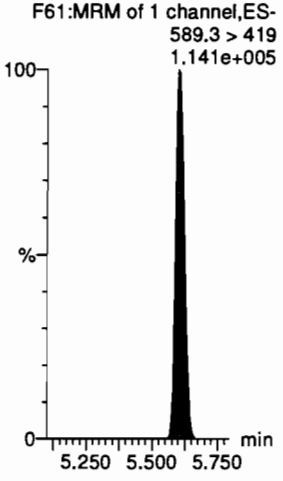

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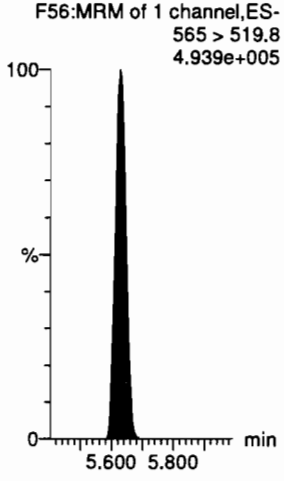

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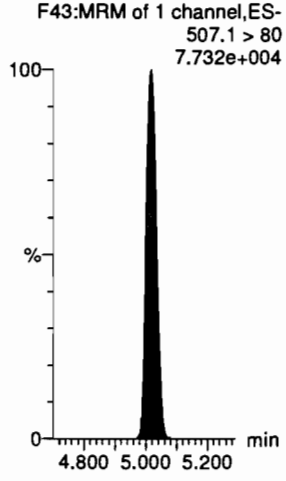

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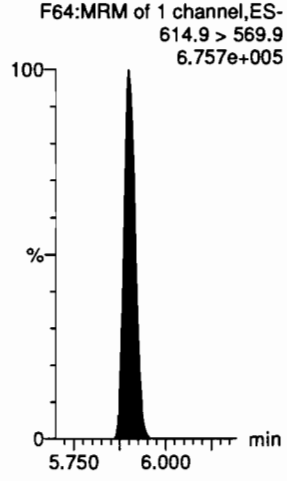

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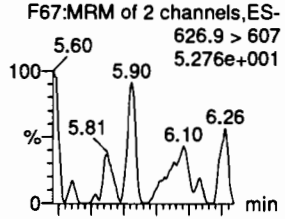
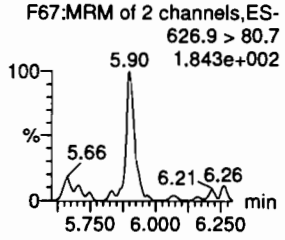
10:2 FTS





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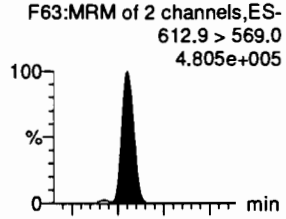
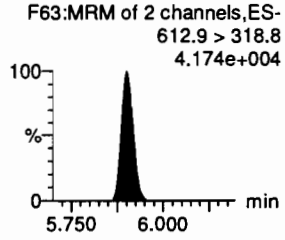
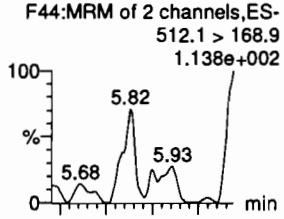
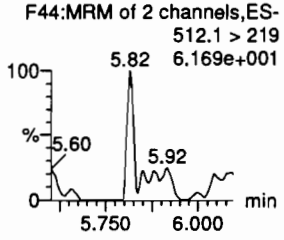




N-MeFOSA





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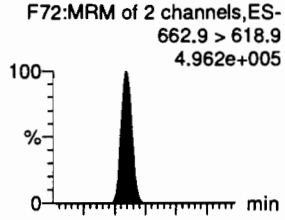

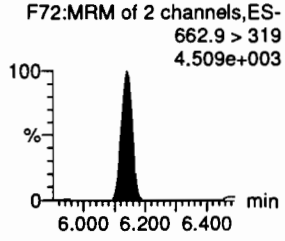

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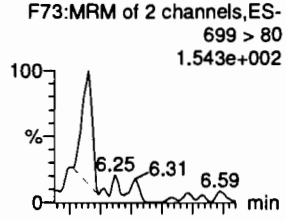

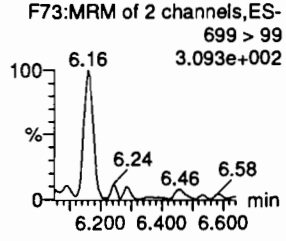

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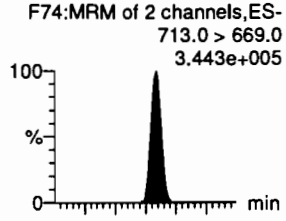
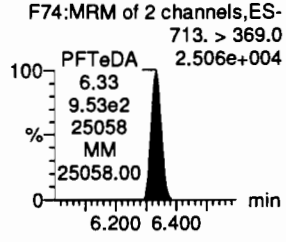
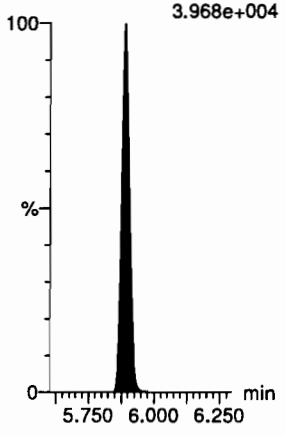
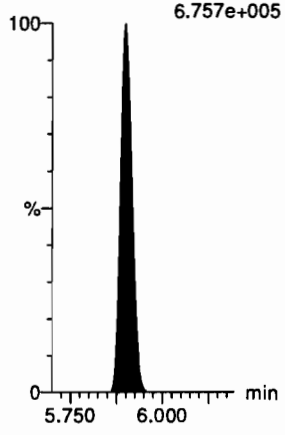




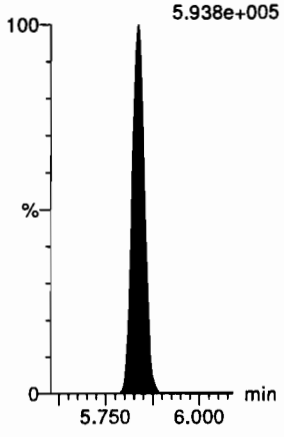
13C2-10:2 FTS-EIS



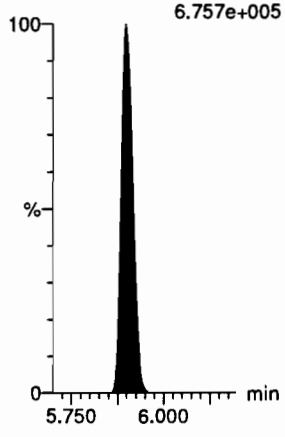
13C2-PFDoA-EIS



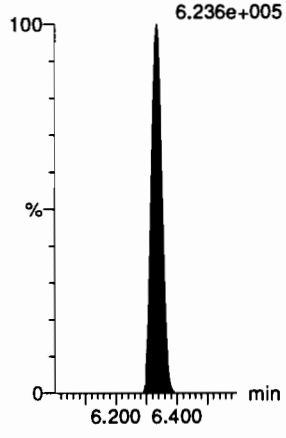
d3-N-MeFOSA-EIS



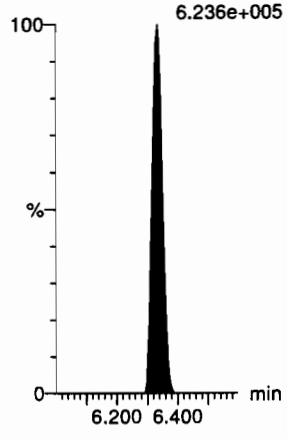
13C2-PFDoA-EIS



13C2-PFTeDA-EIS



13C2-PFTeDA-EIS



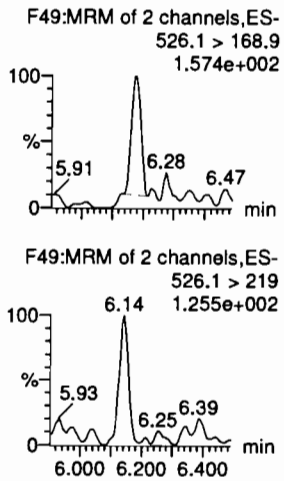
OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-ICV.qld

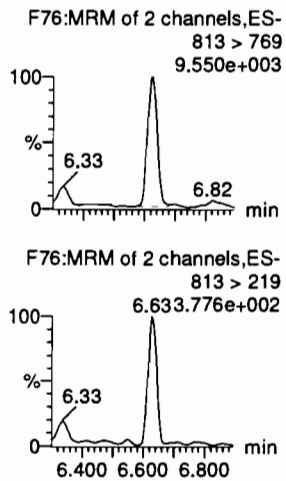
Last Altered: Tuesday, July 07, 2020 09:39:03 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 09:42:05 Pacific Daylight Time

Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

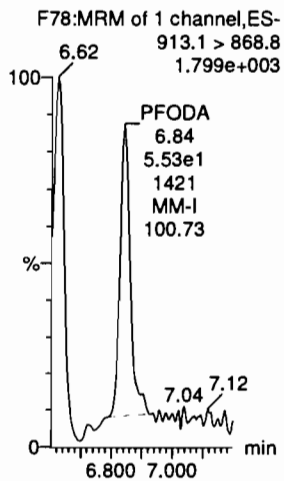
N-EtFOSA



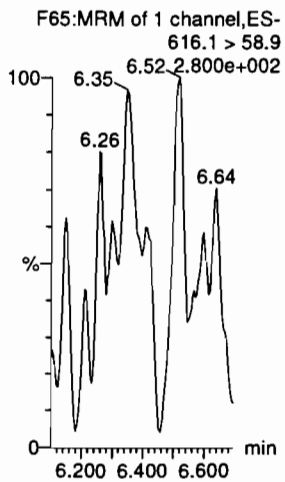
PFHxDA



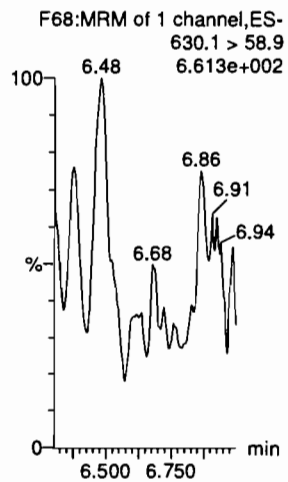
PFODA



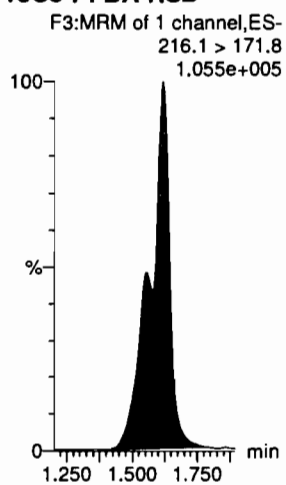
N-MeFOSE



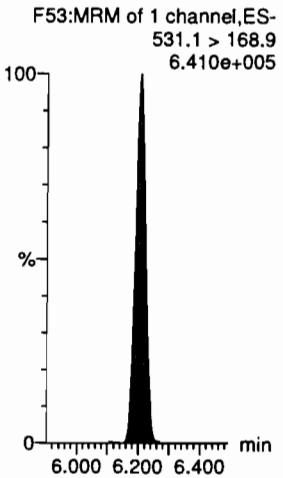
N-EtFOSE



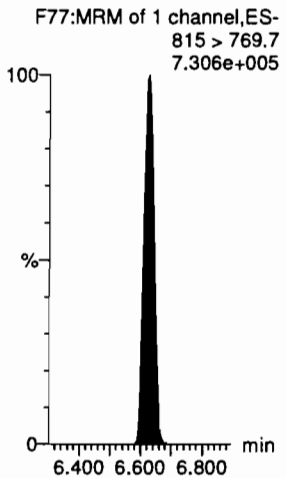
13C3-PFBA-RSD



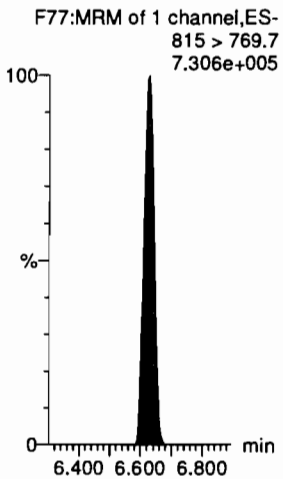
d5-N-ETFOSA-EIS



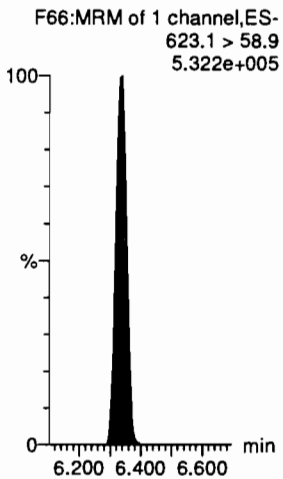
13C2-PFHxDA-EIS



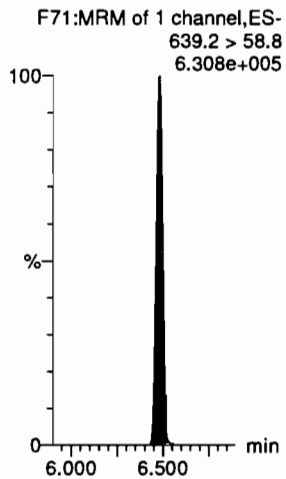
13C2-PFHxDA-EIS



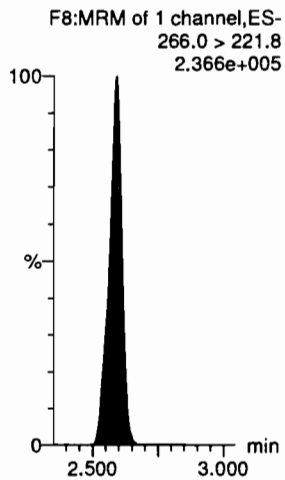
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



OPV 7/7/2020

Dataset: D:\PFAS5.PRO\RESULTS\200706P1\200706P1-ICV.qld

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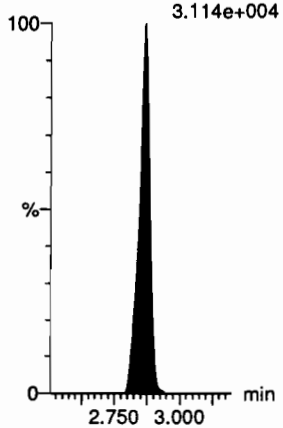
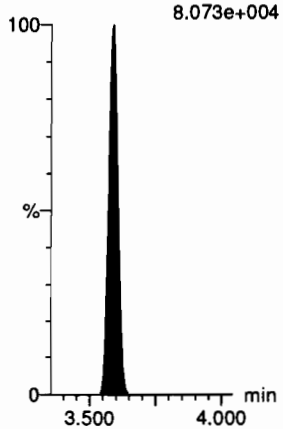
Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

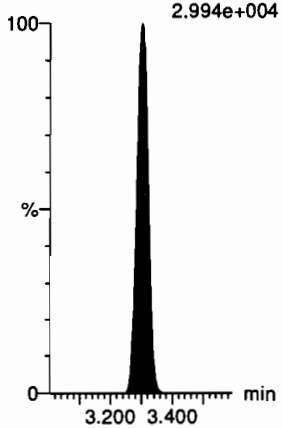
13C3-PFBS-RSD
F12:MRM of 1 channel,ES-
302.0 > 98.9
3.114e+004



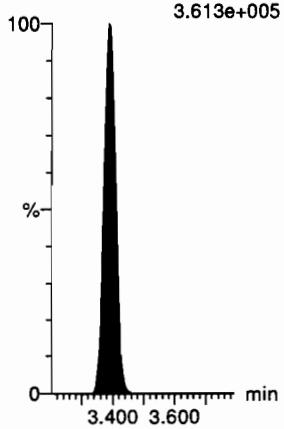
13C3-HFPO-DA-RSD
F10:MRM of 2 channels,ES-
287.0 > 168.9
8.073e+004



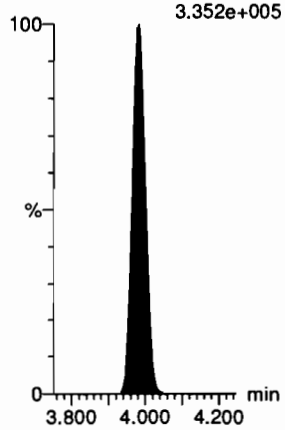
13C2-4:2 FTS-RSD
F17:MRM of 2 channels,ES-
329.0 > 80.8
2.994e+004



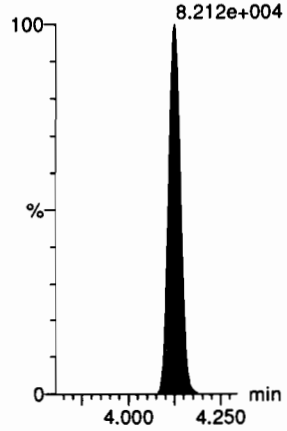
13C2-PFHxA-RSD
F14:MRM of 1 channel,ES-
315.0 > 270.0
3.613e+005



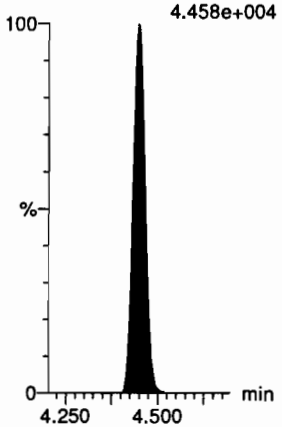
13C4-PFHpA-RSD
F21:MRM of 1 channel,ES-
367.2 > 321.8
3.352e+005



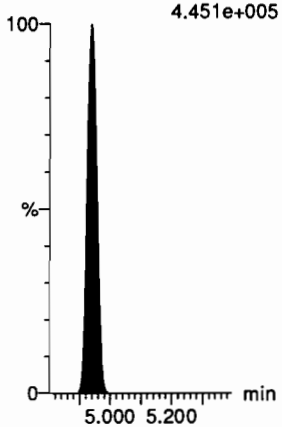
13C3-PFHxS-RSD
F24:MRM of 1 channel,ES-
402 > 80
8.212e+004



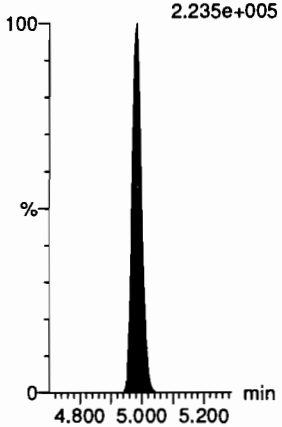
13C2-6:2 FTS-RSD
F30:MRM of 1 channel,ES-
429.0 > 79.7
4.458e+004



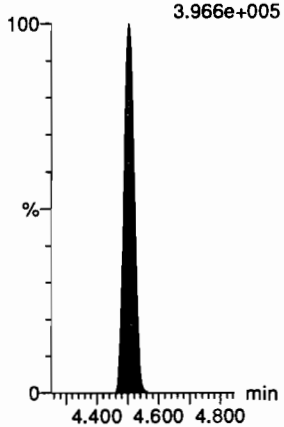
13C5-PFNA-RSD
F36:MRM of 1 channel,ES-
468.2 > 422.9
4.451e+005



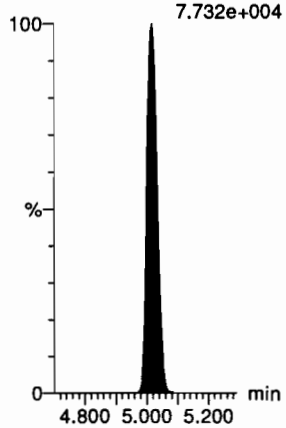
13C8-PFOSA-RSD
F42:MRM of 1 channel,ES-
506 > 78
2.235e+005



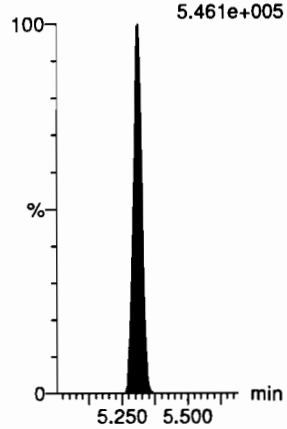
13C2-PFOA-RSD
F27:MRM of 1 channel,ES-
414.9 > 369.7
3.966e+005



13C8-PFOS-RSD
F43:MRM of 1 channel,ES-
507.1 > 80
7.732e+004



13C2-PFDA-RSD
F46:MRM of 1 channel,ES-
515.1 > 469.9
5.461e+005



OPV 7/7/2020

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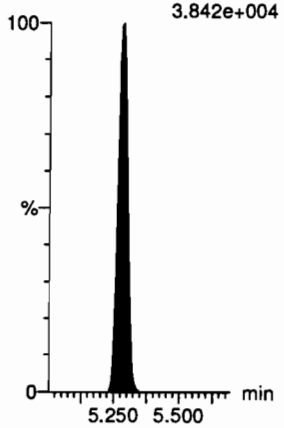
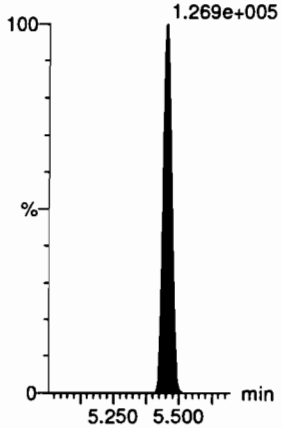
Name: 200706P1-30, Date: 06-Jul-2020, Time: 15:09:30, ID: ICV200706P1-1 PFC ICV 20F1911, Description: PFC ICV 20F1911

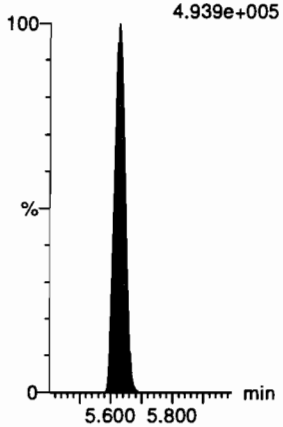
13C2-8:2 FTS-RSD
F51:MRM of 1 channel,ES-
529 > 80
3.842e+004



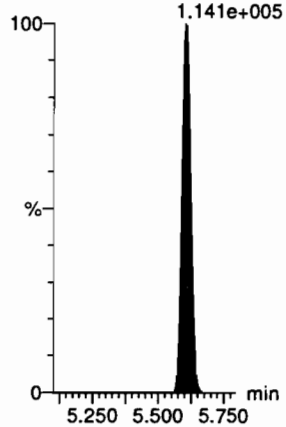
d3-N-MeFOSAA-RSD
F59:MRM of 1 channel,ES-
573.1 > 419
1.269e+005



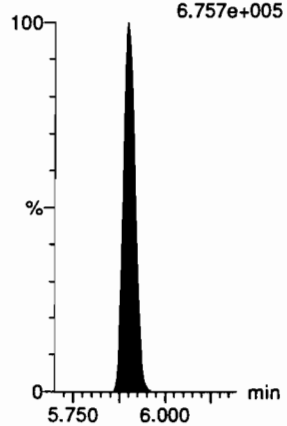
13C2-PFUdA-RSD
F56:MRM of 1 channel,ES-
565 > 519.8
4.939e+005



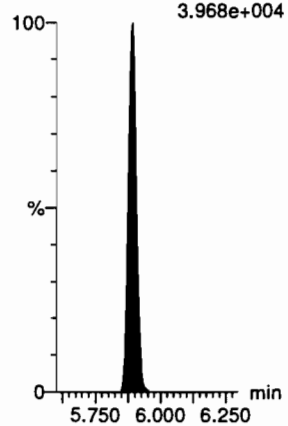
d5-N-EtFOSAA-RSD
F61:MRM of 1 channel,ES-
589.3 > 419
1.141e+005



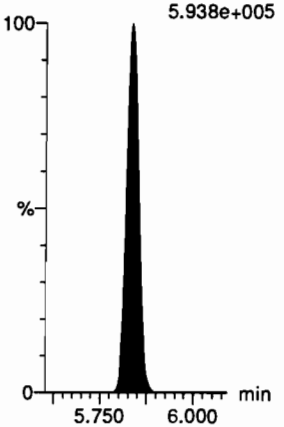
13C2-PFDoA-RSD
F64:MRM of 1 channel,ES-
614.9 > 569.9
6.757e+005



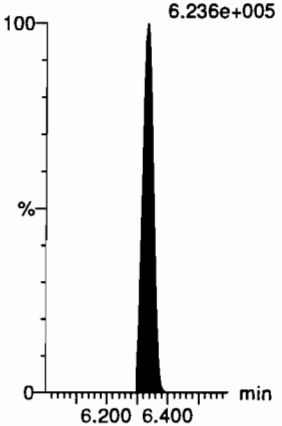
13C2-10:2 FTS-RSD
F70:MRM of 1 channel,ES-
632.9 > 80.0
3.968e+004



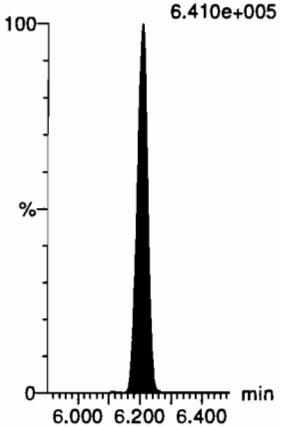
d3-N-MeFOSA-RSD
F47:MRM of 1 channel,ES-
515.2 > 168.9
5.938e+005



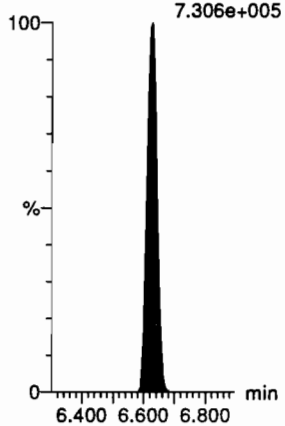
13C2-PFTeDA-RSD
F75:MRM of 2 channels,ES-
715.1 > 669.7
6.236e+005



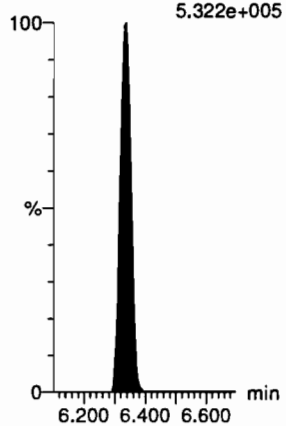
d5-N-ETFOSA-RSD
F53:MRM of 1 channel,ES-
531.1 > 168.9
6.410e+005



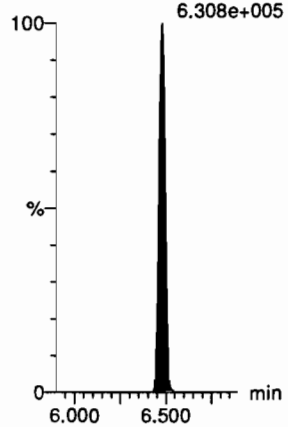
13C2-PFHxDA-RSD
F77:MRM of 1 channel,ES-
815 > 769.7
7.306e+005



d7-N-MeFOSE-RSD
F66:MRM of 1 channel,ES-
623.1 > 58.9
5.322e+005



d9-N-EtFOSE-RSD
F71:MRM of 1 channel,ES-
639.2 > 58.8
6.308e+005



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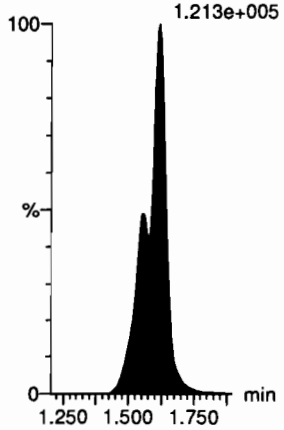
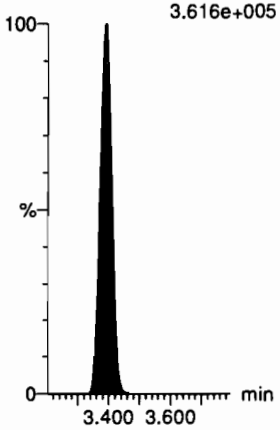
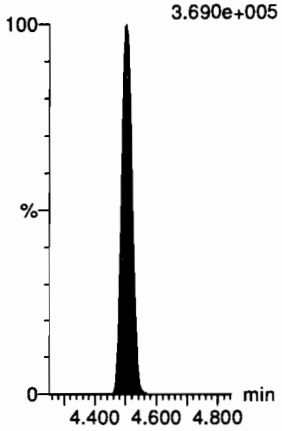
13C4-PFBA



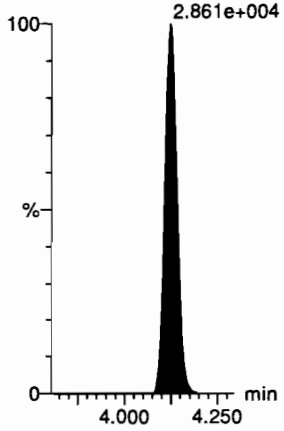
13C5-PFHxA



13C8-PFOA



18O2-PFHxS



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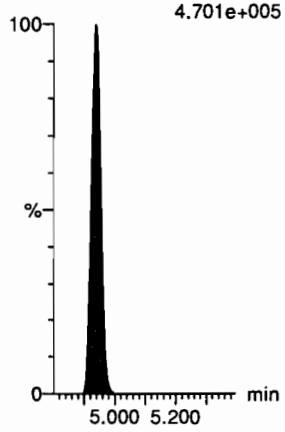

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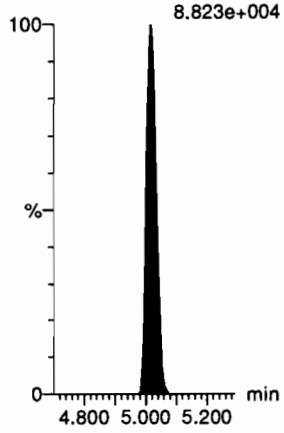

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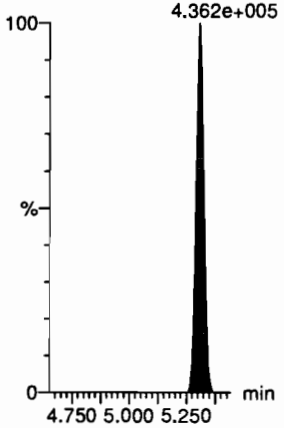

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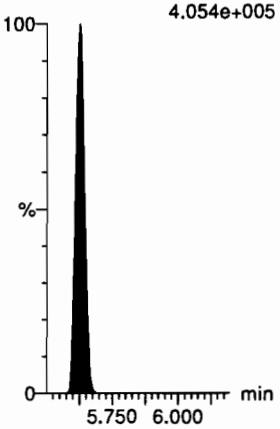

OPV 7/7/2020

Vista Analytical Laboratory

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Printed: Tuesday, July 07, 2020 10:17:38 Pacific Daylight Time

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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

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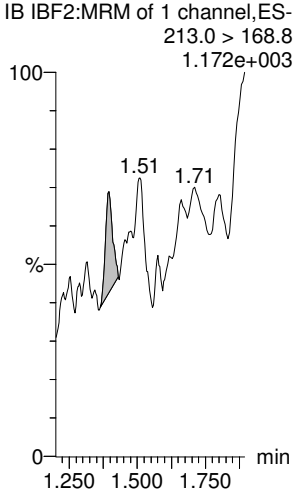

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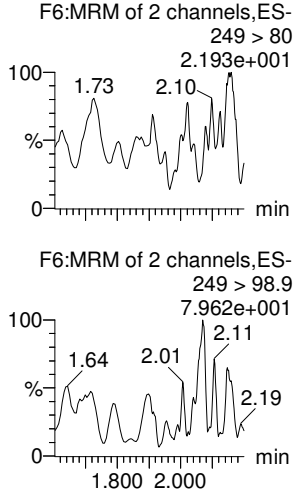
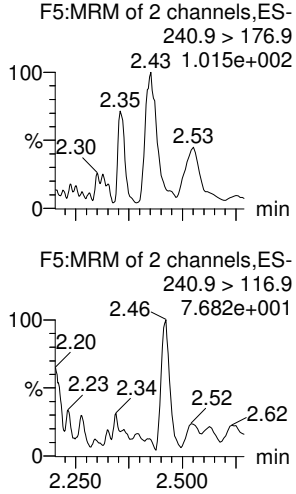


3:3 FTCA



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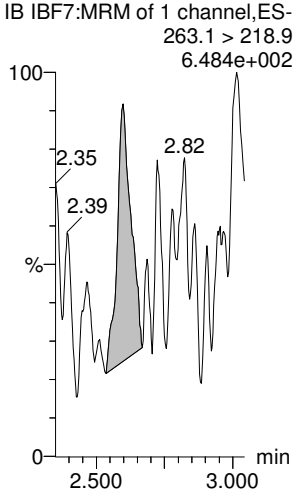

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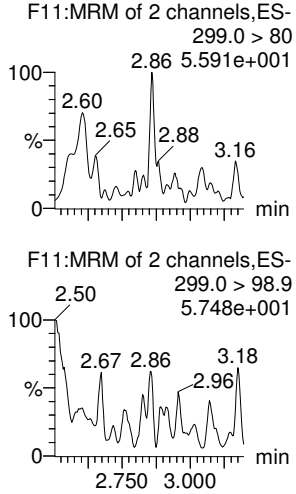

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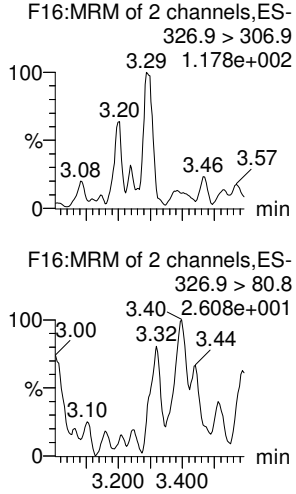

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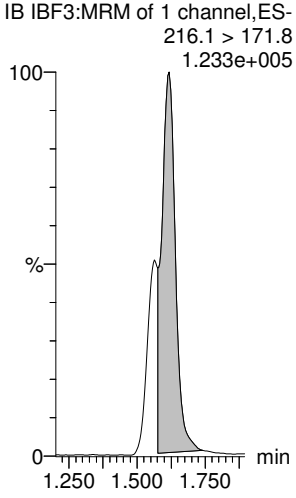

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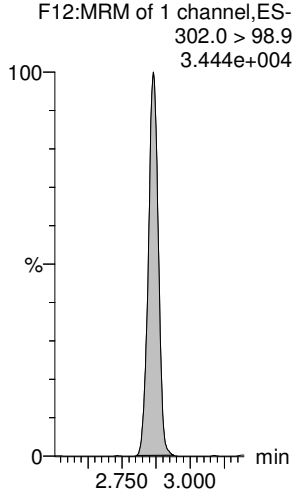

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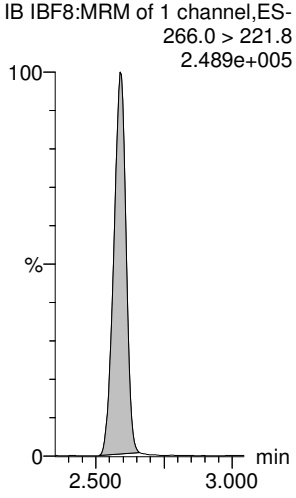

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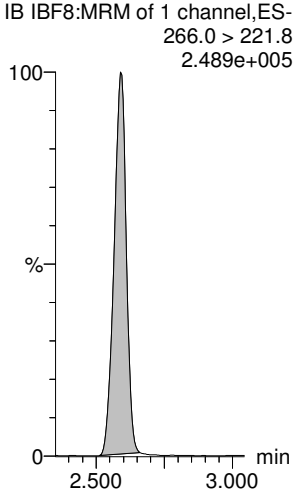

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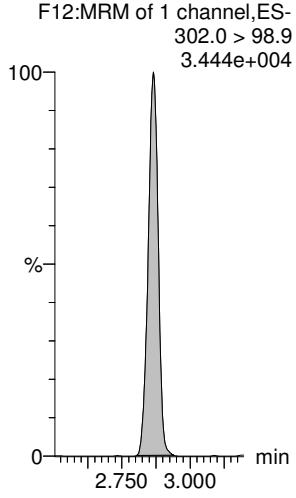

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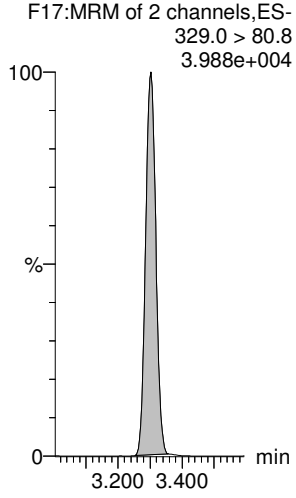

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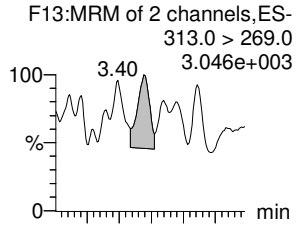

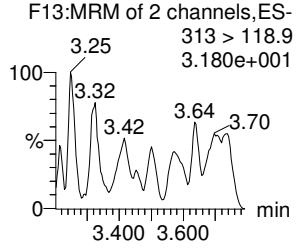

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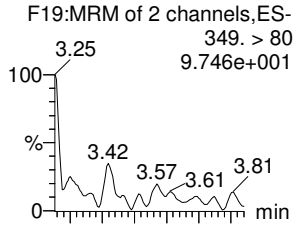
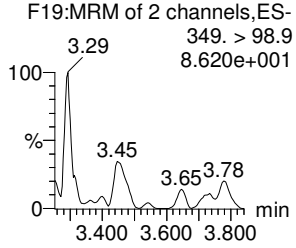
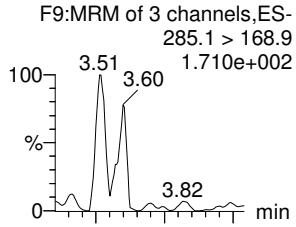
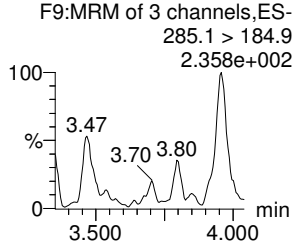




HFPO-DA





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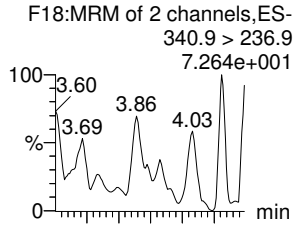

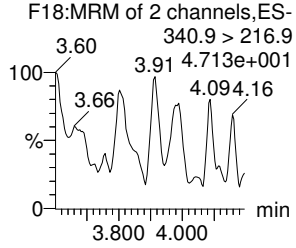

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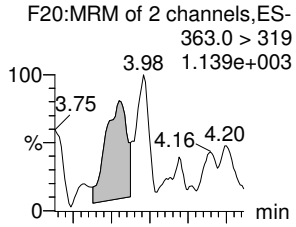

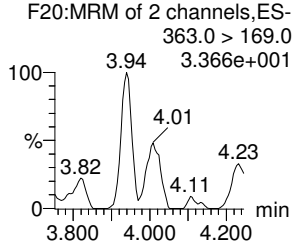

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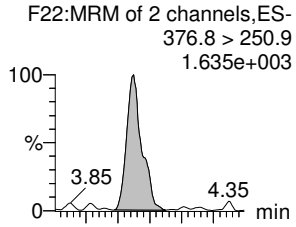

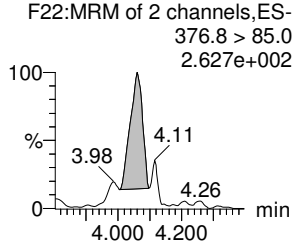

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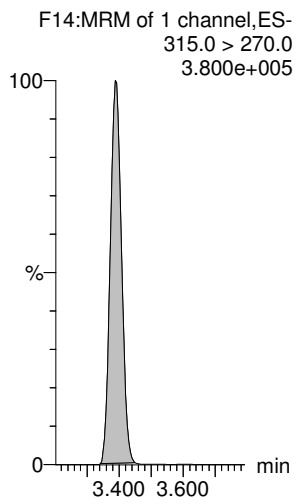

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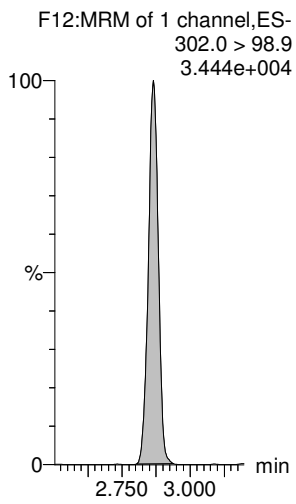

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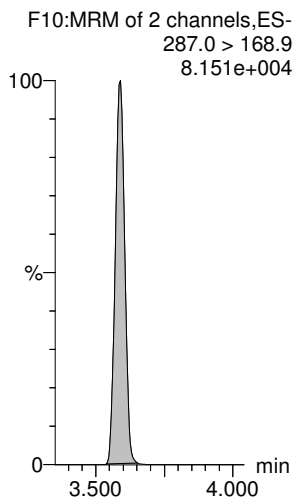

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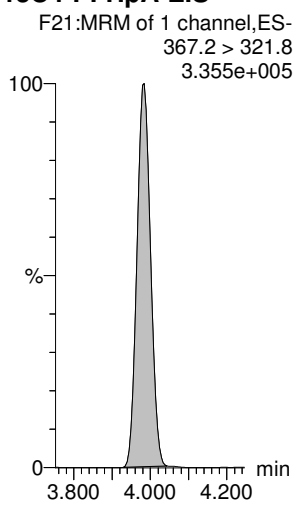

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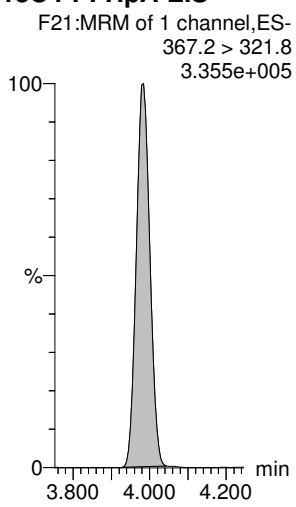

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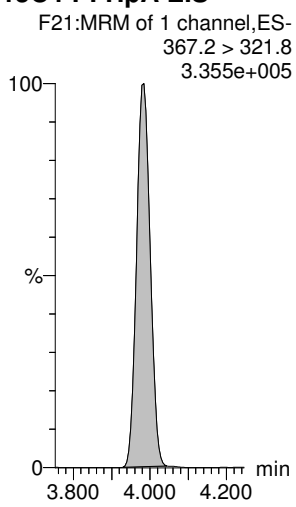

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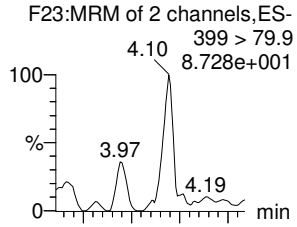
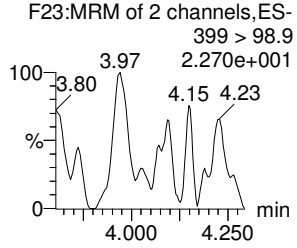
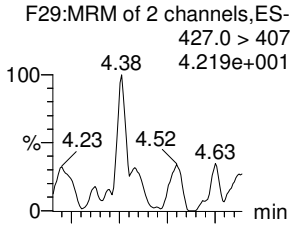
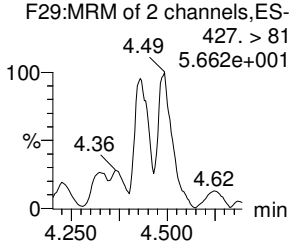
L-PFHxS





6:2 FTS





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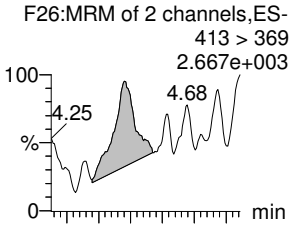

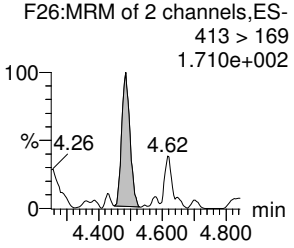

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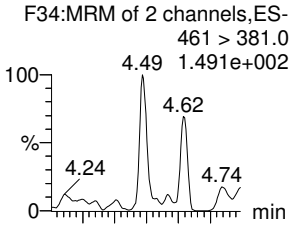

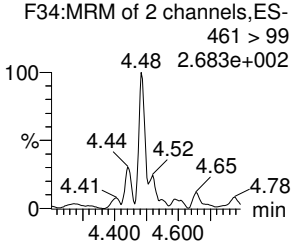

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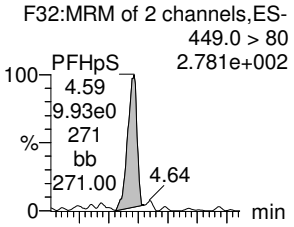

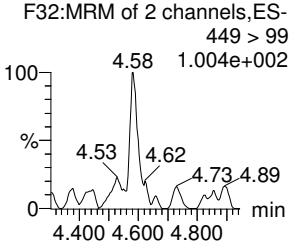

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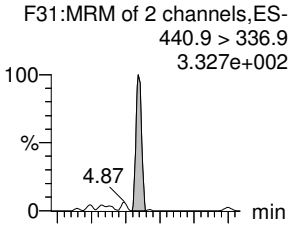

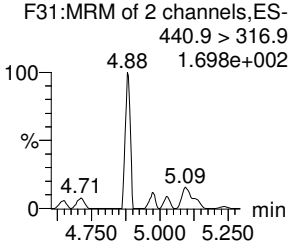

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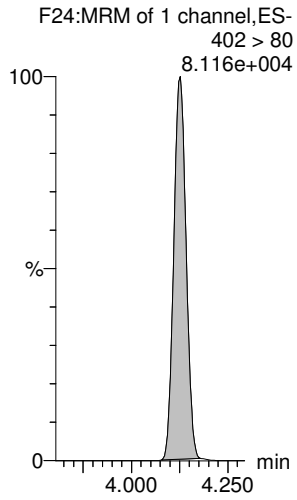

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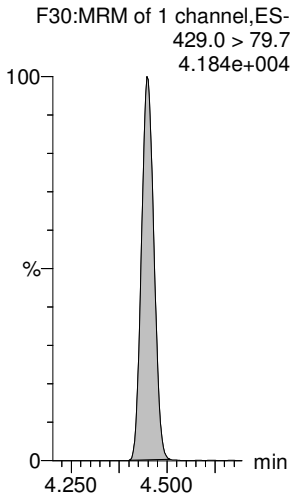

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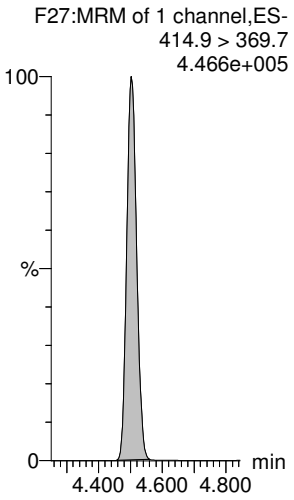

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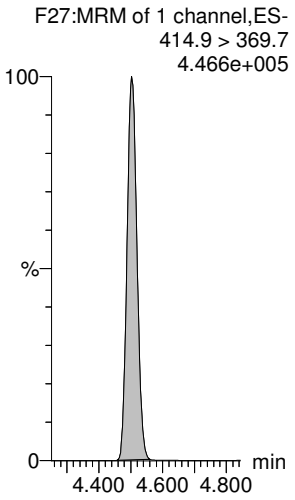

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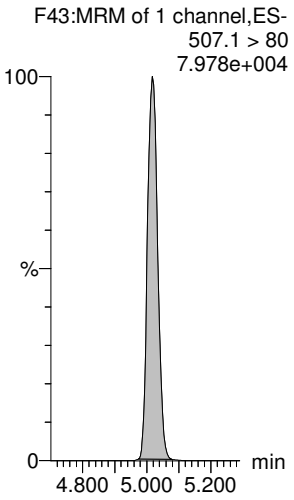
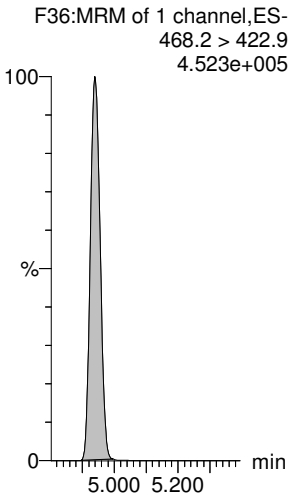


13C5-PFNA-EIS



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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

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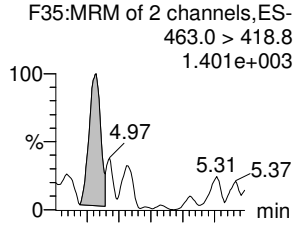

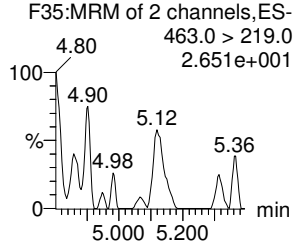

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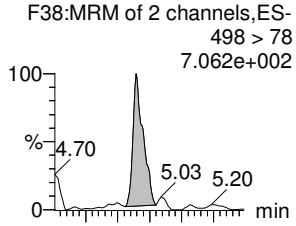

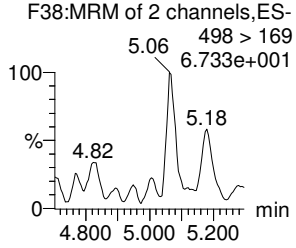

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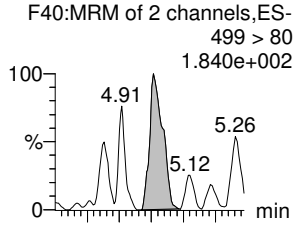

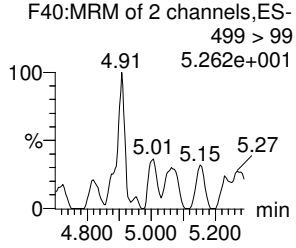

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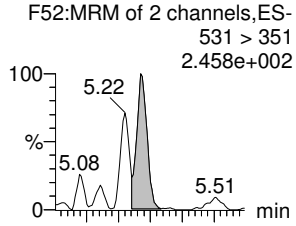

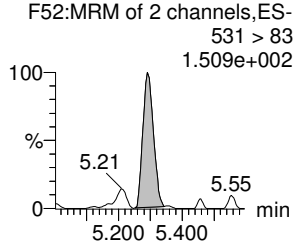

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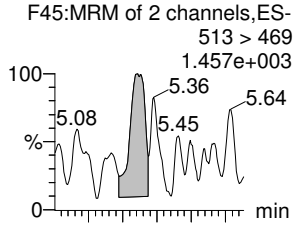
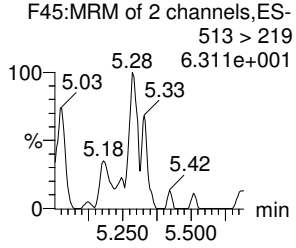
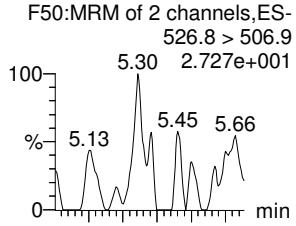
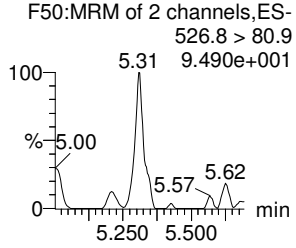




8:2 FTS





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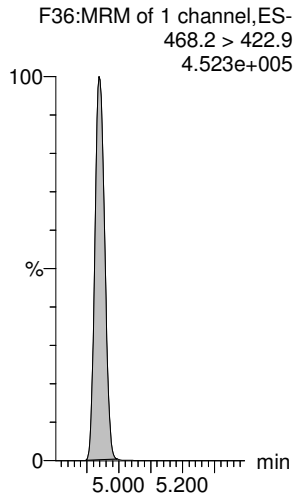
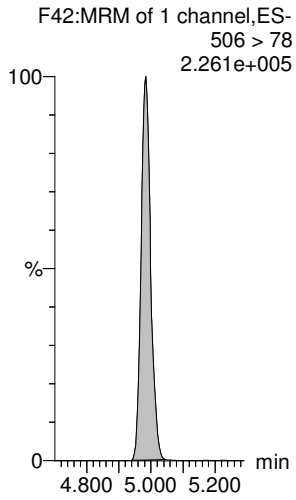


13C8-PFOSA-EIS



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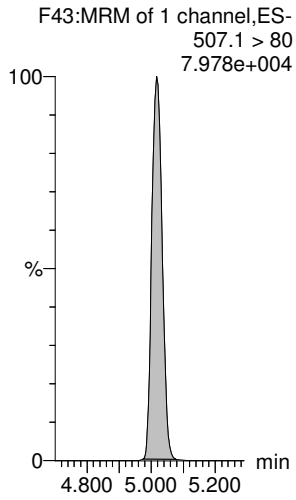

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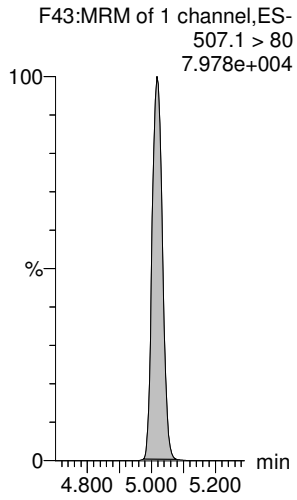

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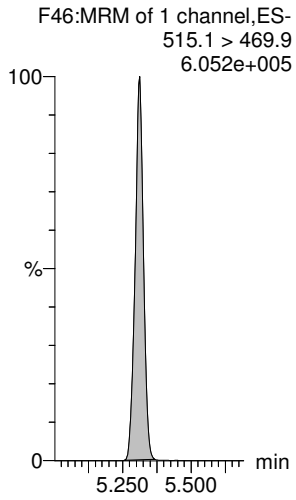

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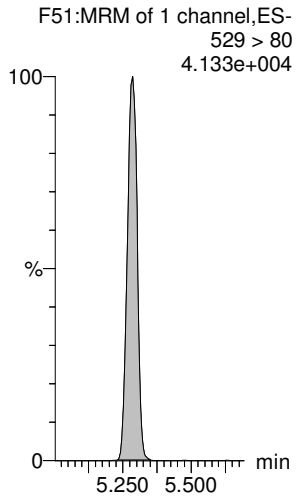

Vista Analytical Laboratory

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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

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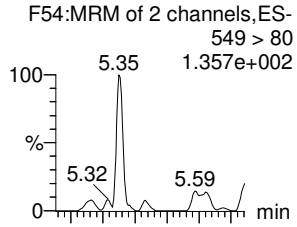

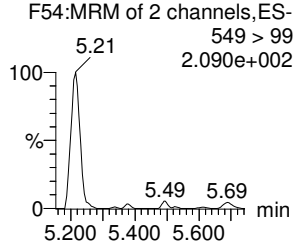

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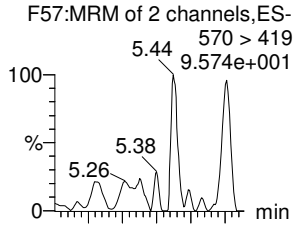

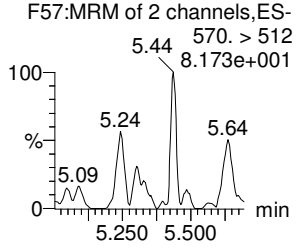

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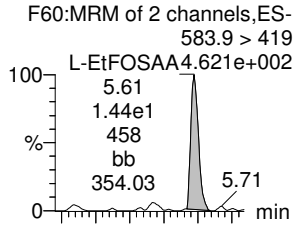

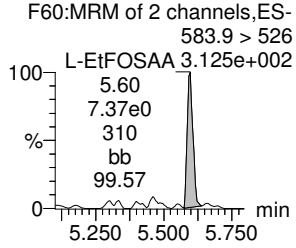

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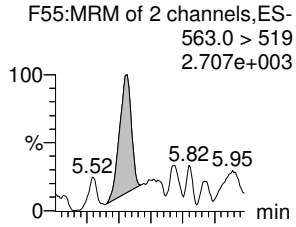

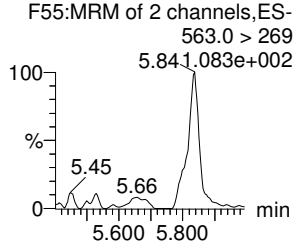

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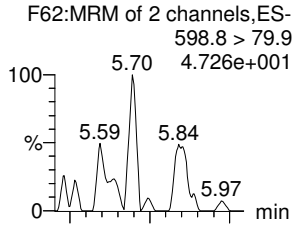

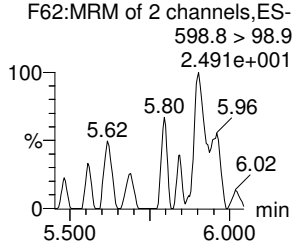

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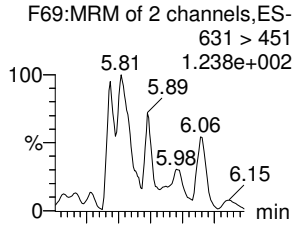
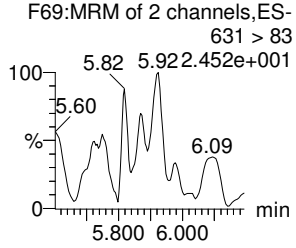
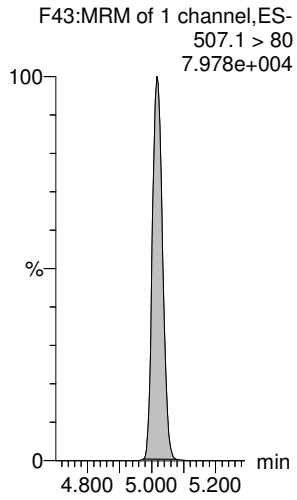




13C8-PFOS-EIS



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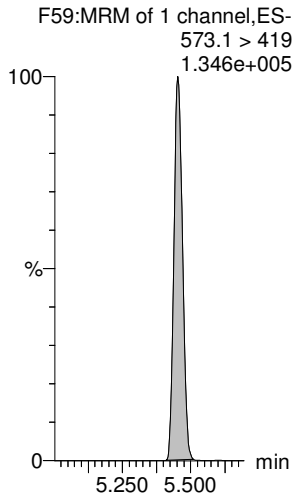

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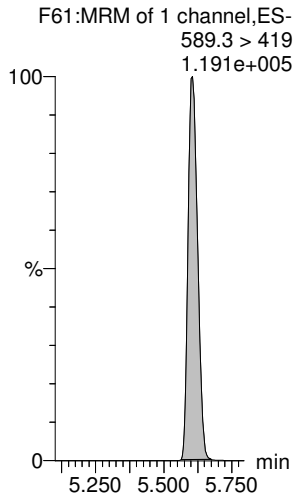

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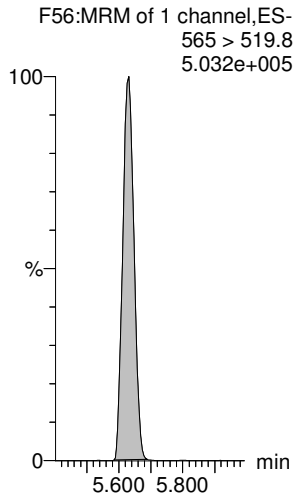

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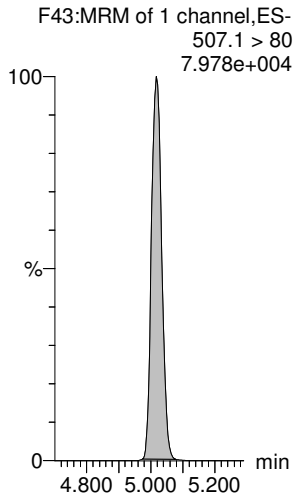

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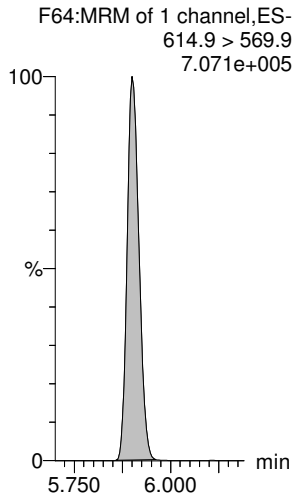

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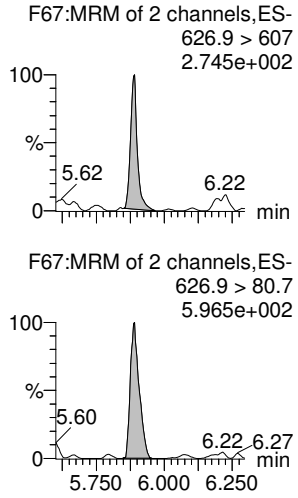
10:2 FTS



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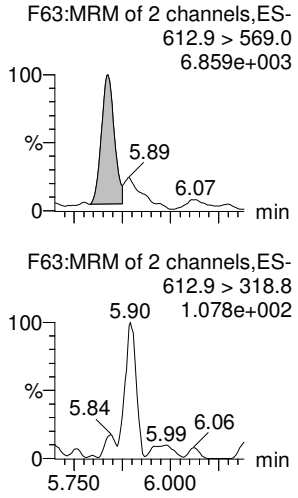

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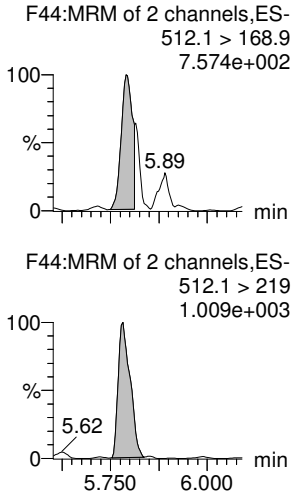

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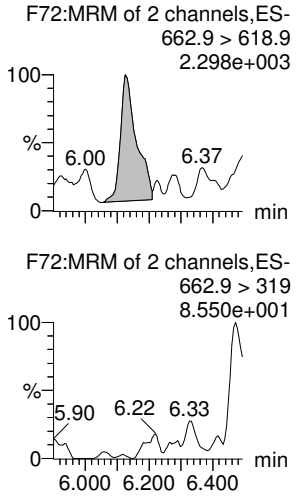

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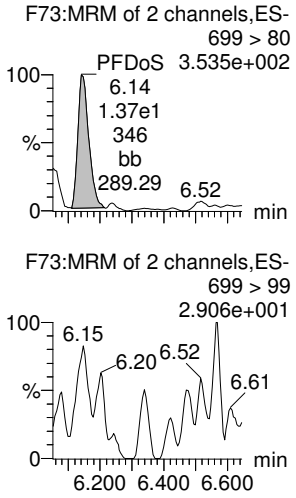

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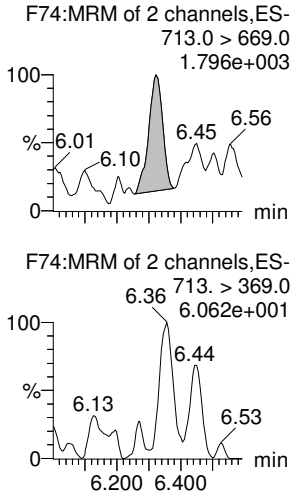

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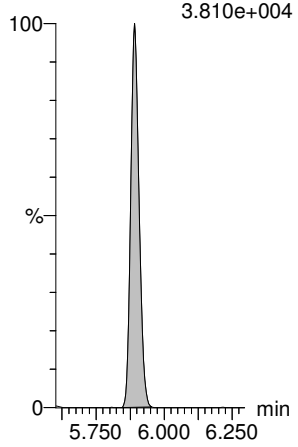

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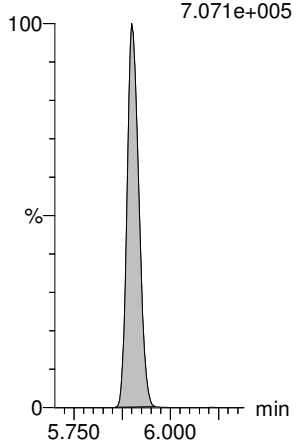

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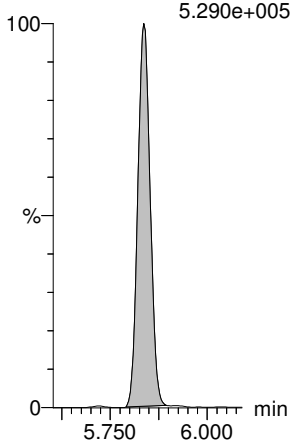

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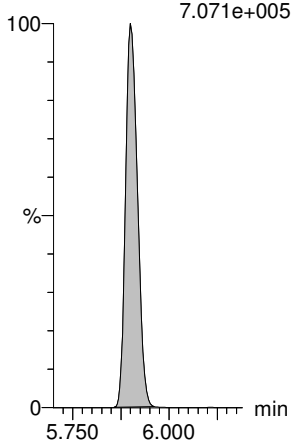

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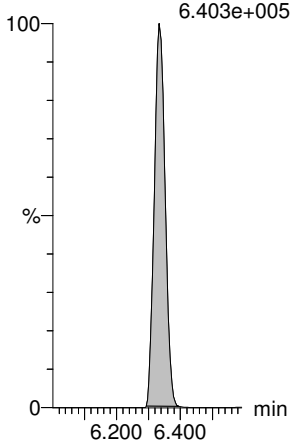

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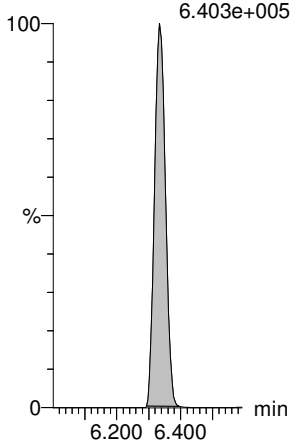

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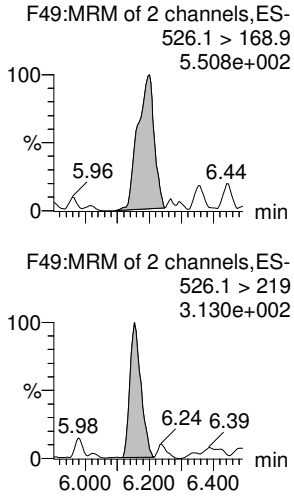
N-EtFOSA



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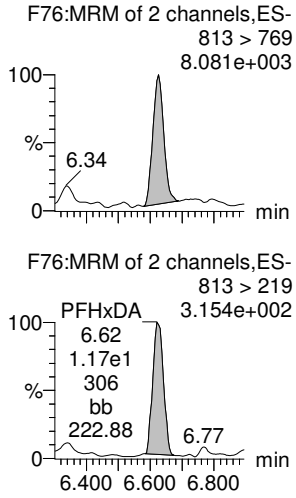

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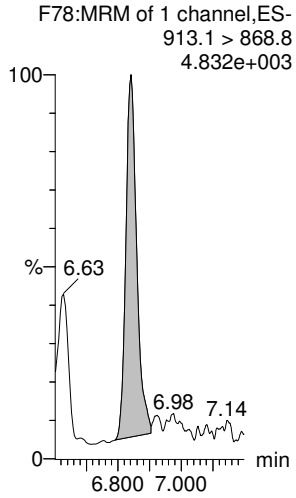
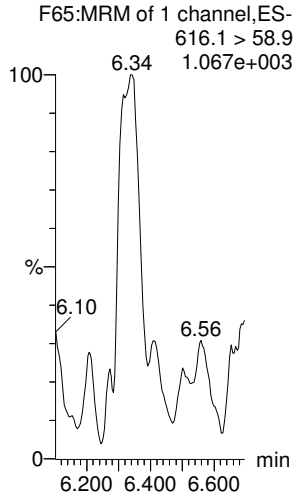
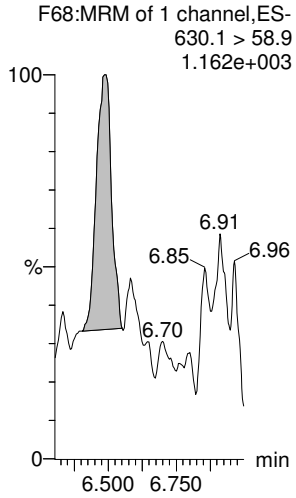


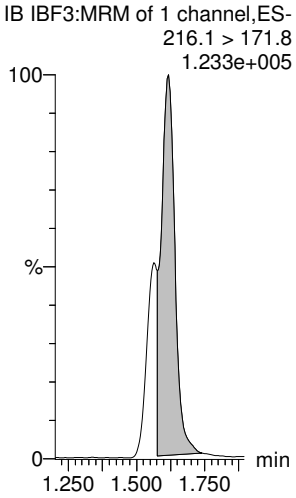
N-MeFOSE



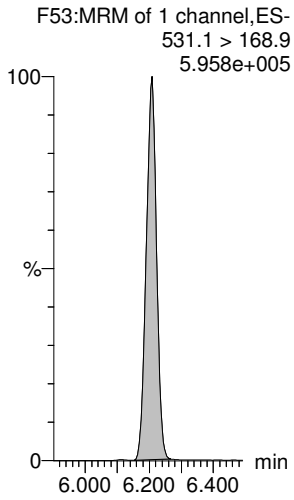
N-EtFOSE



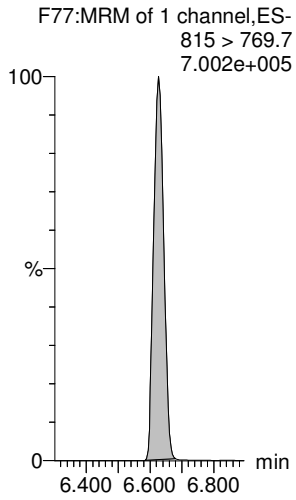
13C3-PFBA-RSD



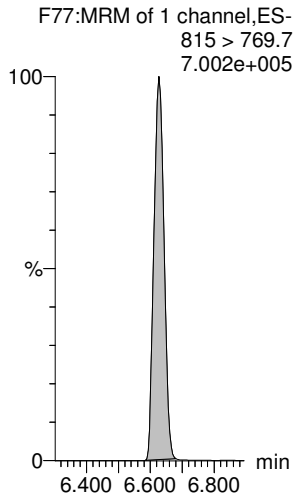
d5-N-ETFOSA-EIS



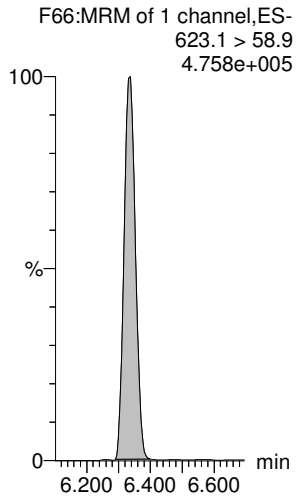
13C2-PFHxDA-EIS



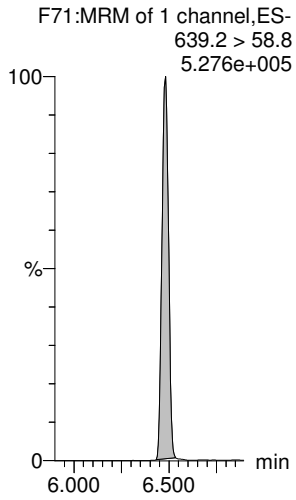
13C2-PFHxDA-EIS



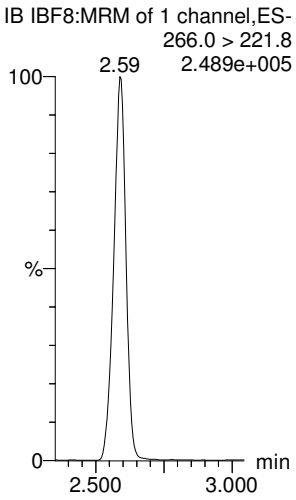
d7-N-MeFOSE-EIS



d9-N-EtFOSE-EIS



13C3-PFPeA-RSD



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Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
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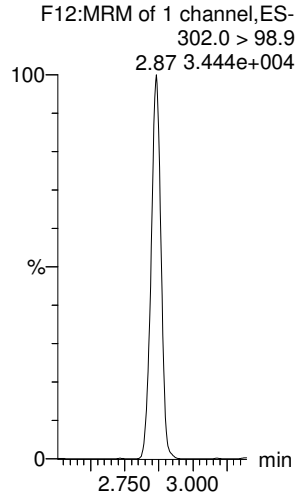
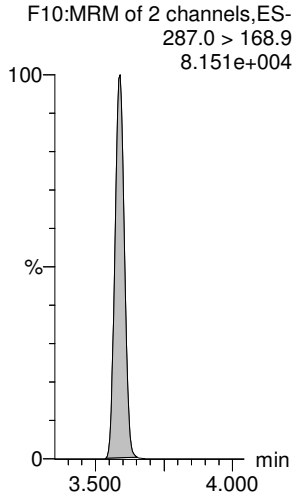
Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

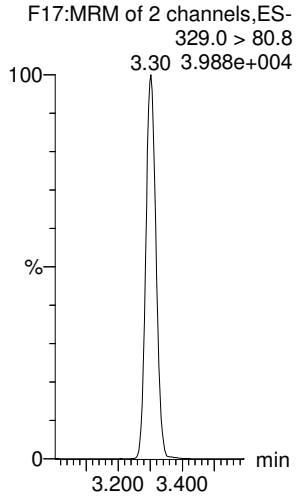
13C3-PFBS-RSD



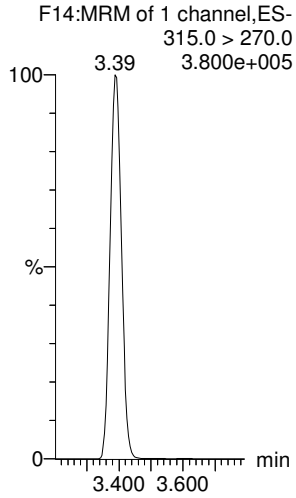
13C3-HFPO-DA-RSD



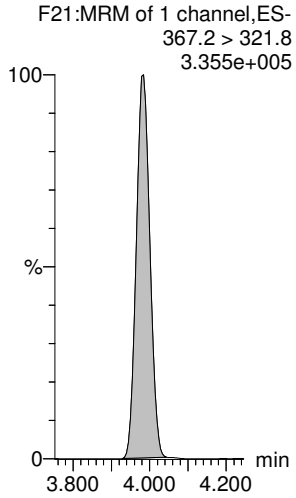
13C2-4:2 FTS-RSD



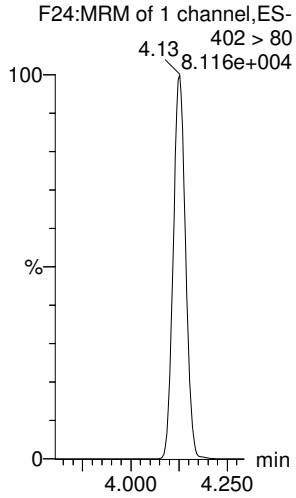
13C2-PFHxA-RSD



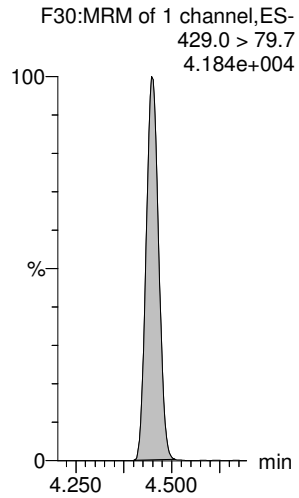
13C4-PFHpA-RSD



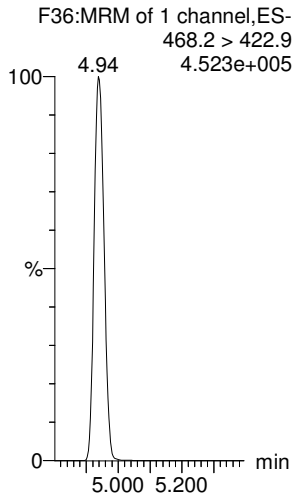
13C3-PFHxS-RSD



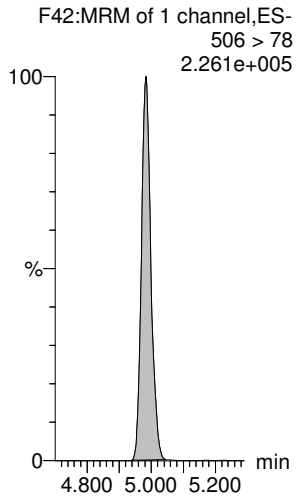
13C2-6:2 FTS-RSD



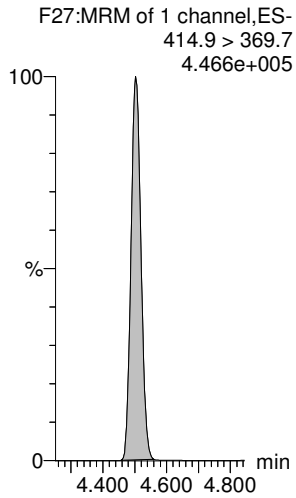
13C5-PFNA-RSD



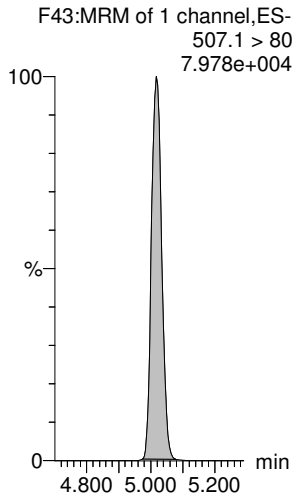
13C8-PFOSA-RSD



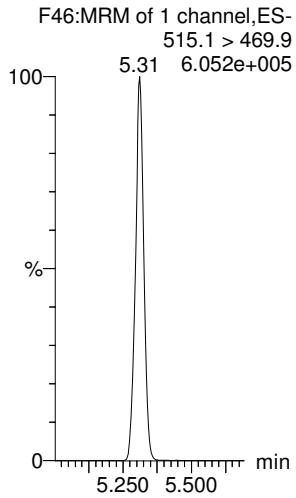
13C2-PFOA-RSD



13C8-PFOS-RSD



13C2-PFDA-RSD



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Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
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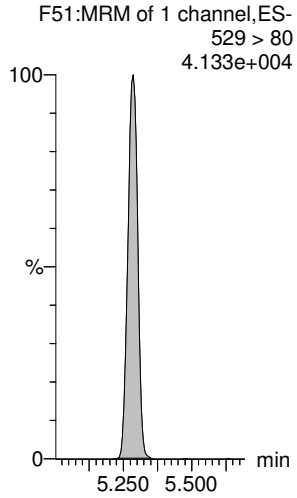
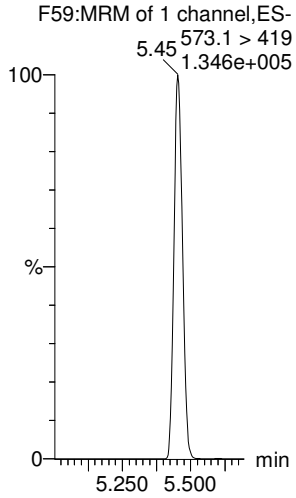
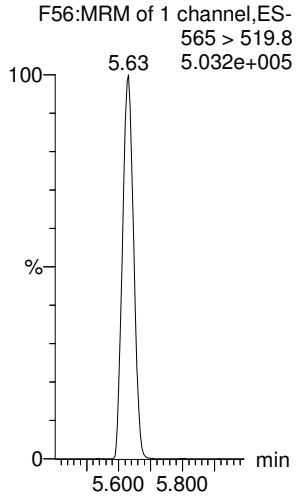
13C2-8:2 FTS-RSD



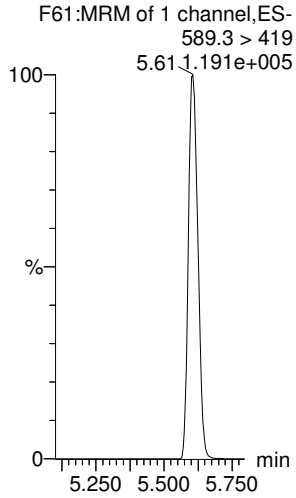
d3-N-MeFOSAA-RSD



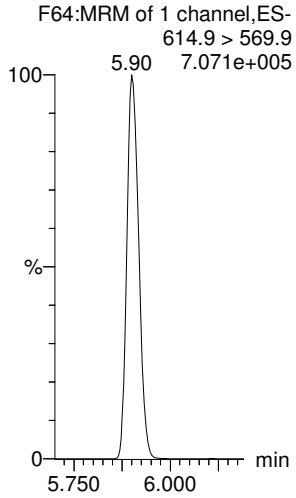
13C2-PFUdA-RSD



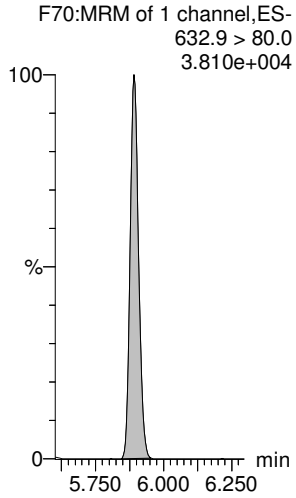
d5-N-EtFOSAA-RSD



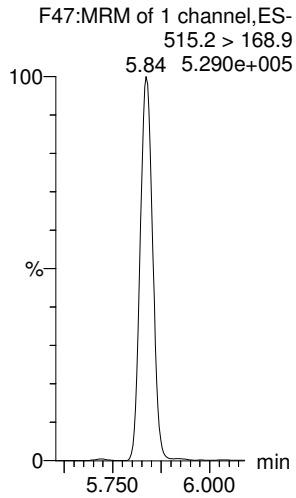
13C2-PFDoA-RSD



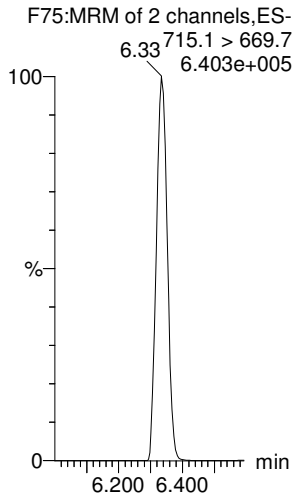
13C2-10:2 FTS-RSD



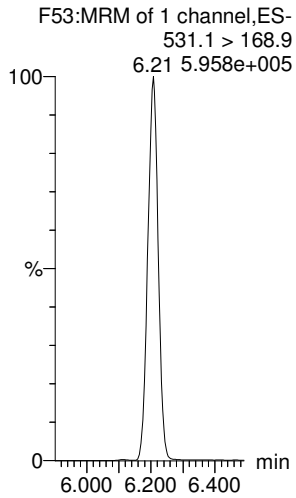
d3-N-MeFOSA-RSD



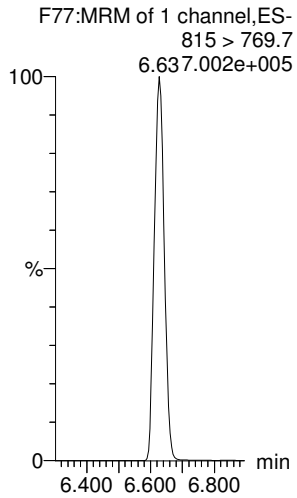
13C2-PFTeDA-RSD



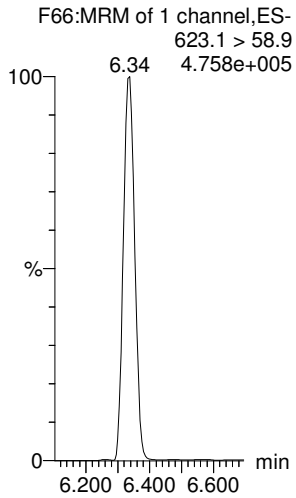
d5-N-ETFOSA-RSD



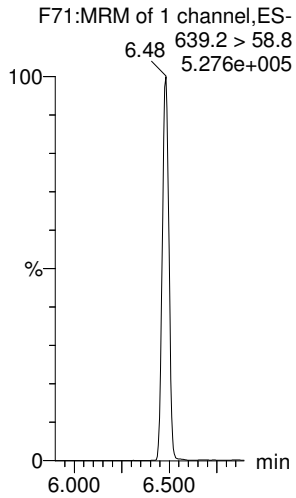
13C2-PFHxDA-RSD



d7-N-MeFOSE-RSD



d9-N-EtFOSE-RSD



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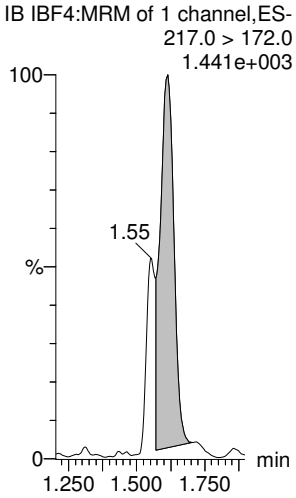
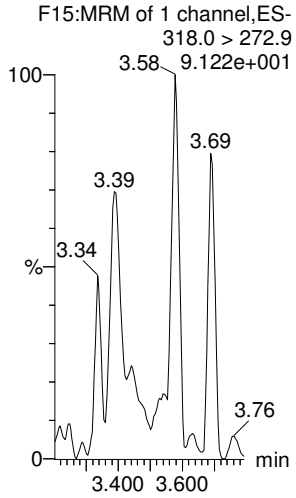
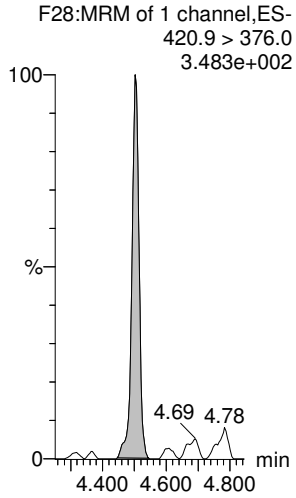
13C4-PFBA



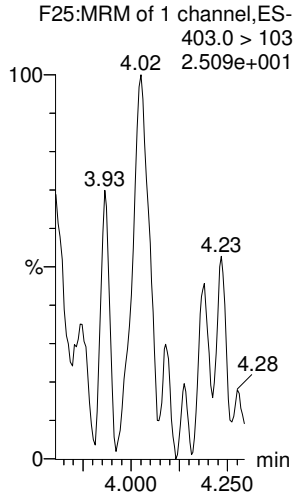
13C5-PFHxA



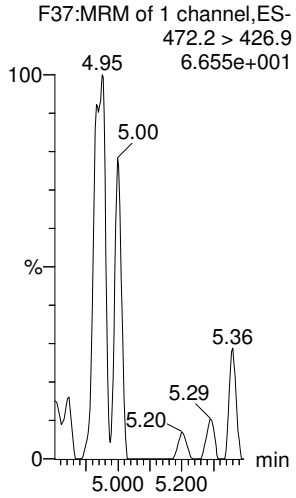
13C8-PFOA



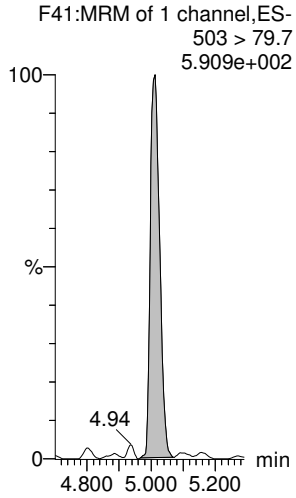
18O2-PFHxS



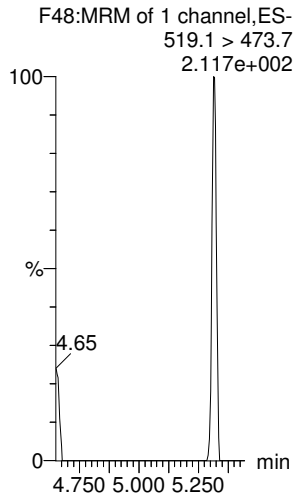
13C9-PFNA



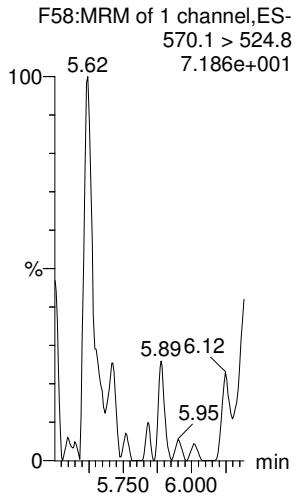
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	9.237	7031.754	1.00	1.40	0.016				NO		
2	2	PFPrS	249 > 80		1445.272	1.00						NO		YES
3	3	3:3 FTCA	240.9 > 176.9		12721.932	1.00						NO		YES
4	4	PFPeA	263.1 > 218.9	25.230	12721.932	1.00	2.60	0.025		0.0220		NO		
5	5	PFBS	299.0 > 80		1445.272	1.00						NO		YES
6	6	4:2 FTS	326.9 > 306.9		1446.075	1.00						NO		YES
7	47	13C3-PFBA-EIS	216.1 > 171.8	7031.754		1.00	1.62	7031.754	12.500	10.2	81.6	NO		
8	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
9	49	13C3-PFPeA-EIS	266.0 > 221.8	12721.932		1.00	2.59	12721.932	12.500	13.2	105.8	NO		
10	49	13C3-PFPeA-EIS	266.0 > 221.8	12721.932		1.00	2.59	12721.932	12.500	13.2	105.8	NO		
11	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
12	55	13C2-4:2 FTS-EIS	329.0 >80.8	1446.075		1.00	3.30	1446.075	12.500	14.3	114.6	NO		
13	-1													
14	7	PFHxA	313.0 > 269.0	72.555	15300.678	1.00	3.48	0.059				NO		YES
15	8	PFPeS	349.>80		1445.272	1.00						NO		YES
16	9	HFPO-DA	285.1 > 168.9		3189.258	1.00						NO		YES
17	10	5:3 FTCA	340.9 > 236.9		13649.274	1.00						NO		YES
18	11	PFHpA	363.0 > 319	52.108	13649.274	1.00	3.92	0.048		0.00883		NO		YES
19	12	ADONA	376.8 > 250.9	88.752	13649.274	1.00	4.05	0.081		0.00188		NO	8.841	YES
20	57	13C2-PFHxA-EIS	315.0 > 270.0	15300.678		1.00	3.39	15300.678	12.500	14.0	112.3	NO		
21	51	13C3-PFBS-EIS	302.0 > 98.9	1445.272		1.00	2.87	1445.272	12.500	13.9	111.2	NO		
22	53	13C3-HFPO-DA-EIS	287.0 > 168.9	3189.258		1.00	3.59	3189.258	12.500	14.0	111.8	NO		
23	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
24	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
25	59	13C4-PFHpA-EIS	367.2 > 321.8	13649.274		1.00	3.98	13649.274	12.500	13.9	111.1	NO		
26	-1													
27	13	L-PFHxS	399 > 79.9		2956.690	1.00						NO		YES
28	15	6:2 FTS	427.0 > 407		1567.986	1.00						NO		YES
29	16	L-PFOA	413 > 369	129.786	15770.835	1.00	4.48	0.103		0.0430		NO	25.854	YES
30	18	PFecHS	461 > 381.0		15770.835	1.00						NO		YES
31	19	PFHpS	449.0 > 80	9.934	2919.588	1.00	4.59	0.043		0.0384		NO		YES
32	20	7:3 FTCA	440.9 > 336.9	7.772	16049.925	1.00	4.92	0.006		0.0180		NO		YES
33	61	13C3-PFHxS-EIS	402 > 80	2956.690		1.00	4.13	2956.690	12.500	13.4	107.5	NO		
34	63	13C2-6:2 FTS-EIS	429.0 >79.7	1567.986		1.00	4.45	1567.986	12.500	12.2	97.4	NO		
35	69	13C2-PFOA-EIS	414.9 > 369.7	15770.835		1.00	4.50	15770.835	12.500	13.7	109.3	NO		
36	69	13C2-PFOA-EIS	414.9 > 369.7	15770.835		1.00	4.50	15770.835	12.500	13.7	109.3	NO		

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:17:38 Pacific Daylight Time

Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
38	65	13C5-PFNA-EIS	468.2 > 422.9	16049.925		1.00	4.94	16049.925	12.500	13.2	105.8	NO		
39	-1													
40	21	PFNA	463.0 > 418.8	57.165	16049.925	1.00	4.93	0.045		0.0224		NO		YES
41	22	PFOSA	498 > 78	25.110	7728.135	1.00	4.96	0.041		0.0514		NO		YES
42	23	L-PFOS	499 > 80	8.560	2919.588	1.00	5.01	0.037		0.103		NO		YES
43	25	9Cl-PF30NS	531 > 351	9.123	2919.588	1.00	5.27	0.039		0.00792		NO	1.599	YES
44	26	PFDA	513 > 469	85.108	21328.793	1.00	5.30	0.050		0.00680		NO		YES
45	27	8:2 FTS	526.8 > 506.9		1698.056	1.00						NO		YES
46	65	13C5-PFNA-EIS	468.2 > 422.9	16049.925		1.00	4.94	16049.925	12.500	13.2	105.8	NO		
47	67	13C8-PFOSA-EIS	506 > 78	7728.135		1.00	4.98	7728.135	12.500	13.5	108.2	NO		
48	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
49	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
50	73	13C2-PFDA-EIS	515.1 > 469.9	21328.793		1.00	5.31	21328.793	12.500	14.3	114.4	NO		
51	75	13C2-8:2 FTS-EIS	529 > 80	1698.056		1.00	5.29	1698.056	12.500	15.4	123.1	NO		
52	-1													
53	28	PFNS	549 > 80		2919.588	1.00						NO		YES
54	29	L-MeFOSAA	570 > 419		4765.928	1.00						NO		YES
55	31	L-EtFOSAA	583.9 > 419	14.370	4706.535	1.00	5.61	0.038		0.0729		NO	1.950	NO
56	33	PFUdA	563.0 > 519	100.840	20308.568	1.00	5.63	0.062		0.0393		NO		YES
57	34	PFDS	598.8 >79.9		2919.588	1.00						NO		YES
58	35	11Cl-PF30UdS	631 > 451		24925.619	1.00						NO		YES
59	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
60	77	d3-N-MeFOSAA-EIS	573.1 > 419	4765.928		1.00	5.45	4765.928	12.500	14.4	115.1	NO		
61	81	d5-N-EtFOSAA-EIS	589.3 > 419	4706.535		1.00	5.61	4706.535	12.500	15.0	119.9	NO		
62	79	13C2-PFUdA-EIS	565 > 519.8	20308.568		1.00	5.63	20308.568	12.500	12.8	102.7	NO		
63	71	13C8-PFOS-EIS	507.1 > 80	2919.588		1.00	5.02	2919.588	12.500	12.9	103.6	NO		
64	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
65	-1													
66	36	10:2 FTS	626.9 > 607	7.920	1352.273	1.00	5.89	0.073				NO	0.352	NO
67	37	PFDoA	612.9 > 569.0	251.215	24925.619	1.00	5.84	0.126		0.123		NO		YES
68	38	N-MeFOSA	512.1 > 168.9	24.563	19283.832	1.00	5.79	0.190		0.115		NO	0.693	YES
69	39	PFTrDA	662.9 > 618.9	124.413	24925.619	1.00	6.13	0.062		0.0581		NO		YES
70	40	PFDoS	699 > 80	13.725	24932.619	1.00	6.14	0.007		0.0634		NO		YES
71	41	PFTeDA	713.0 > 669.0	77.320	24932.619	1.00	6.32	0.039				NO		YES
72	85	13C2-10:2 FTS-EIS	632.9 > 80.0	1352.273		1.00	5.89	1352.273	12.500	12.4	99.6	NO		

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:17:38 Pacific Daylight Time

Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
74	87	d3-N-MeFOSA-EIS	515.2 > 168.9	19283.832		1.00	5.84	19283.832	149.200	139	93.4	NO		
75	83	13C2-PFDoA-EIS	614.9 > 569.9	24925.619		1.00	5.90	24925.619	12.500	13.3	106.7	NO		
76	89	13C2-PFTeDA-EIS	715.1 > 669.7	24932.619		1.00	6.33	24932.619	12.500	13.1	104.7	NO		
77	89	13C2-PFTeDA-EIS	715.1 > 669.7	24932.619		1.00	6.33	24932.619	12.500	13.1	104.7	NO		
78	-1													
79	42	N-EtFOSA	526.1 > 168.9	32.074	22029.455	1.00	6.20	0.217		0.279		NO	2.593	NO
80	43	PFHxDA	813 > 769	298.843	25212.395	1.00	6.63	0.148				NO	25.568	NO
81	44	PFODA	913.1 > 868.8	179.740	25212.395	1.00	6.84	0.089		0.0930		NO		
82	45	N-MeFOSE	616.1 > 58.9		19306.602	1.00						NO		
83	46	N-EtFOSE	630.1 > 58.9	49.654	20422.244	1.00	6.49	0.363		0.0274		NO		
84	48	13C3-PFBA-RSD	216.1 > 171.8	7031.754	81.232	1.00	1.62	1082.048	12.500	1270	10132.7	YES		
85	91	d5-N-ETFOSA-EIS	531.1 > 168.9	22029.455		1.00	6.21	22029.455	149.200	142	95.1	NO		
86	93	13C2-PFHxDA-EIS	815 > 769.7	25212.395		1.00	6.63	25212.395	12.500	12.0	95.6	NO		
87	93	13C2-PFHxDA-EIS	815 > 769.7	25212.395		1.00	6.63	25212.395	12.500	12.0	95.6	NO		
88	95	d7-N-MeFOSE-EIS	623.1 > 58.9	19306.602		1.00	6.34	19306.602	149.200	143	96.0	NO		
89	97	d9-N-EtFOSE-EIS	639.2 > 58.8	20422.244		1.00	6.48	20422.244	149.200	137	92.0	NO		
90	50	13C3-PFPeA-RSD	266.0 > 221.8			1.00			12.500			NO		
91	-1													
92	52	13C3-PFBS-RSD	302.0 > 98.9			1.00			12.500			NO		
93	54	13C3-HFPO-DA-RSD	287.0 > 168.9	3189.258		1.00	3.59		12.500			NO		
94	56	13C2-4:2 FTS-RSD	329.0 >80.8			1.00			12.500			NO		
95	58	13C2-PFHxA-RSD	315.0 > 270.0			1.00			12.500			NO		
96	60	13C4-PFHpA-RSD	367.2 > 321.8	13649.274		1.00	3.98		12.500			NO		
97	62	13C3-PFHxS-RSD	402 > 80			1.00			12.500			NO		
98	64	13C2-6:2 FTS-RSD	429.0 >79.7	1567.986	19.889	1.00	4.45	985.461	12.500	2080	16676.0	YES		
99	66	13C5-PFNA-RSD	468.2 > 422.9			1.00			12.500			NO		
100	68	13C8-PFOSA-RSD	506 > 78	7728.135		1.00	4.98		12.500			NO		
101	70	13C2-PFOA-RSD	414.9 > 369.7	15770.835	8.783	1.00	4.50	22445.114	12.500	20500	16418...	YES		
102	72	13C8-PFOS-RSD	507.1 > 80	2919.588	19.889	1.00	5.02	1834.926	12.500	2100	16783.2	YES		
103	74	13C2-PFDA-RSD	515.1 > 469.9			1.00			12.500			NO		
104	-1													
105	76	13C2-8:2 FTS-RSD	529 > 80	1698.056	19.889	1.00	5.29	1067.208	12.500	2340	18699.8	YES		
106	78	d3-N-MeFOSAA-RSD	573.1 > 419			1.00			12.500			NO		
107	80	13C2-PFUdA-RSD	565 > 519.8			1.00			12.500			NO		
108	82	d5-N-EtFOSAA-RSD	589.3 > 419			1.00			12.500			NO		

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Tuesday, July 07, 2020 10:17:16 Pacific Daylight Time
Printed: Tuesday, July 07, 2020 10:17:38 Pacific Daylight Time

Name: 200706P1-29, Date: 06-Jul-2020, Time: 14:58:58, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Std. Conc	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
109	84	13C2-PFDoA-RSD	614.9 > 569.9			1.00			12.500			NO		
110	86	13C2-10:2 FTS-RSD	632.9 > 80.0	1352.273	19.889	1.00	5.89	849.888	12.500	2210	17709.6	YES		
111	88	d3-N-MeFOSA-RSD	515.2 > 168.9			1.00			149.200			NO		
112	90	13C2-PFTeDA-RSD	715.1 > 669.7			1.00			12.500			NO		
113	92	d5-N-ETFOSA-RSD	531.1 > 168.9			1.00			149.200			NO		
114	94	13C2-PFHxDA-RSD	815 > 769.7			1.00			12.500			NO		
115	96	d7-N-MeFOSE-RSD	623.1 > 58.9			1.00			149.200			NO		
116	98	d9-N-EtFOSE-RSD	639.2 > 58.8			1.00			149.200			NO		
117	-1													
118	99	13C4-PFBA	217.0 > 172.0	81.232	81.232	1.00	1.61	12.500	12.500	12.5	100.0	NO		
119	1...	13C5-PFHxA	318.0 > 272.9			1.00			12.500			NO		
120	1...	13C8-PFOA	420.9 > 376.0	8.783	8.783	1.00	4.50	12.500	12.500	12.5	100.0	NO		
121	1...	18O2-PFHxS	403.0 > 103			1.00			12.500			NO		
122	1...	13C9-PFNA	472.2 > 426.9			1.00			12.500			NO		
123	1...	13C4-PFOS	503 > 79.7	19.889	19.889	1.00	5.01	12.500	12.500	12.5	100.0	NO		
124	1...	13C6-PFDA	519.1 > 473.7			1.00			12.500			NO		
125	1...	13C7-PFUdA	570.1 > 524.8			1.00			12.500			NO		

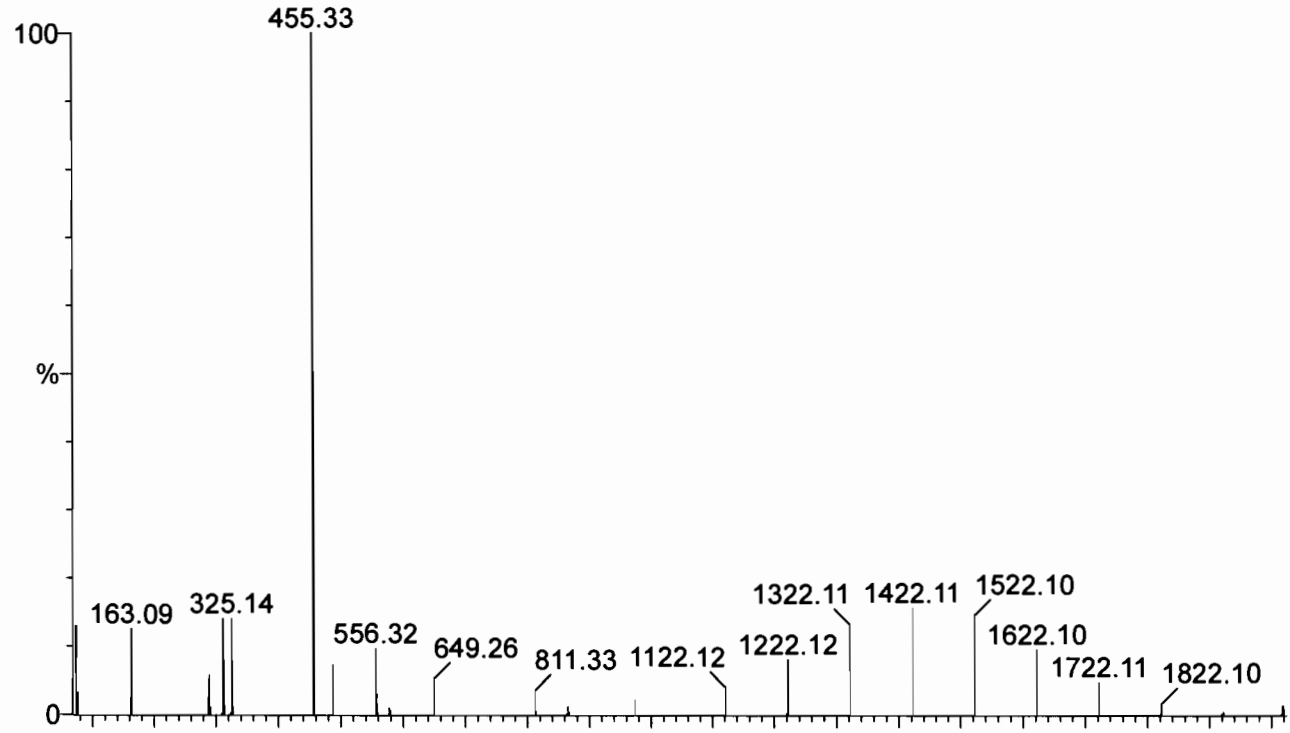
TUNE CHECKS

Calibration Verification Report - MS1 Static

Printed: **Mon Jul 06 07:56:25 2020**

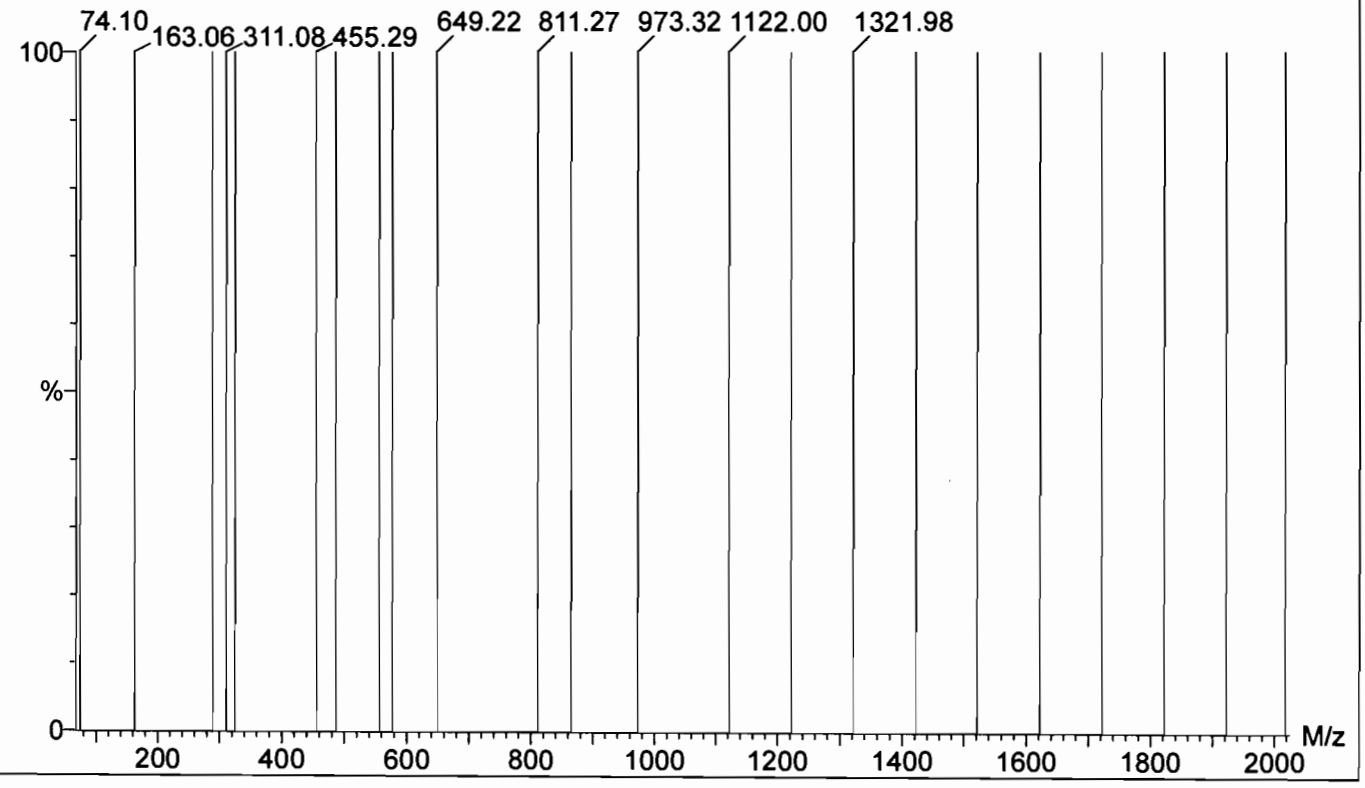
Data file: STATMS1V - Calibrated

23 matches of 23 tested references

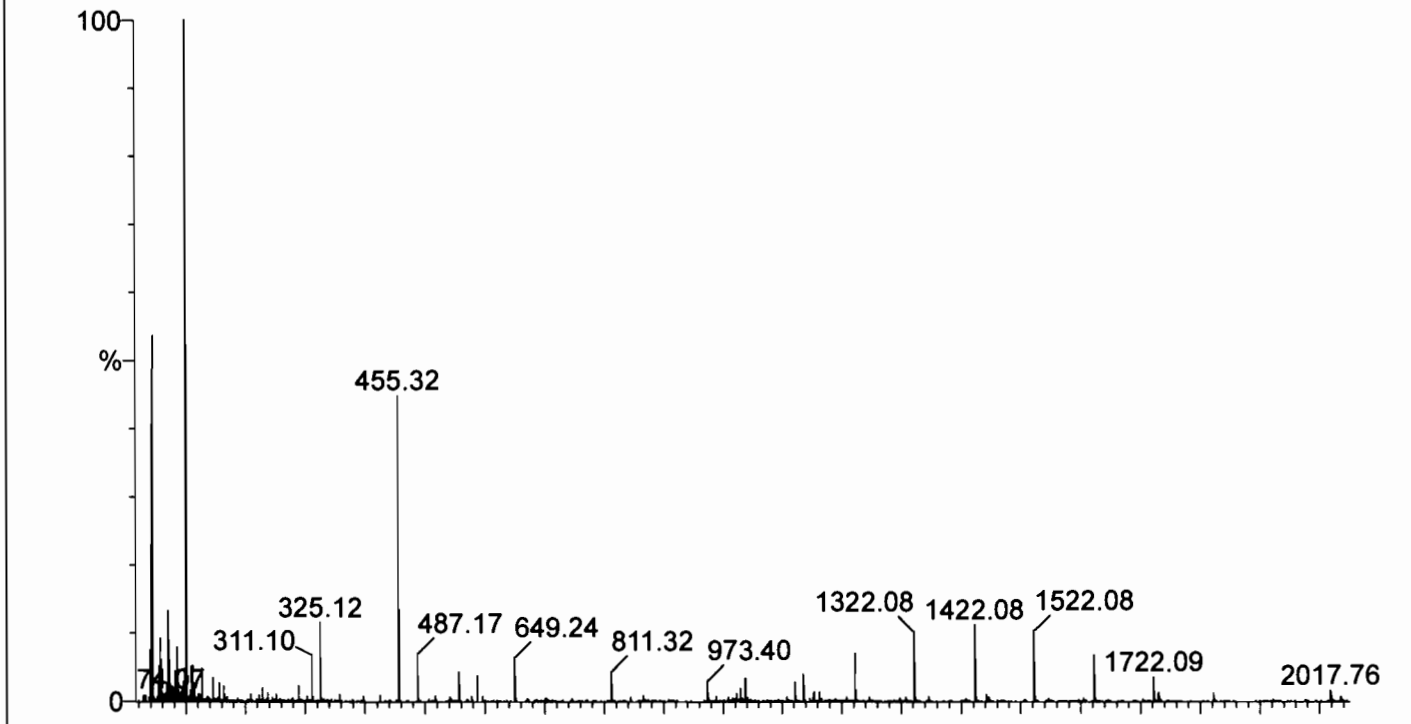


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref

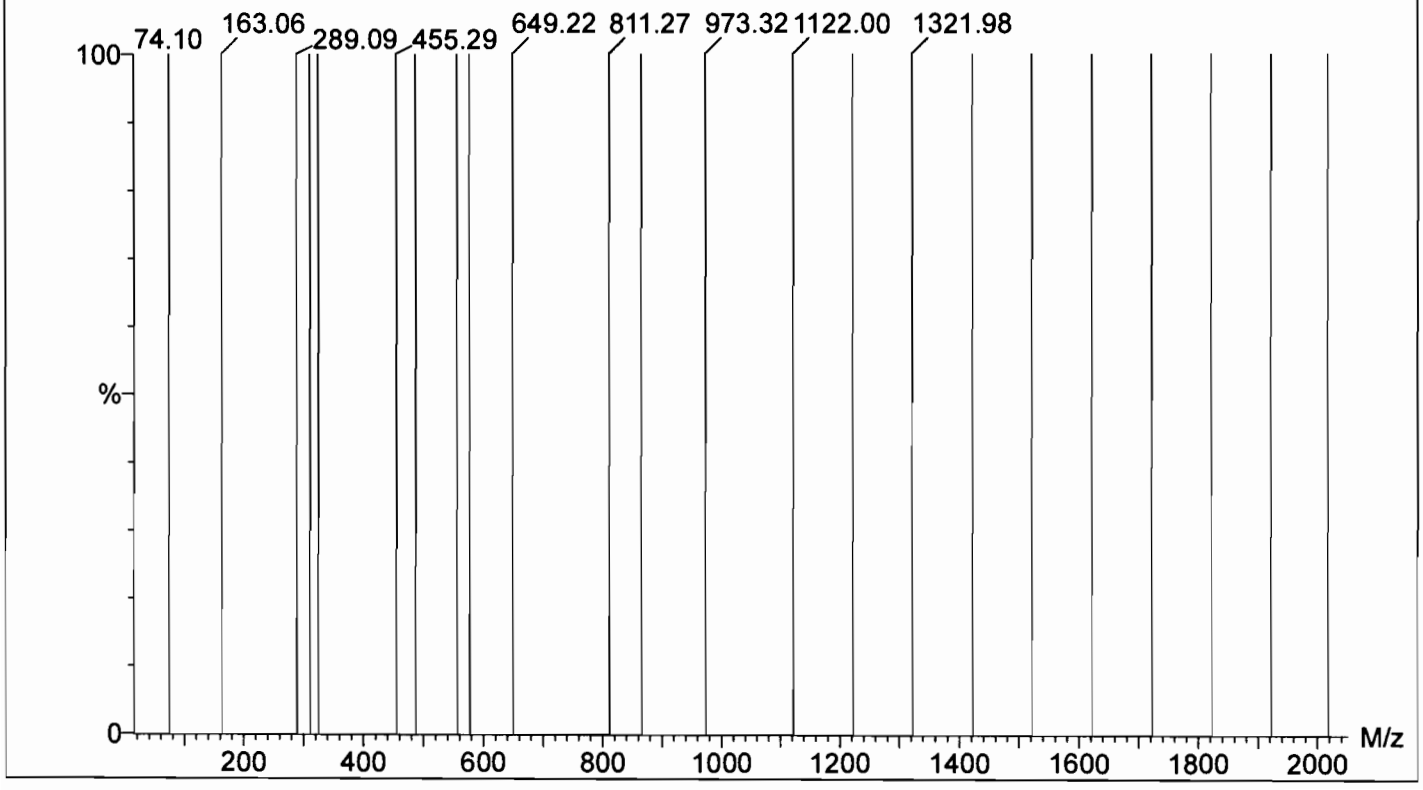
Mean residual = 0.0848 amu

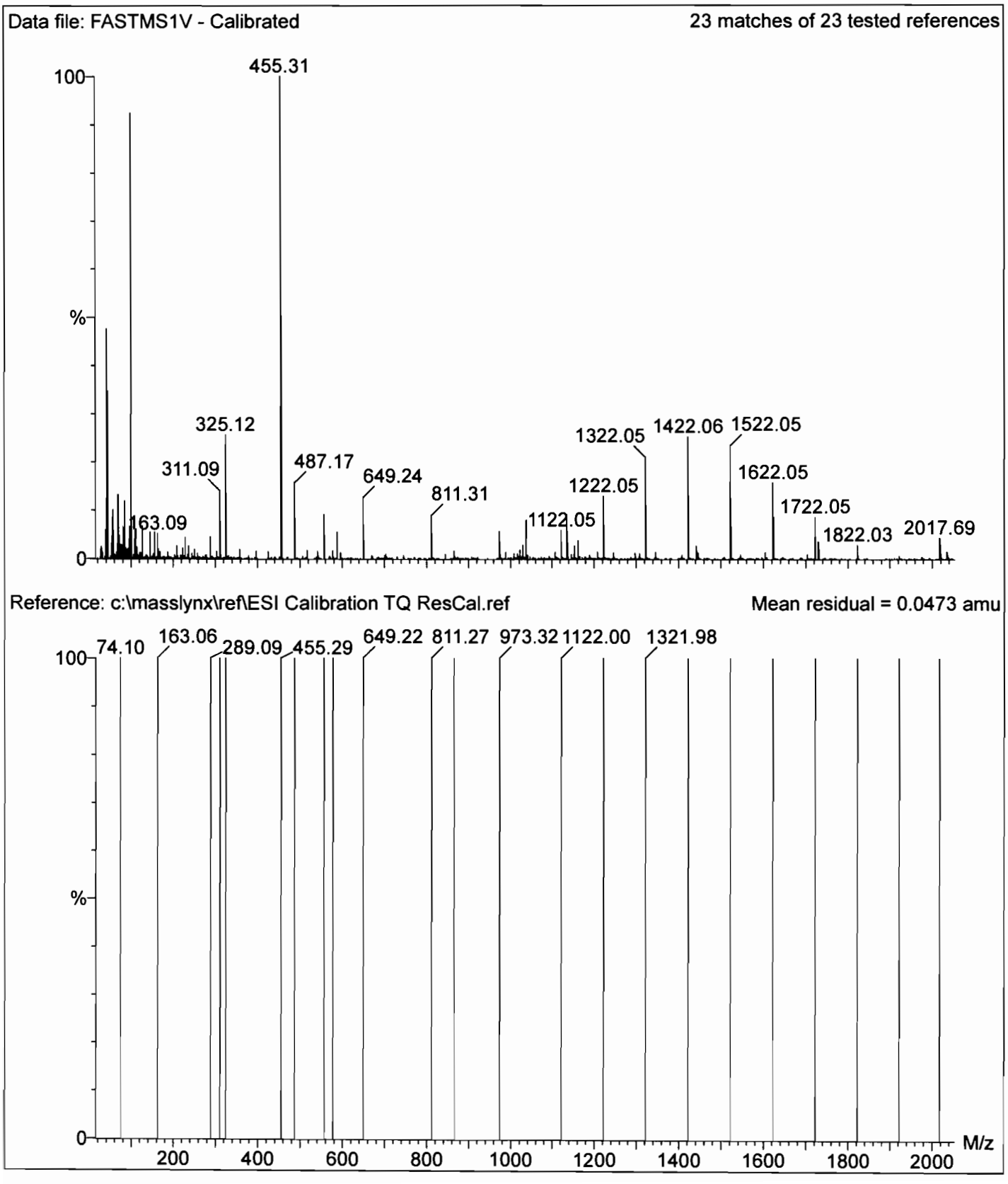


Data file: SCNMS1V - Calibrated 23 matches of 23 tested references

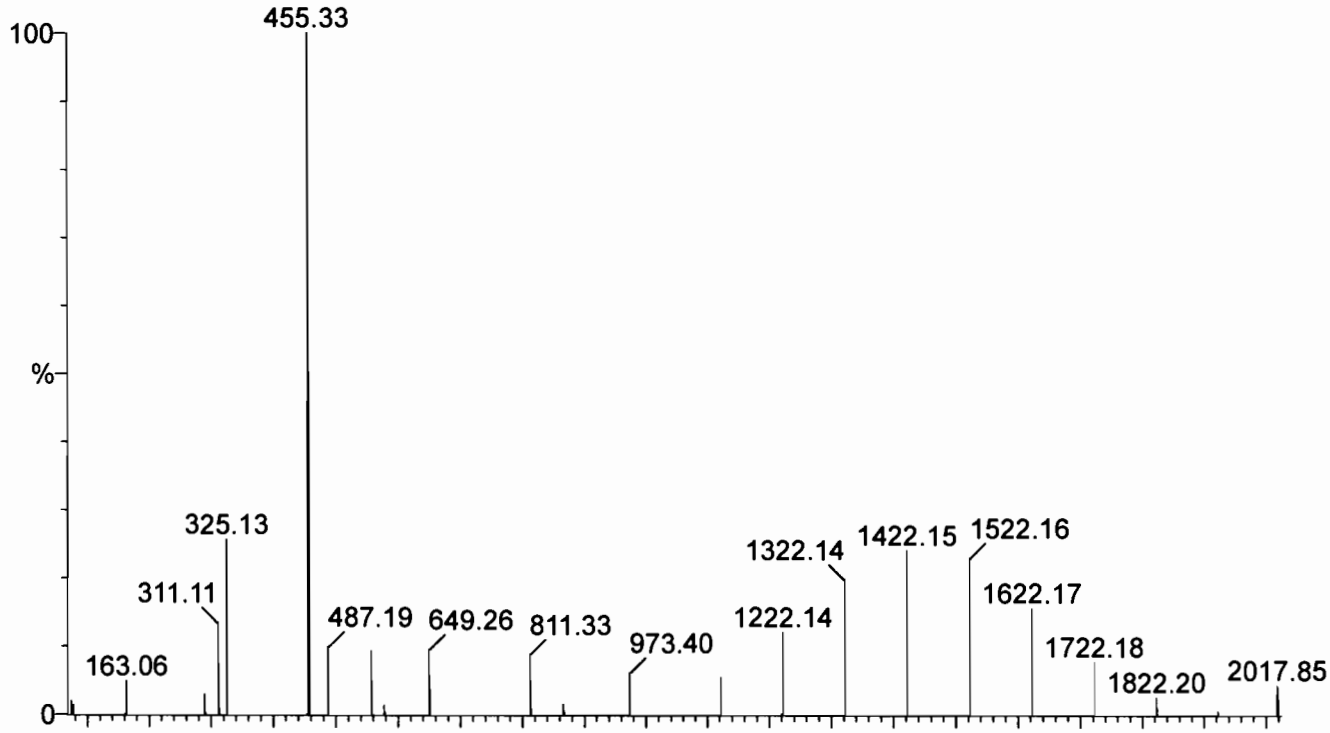


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0631 amu

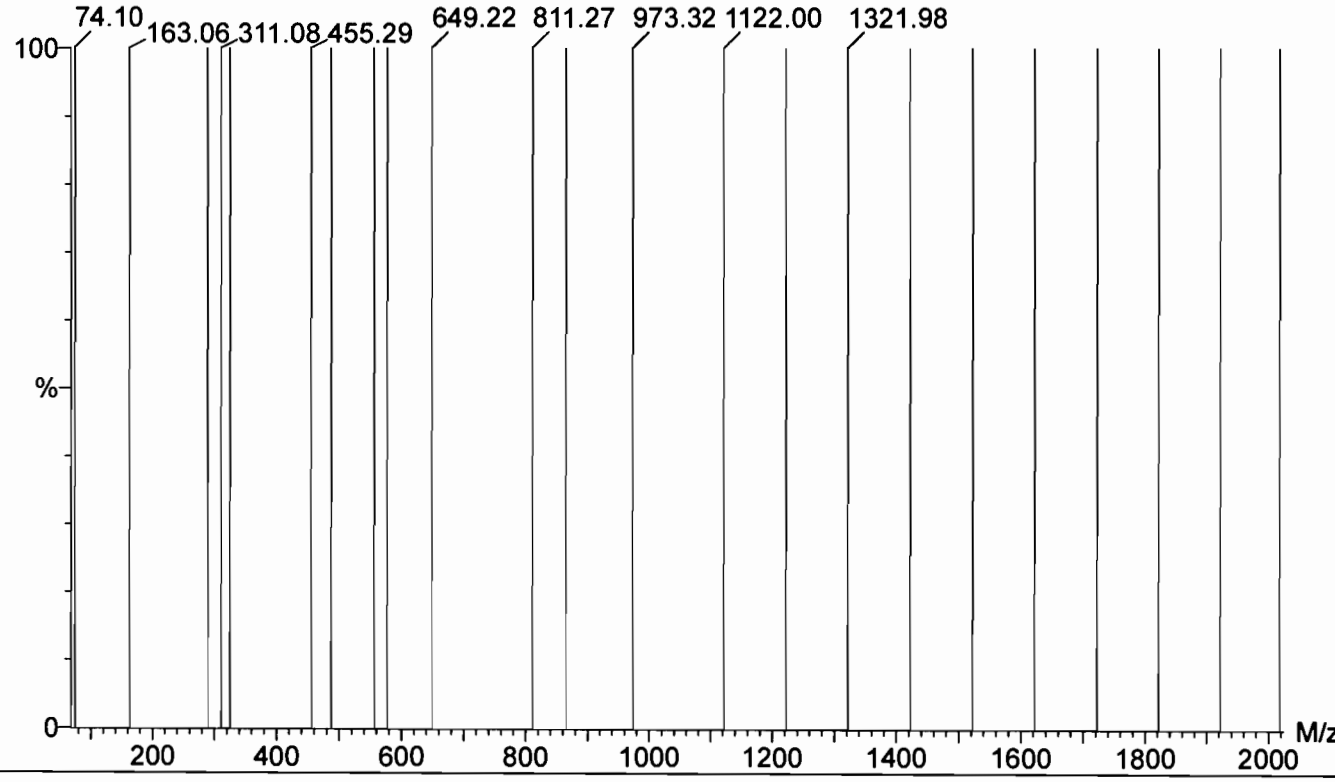



Data file: FASTMS1V - Calibrated
23 matches of 23 tested references
100
%
0
455.31
325.12
311.09
163.09
487.17
649.24
811.31
1322.05
1422.06
1522.05
1222.05
1122.05
1622.05
1722.05
1822.03
2017.69
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref
Mean residual = 0.0473 amu
74.10
163.06
289.09
455.29
649.22
811.27
973.32
1122.00
1321.98
200
400
600
800
1000
1200
1400
1600
1800
2000
M/z

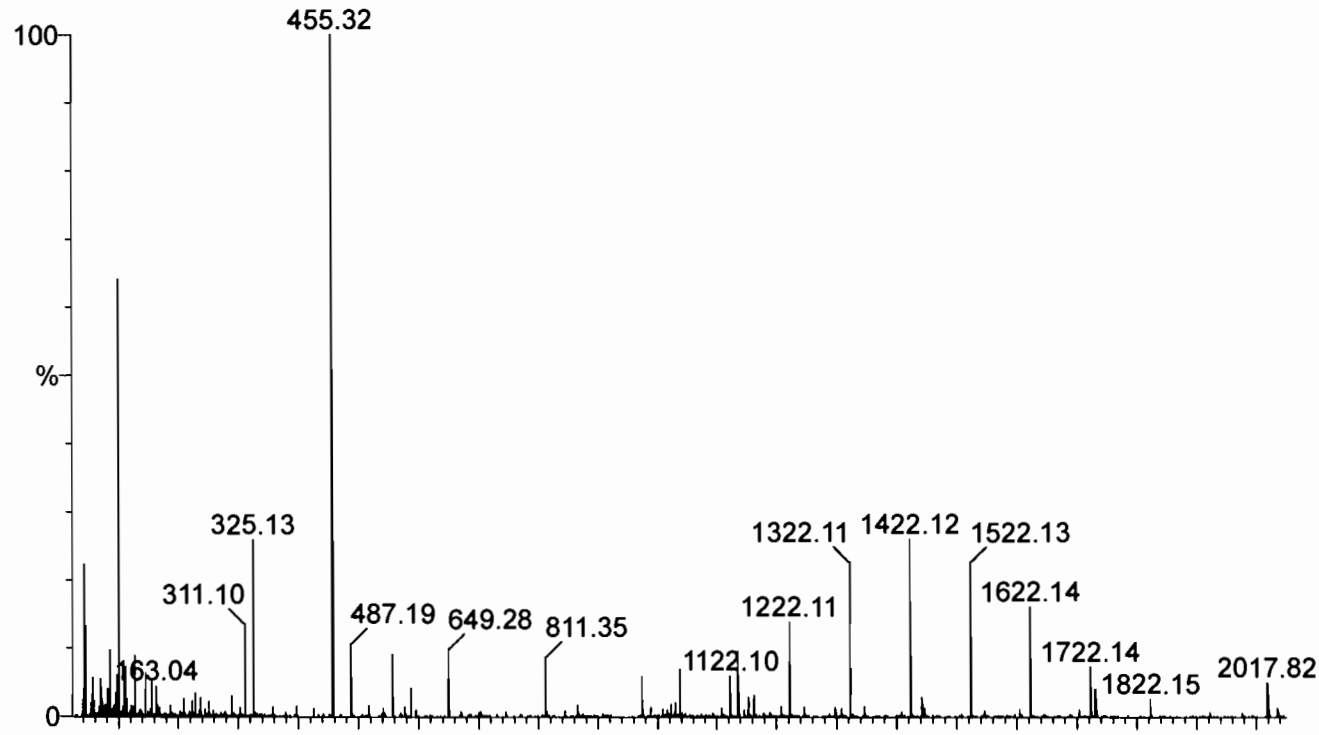
Data file: STATMS2V - Calibrated 23 matches of 23 tested references



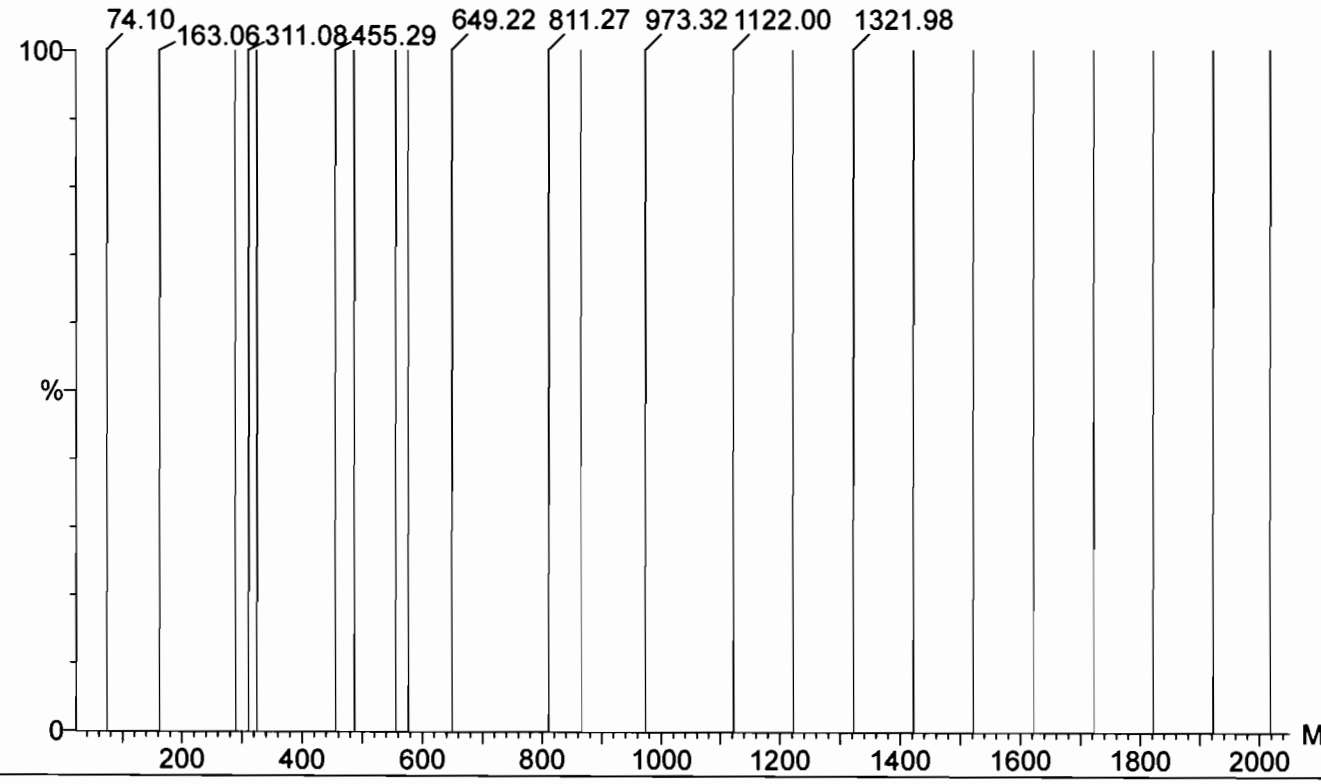
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.106 amu

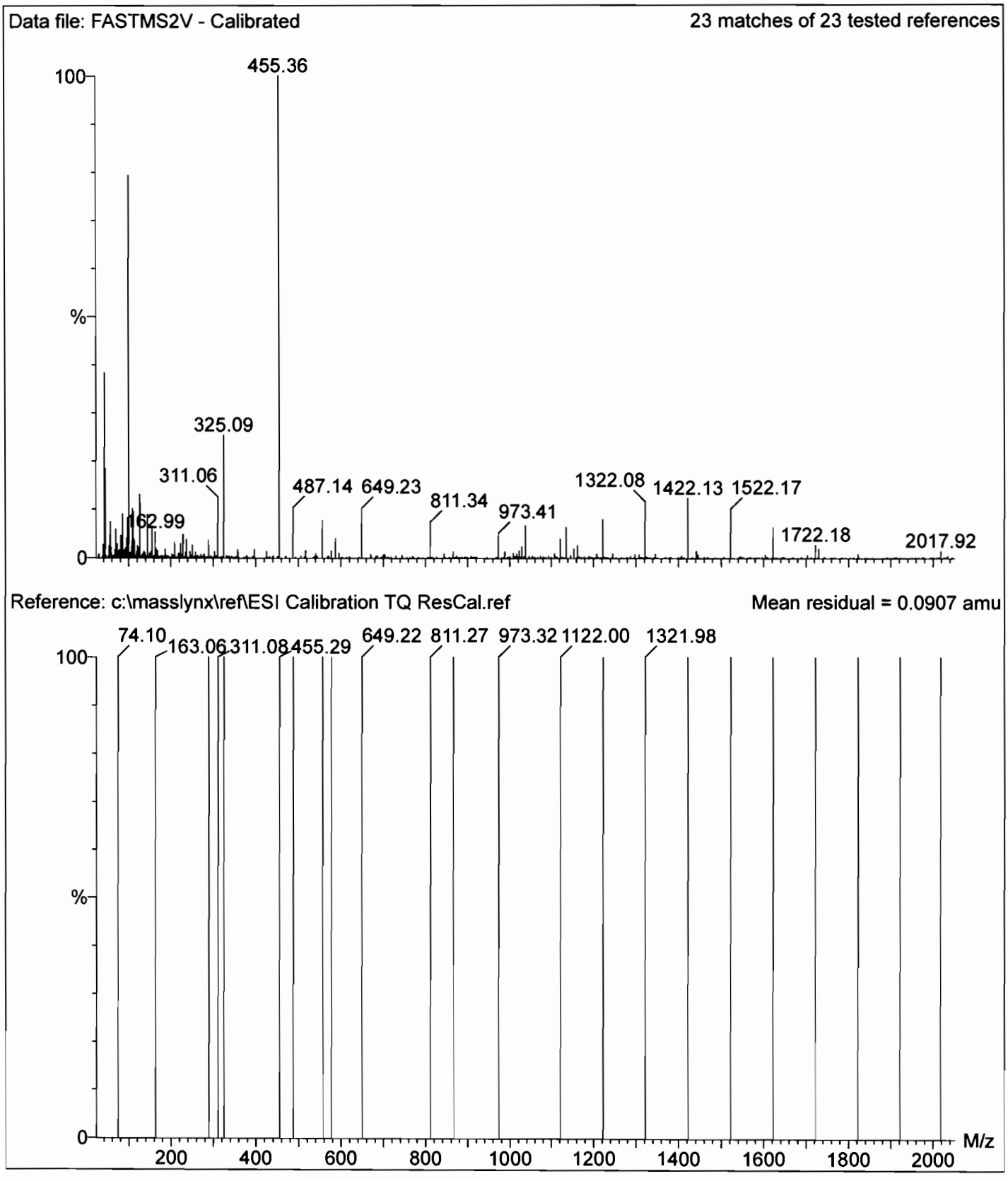


Data file: SCNMS2V - Calibrated 23 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0958 amu




Data file: FASTMS2V - Calibrated
23 matches of 23 tested references
100
%
0
455.36
325.09
311.06
162.99
487.14
649.23
811.34
973.41
1322.08
1422.13
1522.17
1722.18
2017.92
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref
Mean residual = 0.0907 amu
74.10
163.06
311.08
455.29
649.22
811.27
973.32
1122.00
1321.98
100
%
0
200
400
600
800
1000
1200
1400
1600
1800
2000
M/z

STANDARDS

Analytical Standard Record

Vista Analytical Laboratory

20E1201

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
19H2706	13C2-10:2 FTS	21-Aug-19	** Vendor **	21-Aug-24	1
19L0601	13C2-4:2 FTS	06-Dec-19	** Vendor **	29-Oct-24	1.07
19L0602	13C2-6:2 FTS	06-Dec-19	** Vendor **	21-Nov-24	1.05
19L0603	13C2-8:2 FTS	06-Dec-19	** Vendor **	11-Oct-24	1.04
19L0604	13C3-PFBA	06-Dec-19	** Vendor **	14-Dec-22	1
19L0605	13C2-PFDA	06-Dec-19	** Vendor **	05-Sep-24	1
19L0606	13C2-PFUdA	06-Dec-19	** Vendor **	04-Jul-24	1
19L0607	13C2-PFTeDA	06-Dec-19	** Vendor **	11-Dec-23	1
19L0608	13C5-PFNA	06-Dec-19	** Vendor **	05-Dec-23	1
19L0609	13C2-PFDoA	06-Dec-19	** Vendor **	11-Dec-23	1
19L0610	13C4-PFHpA	06-Dec-19	** Vendor **	06-May-24	1
19L0611	13C2-PFOA	06-Dec-19	** Vendor **	21-Jun-24	1
19L0612	13C3-PFPeA	06-Dec-19	** Vendor **	08-Mar-24	1
19L0613	13C8-FOSA-I	06-Dec-19	** Vendor **	19-Jun-24	1
19L0614	d3-N-Me-FOSAA	06-Dec-19	** Vendor **	24-Jul-24	1
19L0615	d5-N-EtFOSAA	06-Dec-19	** Vendor **	25-Jul-24	1
19L0616	13C3-PFBS	06-Dec-19	** Vendor **	29-Oct-24	1.075
19L0617	13C8-PFOS	06-Dec-19	** Vendor **	06-May-24	1.045
19L0618	13C3-PFHxS	06-Dec-19	** Vendor **	15-Oct-24	1.06
19L0619	13C2-PFHxA	06-Dec-19	** Vendor **	11-Oct-24	1
19L0620	13C2-PFHxDA	06-Dec-19	** Vendor **	11-Oct-24	1
19L0621	13C3-HFPO-DA	06-Dec-19	** Vendor **	20-Sep-22	1

Description:	PFC - IS	Expires:	12-May-21
Standard Type:	Reagent	Prepared:	12-May-20
Solvent:	MeOH	Prepared By:	Brittany M. Lamb
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	12-May-20 10:53 by BML

10:2 added
10 uL spike

Analyte	CAS Number	Concentration	Units
13C3-HFPO-DA		1.25	ug/mL
13C2-4:2 FTS		1.25	ug/mL
13C2-6:2 FTS		1.25	ug/mL
13C2-8:2 FTS		1.25	ug/mL
13C2-PFDA		1.25	ug/mL
13C2-PFDoA		1.25	ug/mL
13C2-PFHxA		1.25	ug/mL
13C2-PFHxDA		1.25	ug/mL
13C2-PFOA		1.25	ug/mL
13C2-10:2 FTS		1.25	ug/mL
13C2-PFUnA		1.25	ug/mL
d5-EtFOSAA		1.25	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

20E1201

Description:	PFC - IS	Expires:	12-May-21
Standard Type:	Reagent	Prepared:	12-May-20
Solvent:	MeOH	Prepared By:	Brittany M. Lamb
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	12-May-20 10:53 by BML

10:2 added
10 uL spike

Analyte	CAS Number	Concentration	Units
13C3-PFBA		1.25	ug/mL
13C3-PFBS		1.25	ug/mL
13C3-PFHxS		1.25	ug/mL
13C3-PFPeA		1.25	ug/mL
13C4-PFHpA		1.25	ug/mL
13C5-PFNA		1.25	ug/mL
13C8-PFOS		1.25	ug/mL
13C8-PFOSA		1.25	ug/mL
d3-MeFOSAA		1.25	ug/mL
13C2-PFTeDA		1.25	ug/mL

19H27016

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Product Name:
(Isotopic Label & Enrichment Specification)
1H,1H,2H,2H-PERFLUORODODECANE SULFONATE(10:2 FTS), SODIUM SALT (13C2, 99%; D4, 98%) 50 UG/ML IN MEOH

Lot Number: SDIJ-019A

Catalog Number: CDLM-10750-S

Product Information

Chemical Purity Specification:	≥ 98%
MW*: * *For isotopically labeled compounds, MW listed is for the fully enriched product.*	656.19
Labeled CAS Number:	NA
Unlabeled CAS Number:	108026-35-3
Chemical Formula:	C10*C2D4F21NaO3S
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

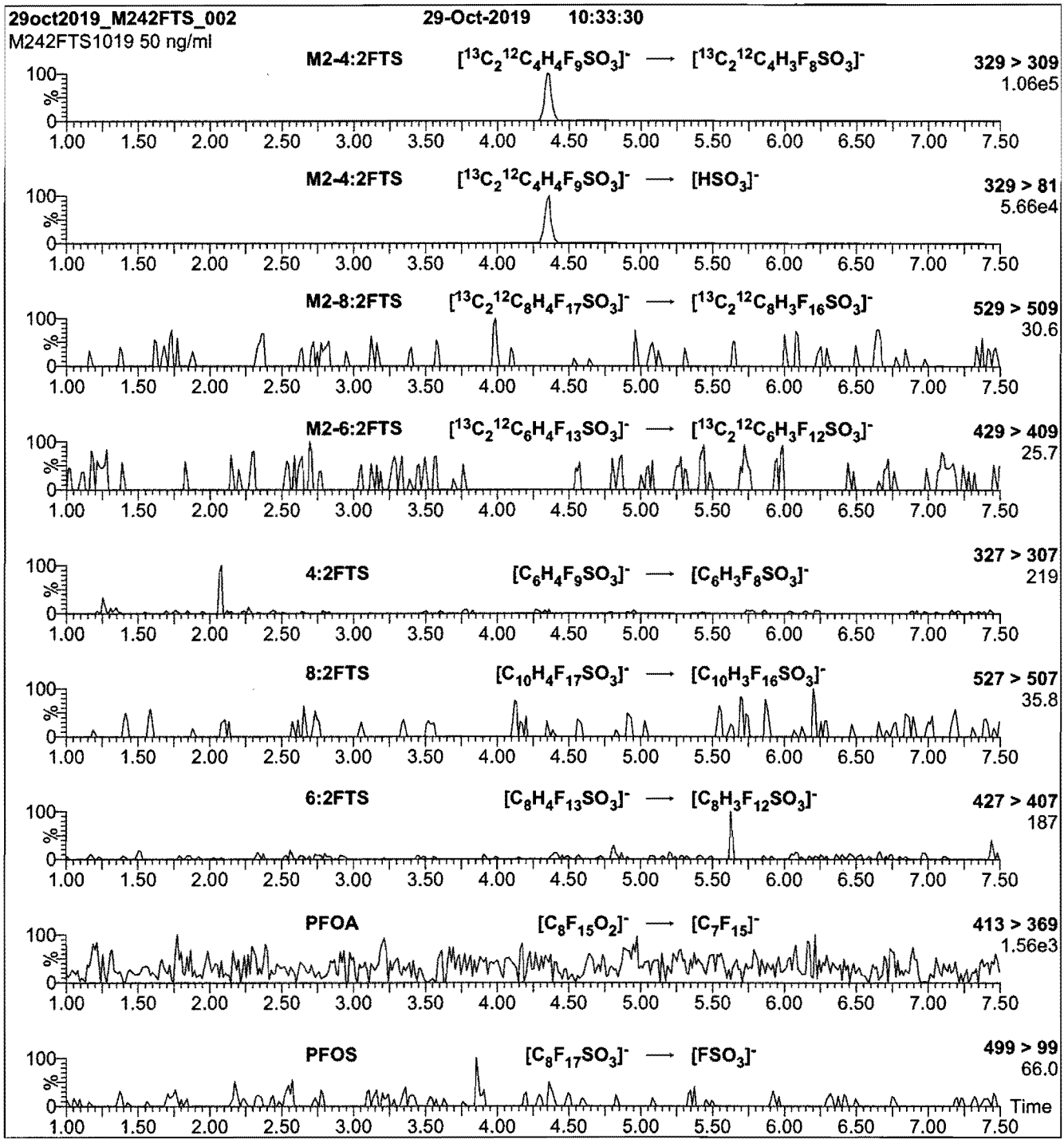
Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	8/21/2019
Expiration Date	8/21/2024
Concentration Based on Gravimetry	50.0 ± 0.5 µg/mL (k=2)
Chemical Purity of Neat Material(s)	100.0%

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.

Figure 2: **M2-4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2-4:2FTS)

Mobile phase: Same as Figure 1

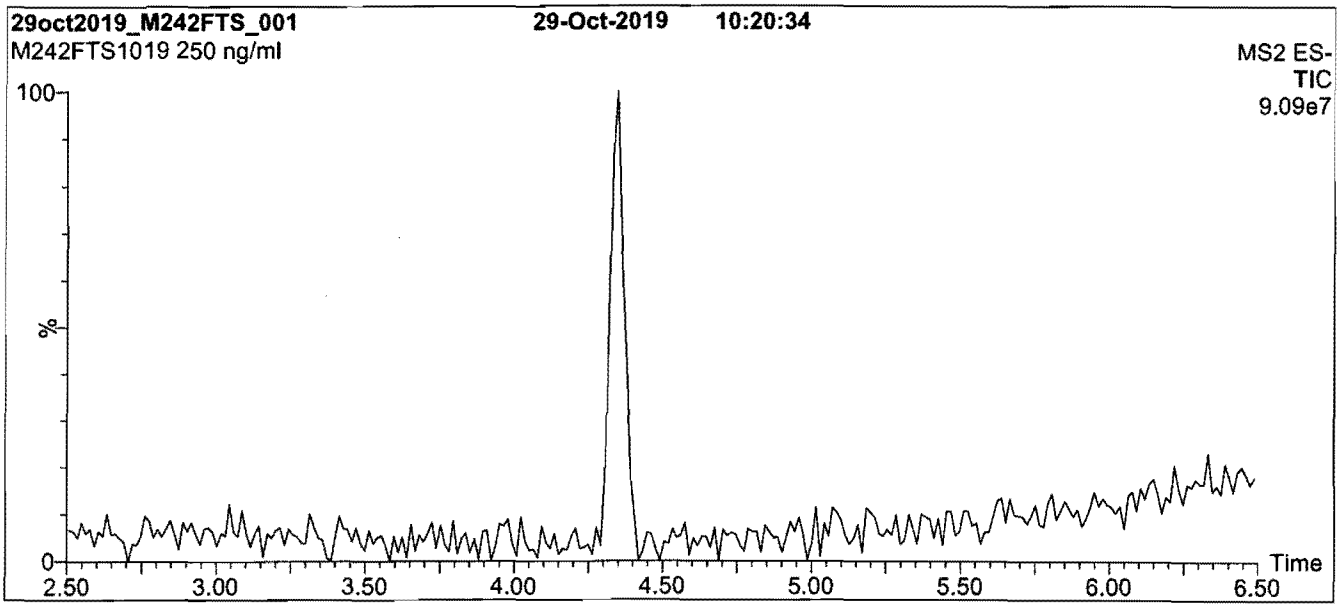
Flow: 300 µl/min

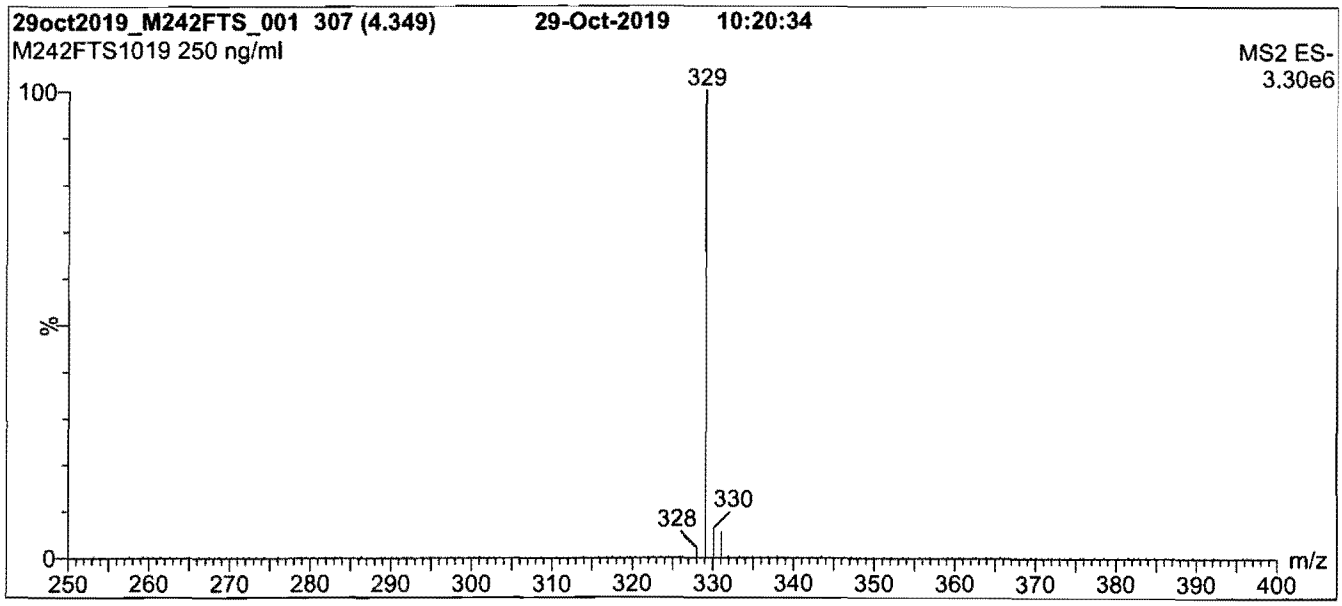
MS Parameters

Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 18

19L0601

Figure 1: **M2-4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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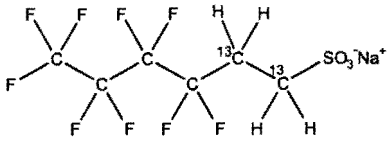
19L0601

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2-4:2FTS	**LOT NUMBER:**	M242FTS1019
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]hexane sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4H_4F_9SO_3Na$	**MOLECULAR WEIGHT:**	352.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (M2-4:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/29/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/29/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 4:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 4:2FTS and M2-4:2FTS will produce signals in the m/z 329 to m/z 309 channel during SRM analysis. We recommend using the m/z 329 to m/z 81 transition to monitor for M2-4:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/05/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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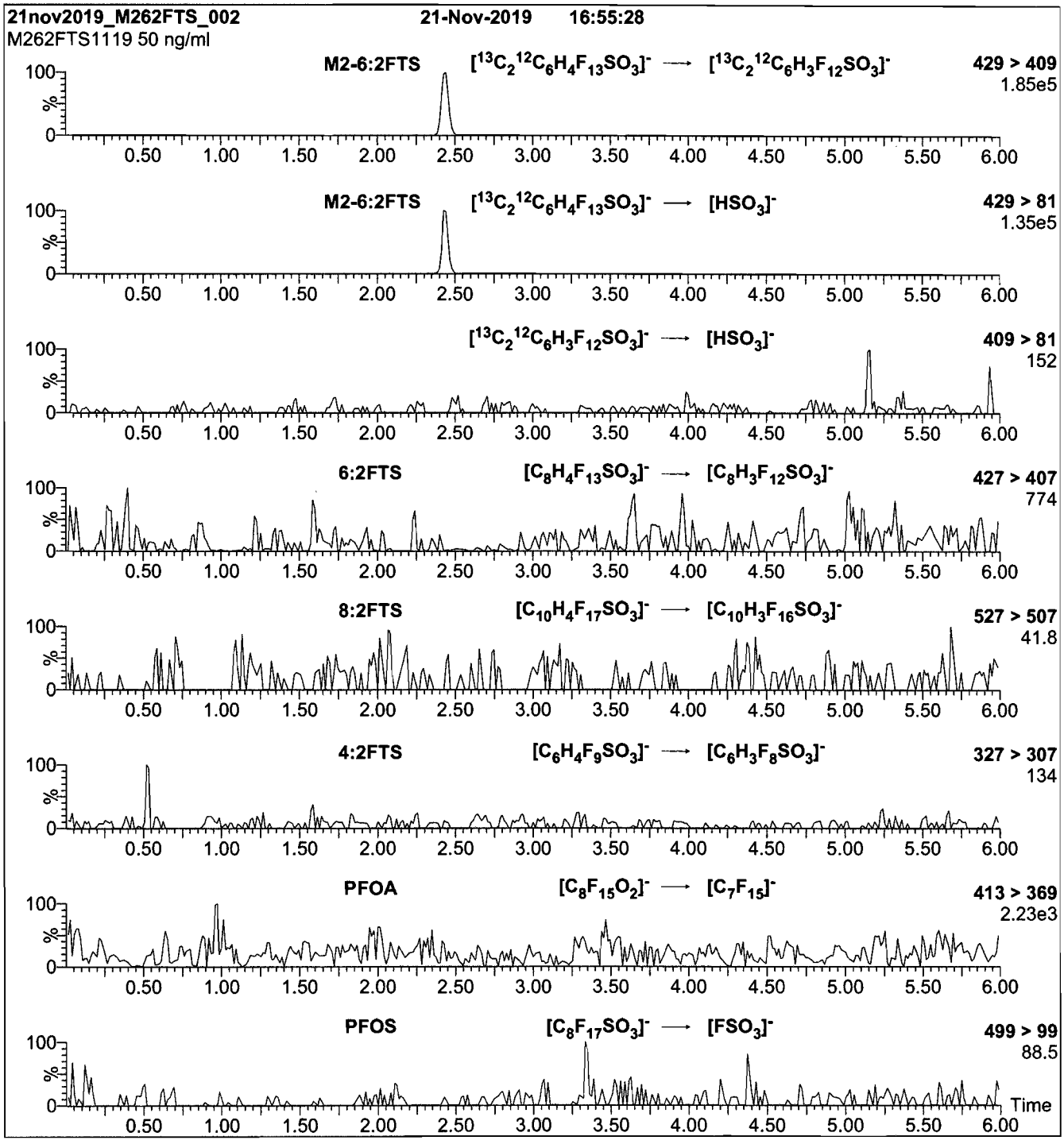
Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2-6:2FTS)

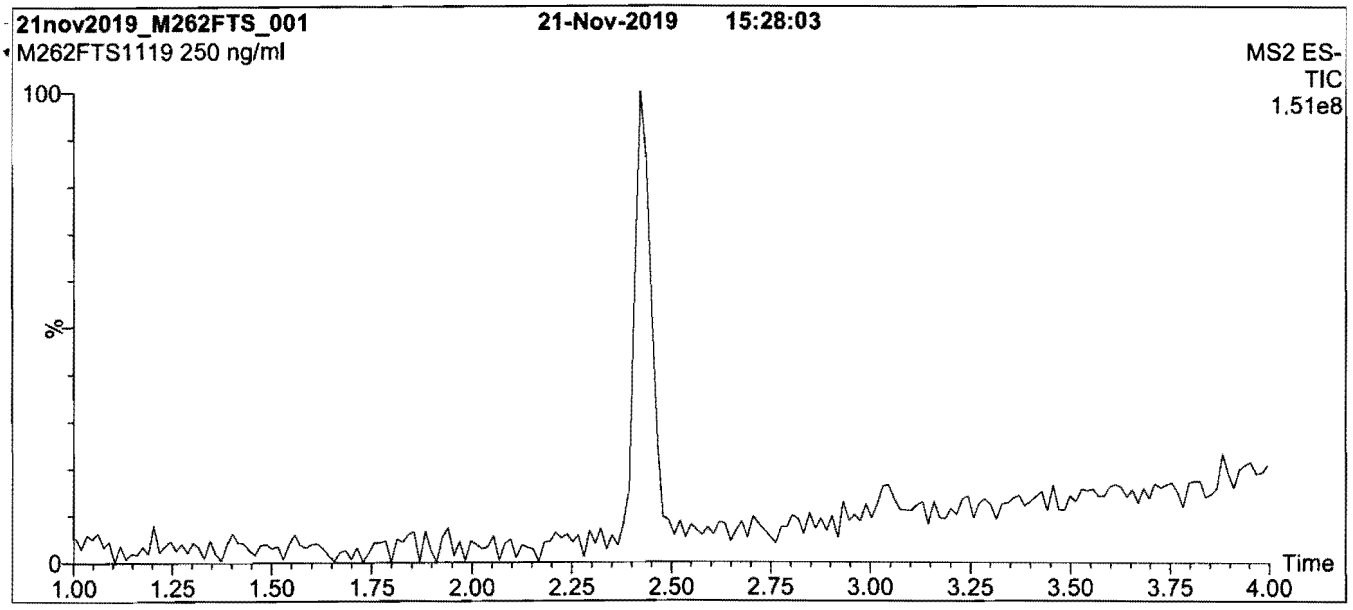
Mobile phase: Same as Figure 1

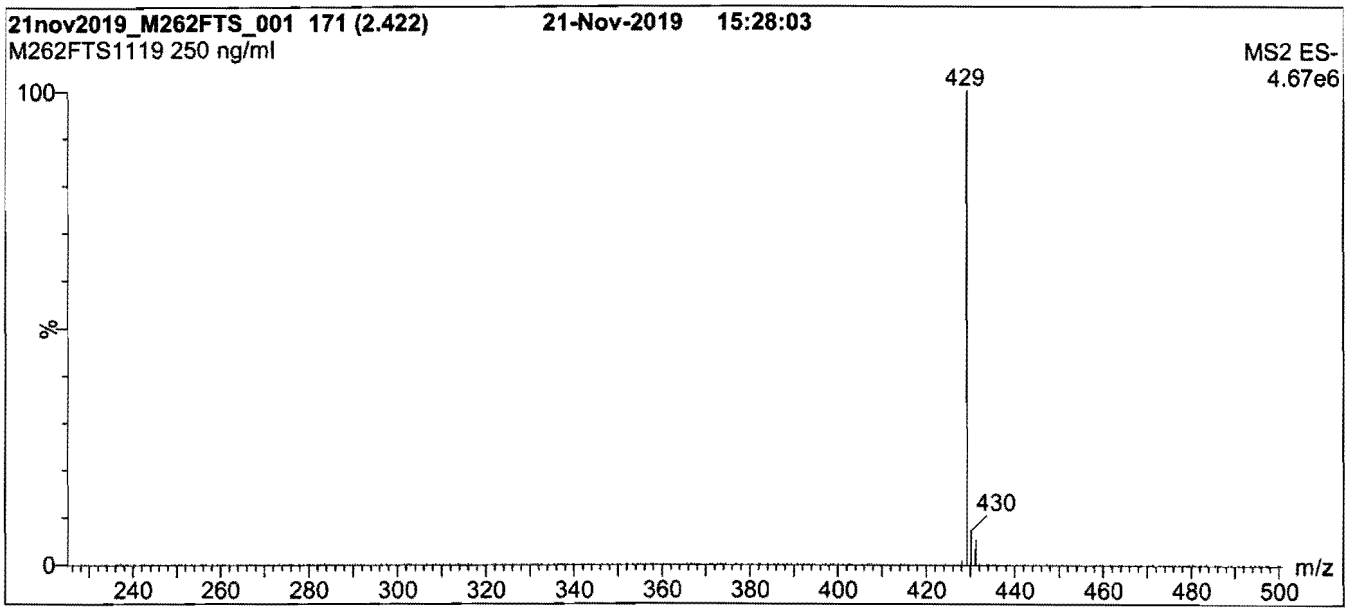
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 20

Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

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Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0602

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where x is expressed as a relative standard uncertainty of the individual parameter.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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19L0602

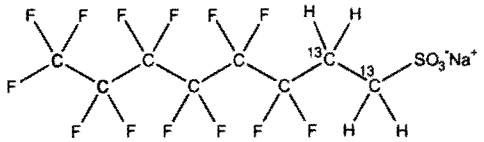
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS1119

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/21/2019		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

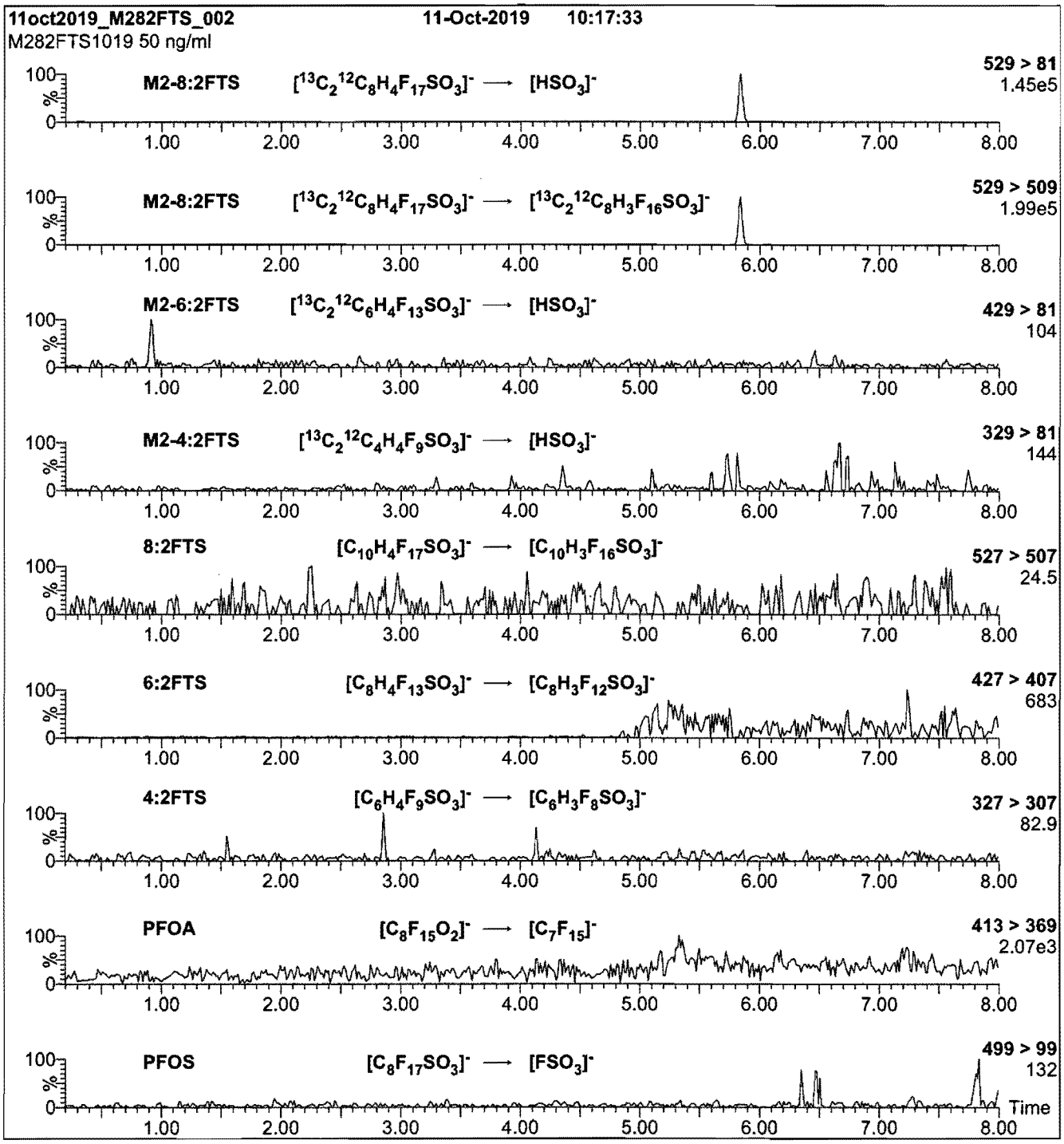
- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/25/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2-8:2FTS)

Mobile phase: Same as Figure 1

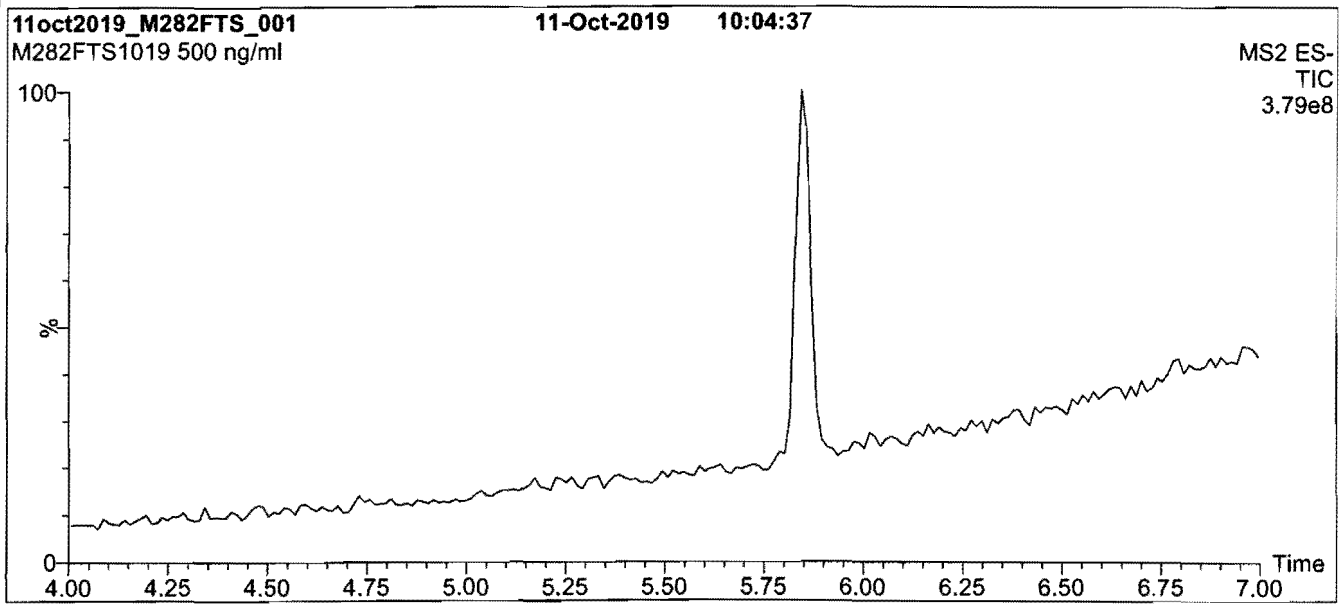
Flow: 300 µl/min

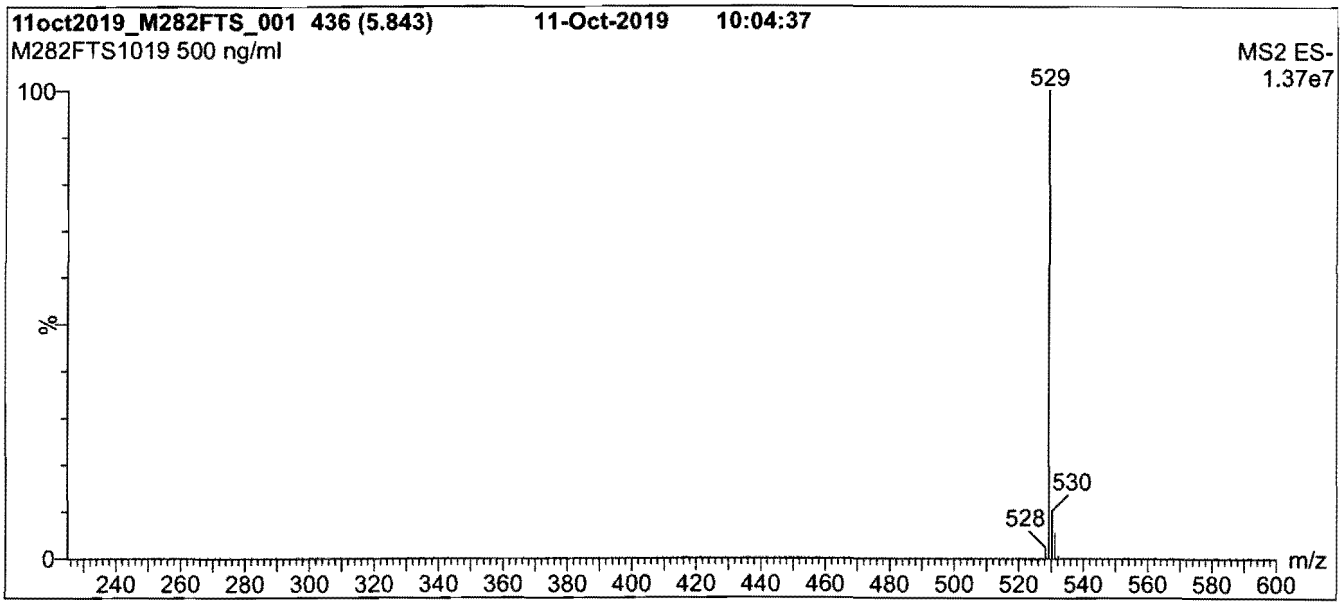
MS Parameters

Collision Gas (mbar) = 3.87e-3
Collision Energy (eV) = 26

19L0603

Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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Flow: 300 µl/min

MS Parameters

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19L0603

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CALA Testing Accreditation No. A 1226

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19L0603

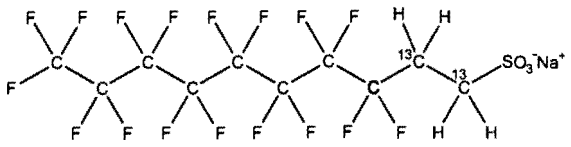
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS1019

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/11/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2024		
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ADDITIONAL INFORMATION:

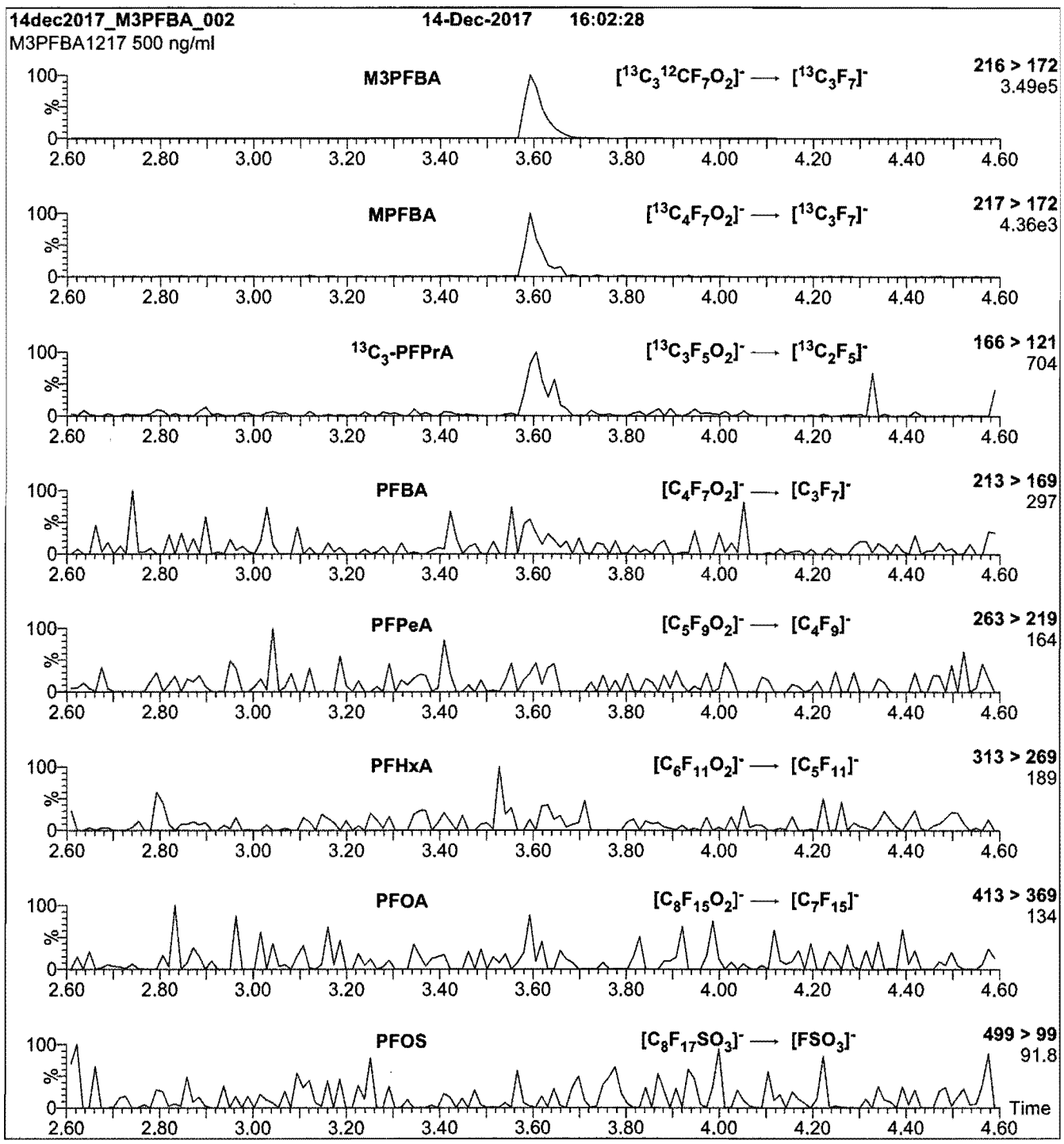
- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/15/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **M3PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

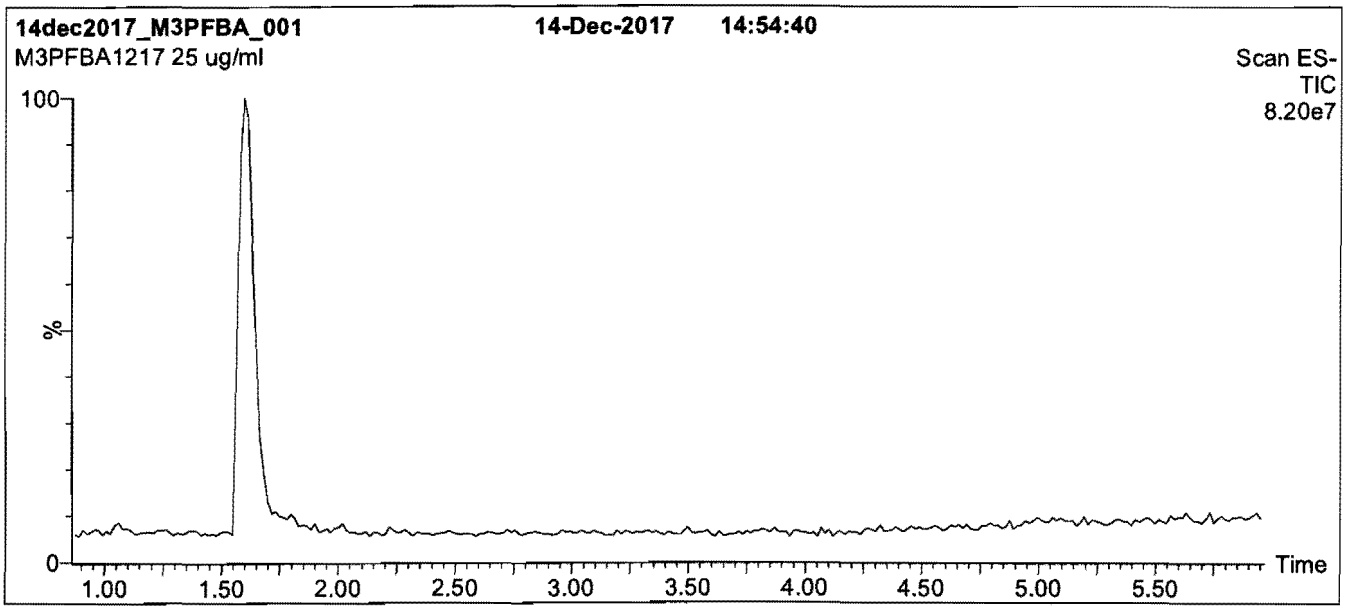
Flow: 300 µl/min

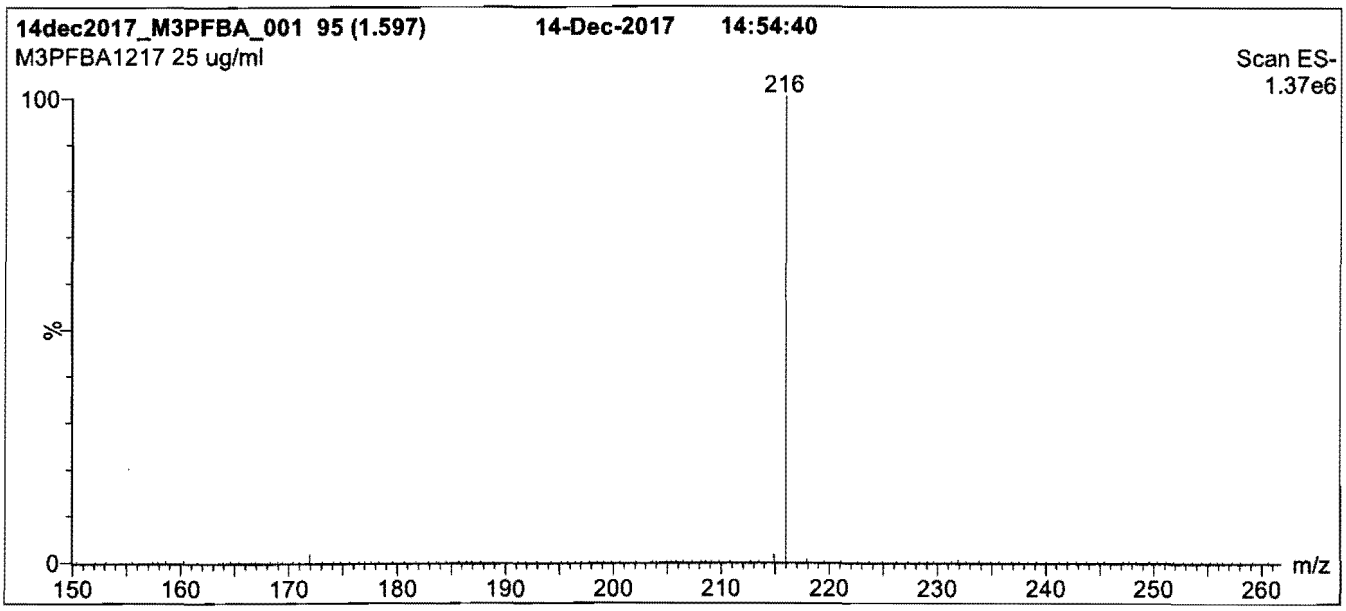
MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

19L0604

Figure 1: **M3PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

19L0604

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

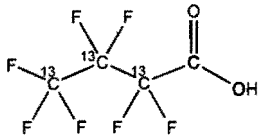
19L0604

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBA
LOT NUMBER: M3PFBA1217
COMPOUND: Perfluoro-n-[2,3,4-$^{13}C_3$]butanoic acid

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA:	$^{13}C_3{}^{12}CHF_7O_2$	**MOLECULAR WEIGHT:**	217.02
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (2,3,4-$^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	12/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	12/14/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

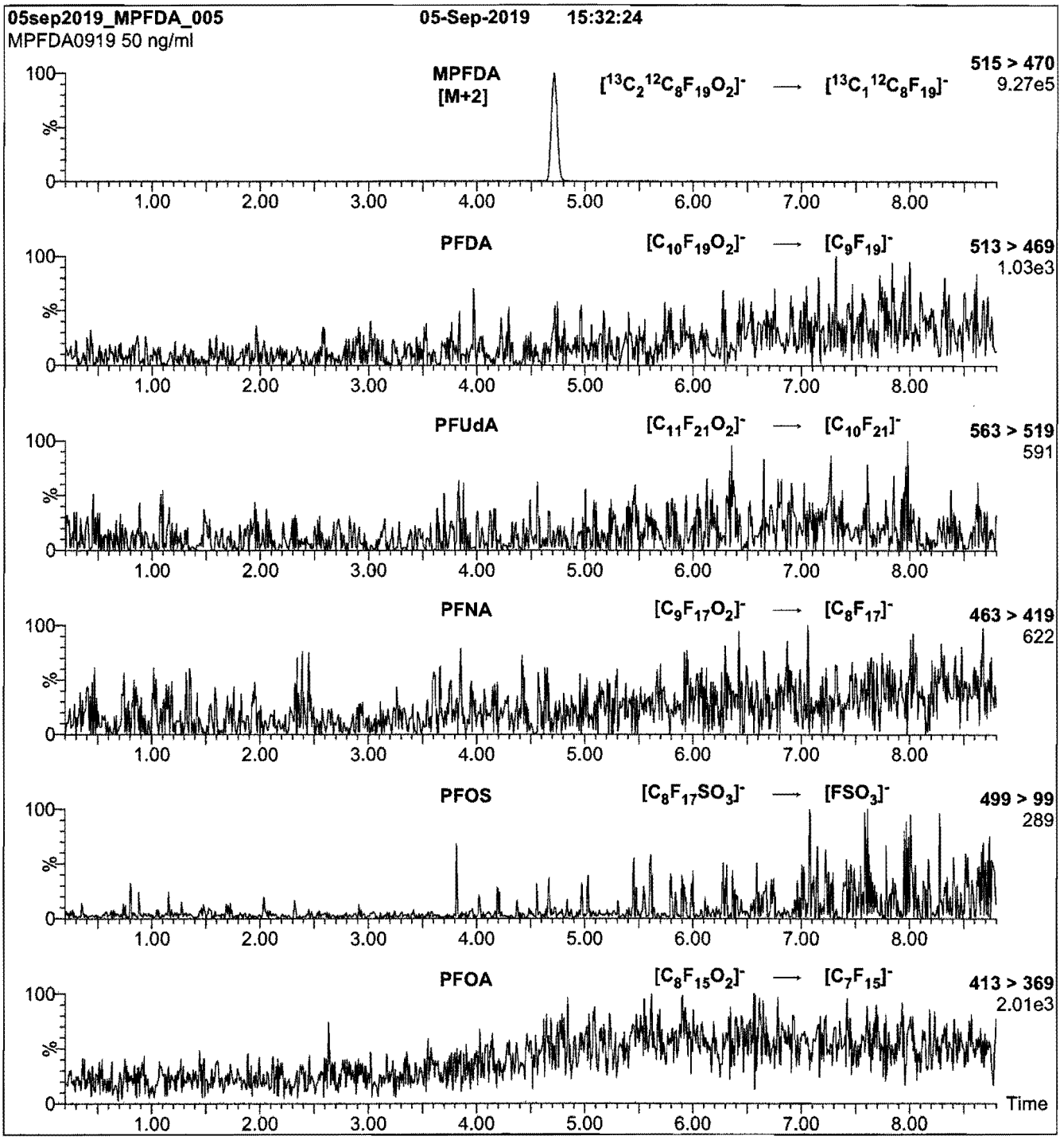
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-[$^{13}C_3$]propanoic acid and also contains ~ 1.0% of perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid due to the naturally occurring isotopic abundance of ^{13}C in the unlabelled carbon atom.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFDA)

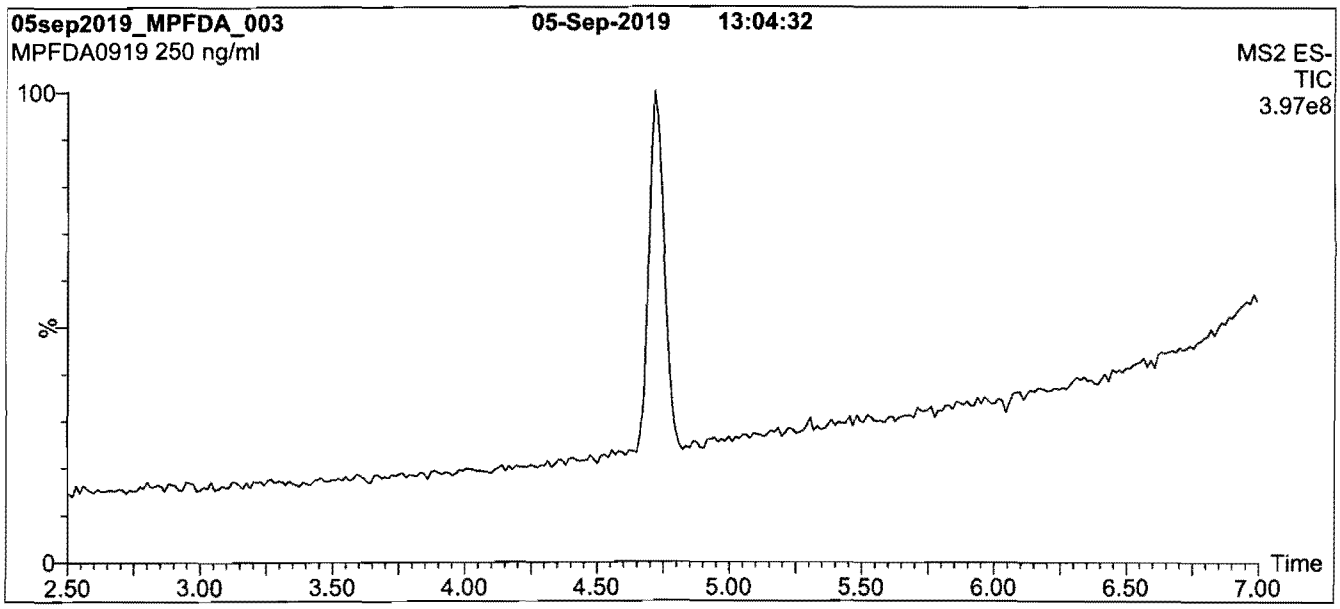
Mobile phase: Same as Figure 1

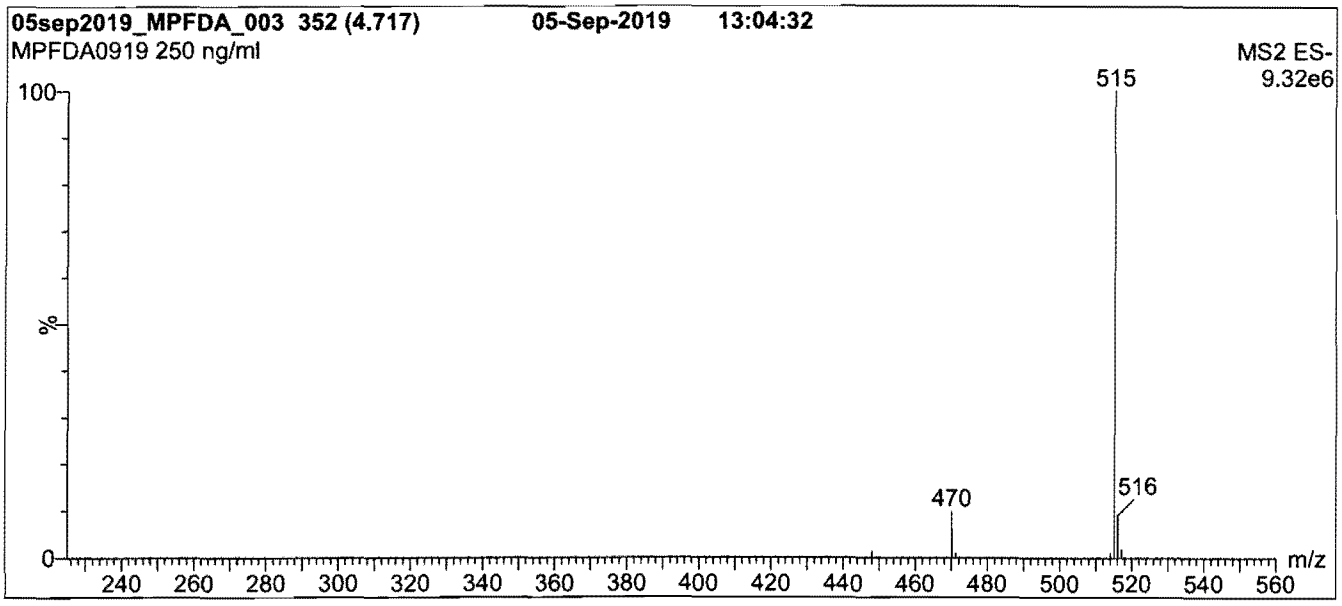
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 10

Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0605

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

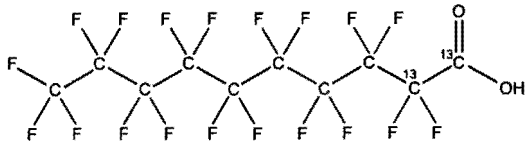
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0605

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0919
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/05/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/05/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

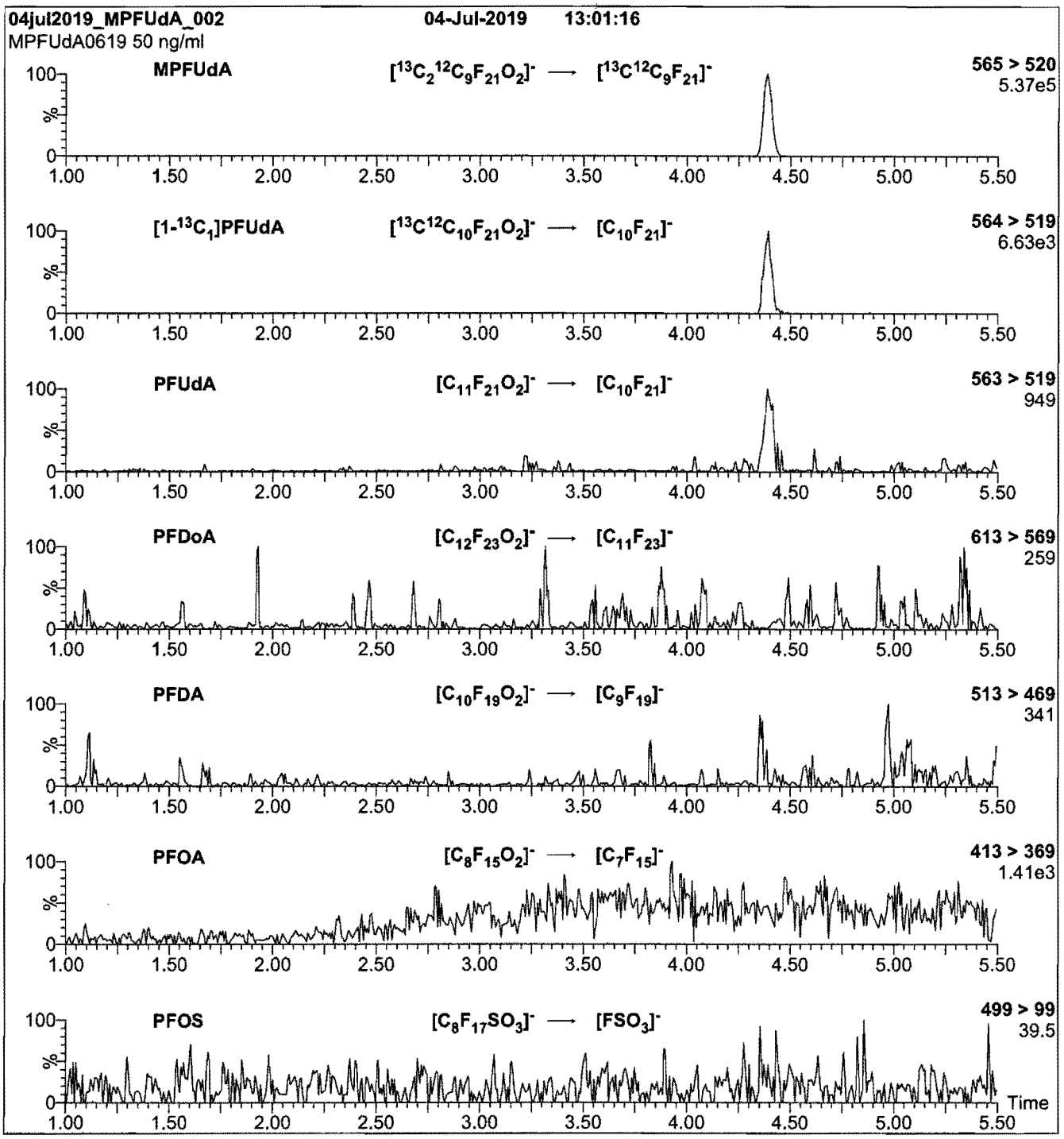
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L06006

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFUdA)

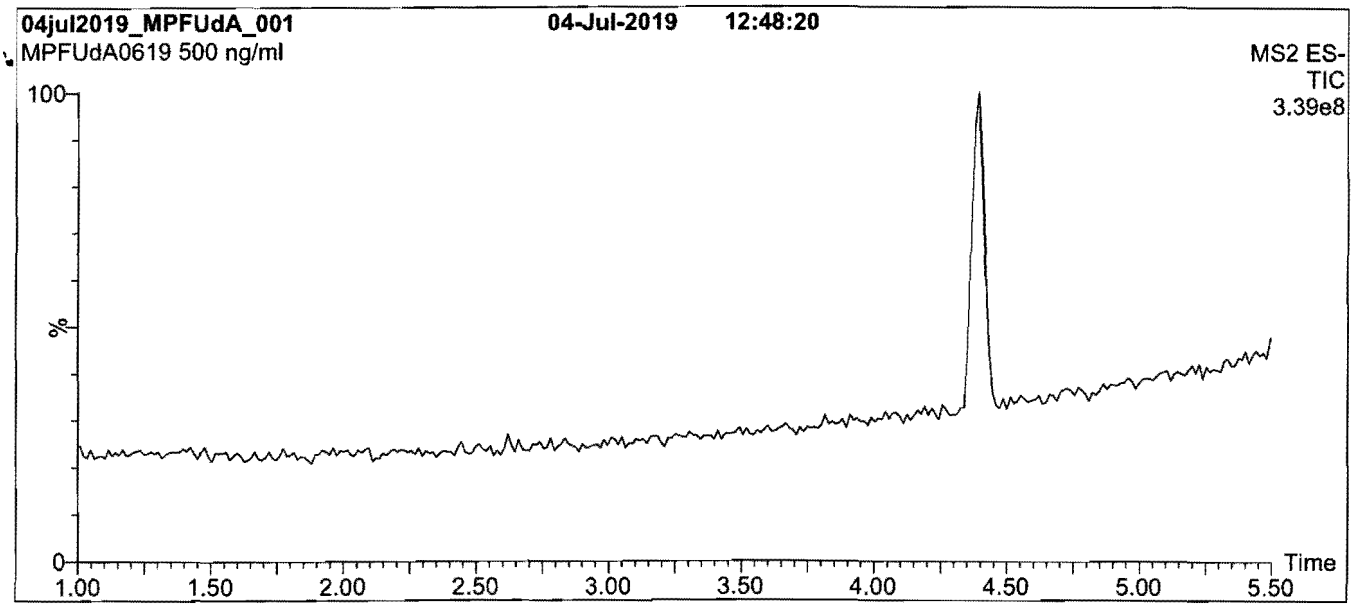
Mobile phase: Same as Figure 1

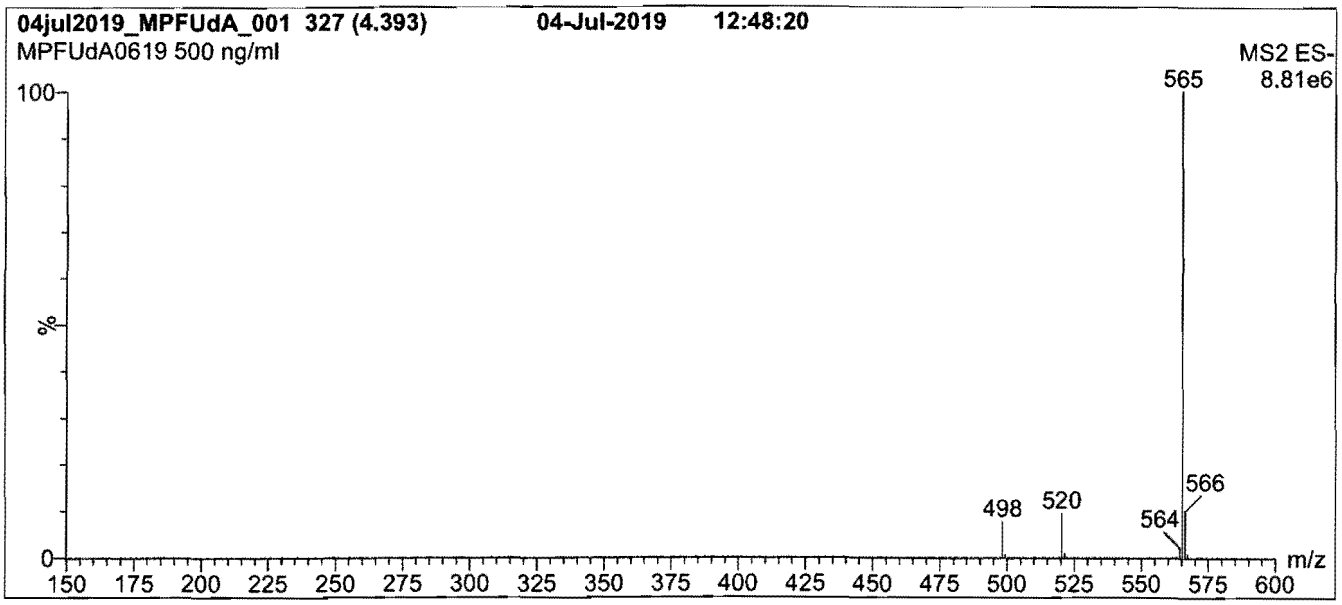
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 12

Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0606

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

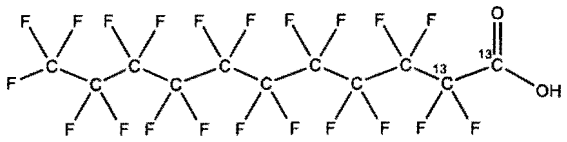
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0606

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA0619
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/04/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

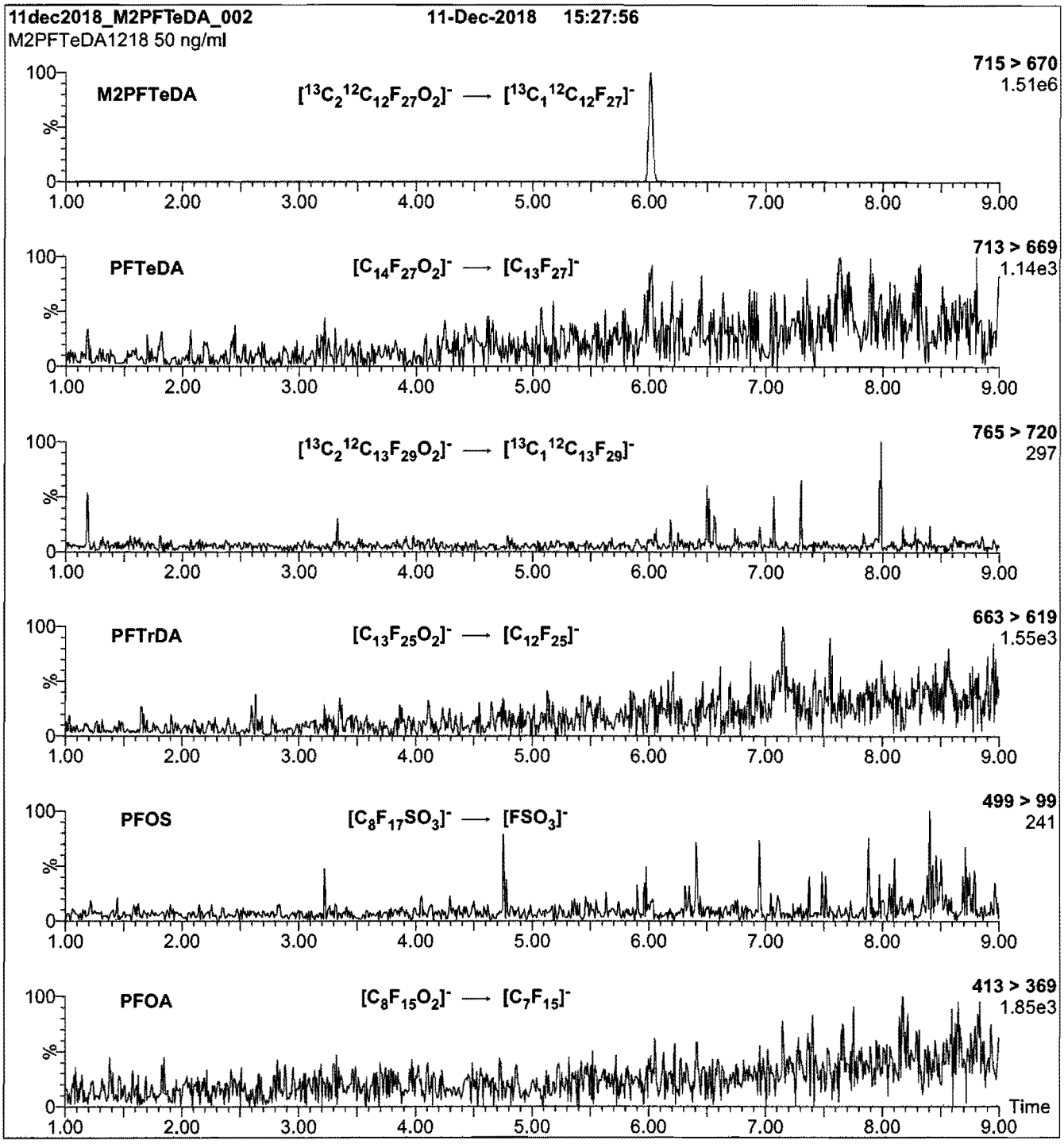
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/05/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2PFTeDA)

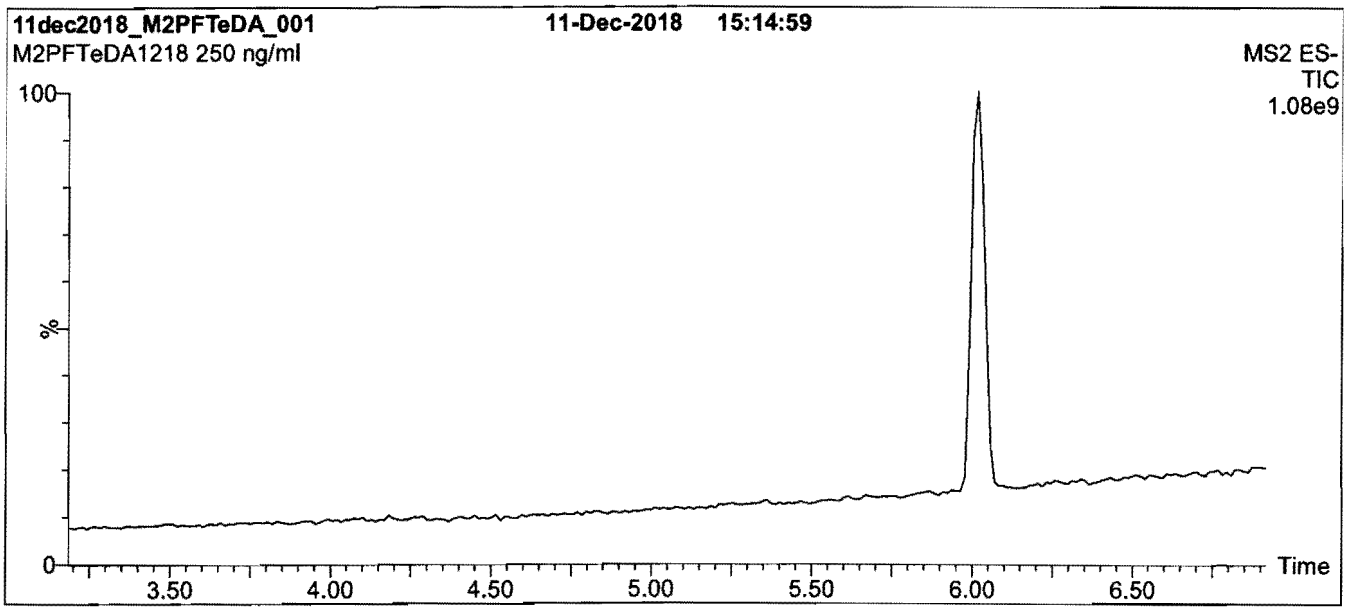
Mobile phase: Same as Figure 1

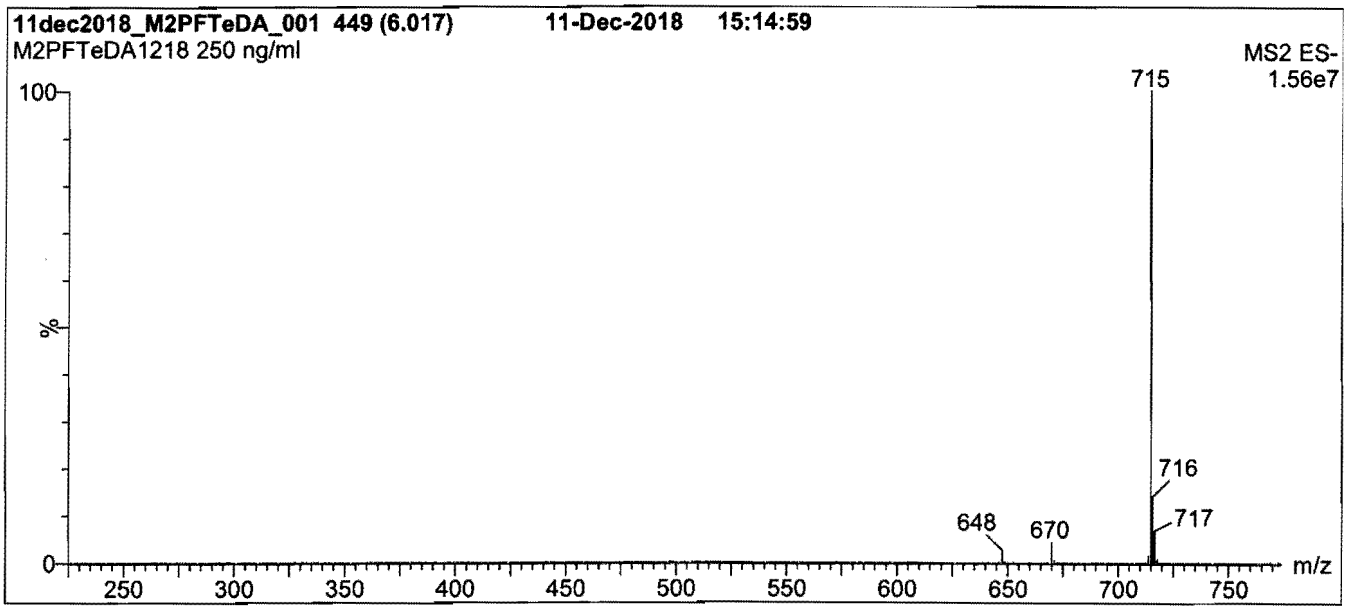
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.16e-3
Collision Energy (eV) = 14

Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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HANDLING:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

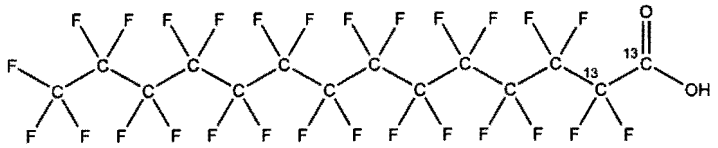
19L0607

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1218
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	12/11/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

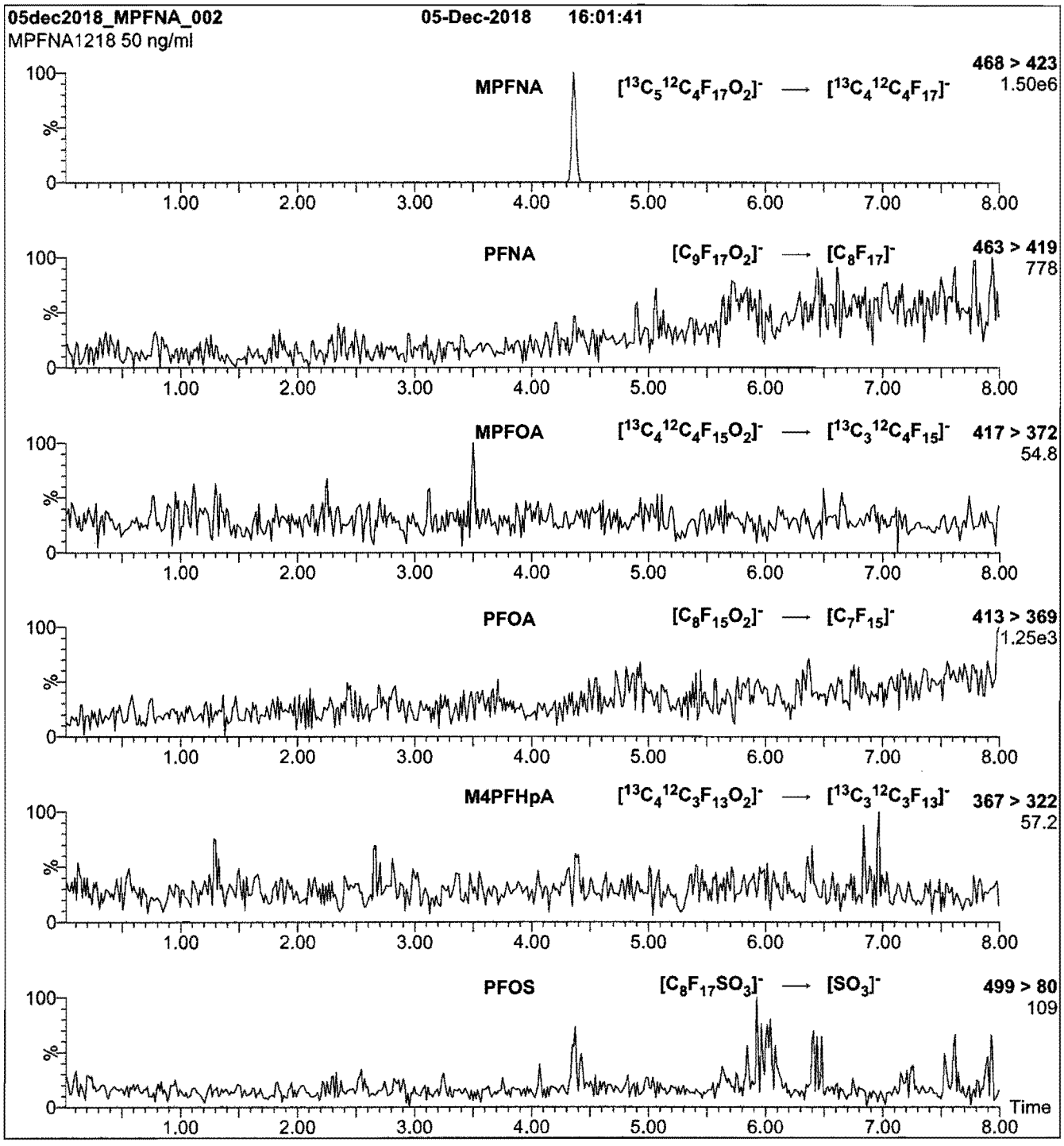
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0608

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFNA)

Mobile phase: Same as Figure 1

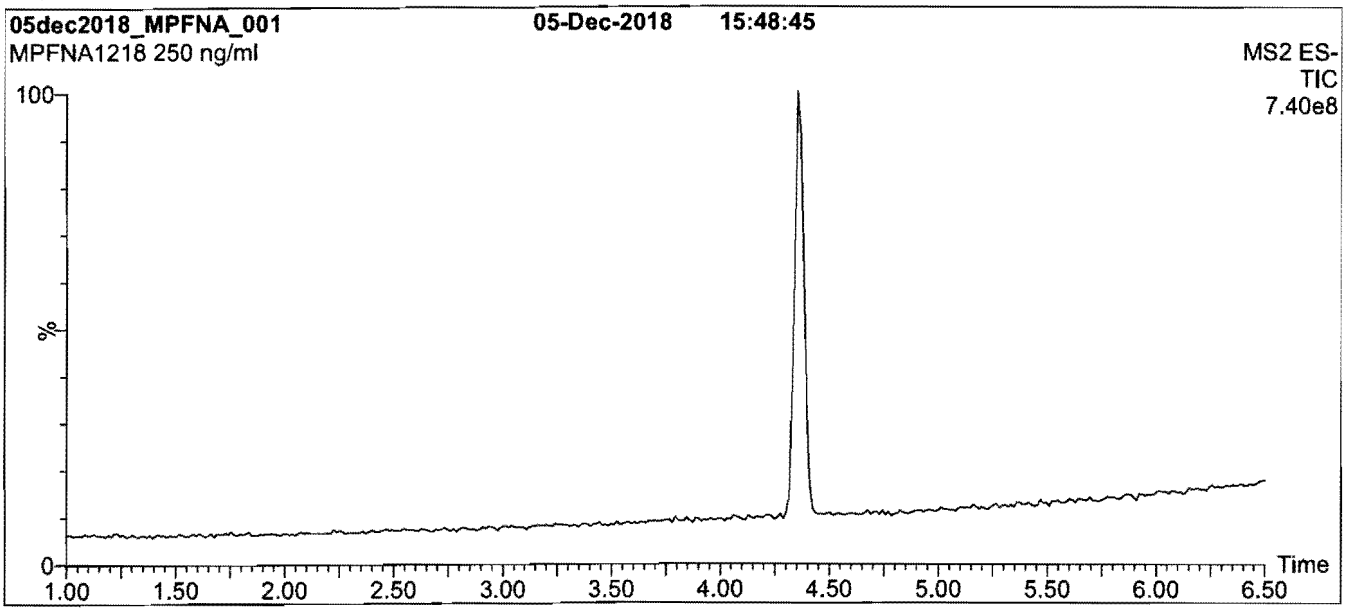
Flow: 300 µl/min

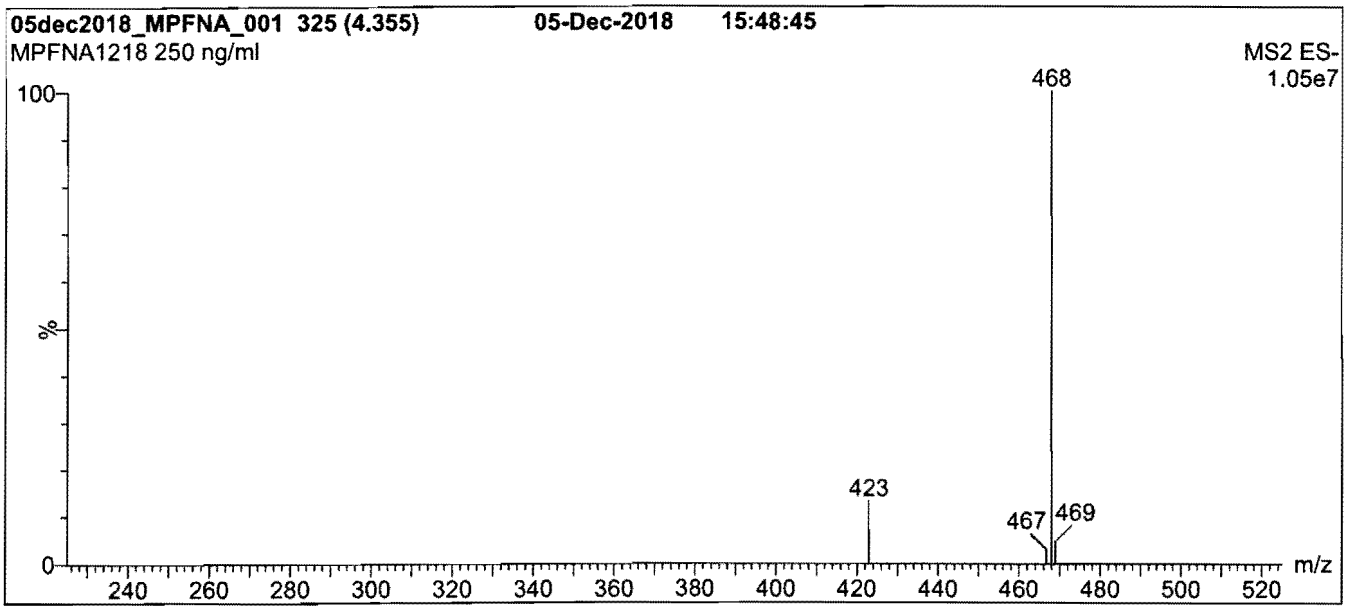
MS Parameters

Collision Gas (mbar) = 2.88e-3
Collision Energy (eV) = 10

19L0608

Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





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Time: 12 min

Flow: 300 µl/min

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Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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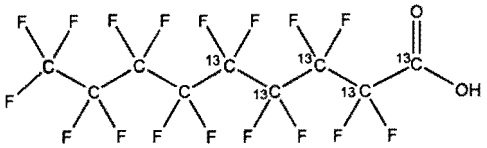
19L0608

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA1218
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	12/05/2018		
EXPIRY DATE: (mm/dd/yyyy)	12/05/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/10/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0609

WELLINGTON LABORATORIES

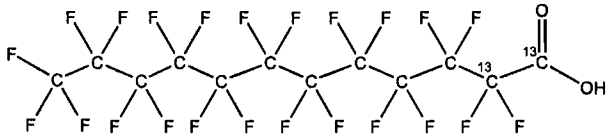
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA1218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	12/11/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
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19L0609

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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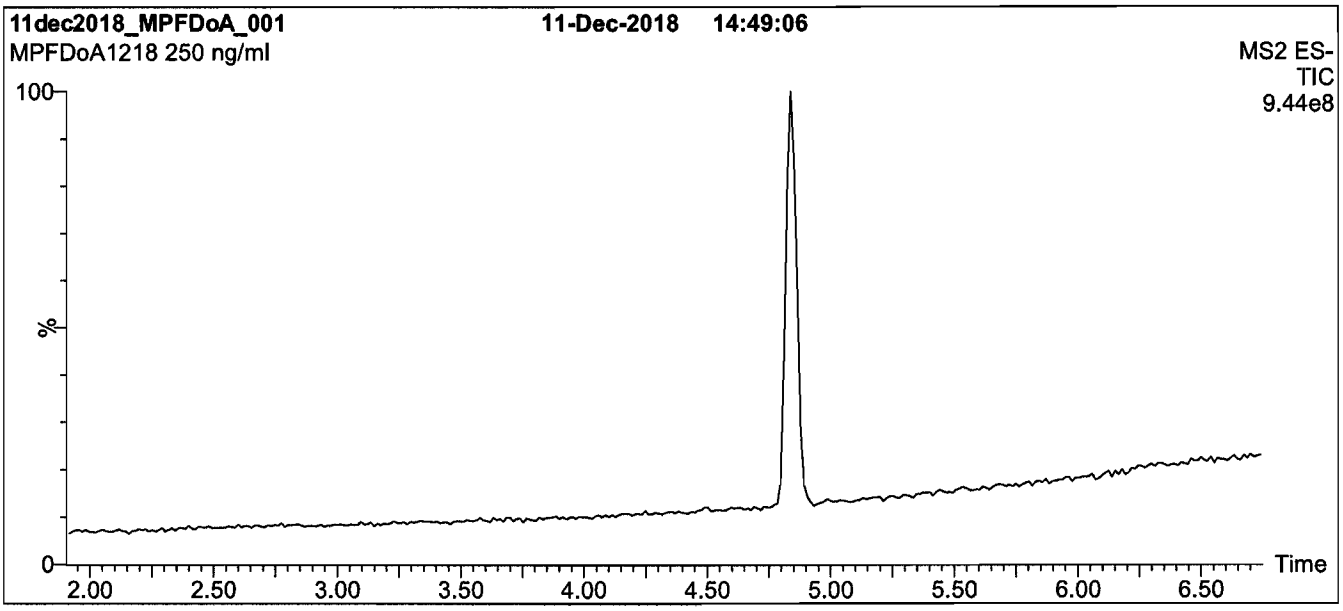
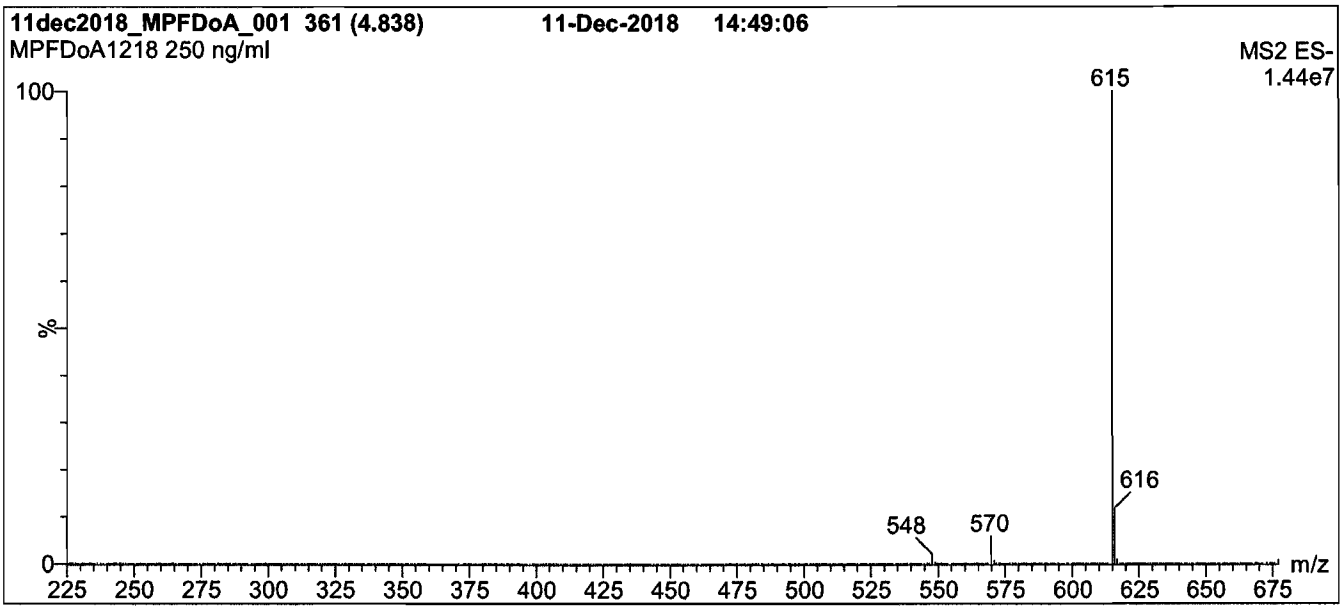
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

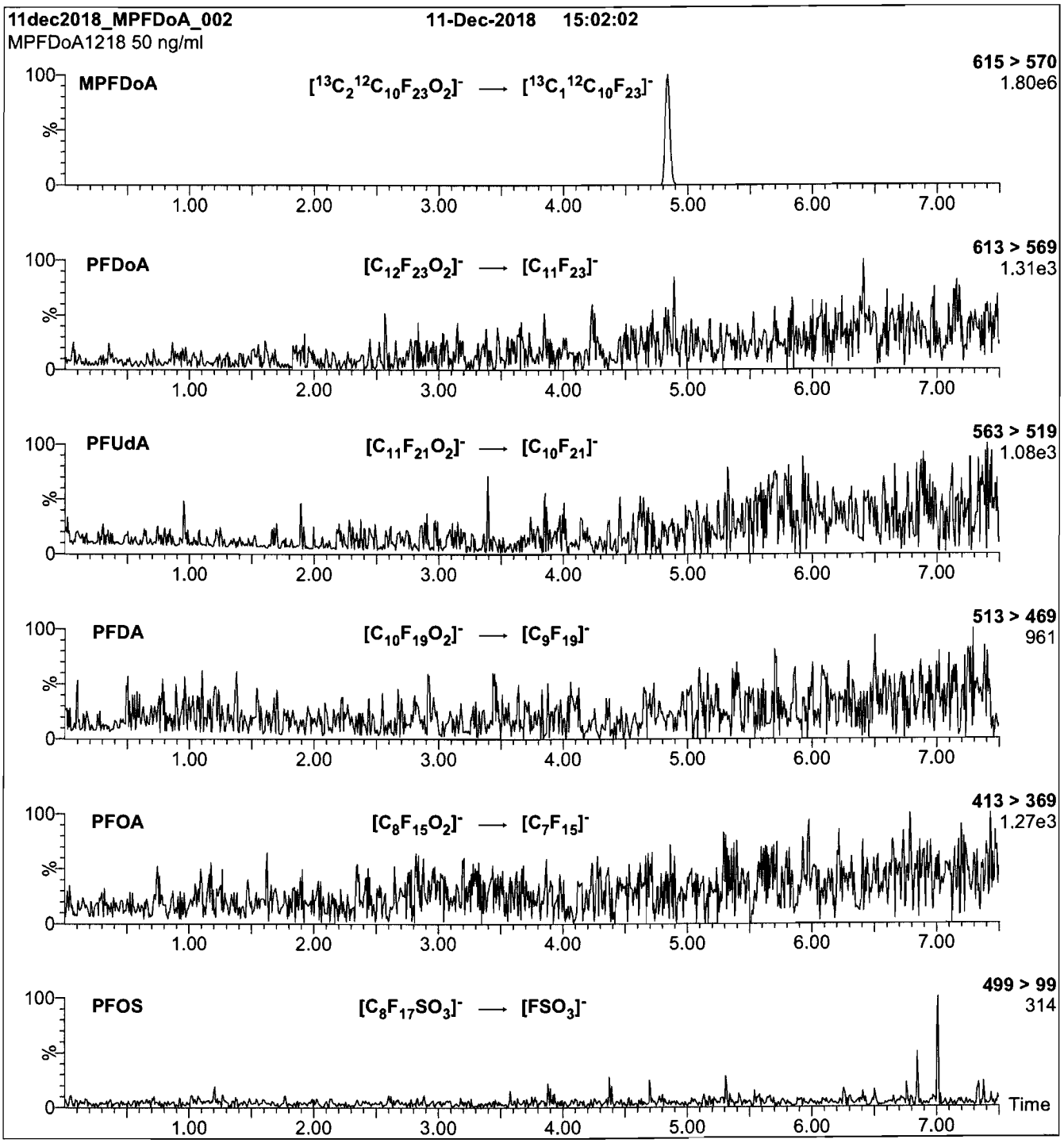
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFDoA)

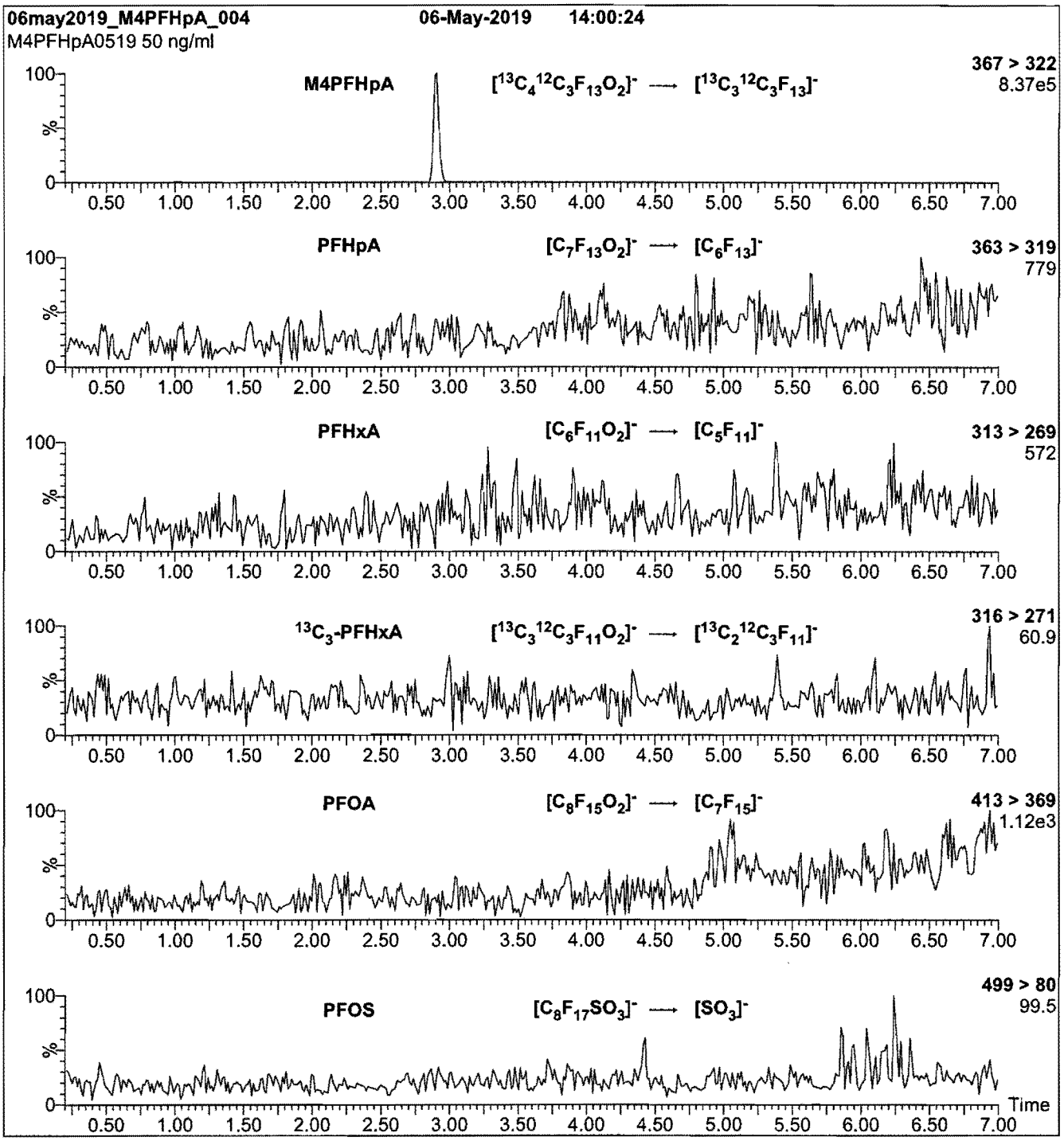
Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.16e-3
Collision Energy (eV) = 12

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M4PFHpA)

Mobile phase: Same as Figure 1

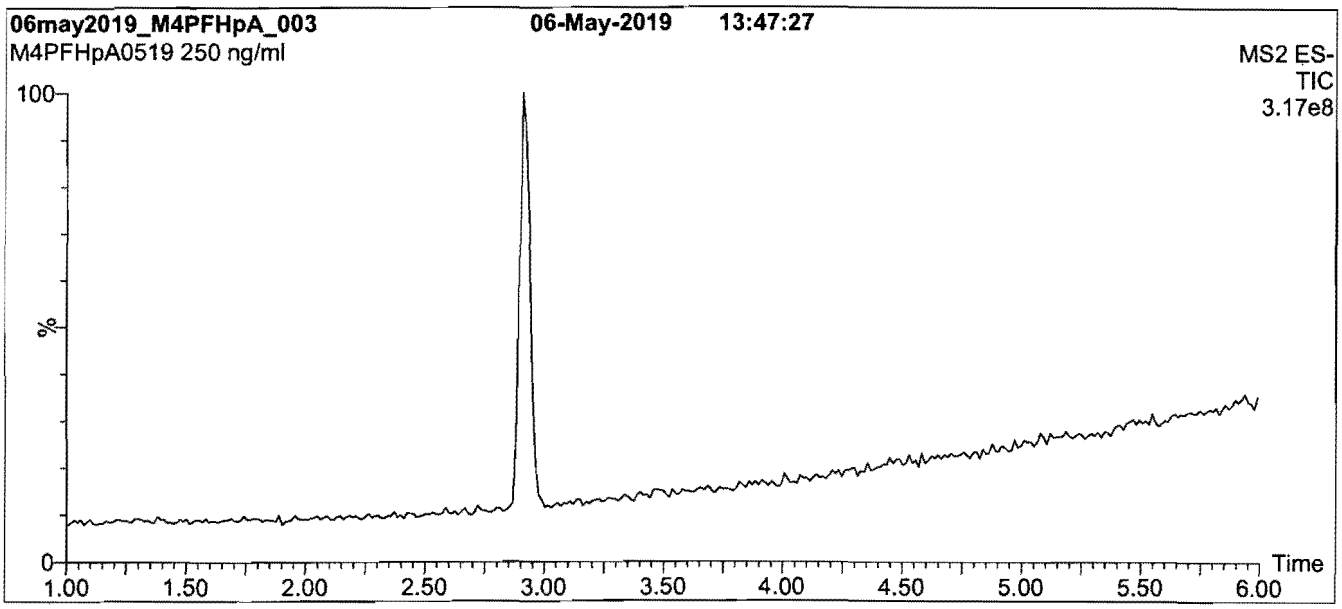
Flow: 300 µl/min

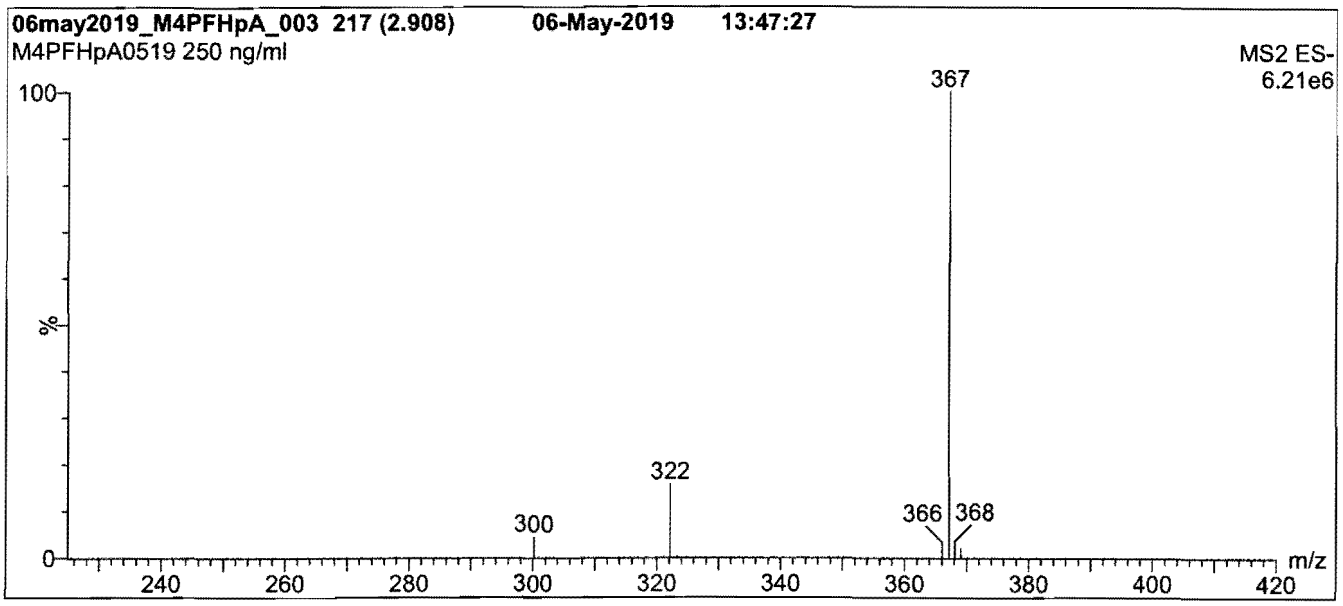
MS Parameters

Collision Gas (mbar) = 2.87e-3
Collision Energy (eV) = 8

19L0610

Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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19L0010

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

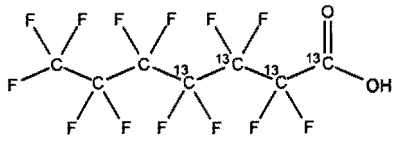
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0610

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0519
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/06/2019		
EXPIRY DATE: (mm/dd/yyyy)	05/06/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

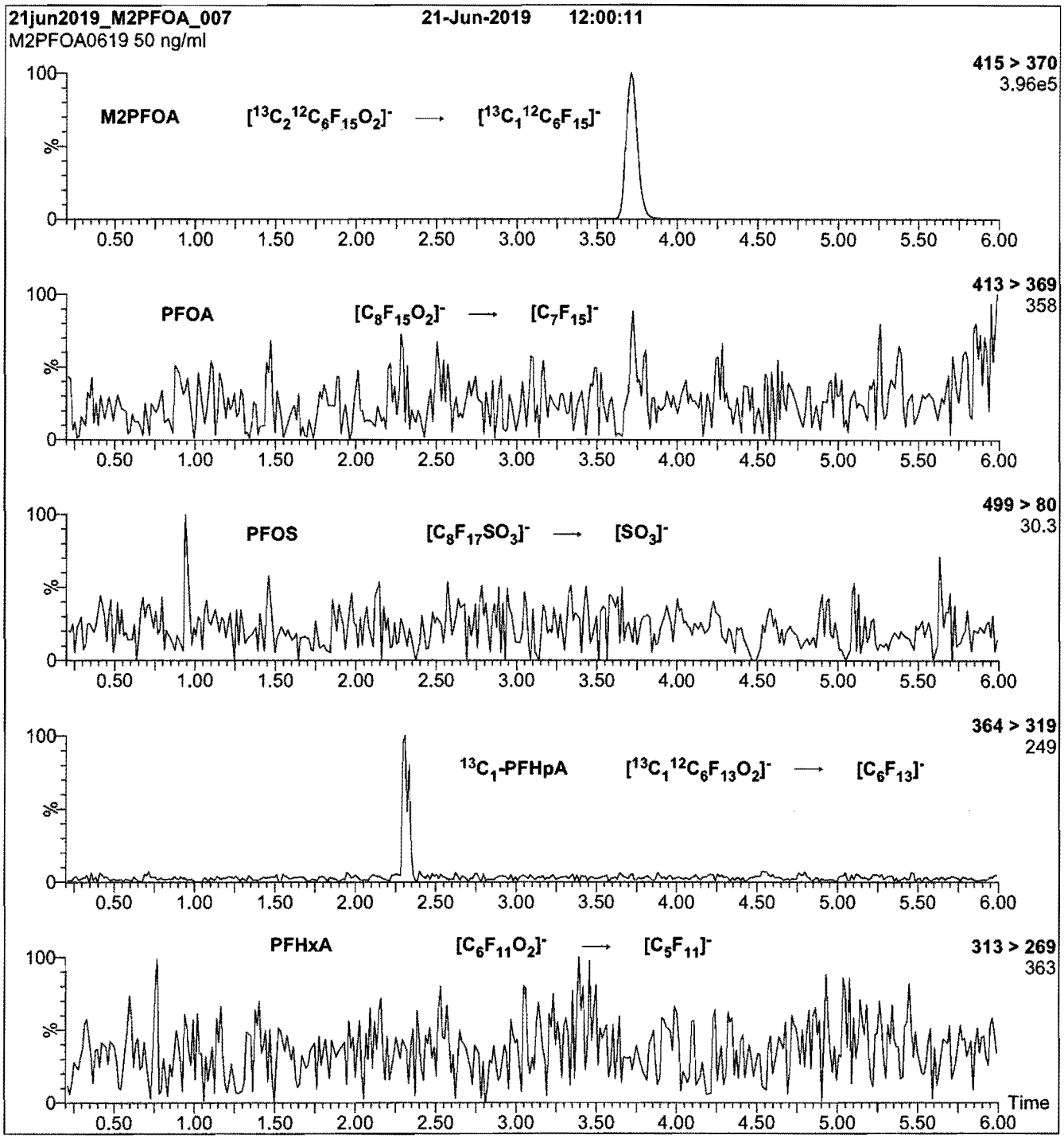
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/17/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0611

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2PFOA)

Mobile phase: Same as Figure 1

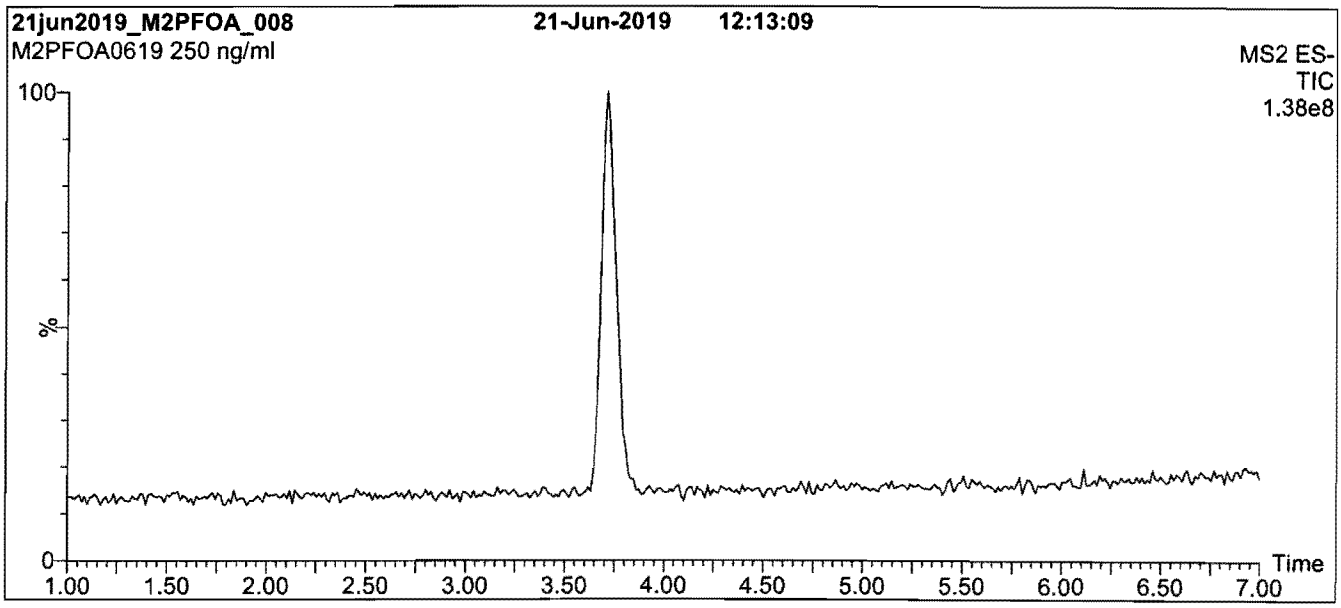
Flow: 300 µl/min

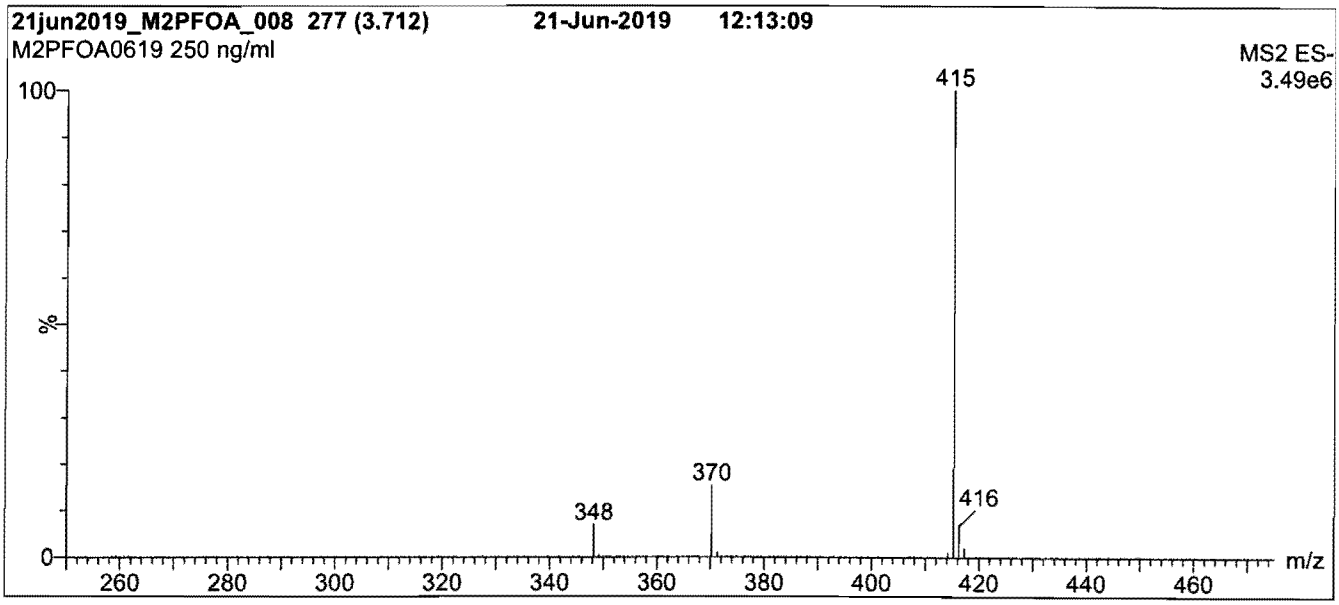
MS Parameters

Collision Gas (mbar) = 2.88e-3
Collision Energy (eV) = 8

19L0611

Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1920611

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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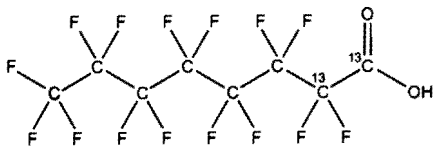
19L 0611

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0619
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99%^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	06/21/2019		
EXPIRY DATE: (mm/dd/yyyy)	06/21/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-[$^{13}C_1$]heptanoic acid ($^{13}C_1$-PFHpA).

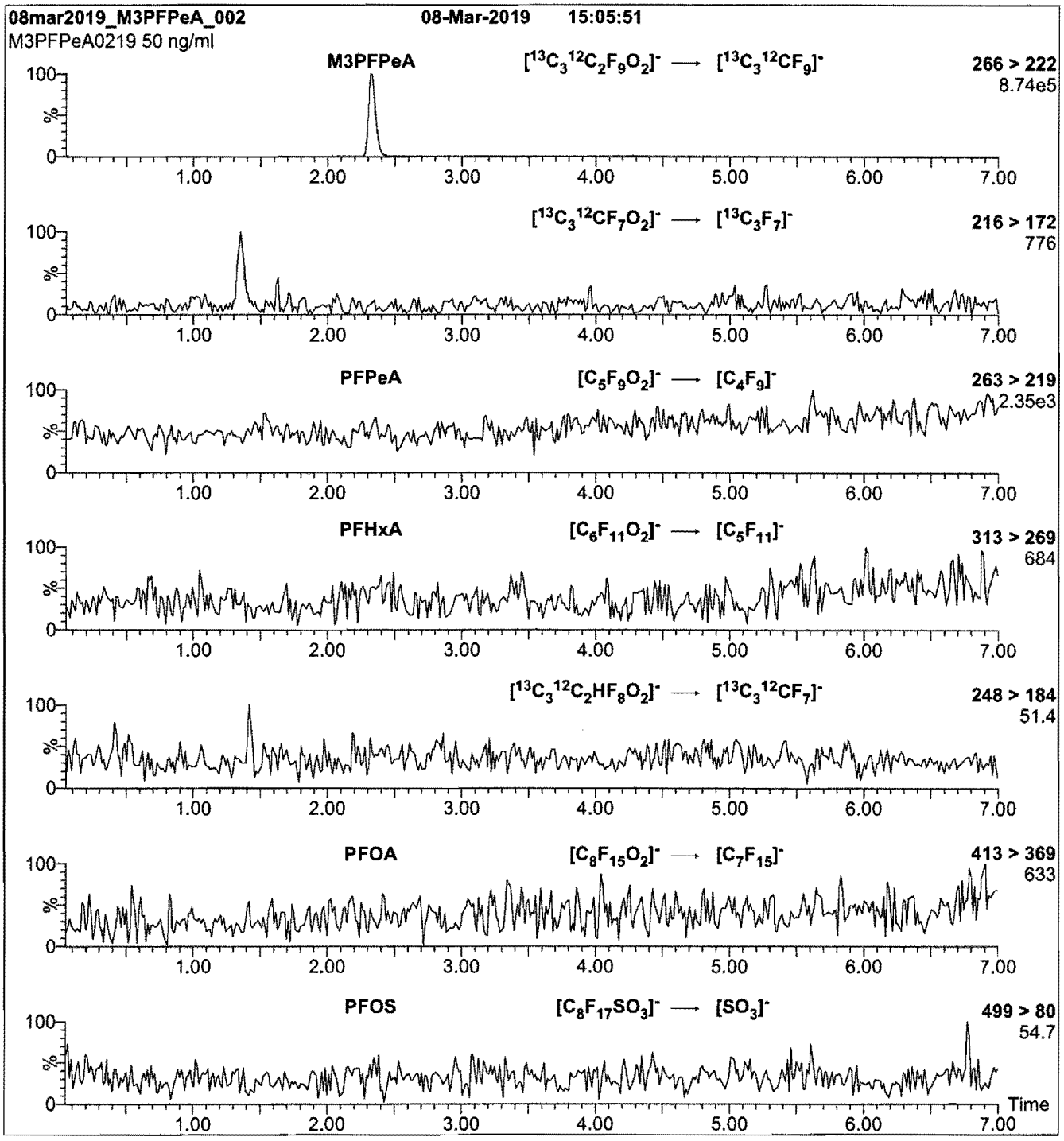
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/21/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0612

Figure 2: **M3PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3PFPeA)

Mobile phase: Same as Figure 1

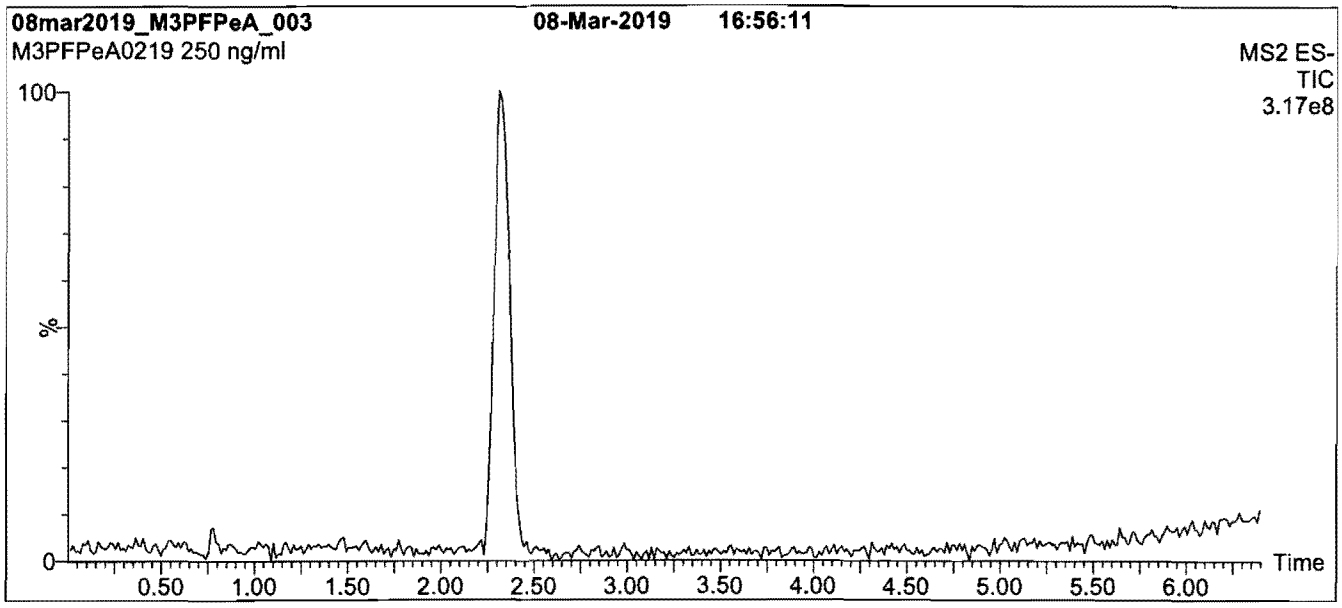
Flow: 300 µl/min

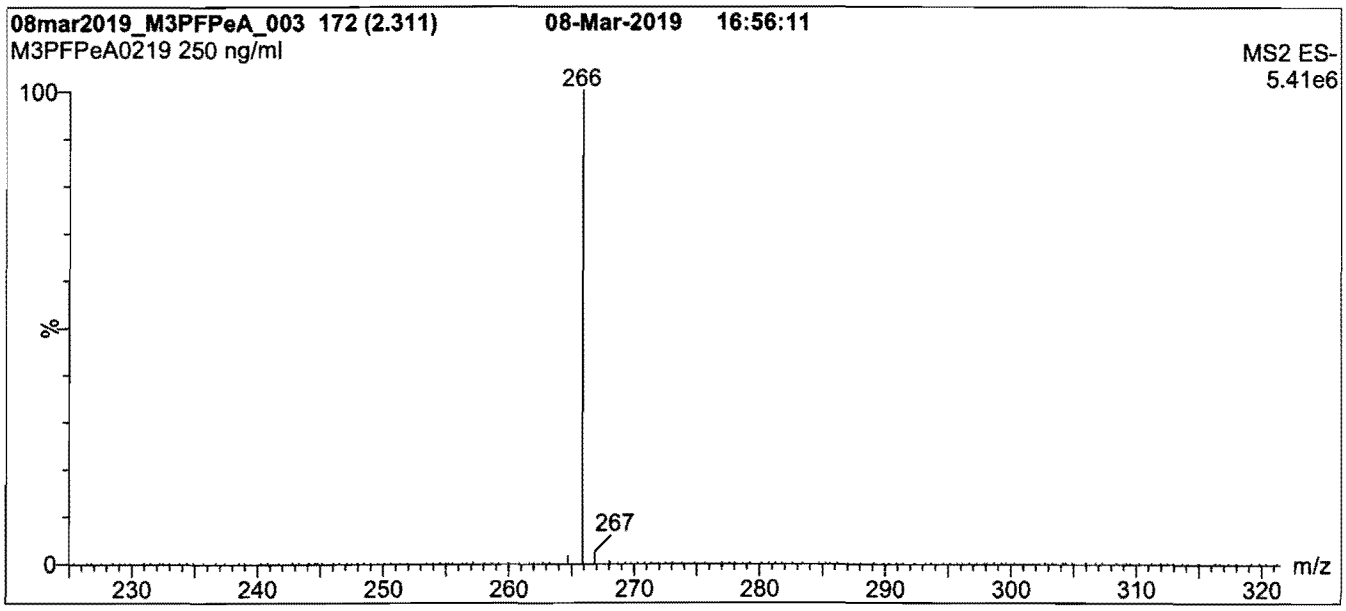
MS Parameters

Collision Gas (mbar) = 2.84e-3
Collision Energy (eV) = 8

19L0612

Figure 1: **M3PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

INTENDED USE:

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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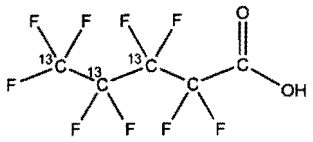
19L0612

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFPeA	**LOT NUMBER:**	M3PFPeA0219
COMPOUND:	Perfluoro-n-[3,4,5-$^{13}C_3$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_2HF_9O_2$	**MOLECULAR WEIGHT:**	267.02
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (3,4,5-$^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	03/08/2019		
EXPIRY DATE: (mm/dd/yyyy)	03/08/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.95% of perfluoro-n-[$^{13}C_3$]butanoic acid and 0.05% of perfluoro-1-pentanoic acid.

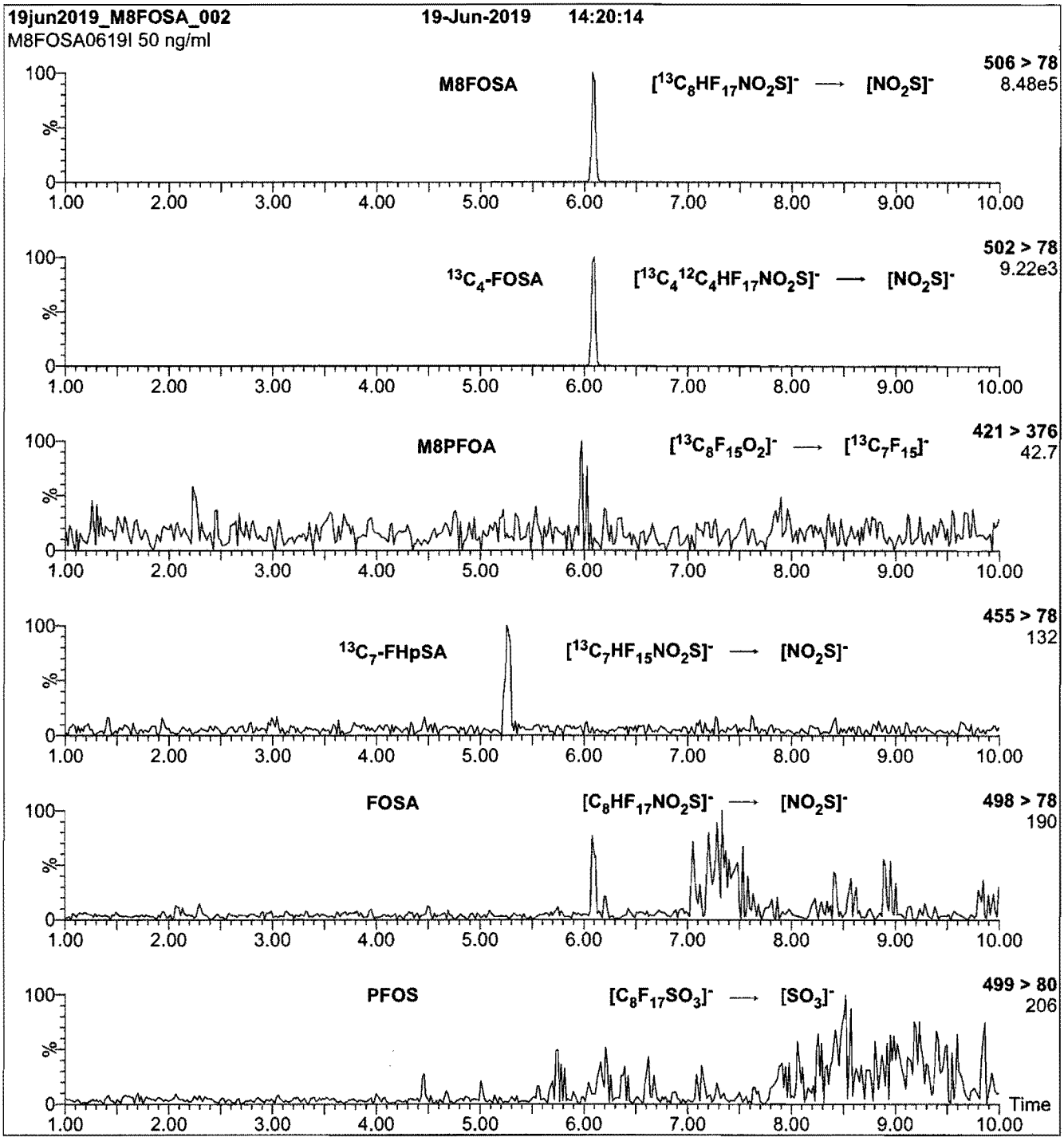
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/19/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0613

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M8FOSA-I)

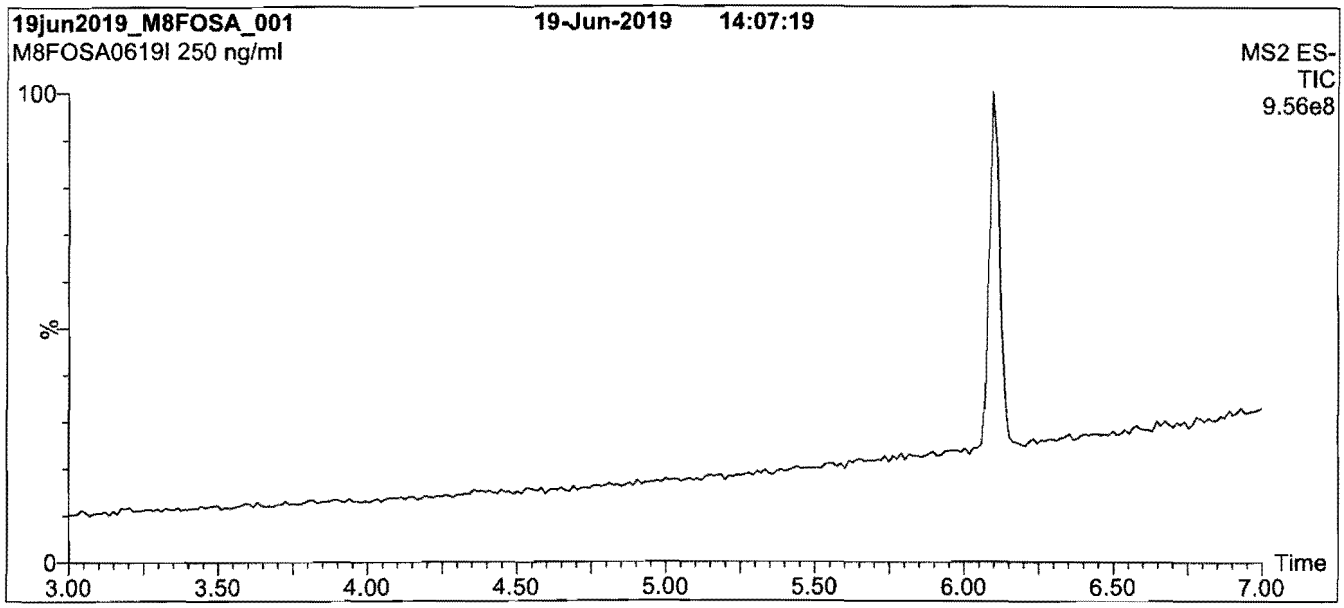
Mobile phase: Same as Figure 1

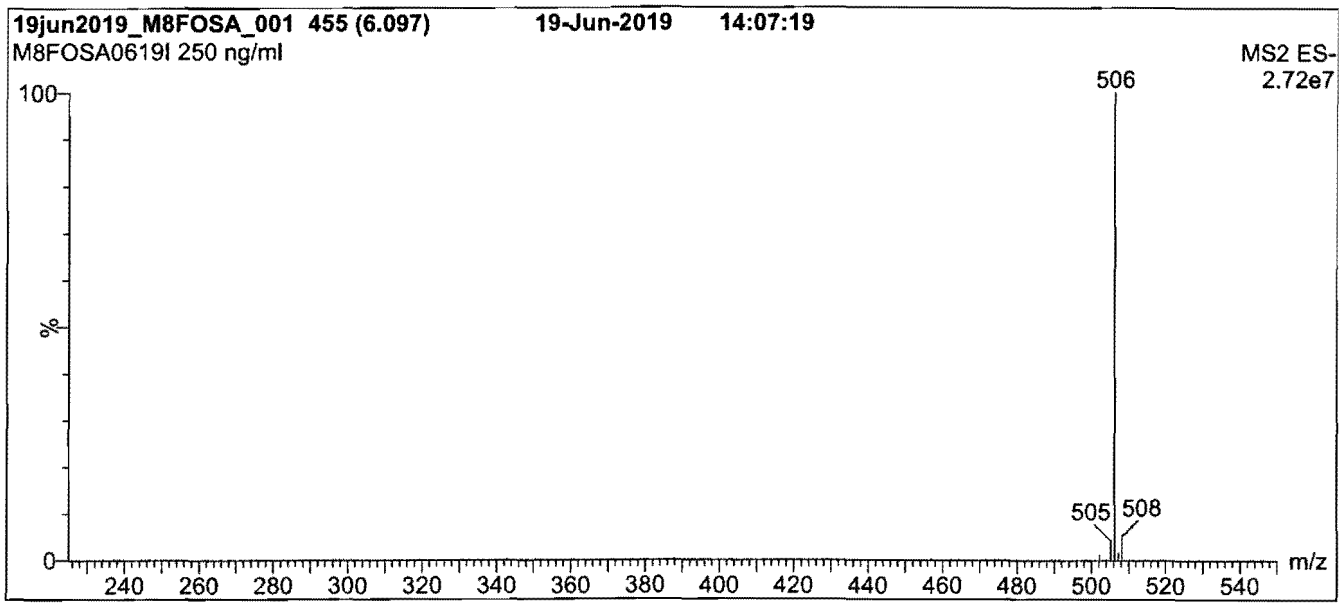
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.94e-3
Collision Energy (eV) = 30

Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

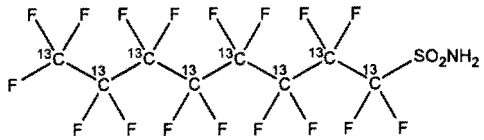
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0613

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA0619I
COMPOUND:	Perfluoro-1-[$^{13}C_8$]octanesulfonamide		
STRUCTURE:		**CAS #:**	1365803-60-6



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	06/19/2019		
EXPIRY DATE: (mm/dd/yyyy)	06/19/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.2% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.02% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/21/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0614

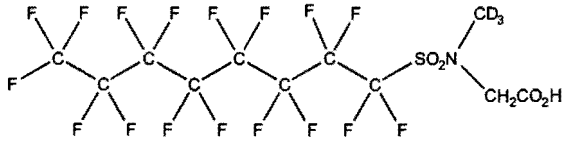
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0719

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 1400690-70-1



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	07/24/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/24/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/26/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19LC06H

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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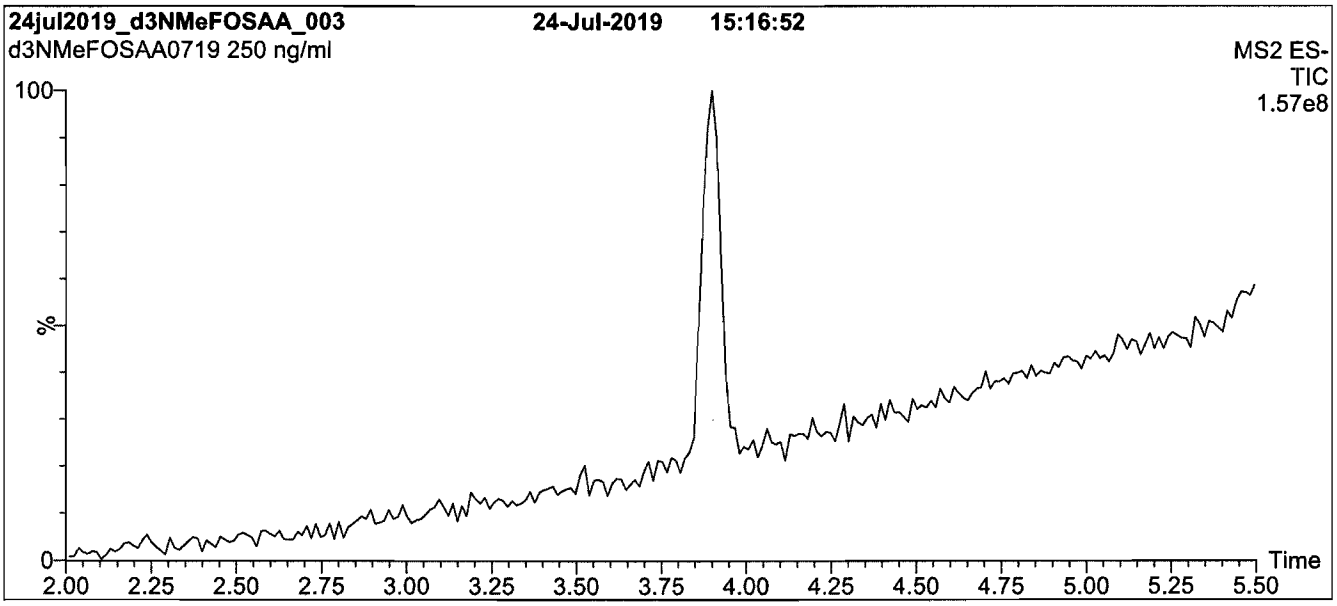
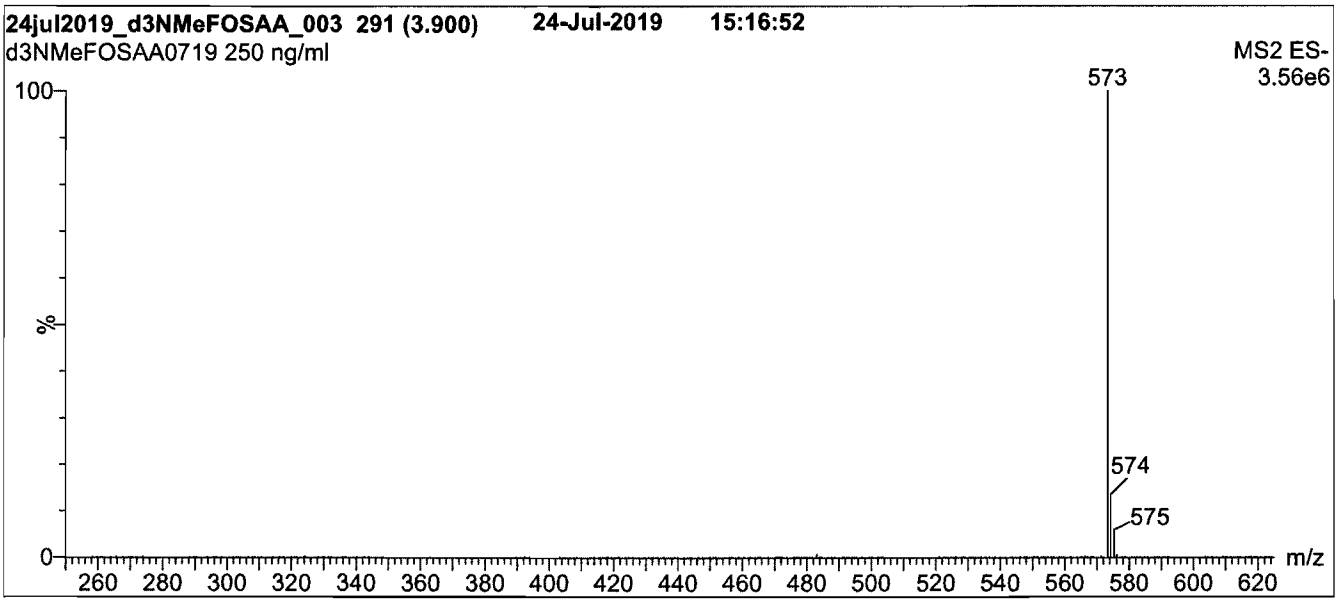
19L0614

Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

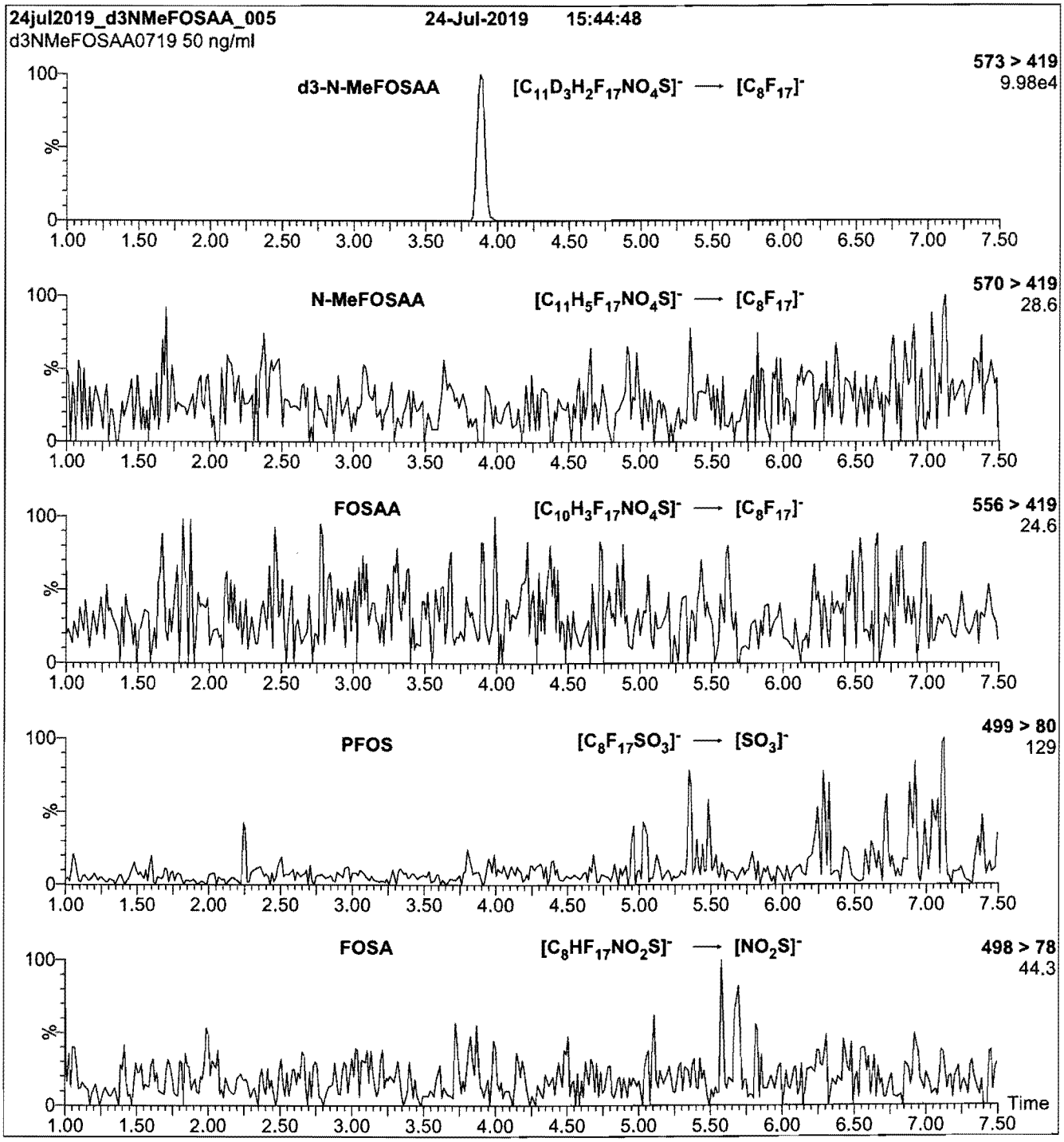
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (d3-N-MeFOSAA)

Mobile phase: Same as Figure 1

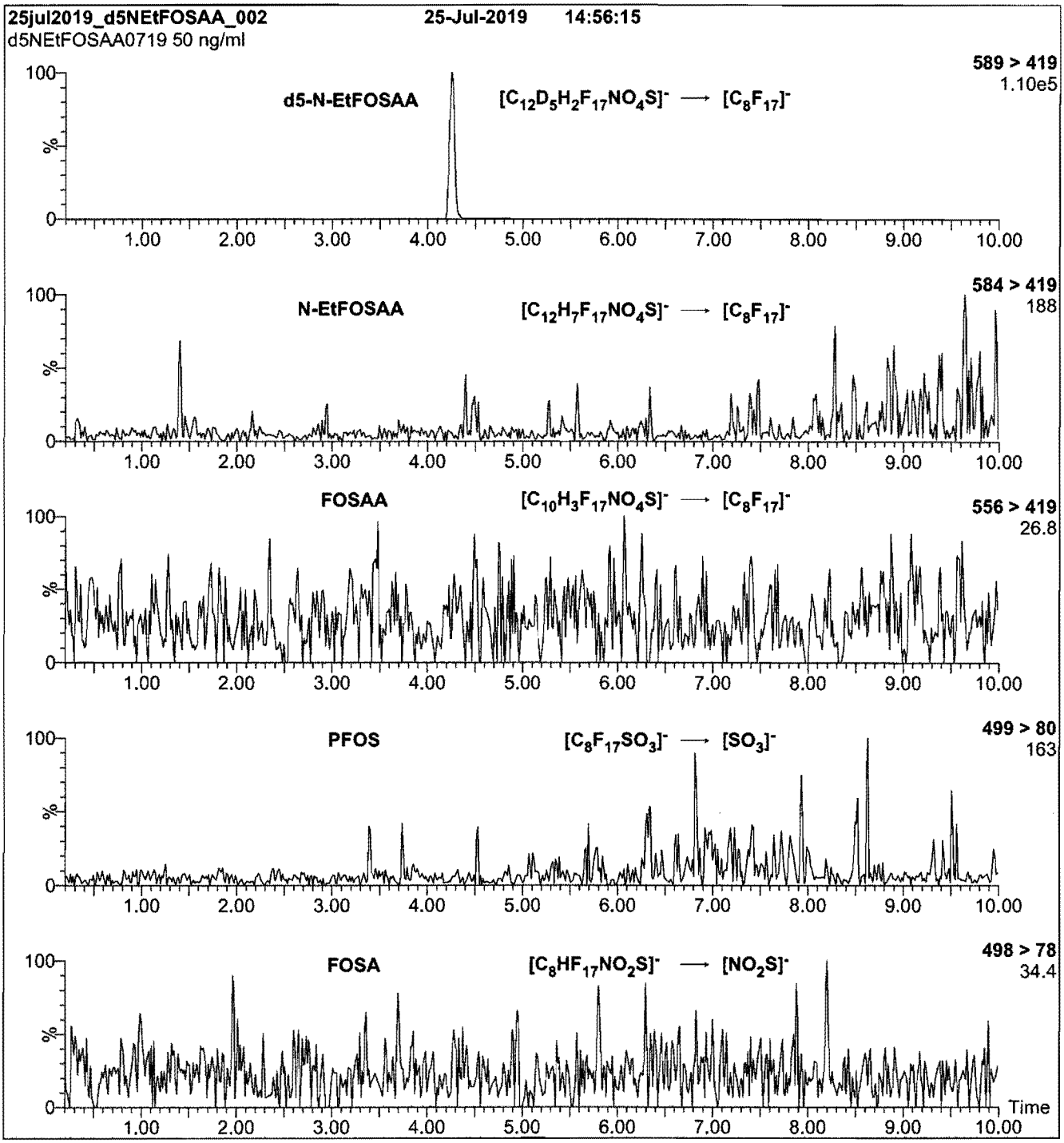
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.33e-3
Collision Energy (eV) = 18

19L0615

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (d5-N-EtFOSAA)

Mobile phase: Same as Figure 1

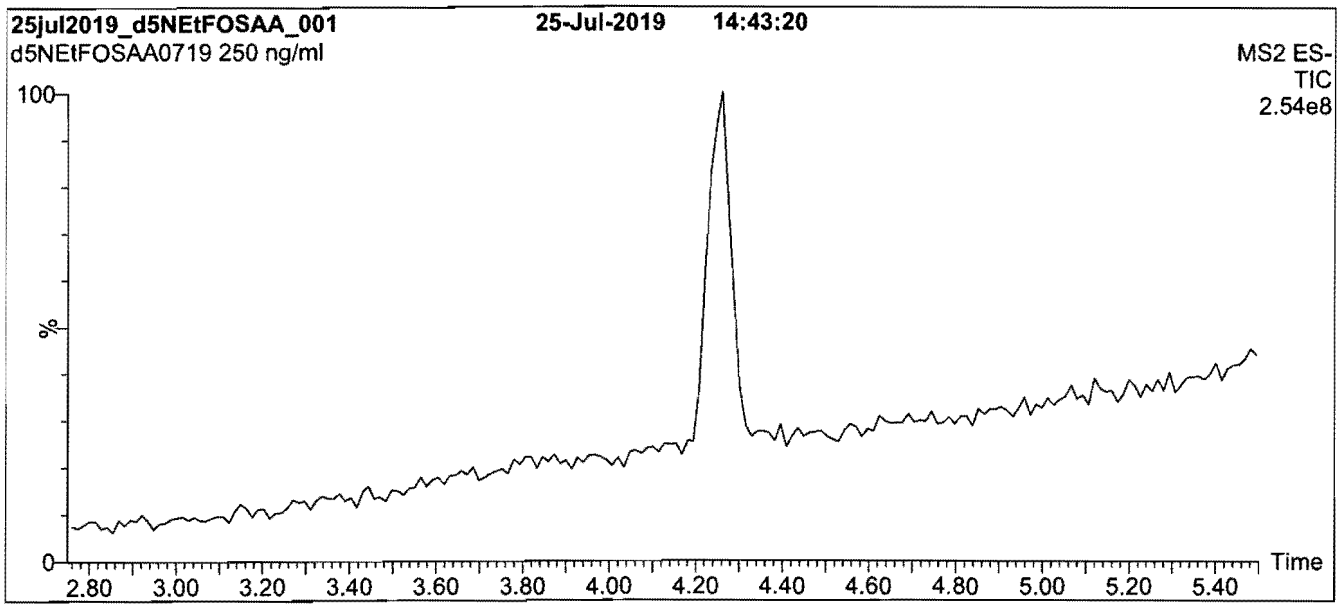
Flow: 300 µl/min

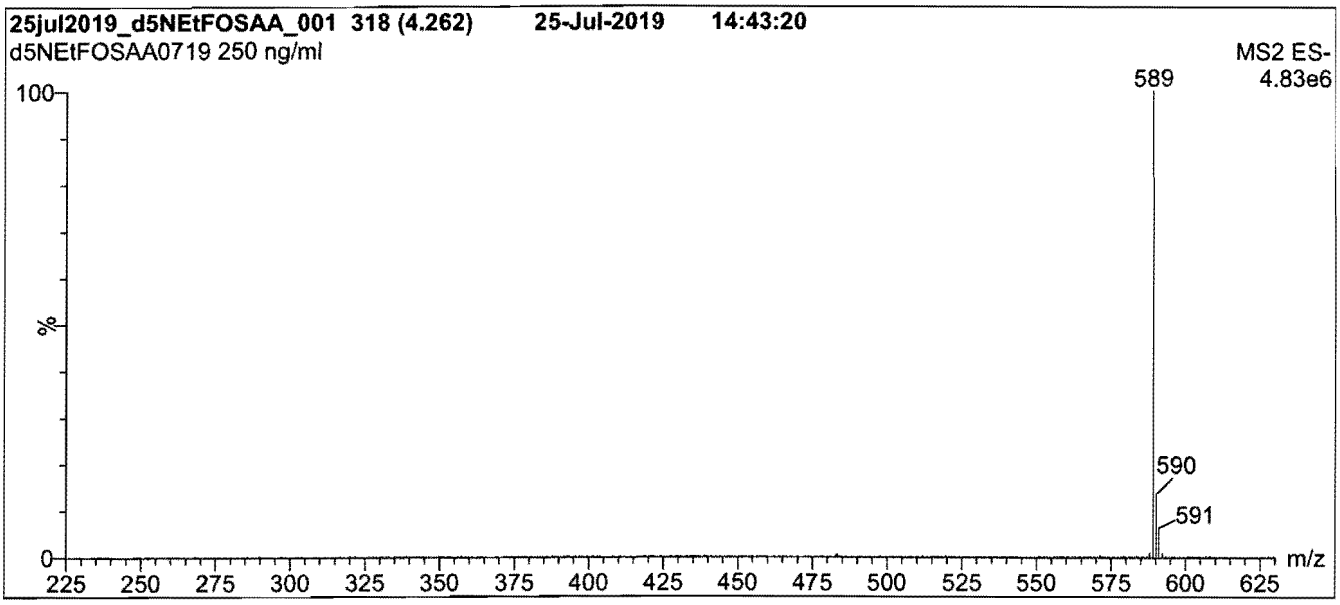
MS Parameters

Collision Gas (mbar) = 3.29e-3
Collision Energy (eV) = 18

19L0615

Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

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1.7 µm, 2.1 x 100 mm

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Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0615

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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where x is expressed as a relative standard uncertainty of the individual parameter.

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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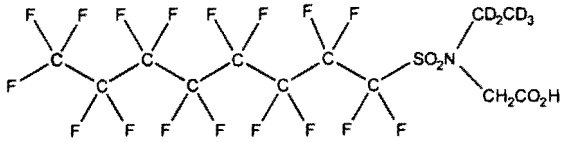
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA0719

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.26
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	07/25/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/25/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

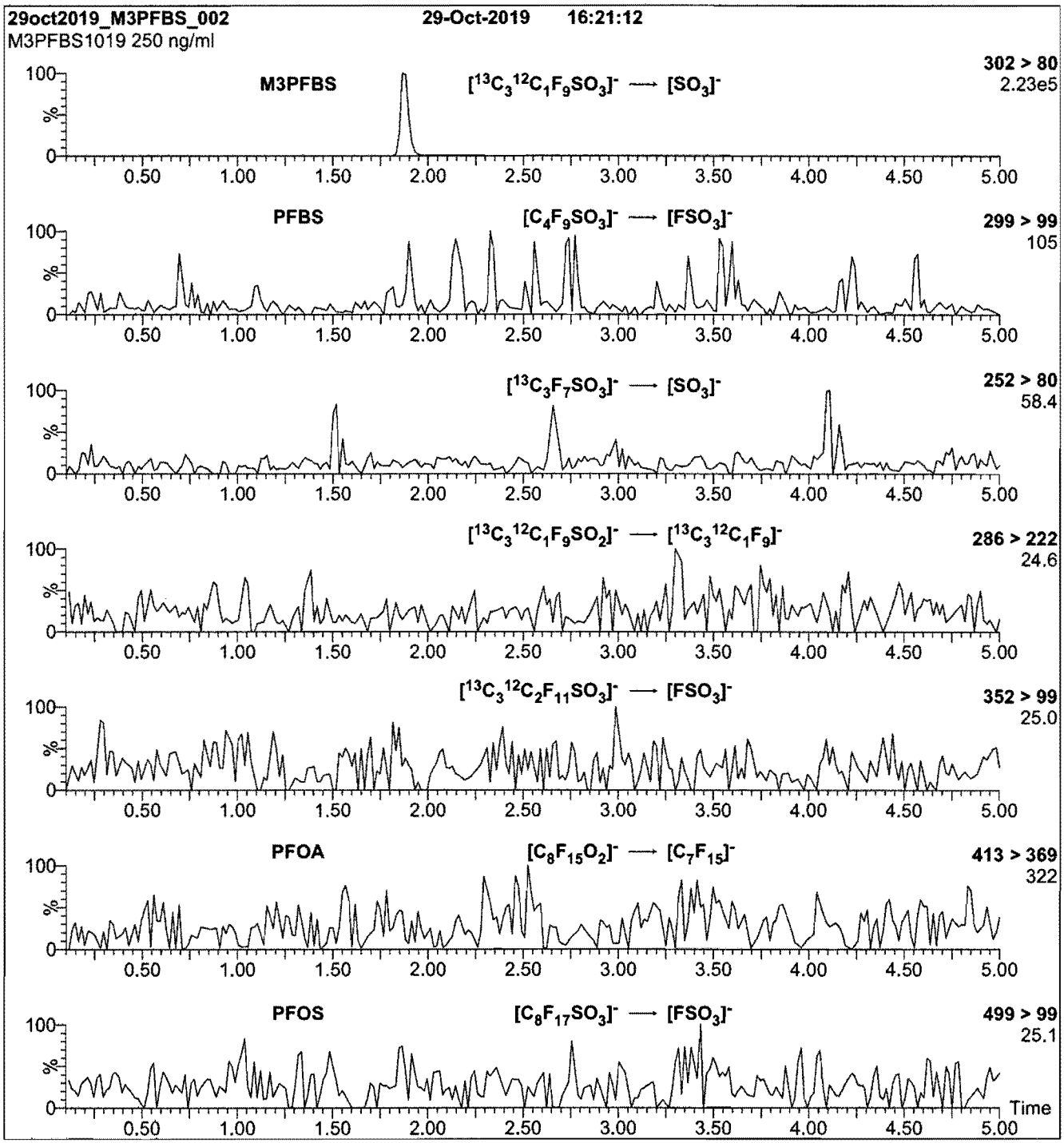
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/26/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3PFBS)

Mobile phase: Same as Figure 1

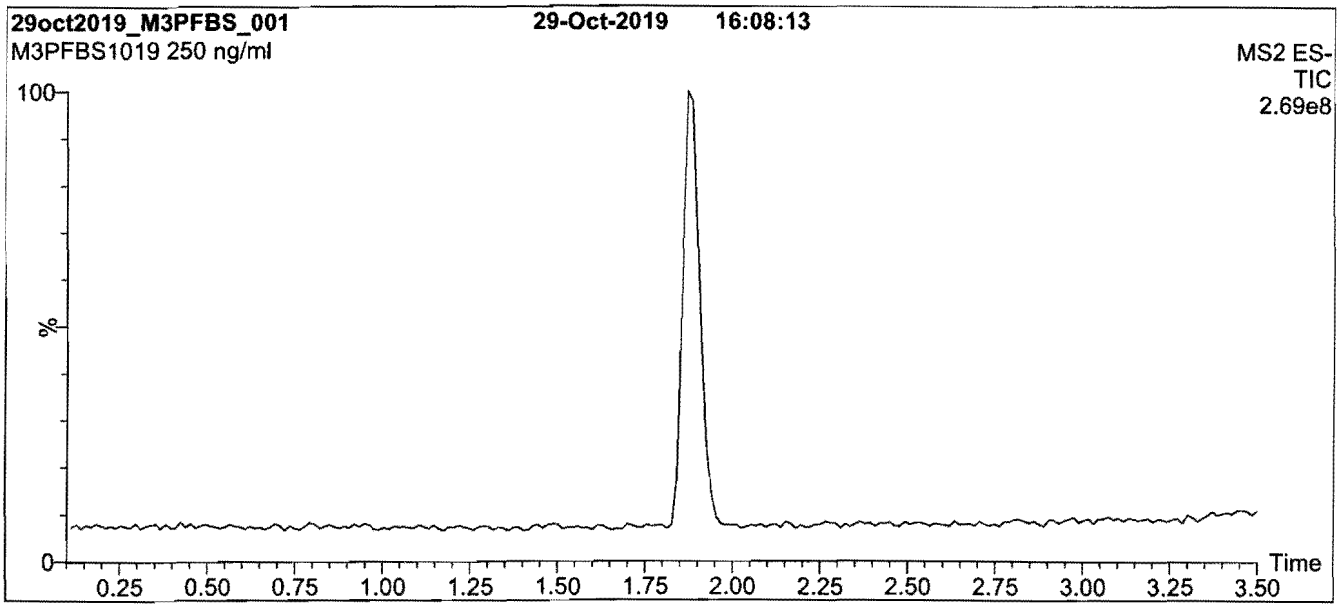
Flow: 300 µl/min

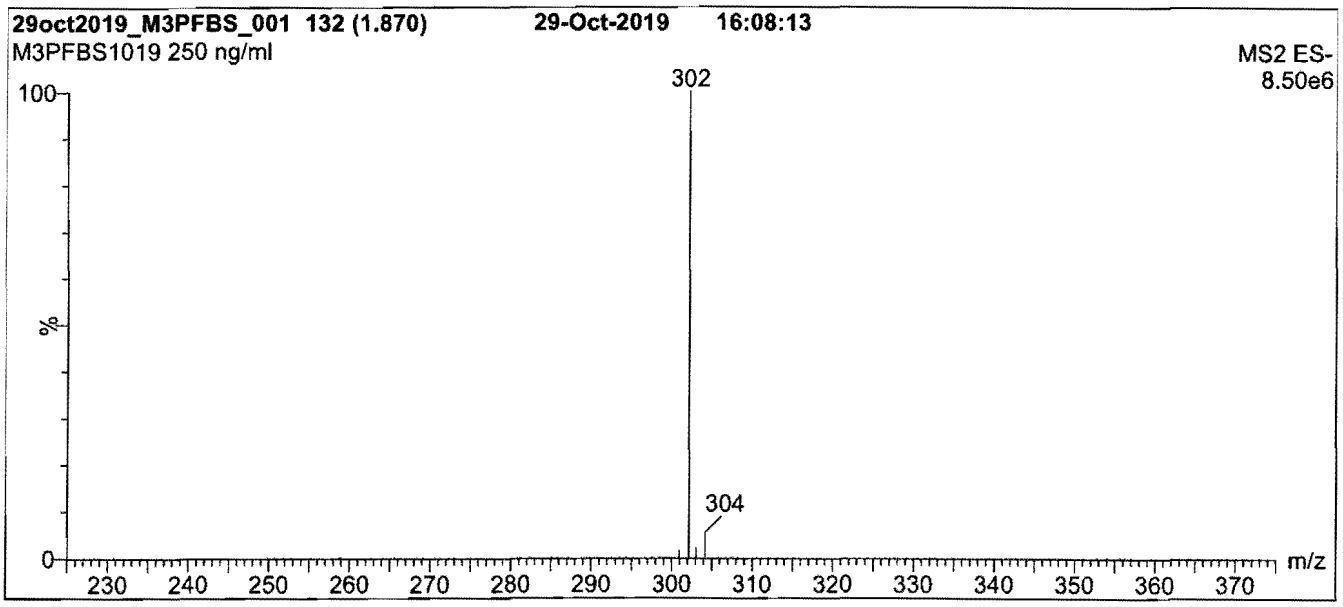
MS Parameters

Collision Gas (mbar) = 3.57e-3
Collision Energy (eV) = 30

19L0616

Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0616

INTENDED USE:

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HANDLING:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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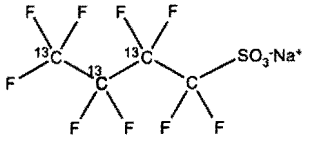
19L0616

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS1019
COMPOUND:	Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	10/29/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/29/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains < 0.1% of perfluoro-1-butanesulfonate.

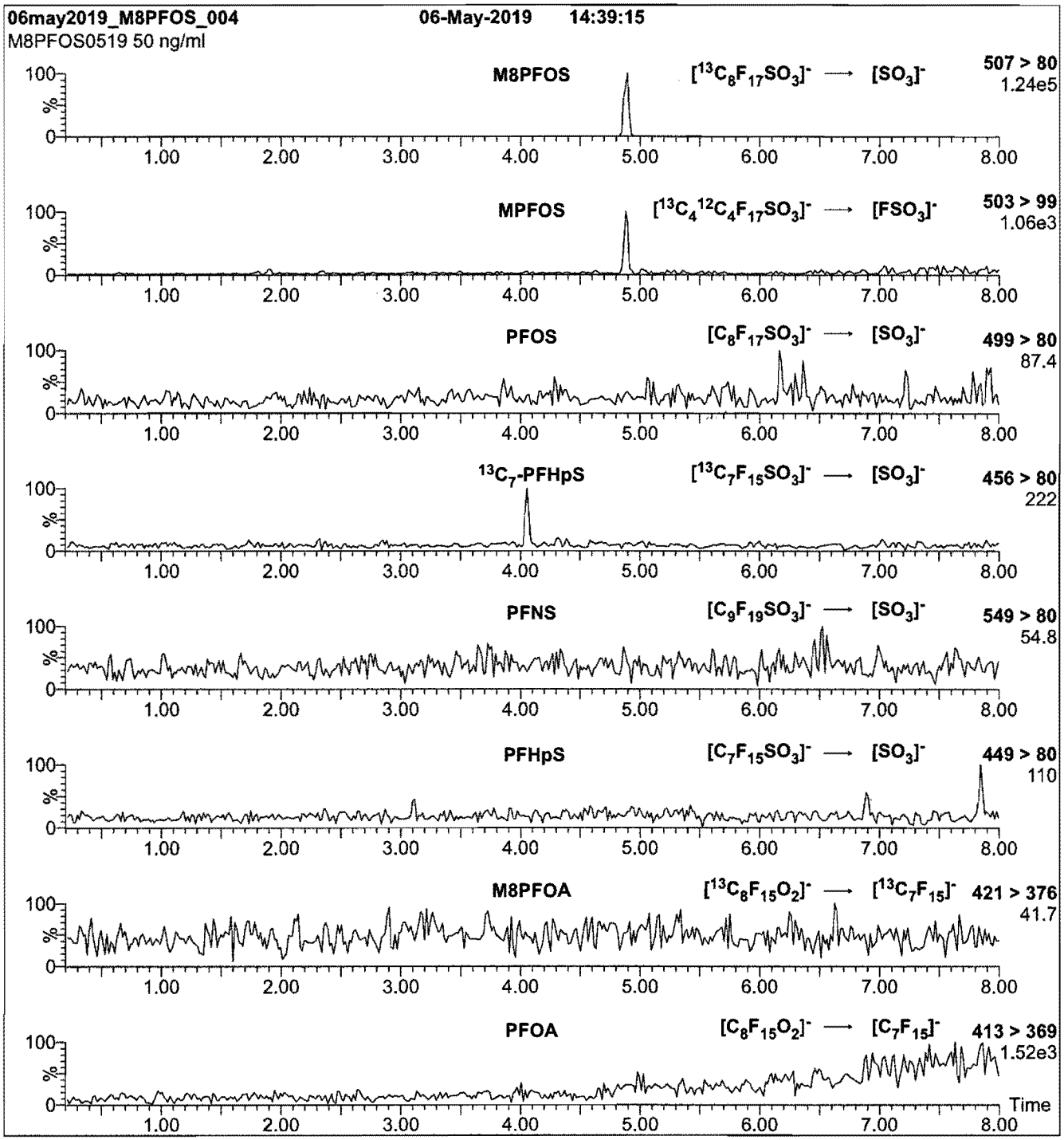
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/08/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0617

Figure 2: **M8PFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M8PFOS)

Mobile phase: Same as Figure 1

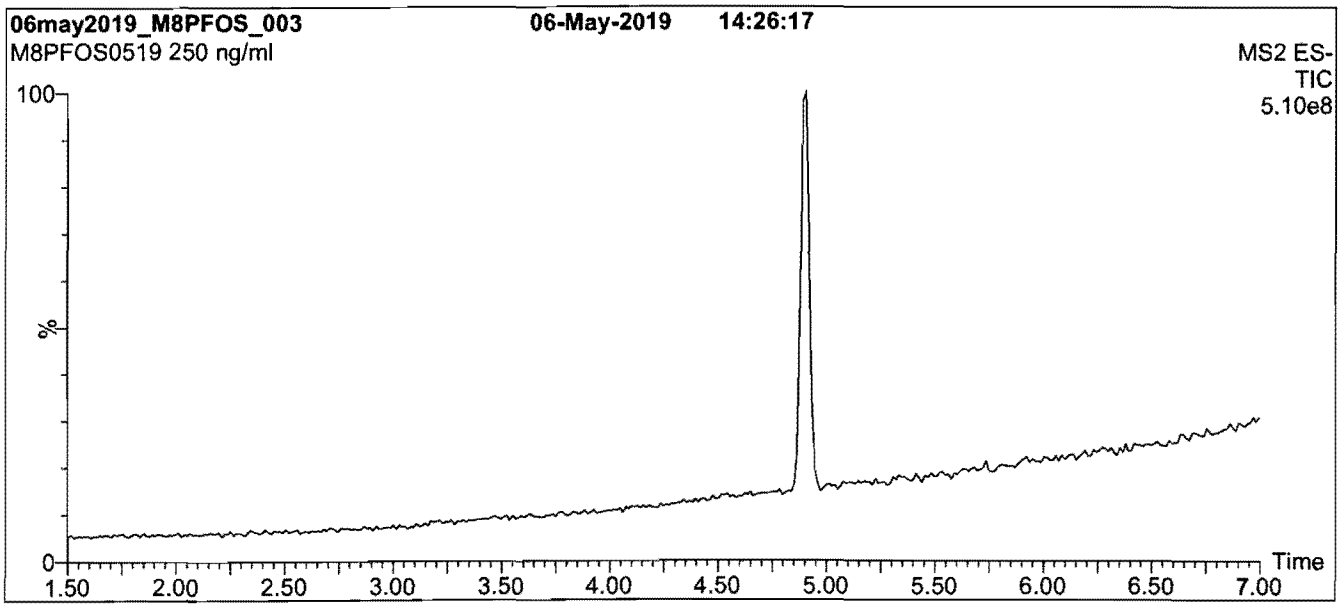
Flow: 300 µl/min

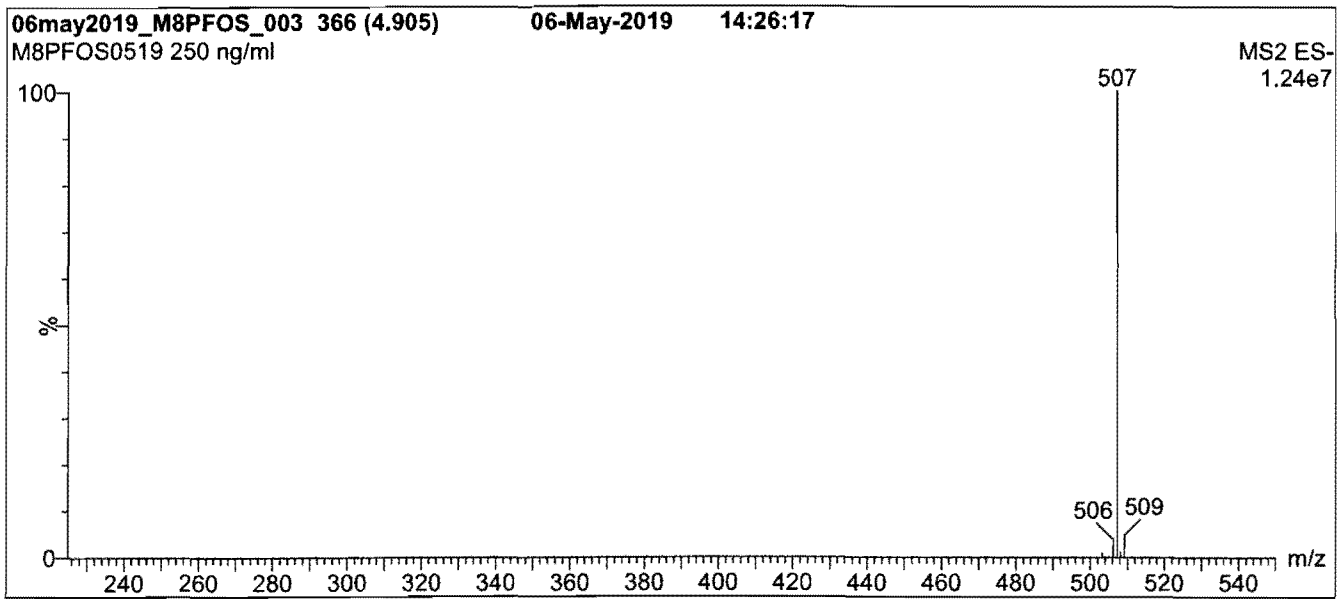
MS Parameters

Collision Gas (mbar) = 2.85e-3
Collision Energy (eV) = 42

19L0617

Figure 1: **M8PFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0617

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

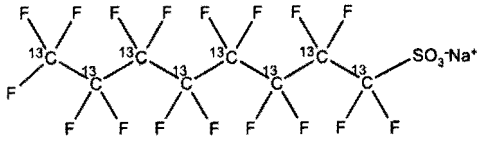
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0617

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOS	**LOT NUMBER:**	M8PFOS0519
COMPOUND:	Sodium perfluoro-1-[$^{13}C_8$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	530.05
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (M8PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	05/06/2019		
EXPIRY DATE: (mm/dd/yyyy)	05/06/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

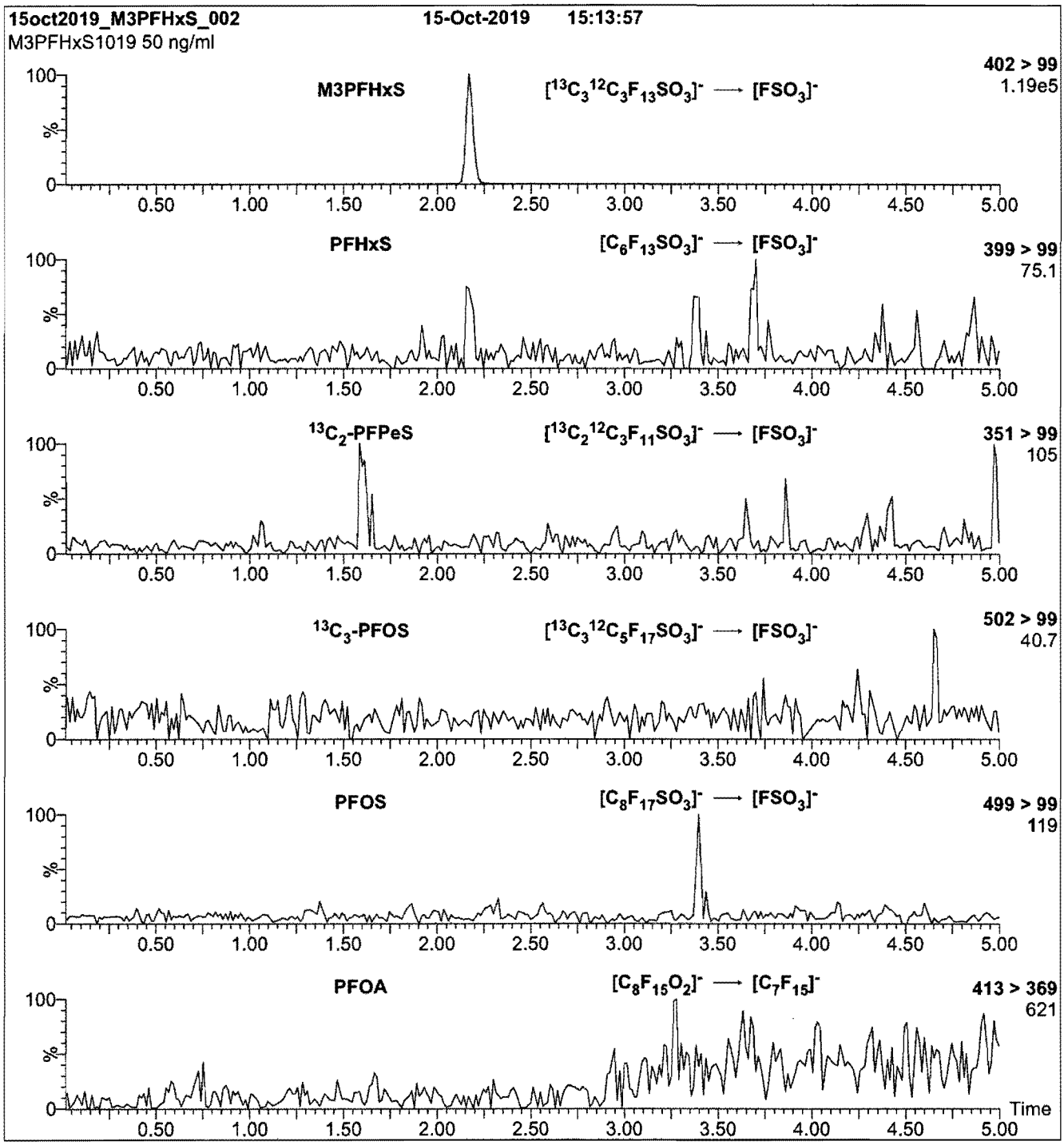
- See page 2 for further details.
- Contains ~ 0.2% of sodium perfluoro-1-[$^{13}C_7$]heptanesulfonate ($^{13}C_7$-PFHpS) and ~ 1.0% of sodium perfluoro-1-[$^{13}C_4$]octanesulfonate (MPFOS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/23/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **M3PFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3PFHxS)

Mobile phase: Same as Figure 1

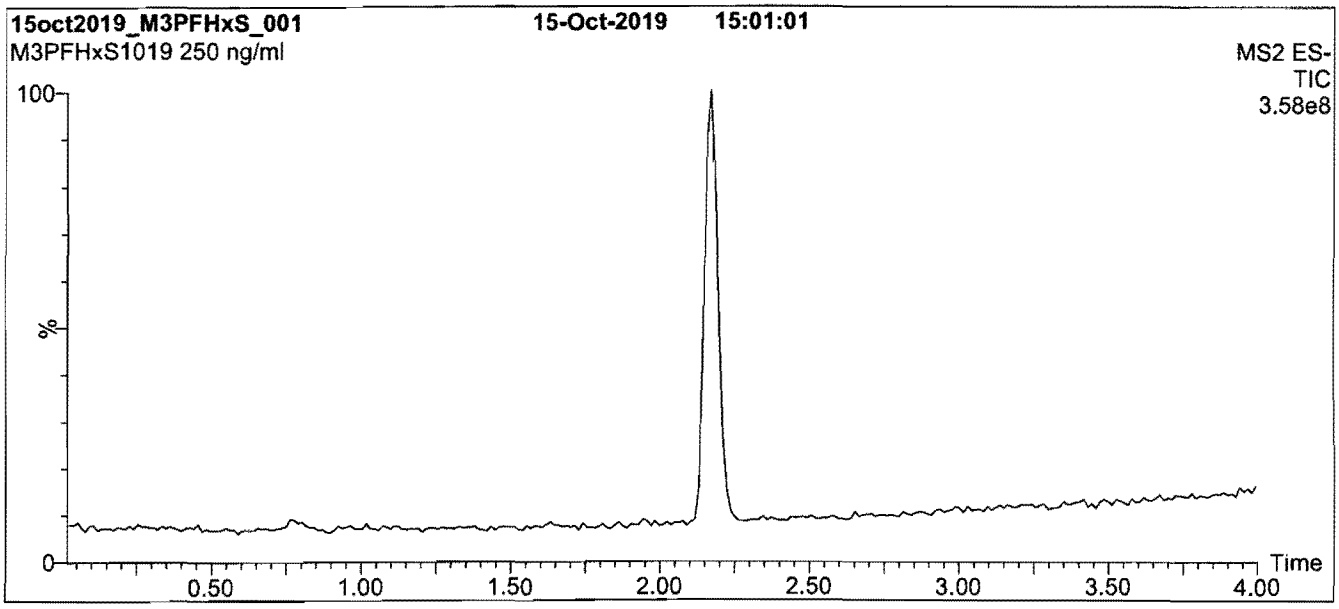
Flow: 300 µl/min

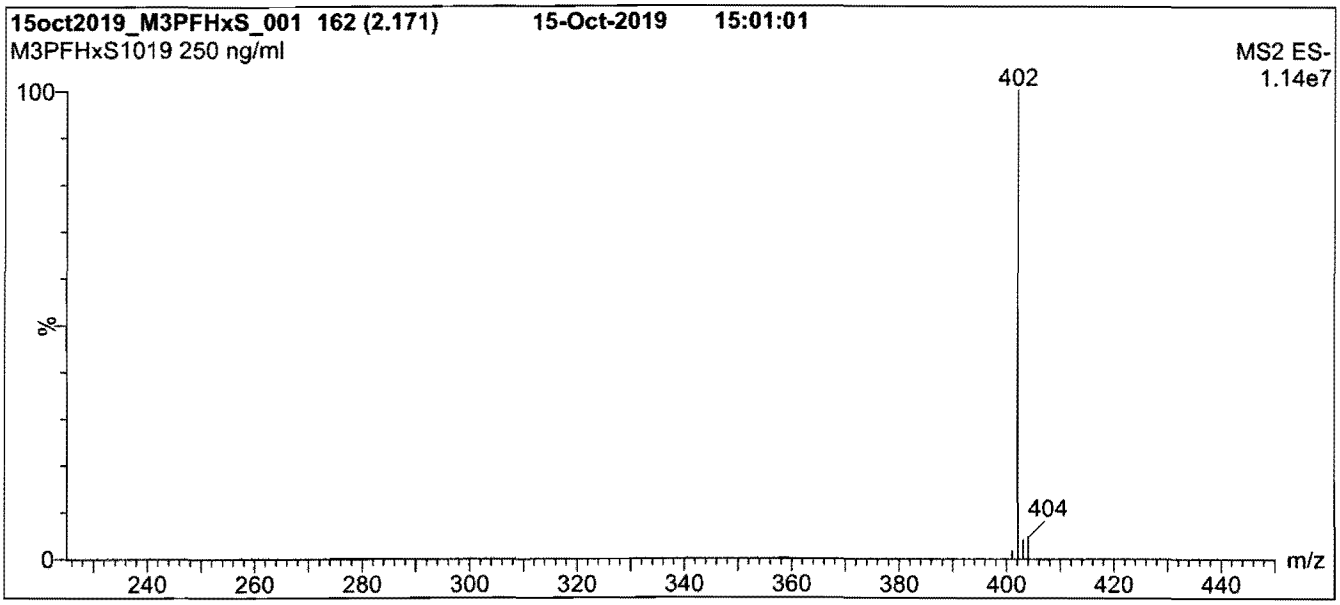
MS Parameters

Collision Gas (mbar) = 3.91e-3
Collision Energy (eV) = 32

19L0618

Figure 1: **M3PFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

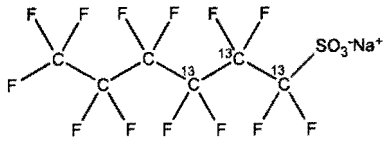
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0618

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFHxS	**LOT NUMBER:**	M3PFHxS1019
COMPOUND:	Sodium perfluoro-1-[1,2,3-$^{13}C_3$]hexanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	425.07
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (M3PFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	10/15/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/15/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.1% perfluoro-1-[1,2-$^{13}C_2$]pentanesulfonate, ~ 0.1% perfluoro-1-octanesulfonate, and ~ 0.05% of perfluoro-1-hexanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/16/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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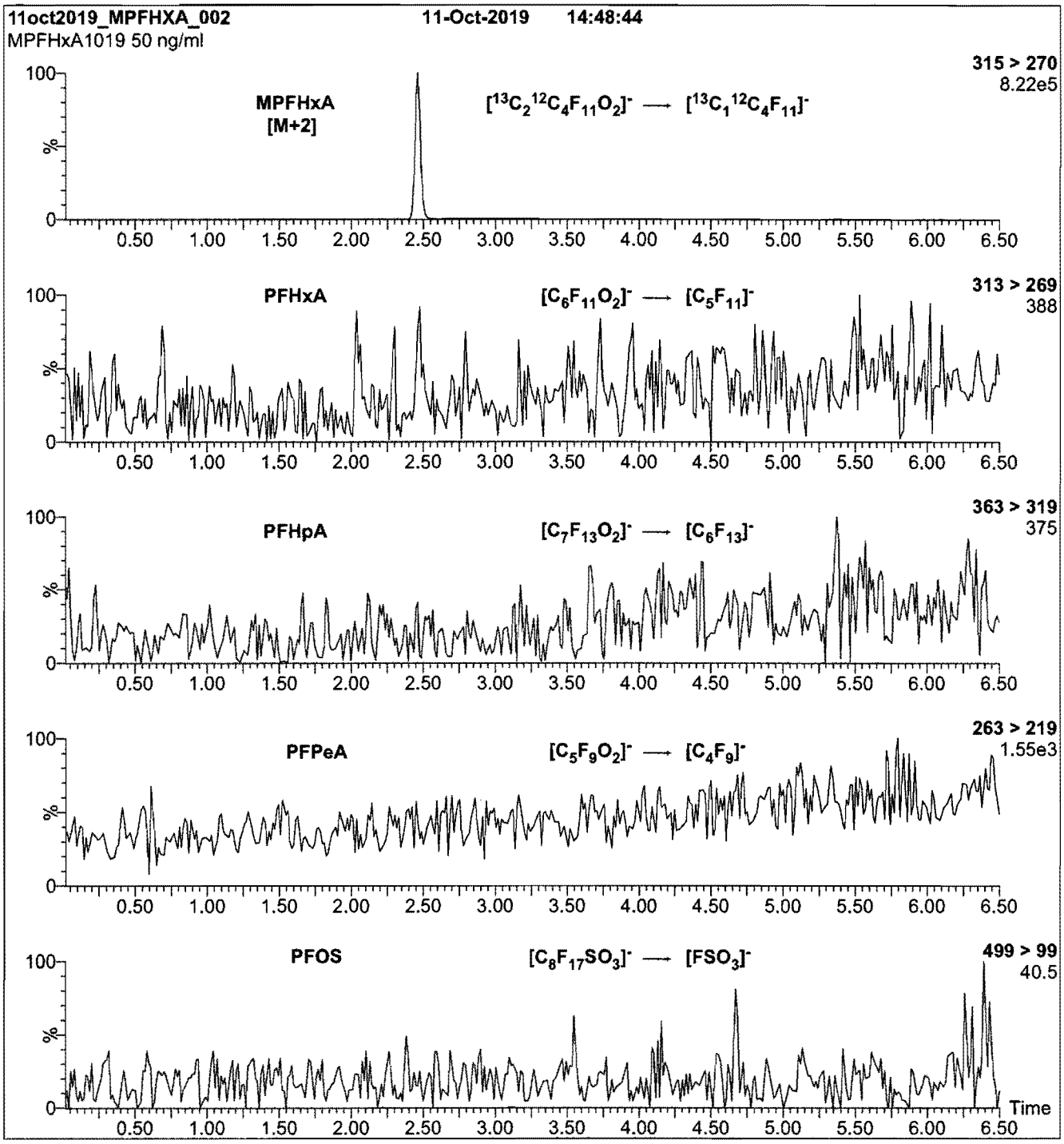
19L0619

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxA)

Mobile phase: Same as Figure 1

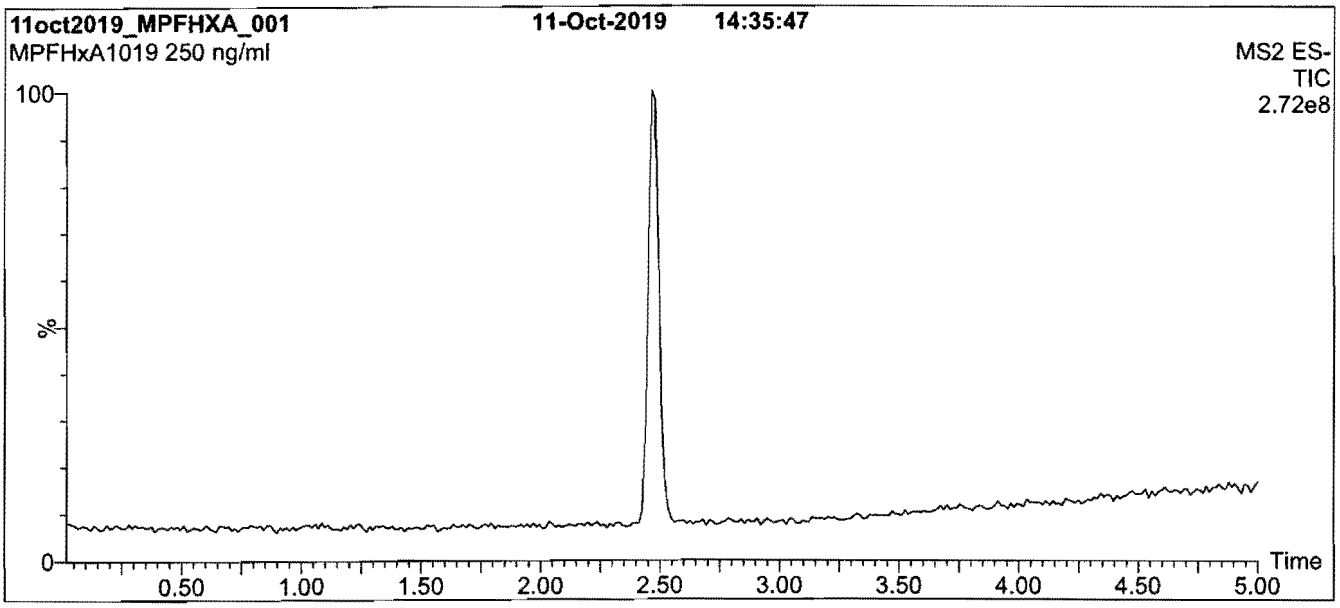
Flow: 300 µl/min

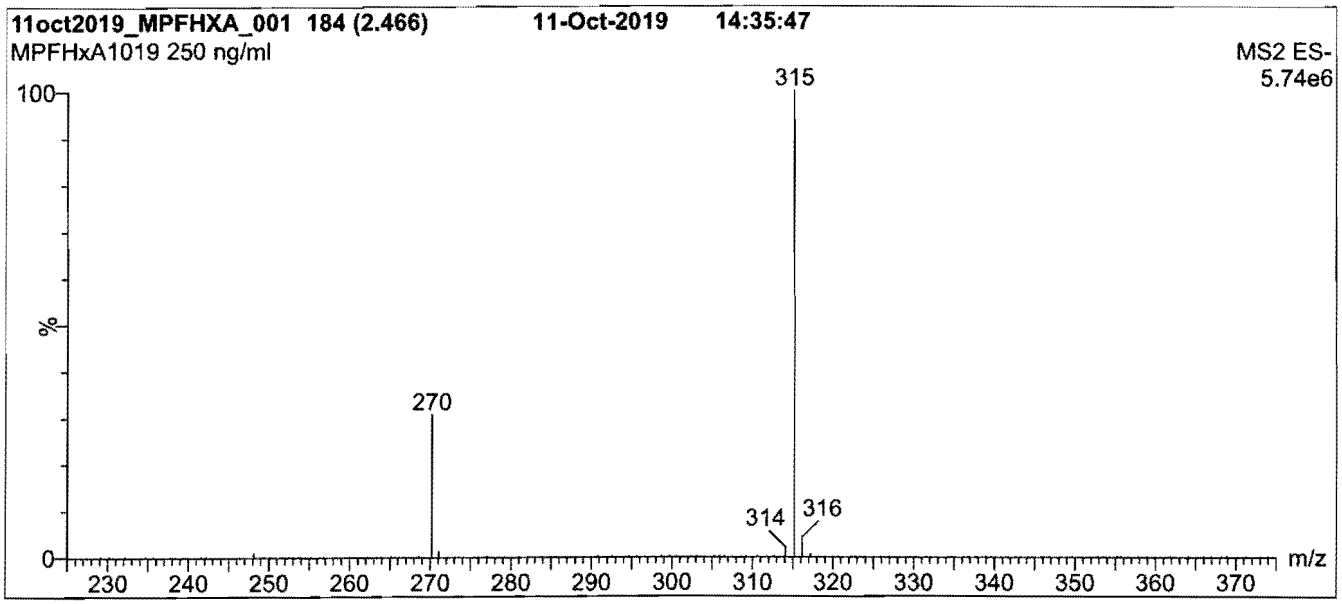
MS Parameters

Collision Gas (mbar) = 3.80e-3
Collision Energy (eV) = 8

19L0619

Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

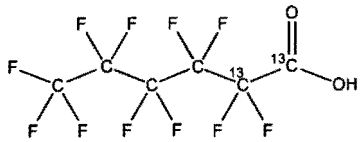
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0619

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA1019
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/11/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

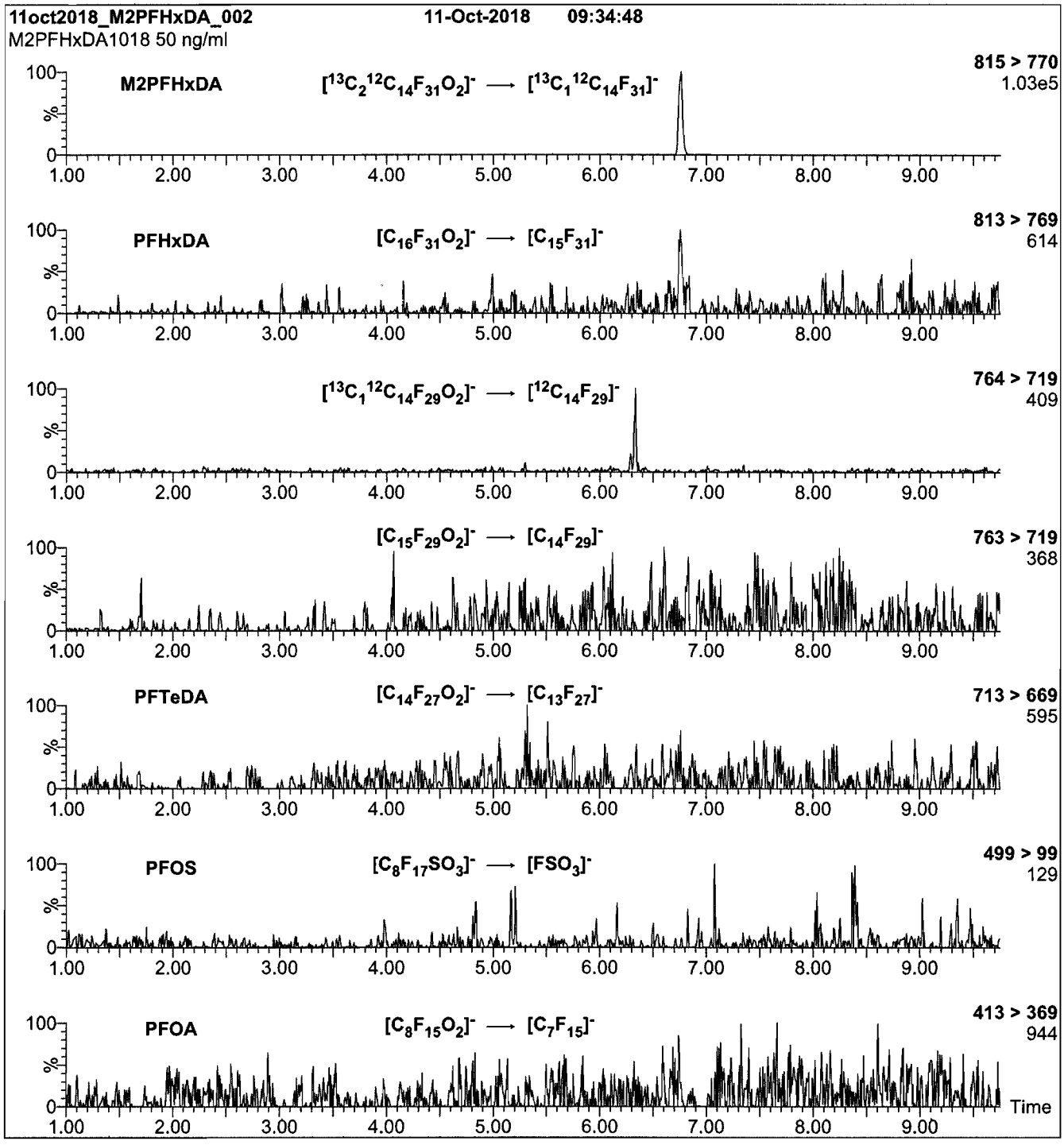
Certified By: _____ **Date:** 10/22/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Form#:27, Issued 2004-11-10
Revision#:6, Revised 2018-08-14

19L0620

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M2PFHxDA)

Mobile phase: Same as Figure 1

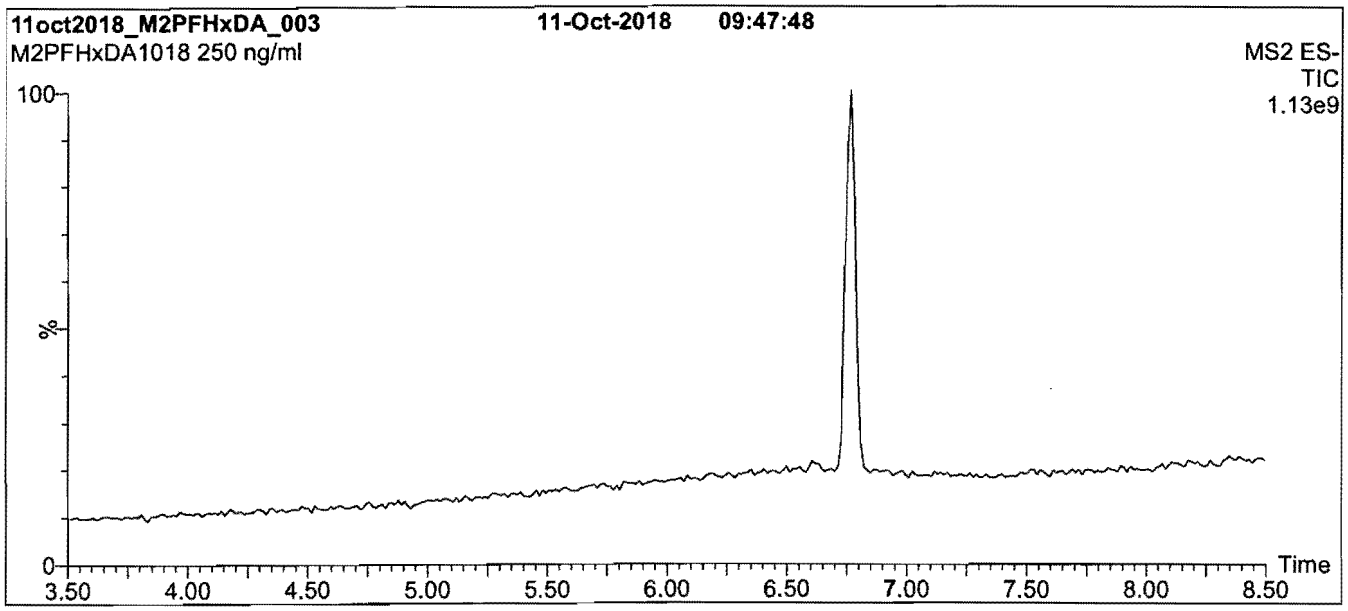
Flow: 300 µl/min

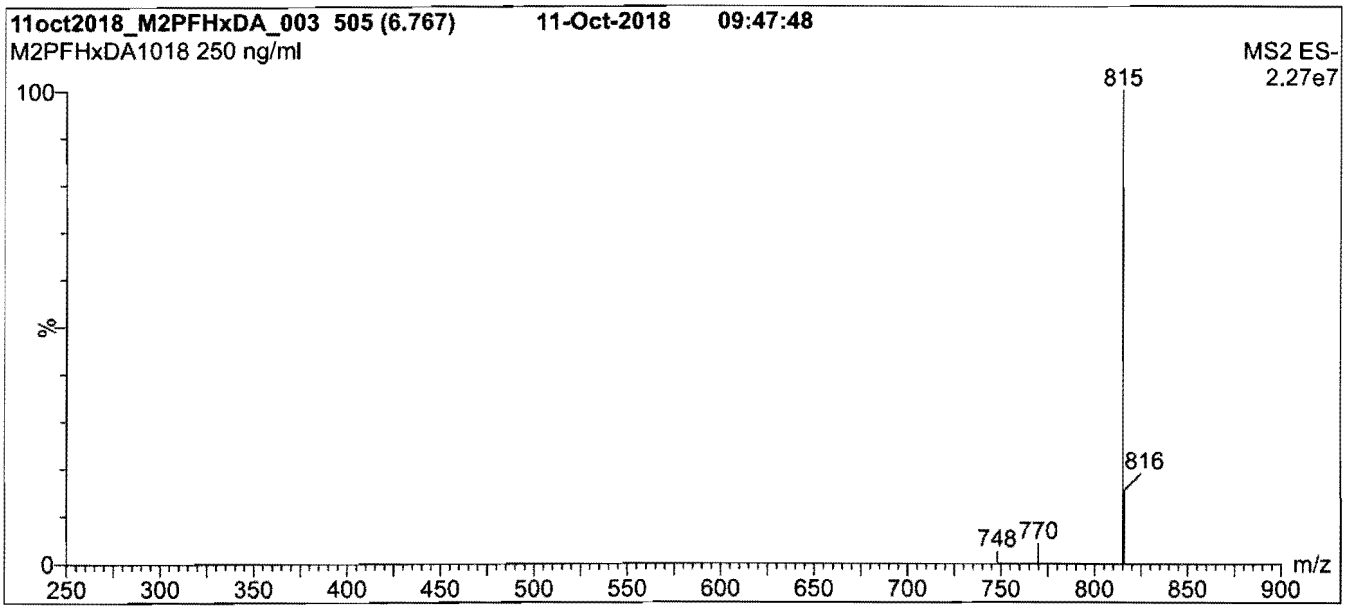
MS Parameters

Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 15

19L0620

Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

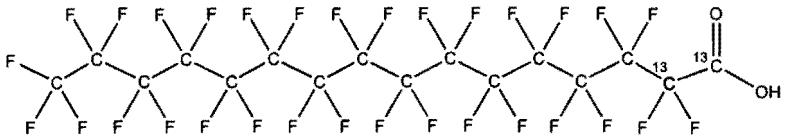
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0620

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA1018
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid and ~ 0.2% of perfluoro-n-[$^{13}C_1$]pentadecanoic acid.

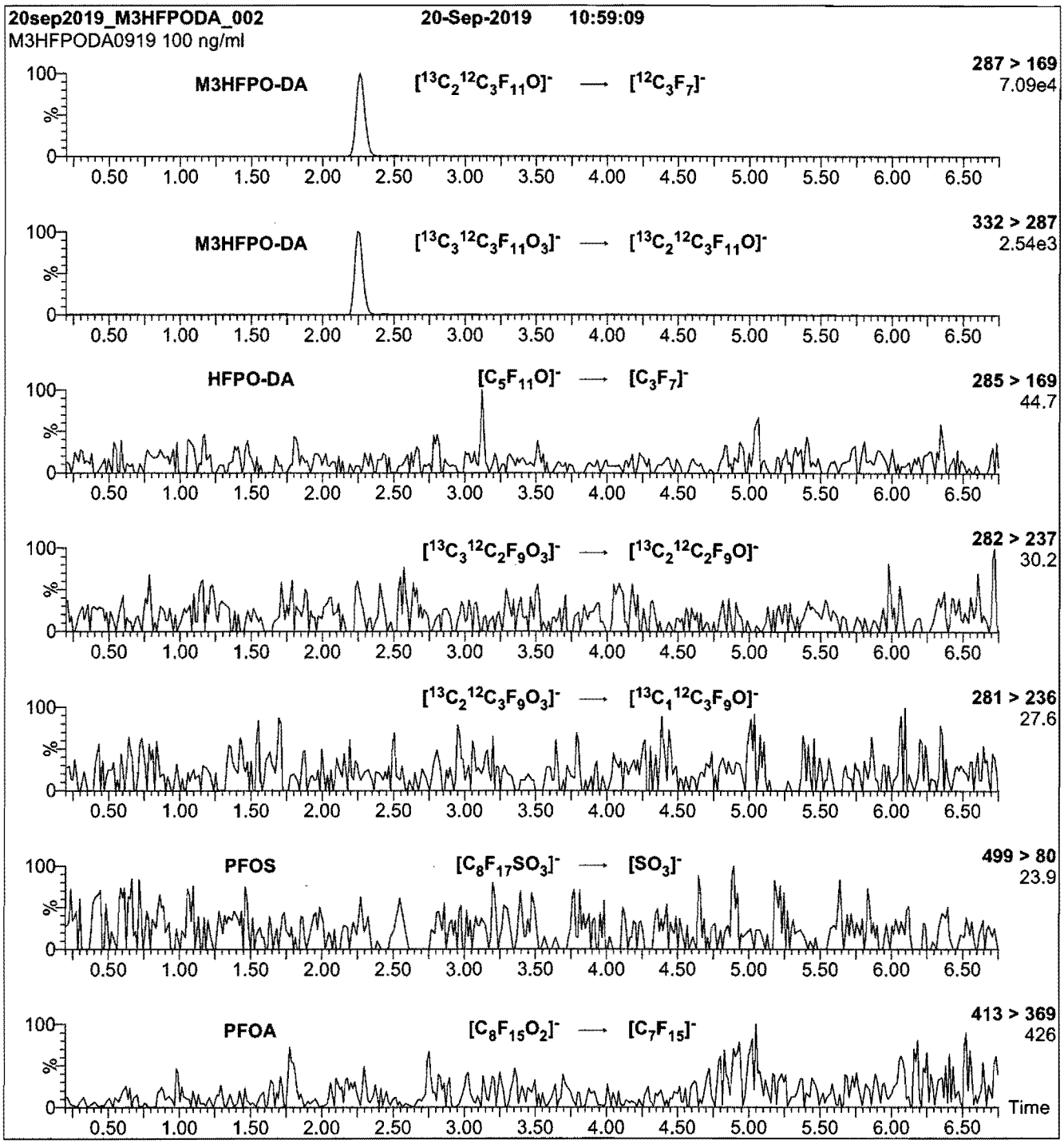
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/19/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0621

Figure 2: **M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M3HFPO-DA)

Mobile phase: Same as Figure 1

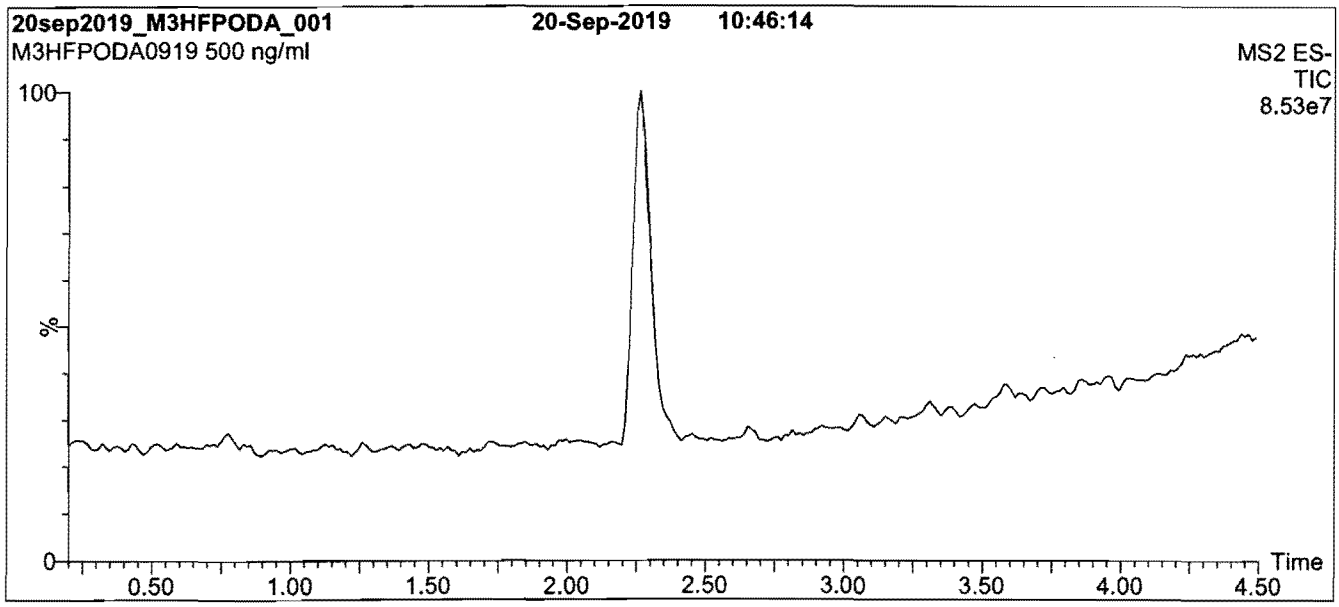
Flow: 300 µl/min

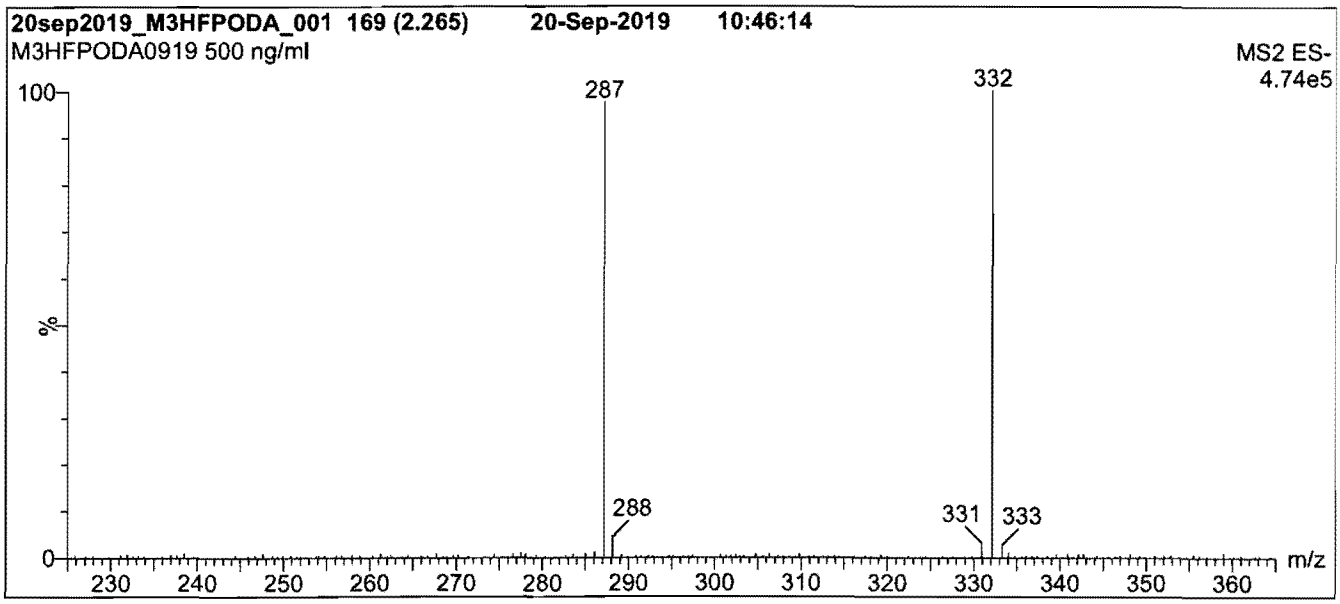
MS Parameters

Collision Gas (mbar) = 3.60e-3
Collision Energy (eV) = 8

19L0621

Figure 1: **M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





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Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Desolvation Temperature (°C) = 325
Desolvation Gas Flow (l/hr) = 1000

19L0621

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HANDLING:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0621

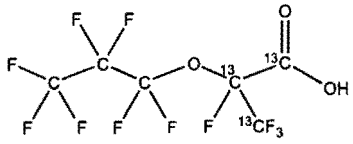
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA0919

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-$^{13}C_3$-propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	09/20/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/20/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.9% of the linear M3HFPO-DA isomer.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/30/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Analytical Standard Record

Vista Analytical Laboratory

20E1202

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
19L0635	PFDoA	06-Dec-19	** Vendor **	23-Jan-24	0.4
19L0636	PFBA	06-Dec-19	** Vendor **	10-Jul-24	0.4
19L0637	PFPeA	06-Dec-19	** Vendor **	04-Sep-24	0.4
19L0638	PFHxA	06-Dec-19	** Vendor **	08-Aug-24	0.4
19L0639	PFDA	06-Dec-19	** Vendor **	01-May-24	0.4
19L0640	PFUdA	06-Dec-19	** Vendor **	19-Mar-24	0.4
19L0641	PFTrDA	06-Dec-19	** Vendor **	26-Sep-24	0.4
19L0642	PFHpA	06-Dec-19	** Vendor **	05-Mar-24	0.4
19L0643	PFOA	06-Dec-19	** Vendor **	06-Sep-24	0.4
19L0644	PFNA	06-Dec-19	** Vendor **	08-Jul-24	0.4
19L0645	PFTeDA	06-Dec-19	** Vendor **	11-Mar-24	0.4
19L0646	PFHxDA	06-Dec-19	** Vendor **	03-Nov-24	0.4
19L0647	PFODA	06-Dec-19	** Vendor **	02-May-24	0.4
19L0648	L-PFBS	06-Dec-19	** Vendor **	10-Jul-24	0.454
19L0649	L-PFPeS	06-Dec-19	** Vendor **	08-Jul-24	0.428
19L0650	L-PFHpS	06-Dec-19	** Vendor **	16-Aug-24	0.42
19L0651	L-PFNS	06-Dec-19	** Vendor **	06-Aug-24	0.418
19L0652	L-PFDS	06-Dec-19	** Vendor **	04-Apr-24	0.415
19L0653	br-PFHxSK	06-Dec-19	** Vendor **	02-Oct-23	0.44
19L0654	br-PFOSK anion	06-Dec-19	** Vendor **	07-Jun-24	0.431
19L0655	4:2 FTS	06-Dec-19	** Vendor **	08-May-24	0.43
19L0656	6:2FTS	06-Dec-19	** Vendor **	09-Sep-24	0.422
19L0657	8:2FTS	06-Dec-19	** Vendor **	11-Sep-24	0.418
19L0658	FOSA-I	06-Dec-19	** Vendor **	12-Sep-24	0.4
19L0659	br-NMeFOSAA	06-Dec-19	** Vendor **	08-Jan-24	0.4
19L0660	br-NEtFOSAA	06-Dec-19	** Vendor **	20-Aug-24	0.4
19L0661	N-MeFOSA-M	06-Dec-19	** Vendor **	07-May-24	2
19L0662	N-EtFOSA-M	06-Dec-19	** Vendor **	07-May-24	2
19L0663	N-MeFOSE-M	06-Dec-19	** Vendor **	08-Apr-24	2
19L0664	N-EtFOSE-M	06-Dec-19	** Vendor **	08-Apr-24	2
19L0665	10:2FTS	06-Dec-19	** Vendor **	11-Jun-22	0.415
19L0666	HFPO-DA	06-Dec-19	** Vendor **	20-Sep-22	0.4
19L0667	11Cl-PF3OUdS	06-Dec-19	** Vendor **	23-Nov-24	0.425
19L0668	9Cl-PF3ONS	06-Dec-19	** Vendor **	30-Oct-24	0.43
19L0669	NaDONA	06-Dec-19	** Vendor **	15-Jul-24	0.425
19L0670	PFECHS	06-Dec-19	** Vendor **	04-Apr-24	0.435
19L0671	L-PFPrS	06-Dec-19	** Vendor **	14-Dec-24	0.438
19L1707	L-PFDoS	17-Dec-19	** Vendor **	06-Dec-23	0.415

Analytical Standard Record

Vista Analytical Laboratory

20E1202

Description:	PFC NS Stock	Expires:	12-May-21
Standard Type:	Analyte Spike	Prepared:	12-May-20
Solvent:	MeOH	Prepared By:	Brittany M. Lamb
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	12-May-20 10:53 by BML

Analyte	CAS Number	Concentration	Units
L-PFHpA		1	ug/mL
10:2 FTS	120226-60-0	1	ug/mL
L-MeFOSA	31506-32-8	5	ug/mL
L-MeFOSAA	2355-31-9	0.76	ug/mL
L-MeFOSE	24448-09-7	5	ug/mL
L-PFBA		1	ug/mL
L-PFBS		1	ug/mL
L-PFDA		1	ug/mL
L-PFDoA		1	ug/mL
L-EtFOSAA	2991-50-6	0.776	ug/mL
L-PFDS		1	ug/mL
L-EtFOSA	4151-50-2	5	ug/mL
L-PFHpS		1	ug/mL
L-PFHxA		1	ug/mL
L-PFHxDA		1	ug/mL
L-PFHxS		0.812	ug/mL
L-PFNA		1	ug/mL
L-PFNS	68259-12-1	1	ug/mL
L-PFOA		1	ug/mL
L-PFODA		1	ug/mL
L-PFDoS		1	ug/mL
cis-PFECHS		0.668	ug/mL
11Cl-PF3OUdS	763051-92-9	1	ug/mL
4:2 FTS	757124-72-4	1	ug/mL
6:2 FTS	27619-97-2	1	ug/mL
8:2 FTS	39108-34-4	1	ug/mL
9Cl-PF3ONS	756426-58-1	1	ug/mL
ADONA	919005-14-4	1	ug/mL
Br-EtFOSAA		0.224	ug/mL
Br-MeFOSAA		0.24	ug/mL
L-EtFOSE	1691-99-2	5	ug/mL
Br-PFOS	2795-39-3	0.211	ug/mL
L-PFPeA		1	ug/mL
EtFOSA	4151-50-2	5	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

20E1202

Description:	PFC NS Stock	Expires:	12-May-21
Standard Type:	Analyte Spike	Prepared:	12-May-20
Solvent:	MeOH	Prepared By:	Brittany M. Lamb
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	12-May-20 10:53 by BML

Analyte	CAS Number	Concentration	Units
EtFOSAA	2991-50-6	1	ug/mL
EtFOSE	1691-99-2	5	ug/mL
F-53B Total		2	ug/mL
HFPO-DA	13252-13-6	1	ug/mL
L-4:2 FTS	75124-72-4	1	ug/mL
L-6:2 FTS		1	ug/mL
L-8:2FTS		1	ug/mL
Br-PFHxS	3871-99-6	0.189	ug/mL
Total 6:2 FTS		1	ug/mL
PFOA	335-67-1	1	ug/mL
PFODA	16517-11-6	1	ug/mL
PFOS	1763-23-1	1	ug/mL
PFOSA	754-91-6	1	ug/mL
PFPeA	2706-90-3	1	ug/mL
PFPeS	2706-91-4	1	ug/mL
PFPrS	423-41-6	1	ug/mL
PFTeDA	376-06-7	1	ug/mL
L-PFOS		0.789	ug/mL
PFUnA	2058-94-8	1	ug/mL
PFHxS	355-46-4	1	ug/mL
Total EtFOSAA		1	ug/mL
Total MeFOSAA		1	ug/mL
Total PFDS		1	ug/mL
Total PFHpS		1	ug/mL
Total PFHxS		1	ug/mL
Total PFOA		1	ug/mL
Total PFOS		1	ug/mL
Total PFUnA		1	ug/mL
PFTrDA	72629-94-8	1	ug/mL
PFDA	335-76-2	1	ug/mL
trans-PFECHS		0.335	ug/mL
L-PFPeS	2706-91-4	1	ug/mL
L-PFTeDA		1	ug/mL
L-PFTrDA		1	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

20E1202

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Vials:	1	Last Edit:	12-May-20 10:53 by BML

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MeFOSA	31506-32-8	5	ug/mL
MeFOSAA	2355-31-9	1	ug/mL
MeFOSE	24448-09-7	5	ug/mL
PFNS	68259-12-1	1	ug/mL
PFBS	375-73-5	1	ug/mL
PFNA	375-95-1	1	ug/mL
PFDoA	307-55-1	1	ug/mL
PFDoS	79780-39-5	1	ug/mL
PFDS	335-77-3	1	ug/mL
PFecHS	646-83-3	1	ug/mL
PFHpA	375-85-9	1	ug/mL
PFHpS	375-92-8	1	ug/mL
PFHxA	307-24-4	1	ug/mL
PFHxDA	67905-19-5	1	ug/mL
L-PFOSA		1	ug/mL
PFBA	375-22-4	1	ug/mL

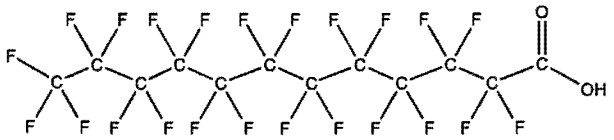
19L0635

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid
LOT NUMBER: PFDoA0119

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
MOLECULAR WEIGHT: 614.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/23/2019
EXPIRY DATE: (mm/dd/yyyy) 01/23/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/30/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0635

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

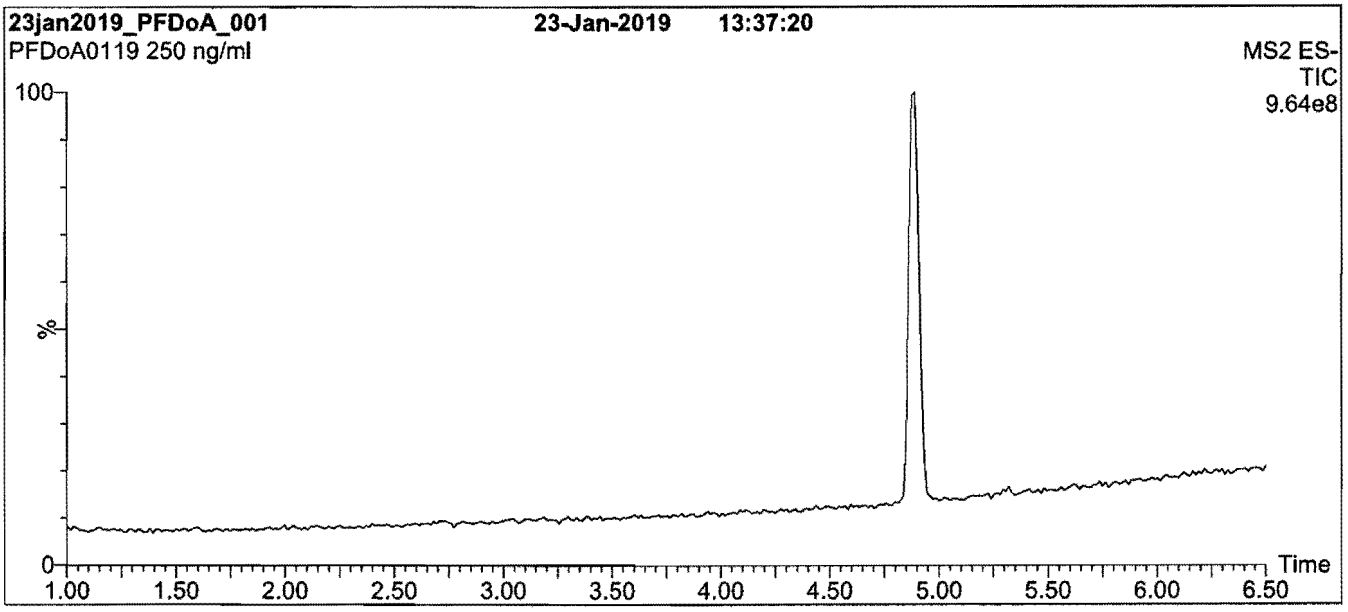
CALA Testing Accreditation No. A 1326

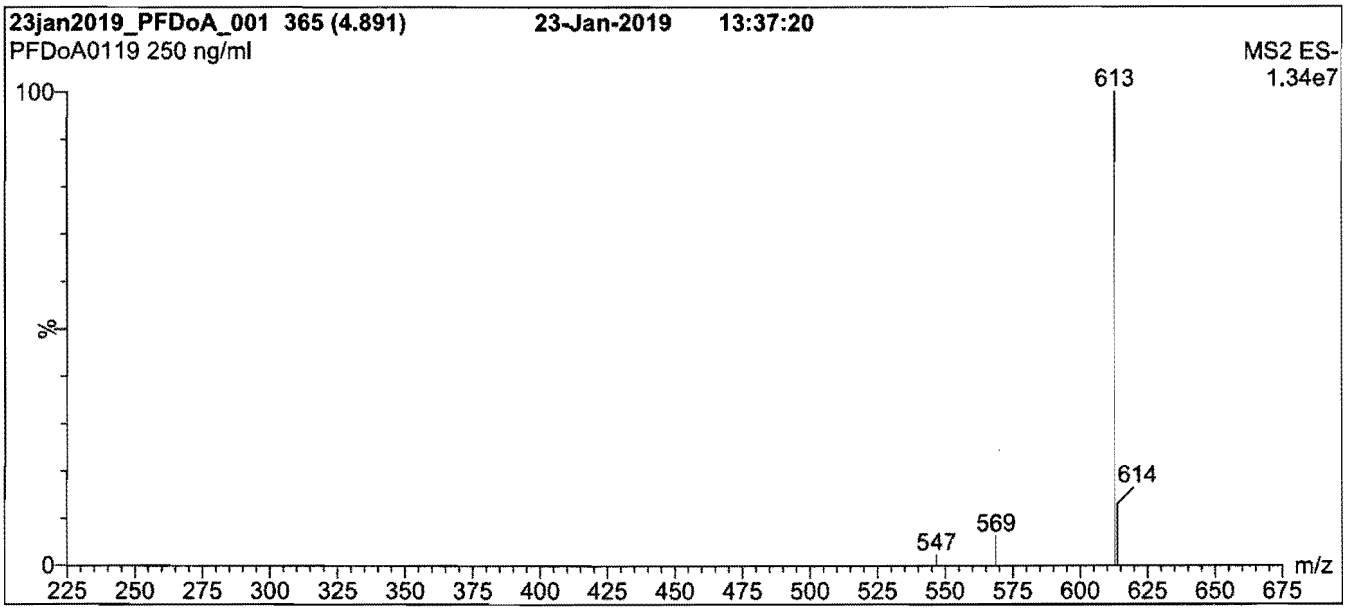
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0635

- **Figure 1:** **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

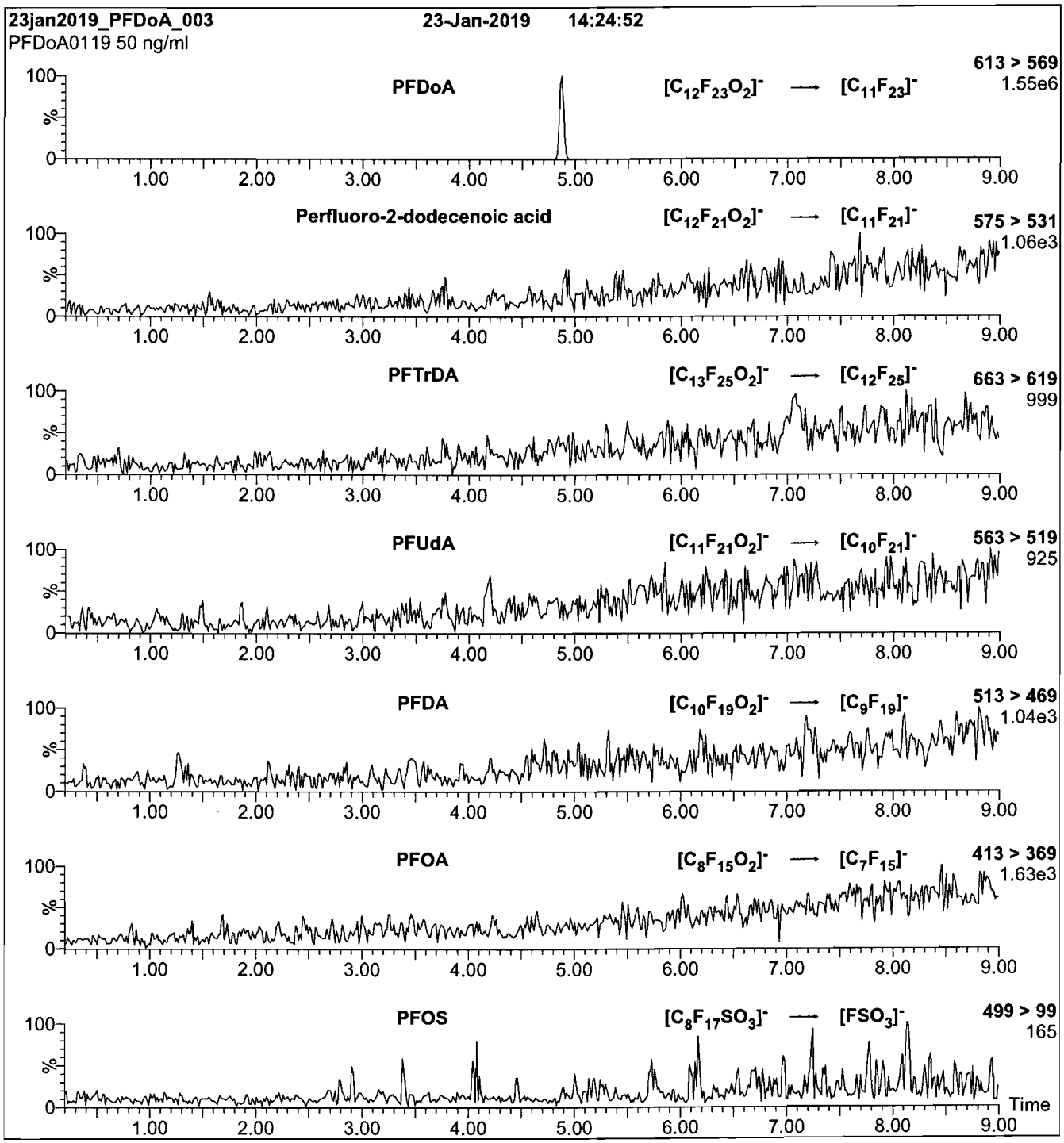
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 500
Desolvation Gas Flow (l/hr) = 1000

191L0635

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFDoA)

Mobile phase: Same as Figure 1

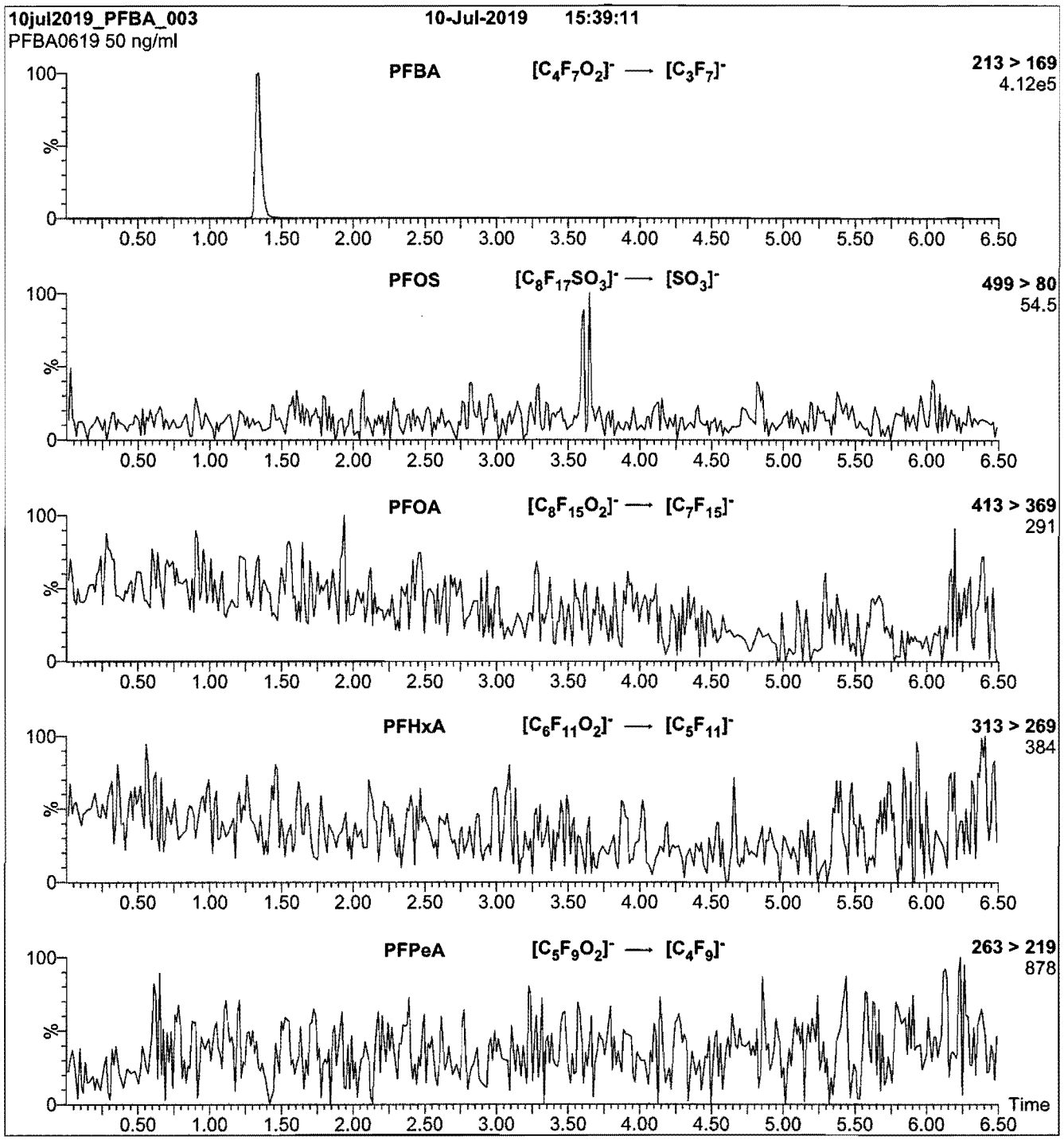
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.72e-3
Collision Energy (eV) = 12

19L0636

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFBA)

Mobile phase: Same as Figure 1

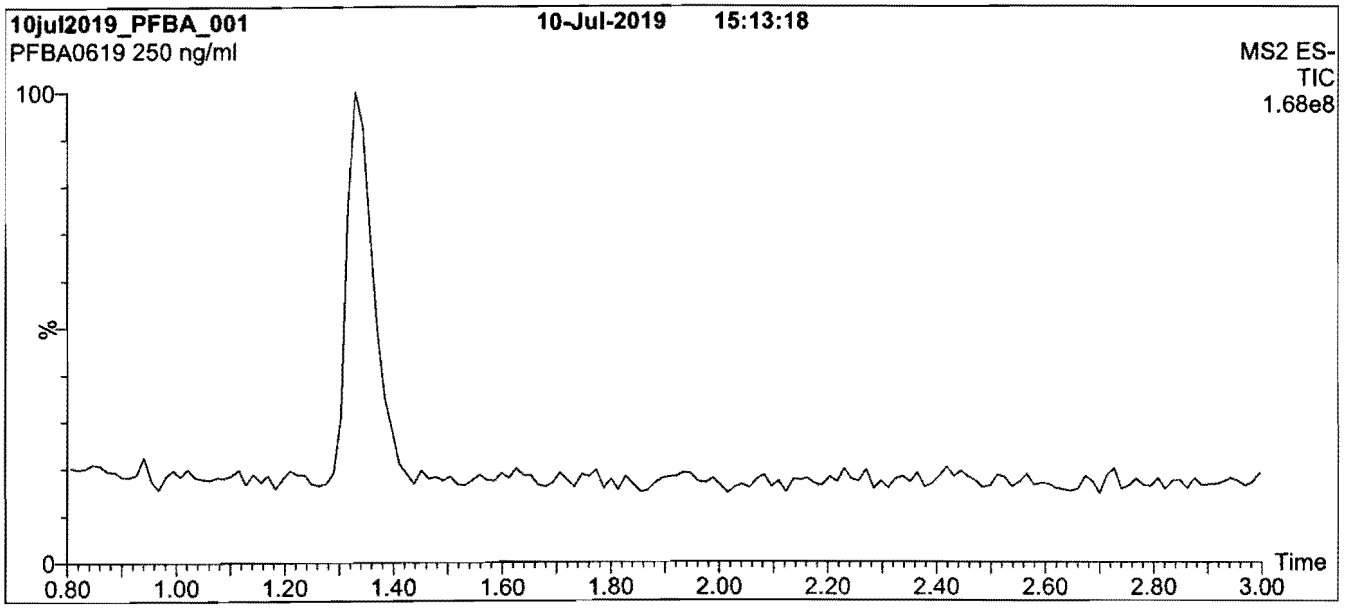
Flow: 300 µl/min

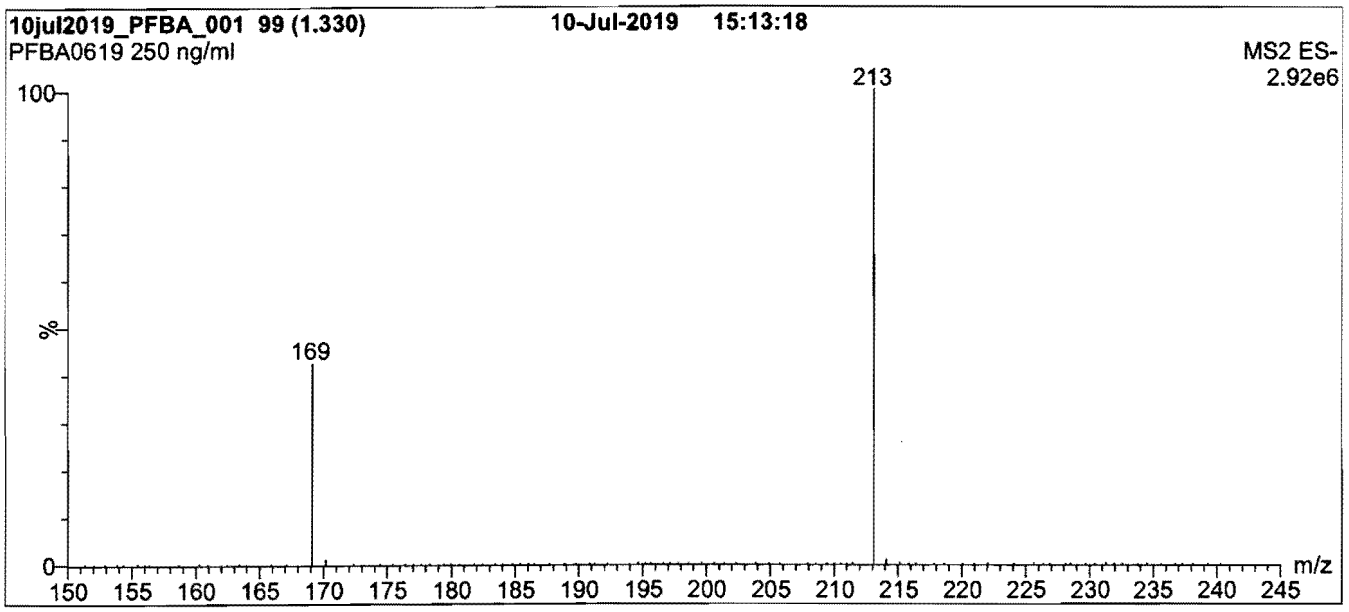
MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 8

1910636

Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 70% organic over 7 min.
Ramp to 90% organic over 2 min and hold for
1.5 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
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19L0636

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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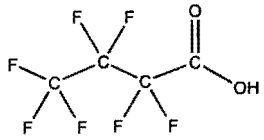
19L0636

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA0619
COMPOUND:	Perfluoro-n-butanoic acid		
STRUCTURE:		**CAS #:**	375-22-4



MOLECULAR FORMULA:	$C_4HF_7O_2$	**MOLECULAR WEIGHT:**	214.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/10/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/10/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

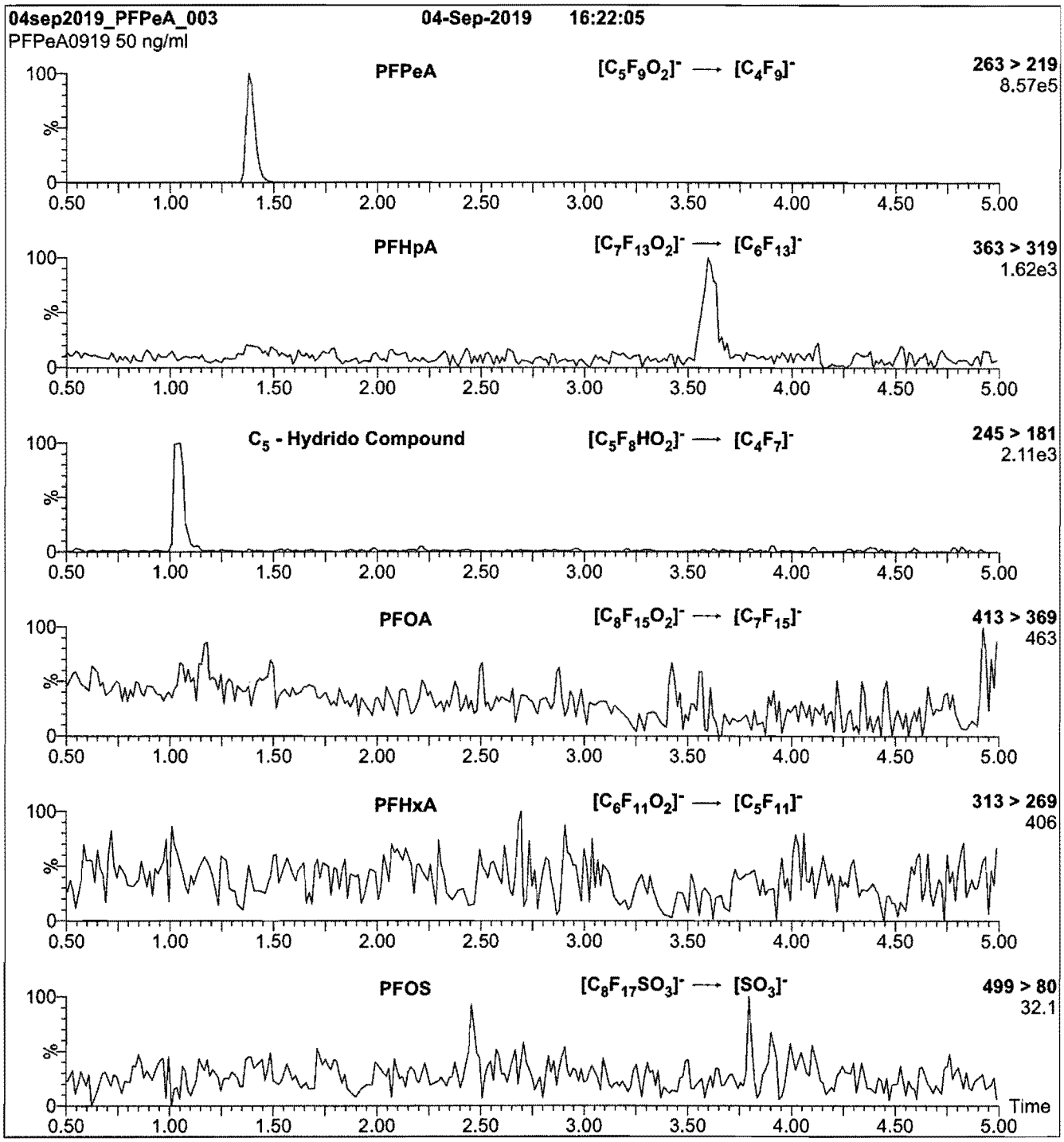
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/22/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1920637

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFPeA)

Mobile phase: Same as Figure 1

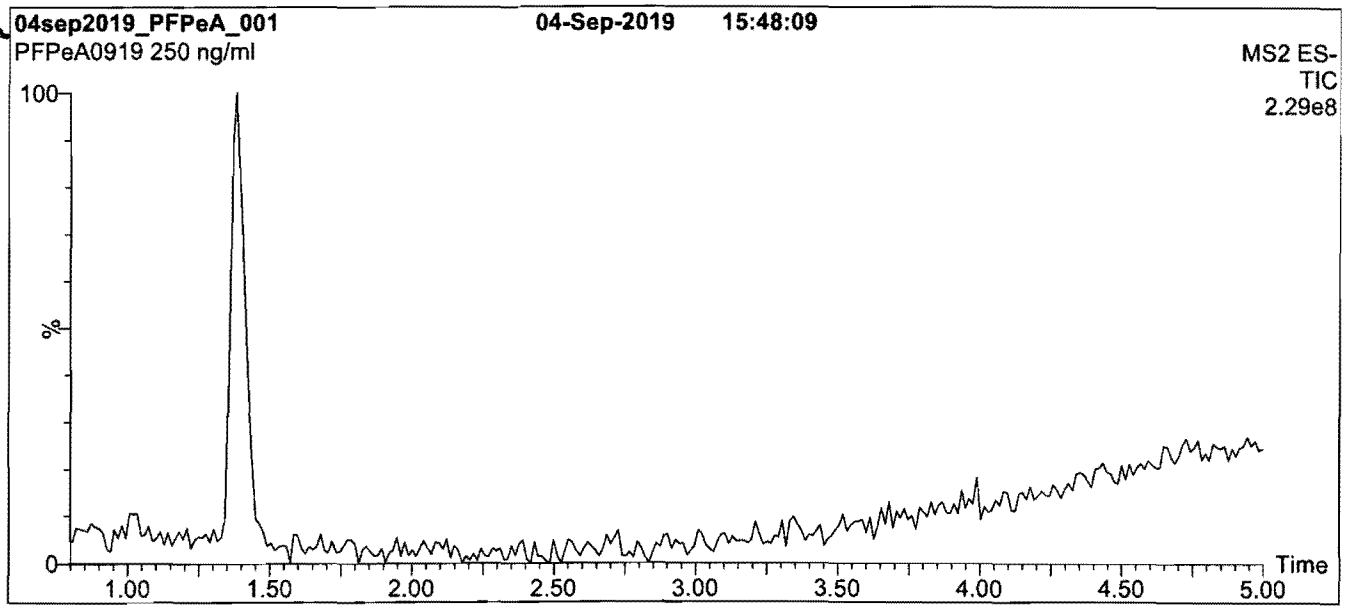
Flow: 300 µl/min

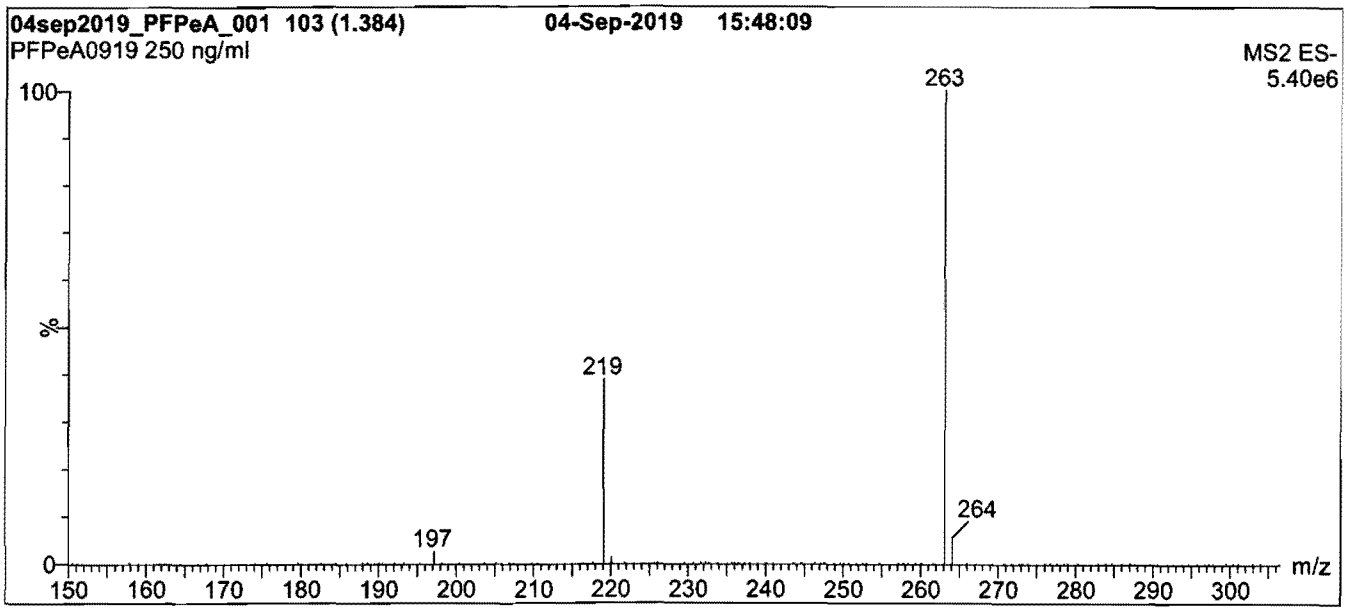
MS Parameters

Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 8

1920637

Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1926637

INTENDED USE:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

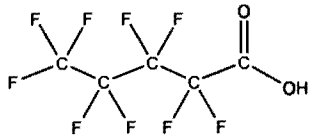
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0637

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0919
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/04/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/04/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

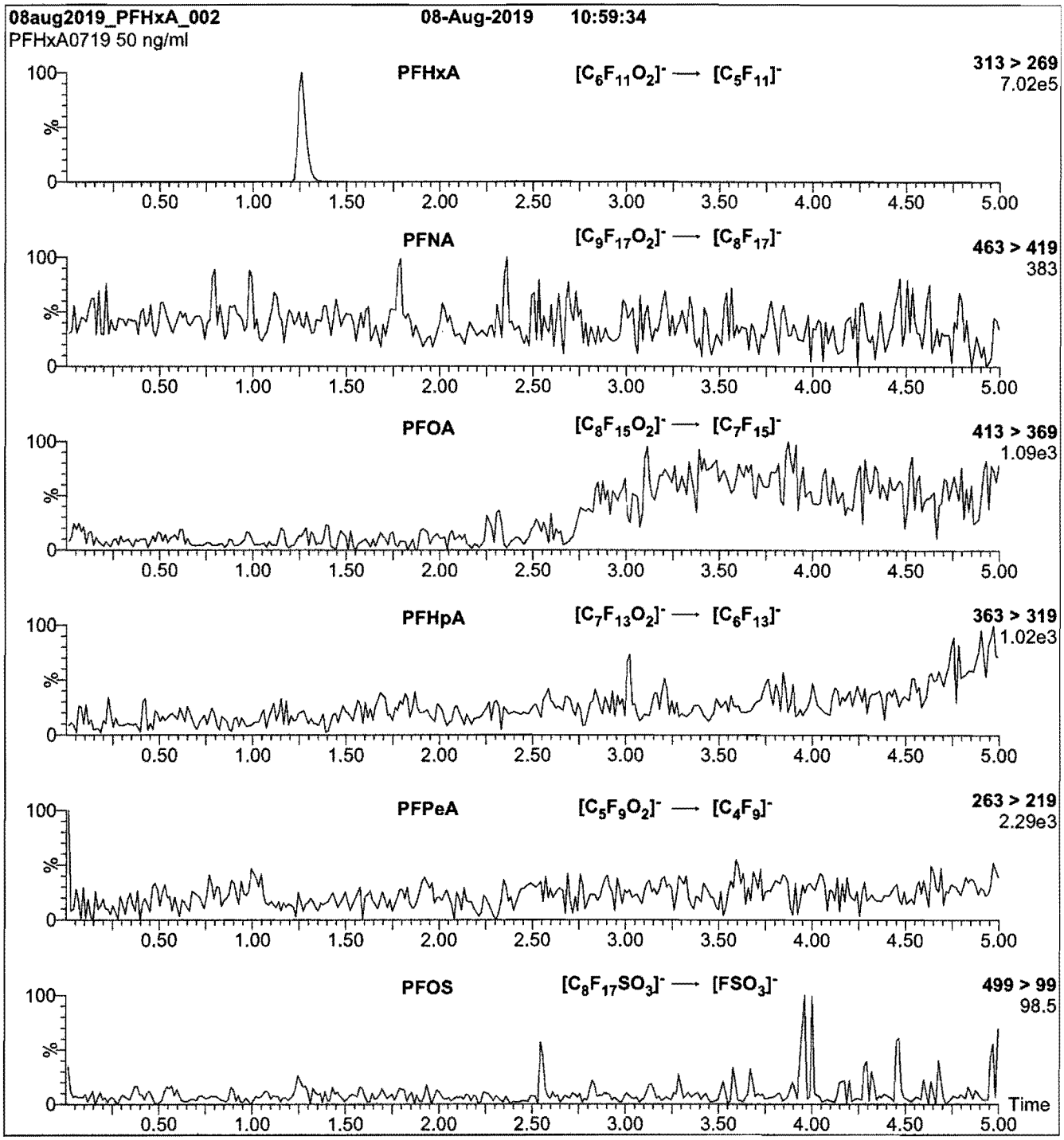
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/05/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFHxA)

Mobile phase: Same as Figure 1

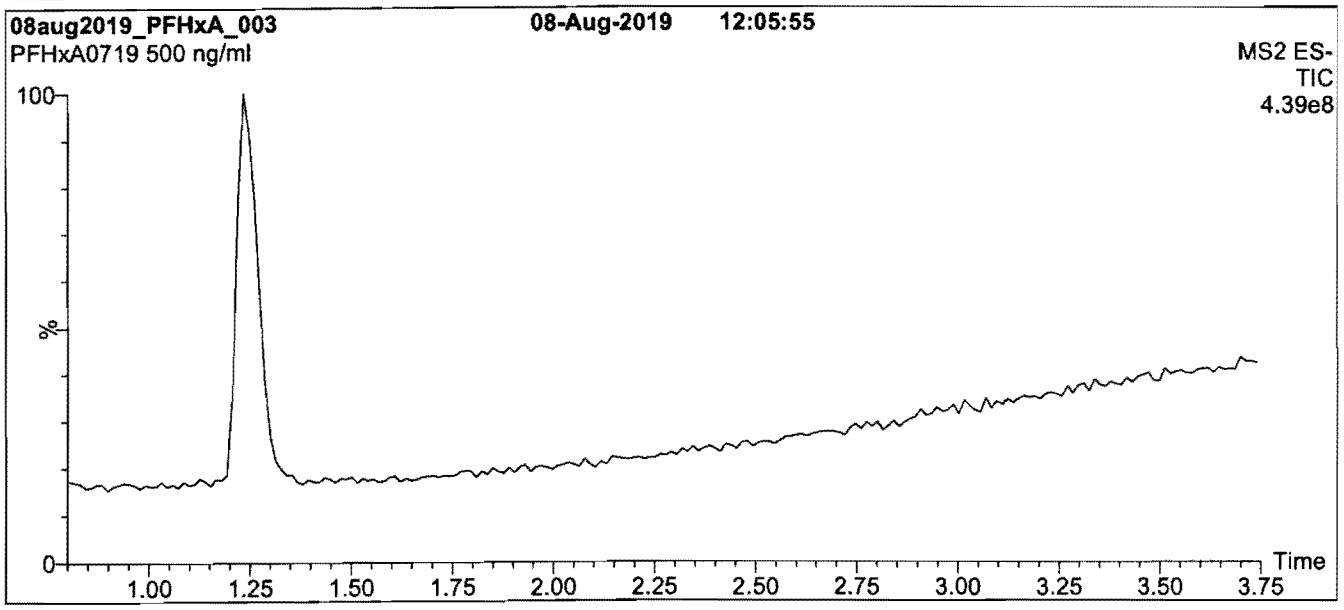
Flow: 300 µl/min

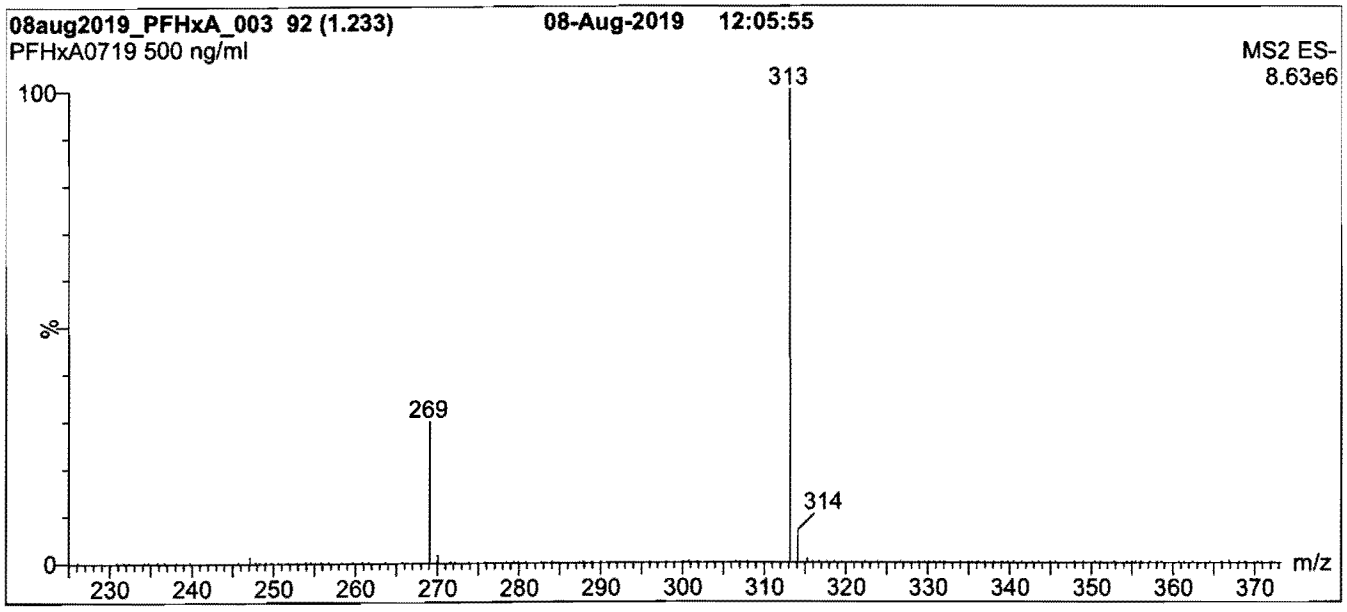
MS Parameters

Collision Gas (mbar) = 3.49e-3
Collision Energy (eV) = 8

19L0638

Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





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1.7 µm, 2.1 x 100 mm

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Start: 60% (80:20 MeOH:ACN) / 40% H_2O
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Ramp to 90% organic over 7 min and hold for
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Time: 12 min

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MS Parameters

Experiment: Full Scan (225 - 850 amu)

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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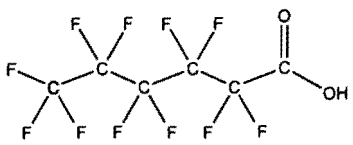
19L0638

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
LOT NUMBER: PFHxA0719
COMPOUND: Perfluoro-n-hexanoic acid

STRUCTURE:
CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/08/2019
EXPIRY DATE: (mm/dd/yyyy) 08/08/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/15/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

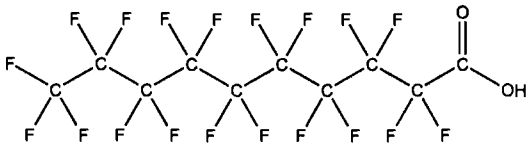
19L0639

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0419

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/01/2019
EXPIRY DATE: (mm/dd/yyyy) 05/01/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/02/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0639

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED 17034 REFERENCE MATERIAL PRODUCER

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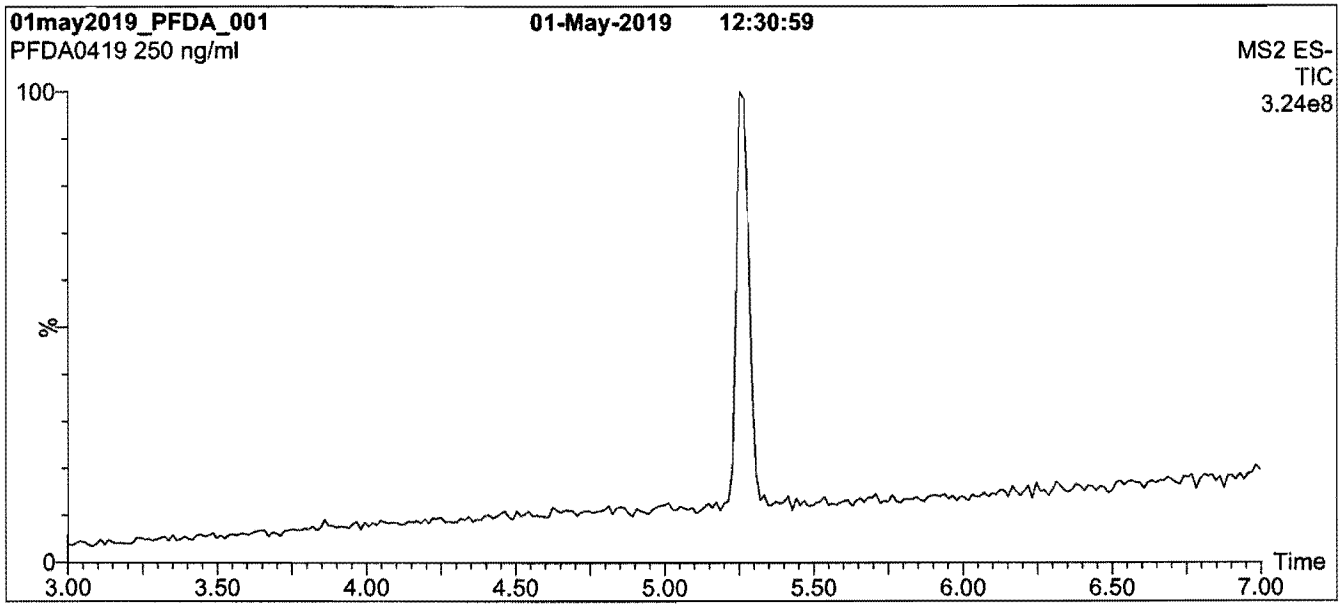
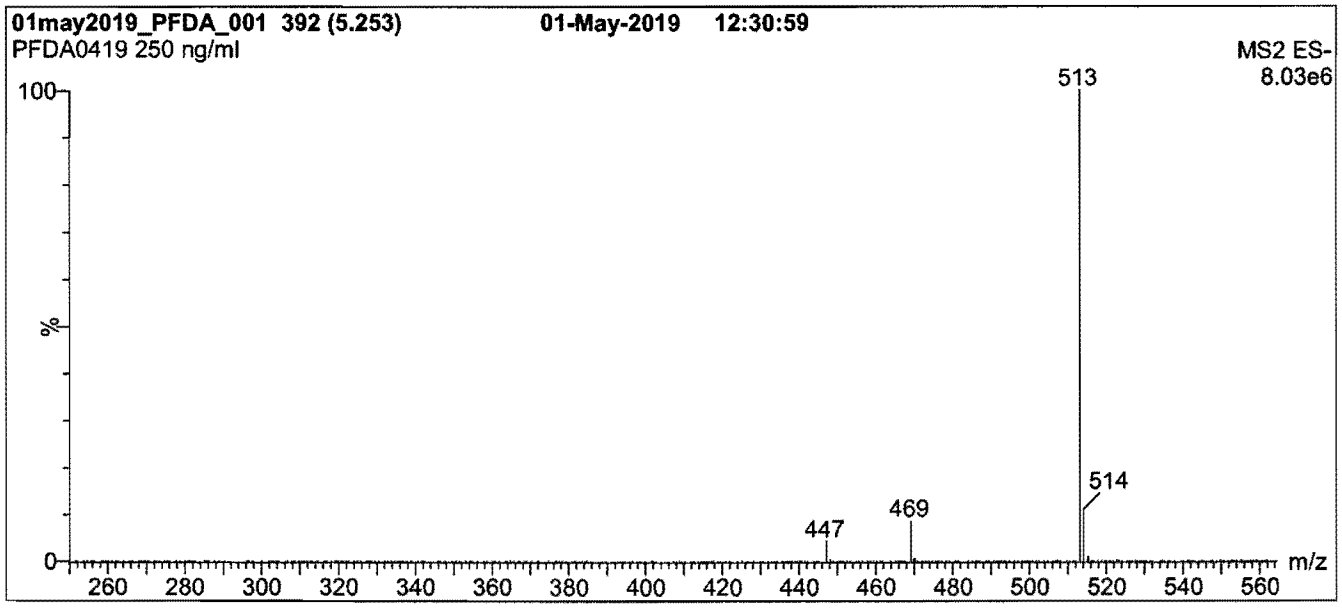
19L0639

Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

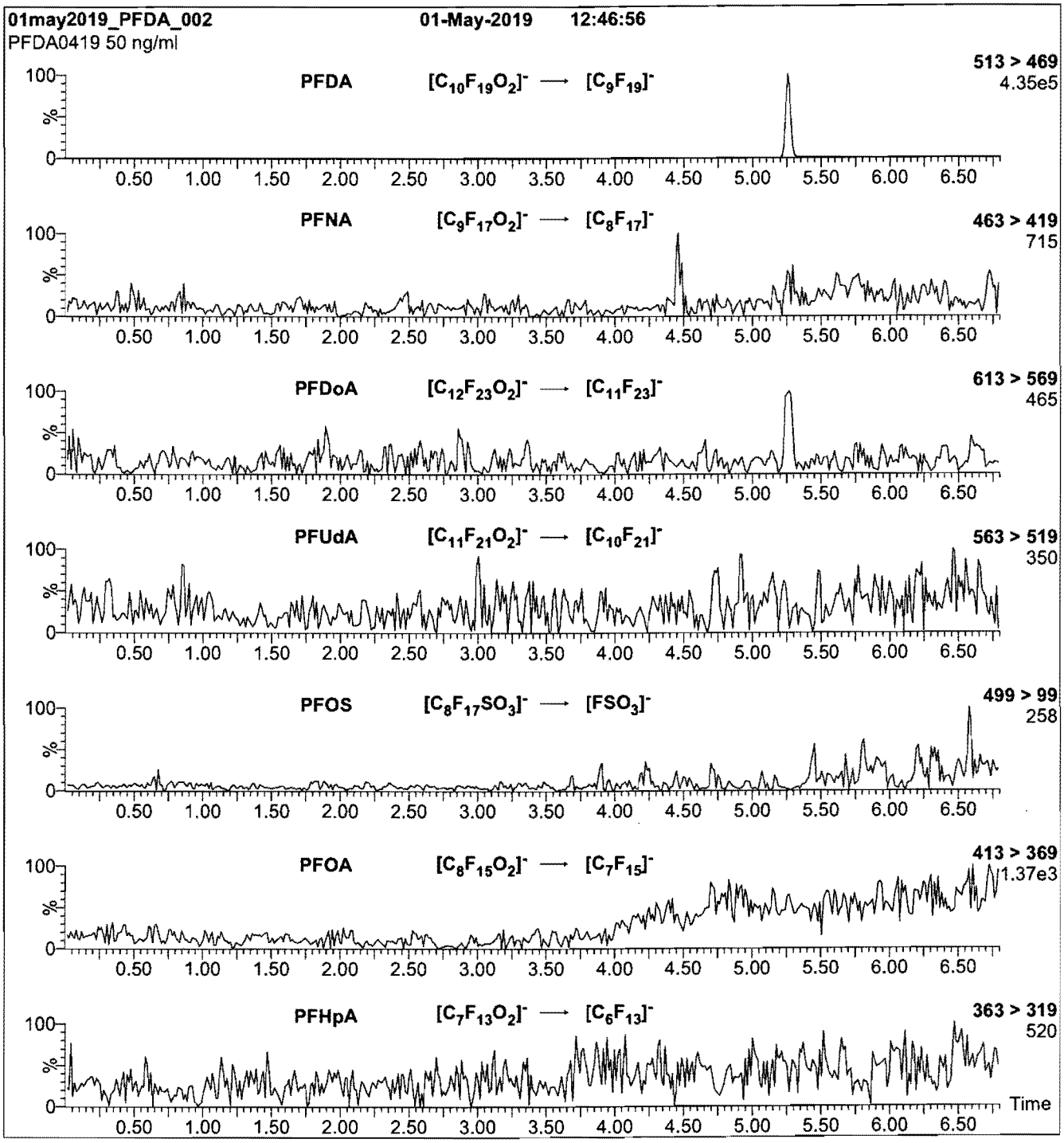
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0639

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFDA)

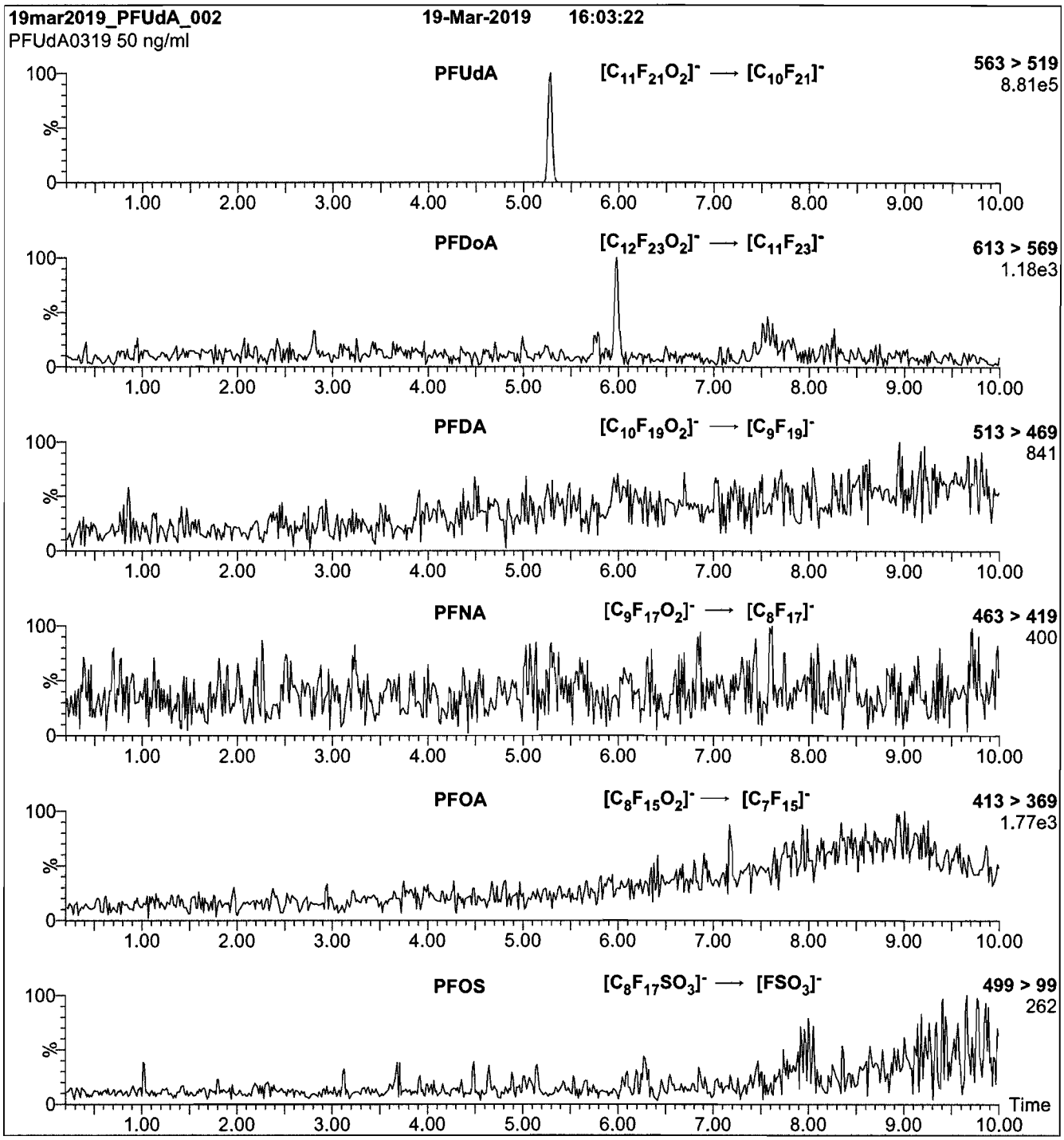
Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.88e-3
Collision Energy (eV) = 10

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFUdA)

Mobile phase: Same as Figure 1

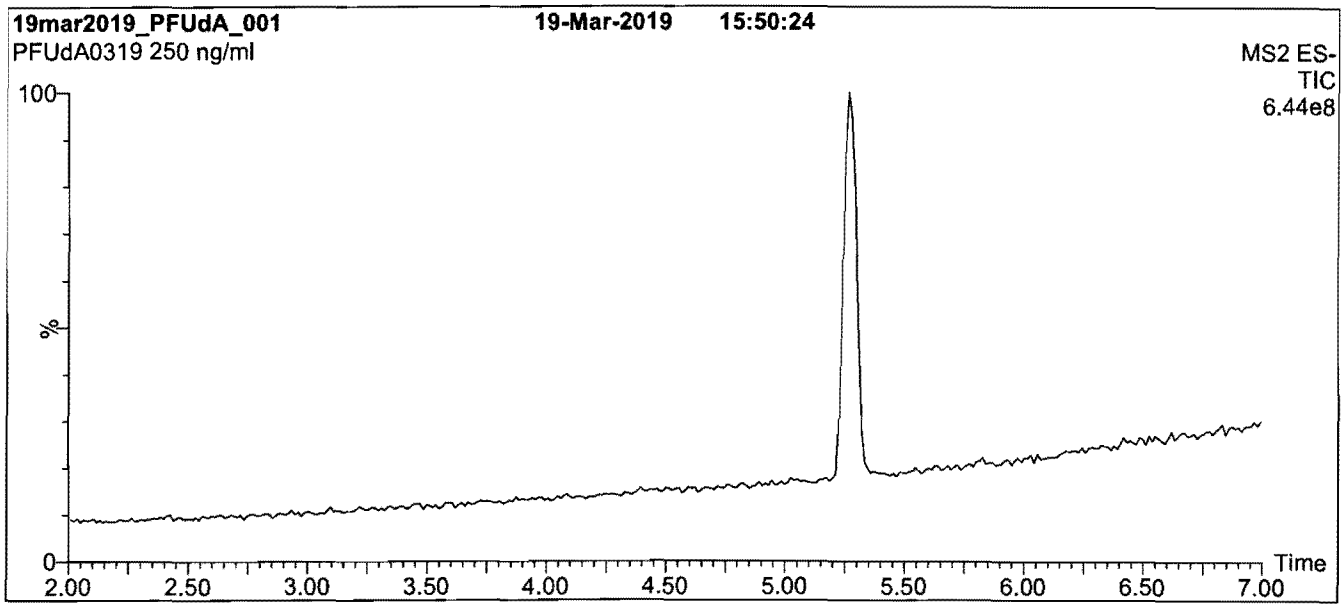
Flow: 300 µl/min

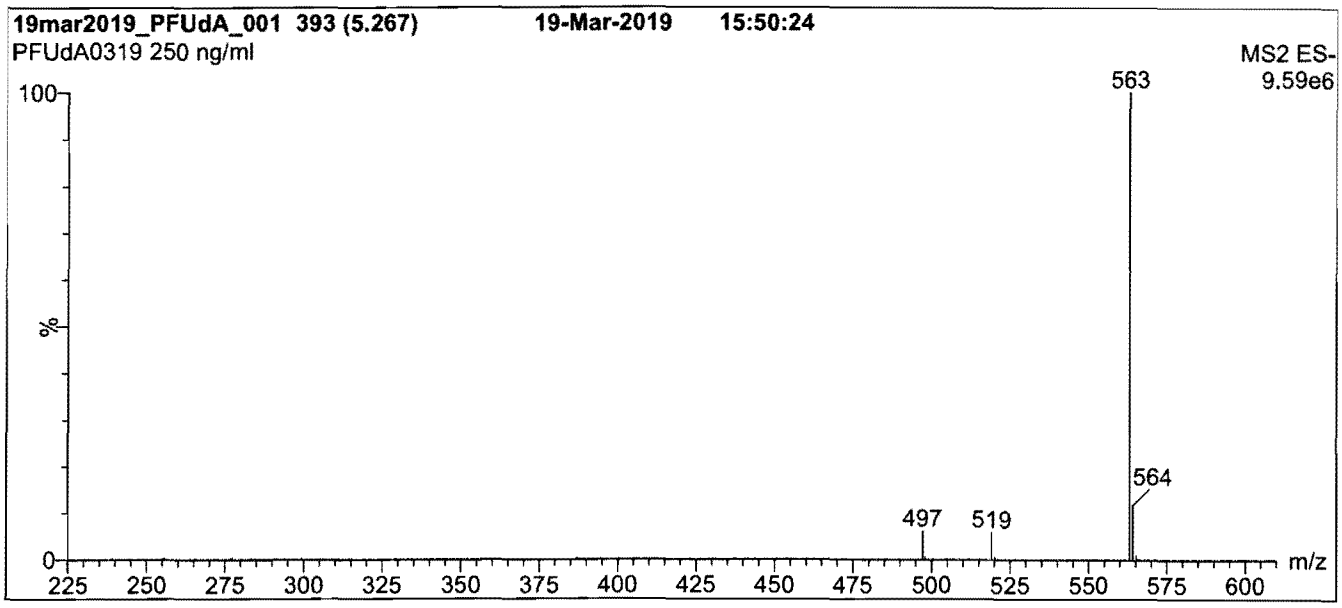
MS Parameters

Collision Gas (mbar) = 3.04e-3
Collision Energy (eV) = 12

19L0690

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0640

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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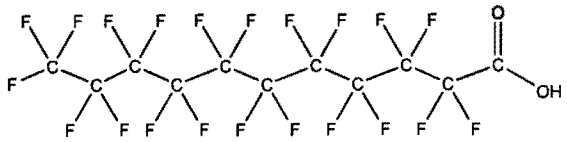
19L0640

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA0319

STRUCTURE:
CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/19/2019
EXPIRY DATE: (mm/dd/yyyy) 03/19/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of pefluoro-n-dodecanoic acid (PFDoA).

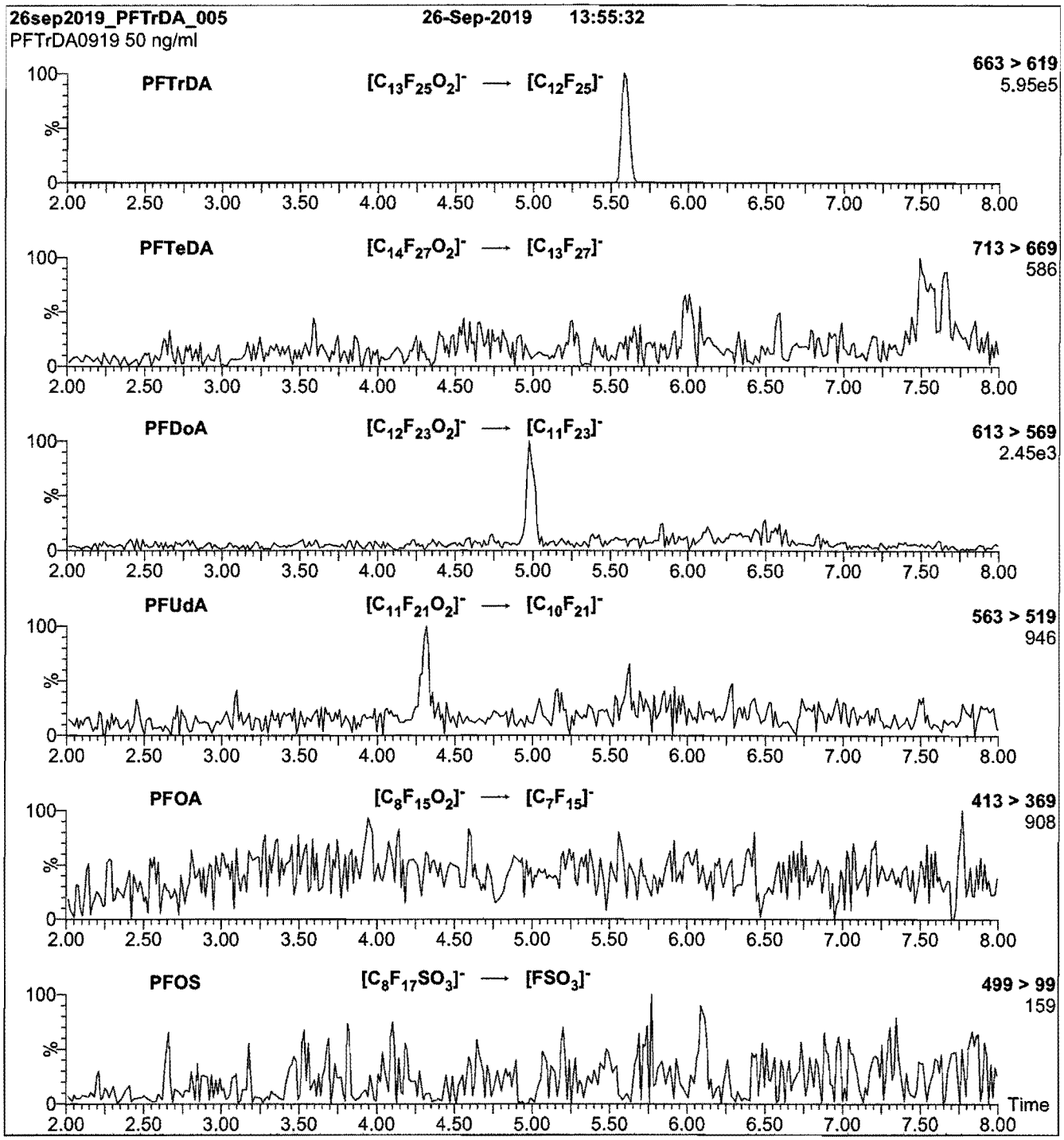
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/21/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0641

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFTrDA)

Mobile phase: Same as Figure 1

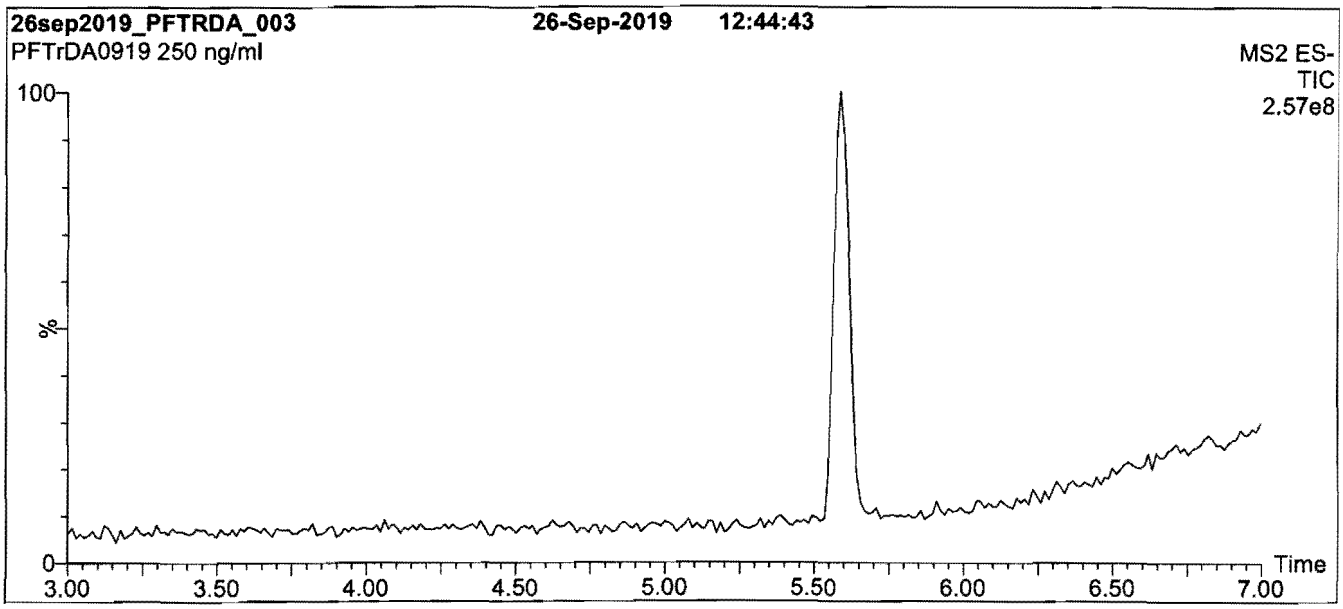
Flow: 300 µl/min

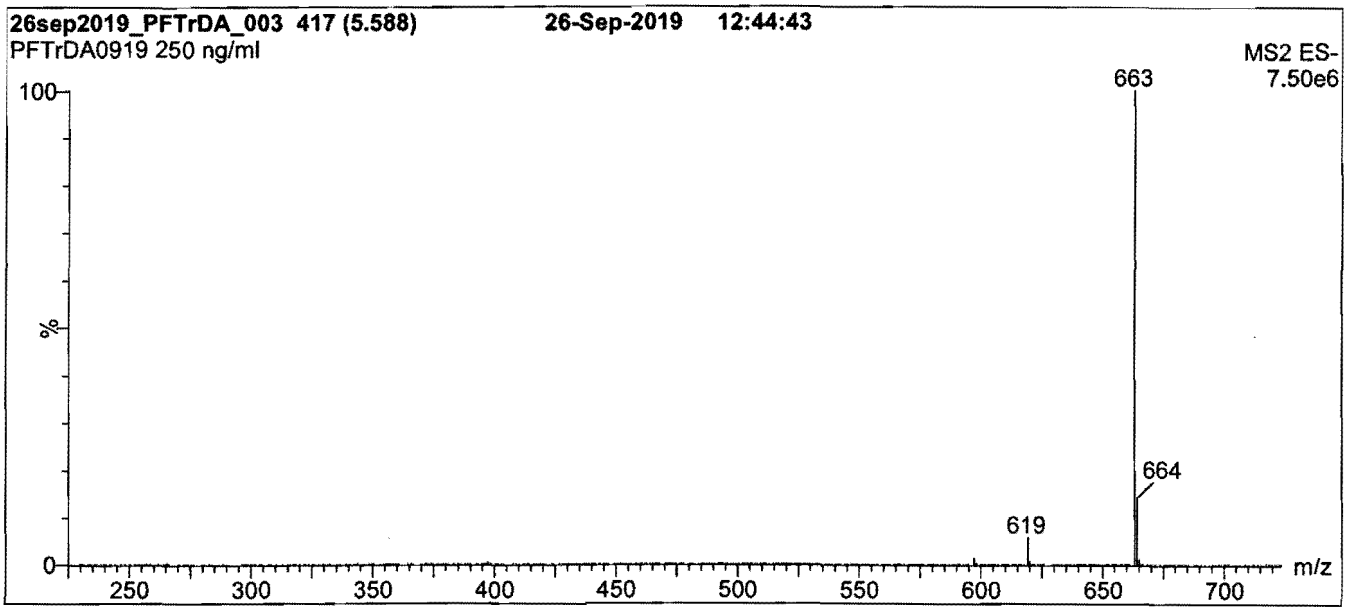
MS Parameters

Collision Gas (mbar) = 3.73e-3
Collision Energy (eV) = 12

1910641

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

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Start: 60% (80:20 MeOH:ACN) / 40% H_2O
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Ramp to 90% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0641

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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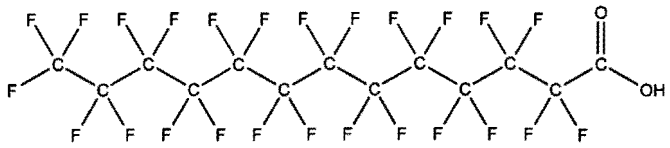
19L0691

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA0919
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/26/2019
EXPIRY DATE: (mm/dd/yyyy) 09/26/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

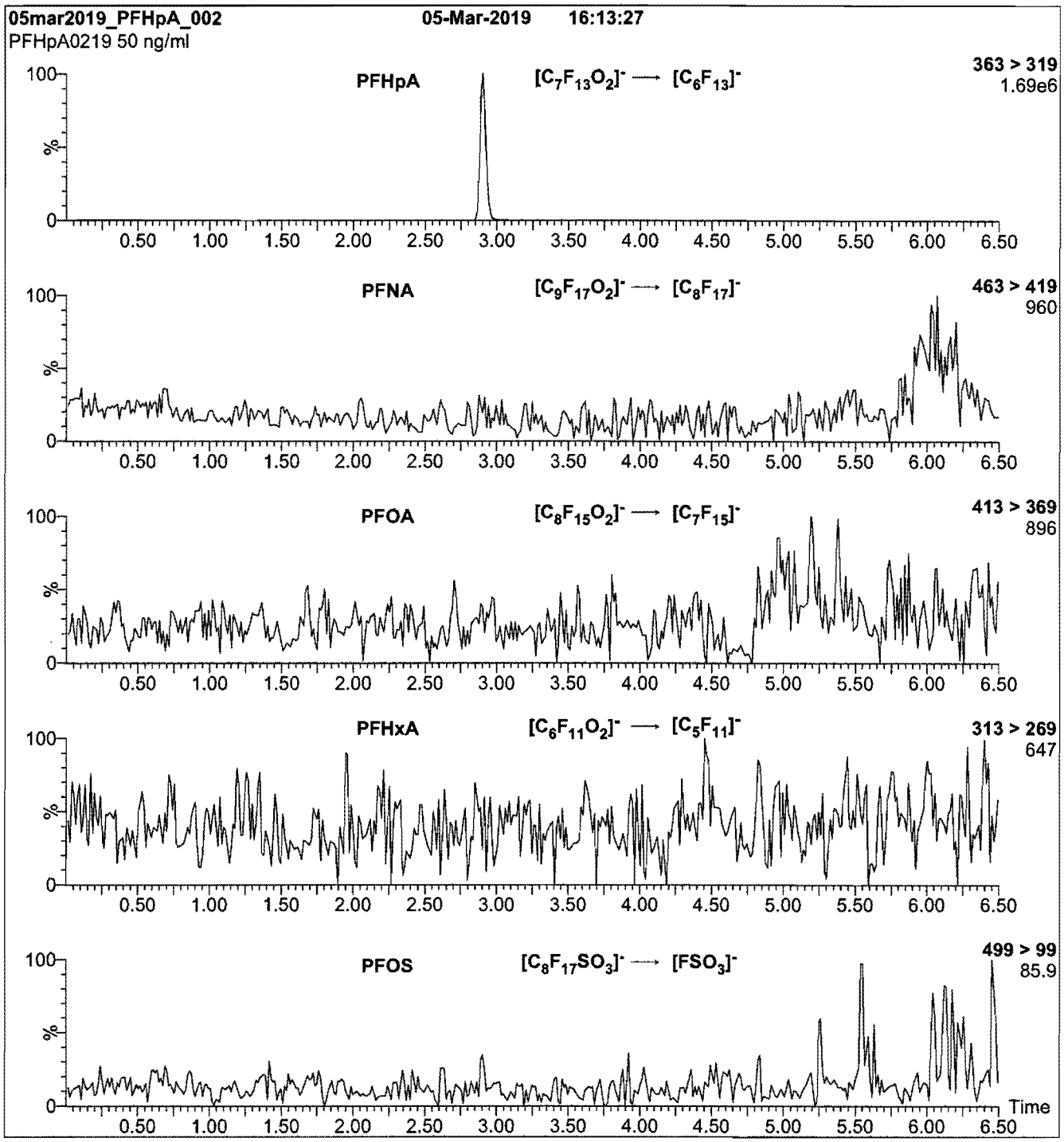
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/03/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0642

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFHpA)

Mobile phase: Same as Figure 1

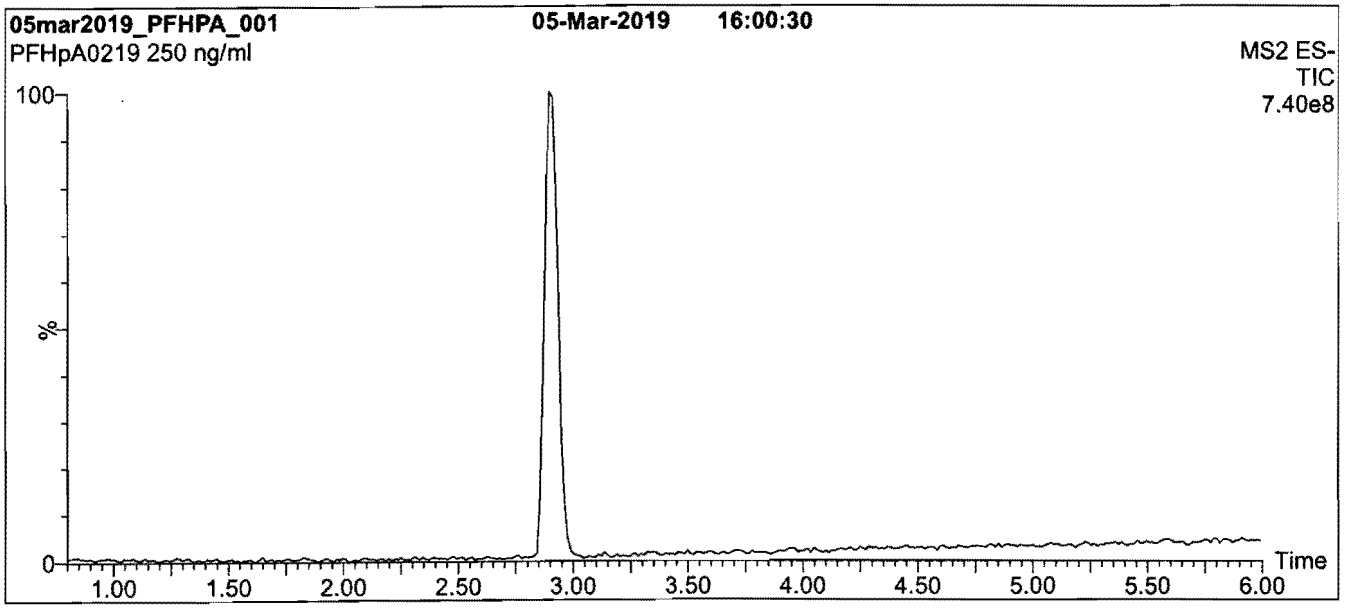
Flow: 300 µl/min

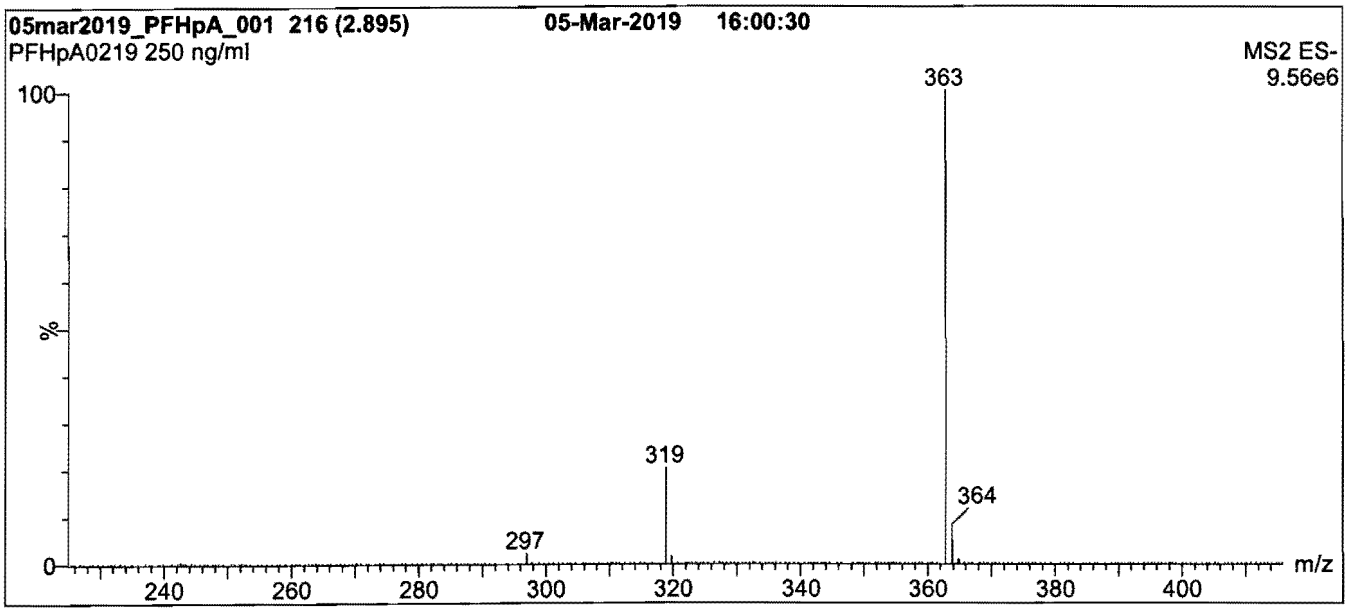
MS Parameters

Collision Gas (mbar) = 2.74e-3
Collision Energy (eV) = 8

19L0642

Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0642

INTENDED USE:

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HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

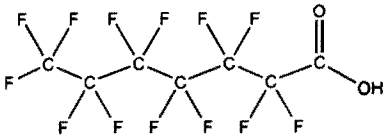
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0642

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA0219
COMPOUND:	Perfluoro-n-heptanoic acid		
STRUCTURE:		**CAS #:**	375-85-9



MOLECULAR FORMULA:	$C_7HF_{13}O_2$	**MOLECULAR WEIGHT:**	364.06
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/05/2019		
EXPIRY DATE: (mm/dd/yyyy)	03/05/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

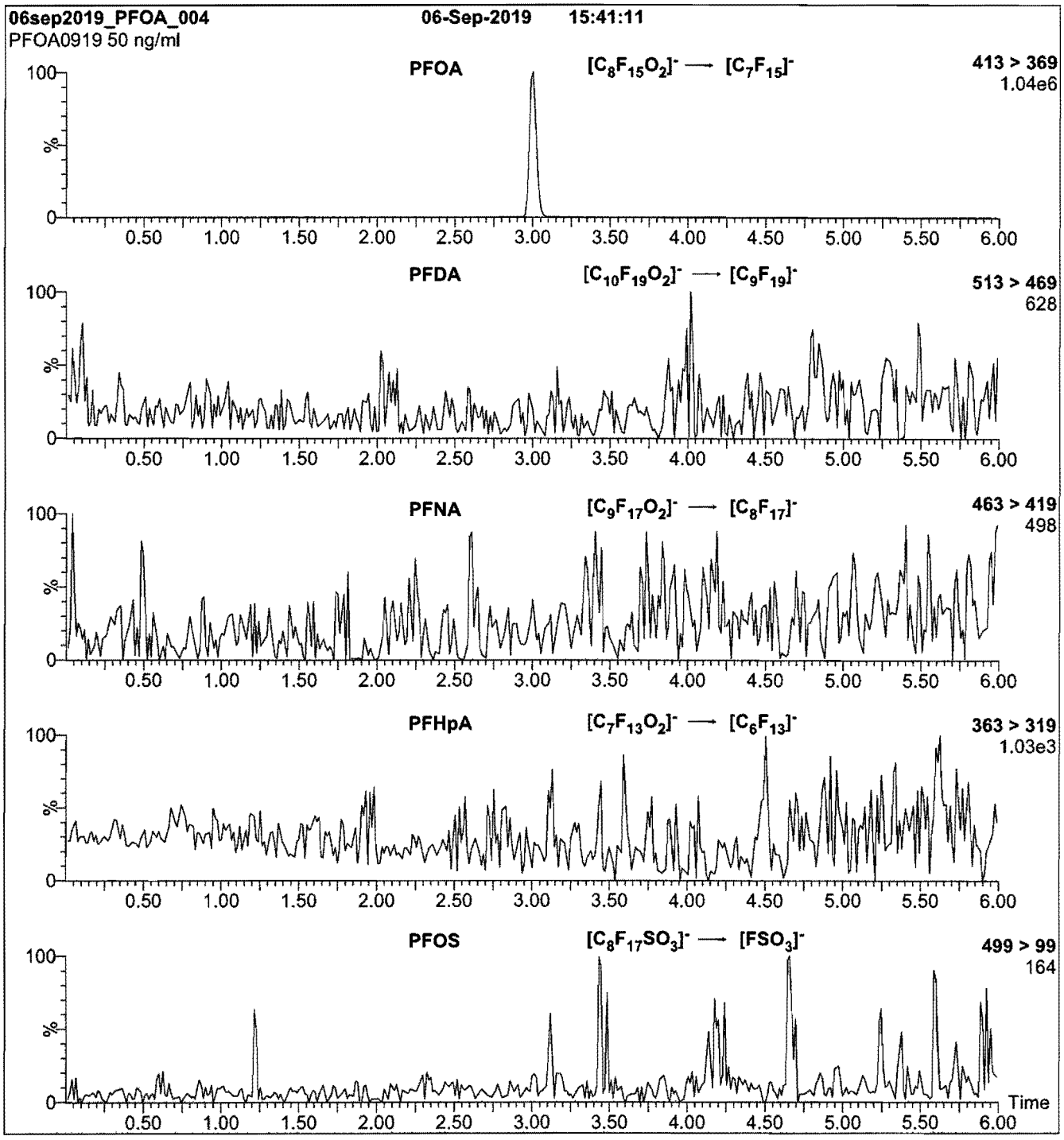
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/18/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFOA)

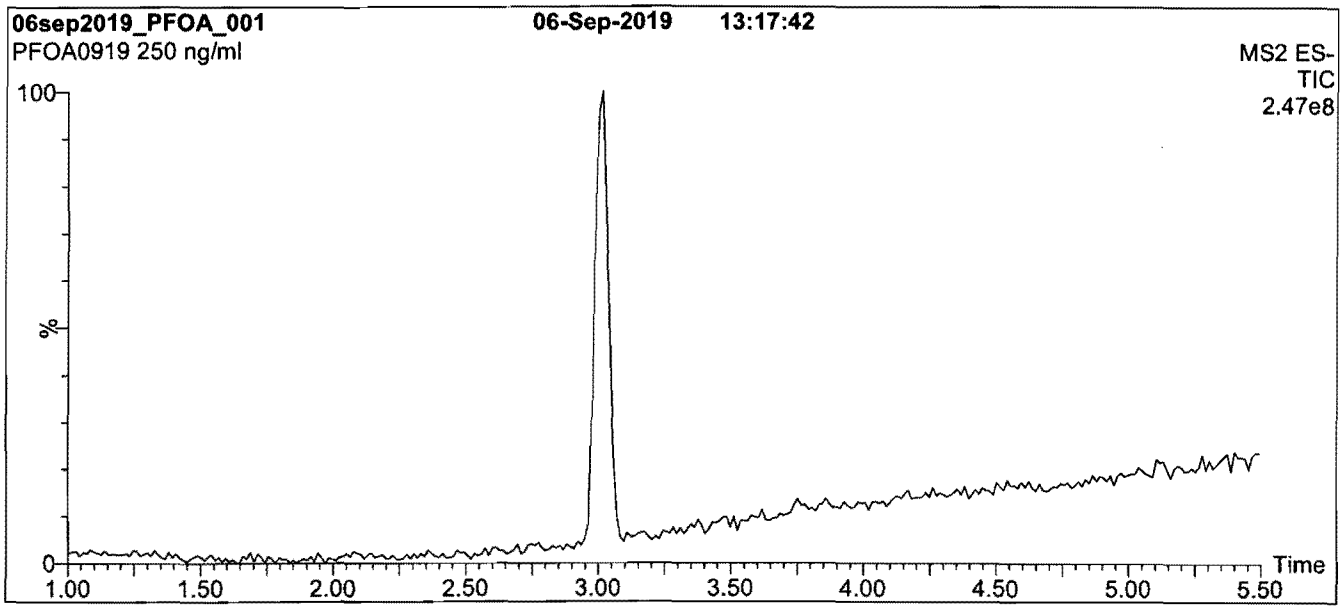
Mobile phase: Same as Figure 1

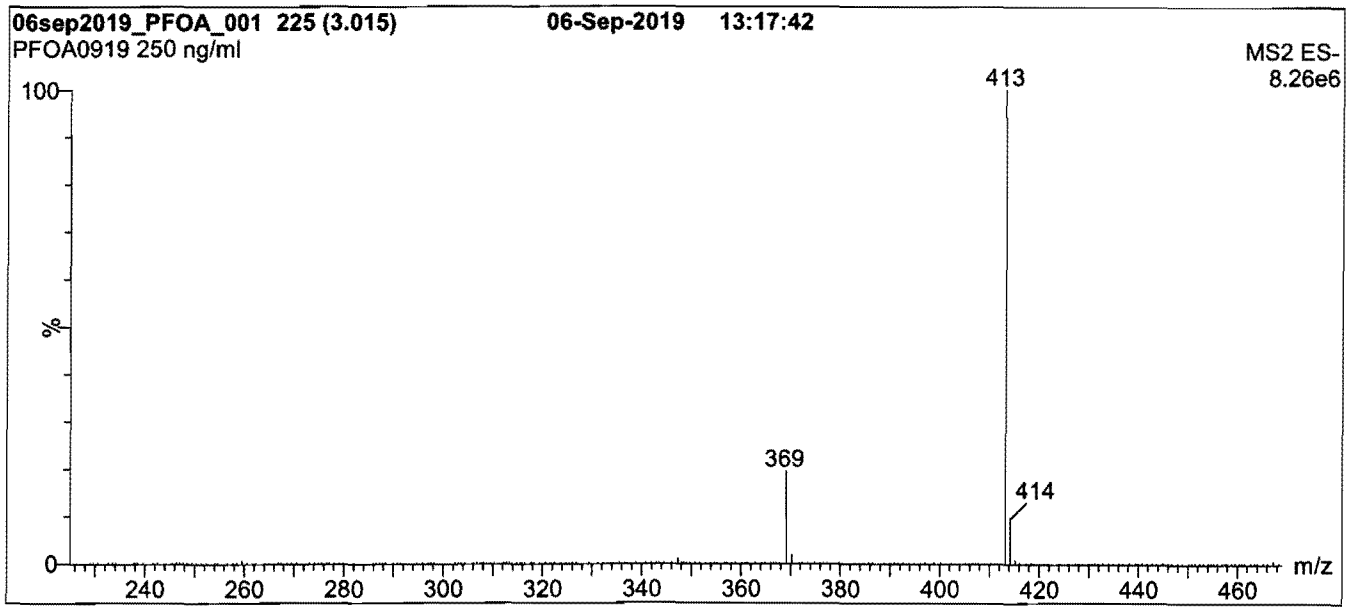
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.49e-3
Collision Energy (eV) = 8

Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0643

INTENDED USE:

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HANDLING:

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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

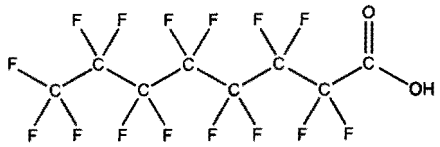
19L0643

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA0919

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/06/2019
EXPIRY DATE: (mm/dd/yyyy) 09/06/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

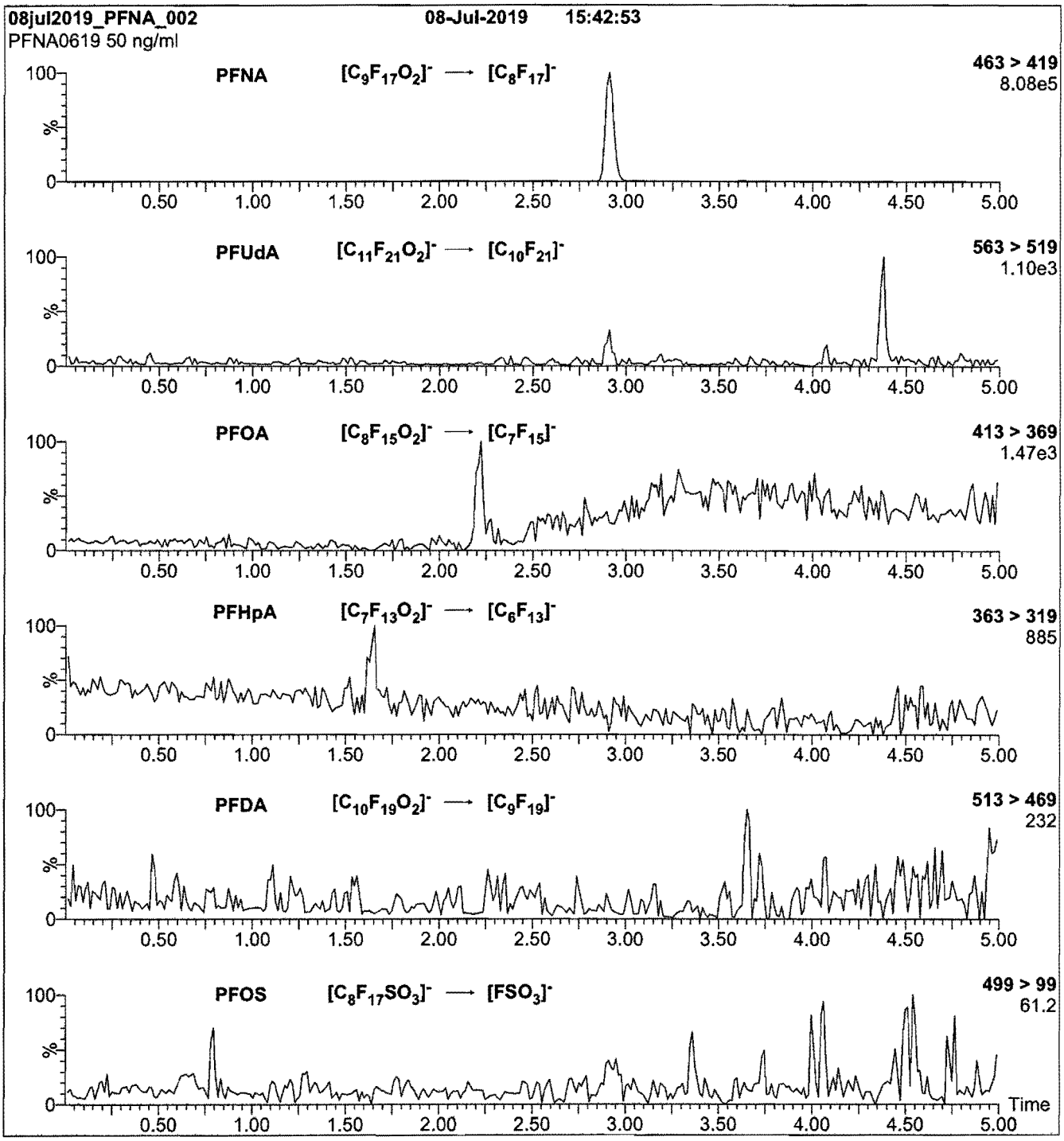
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0644

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFNA)

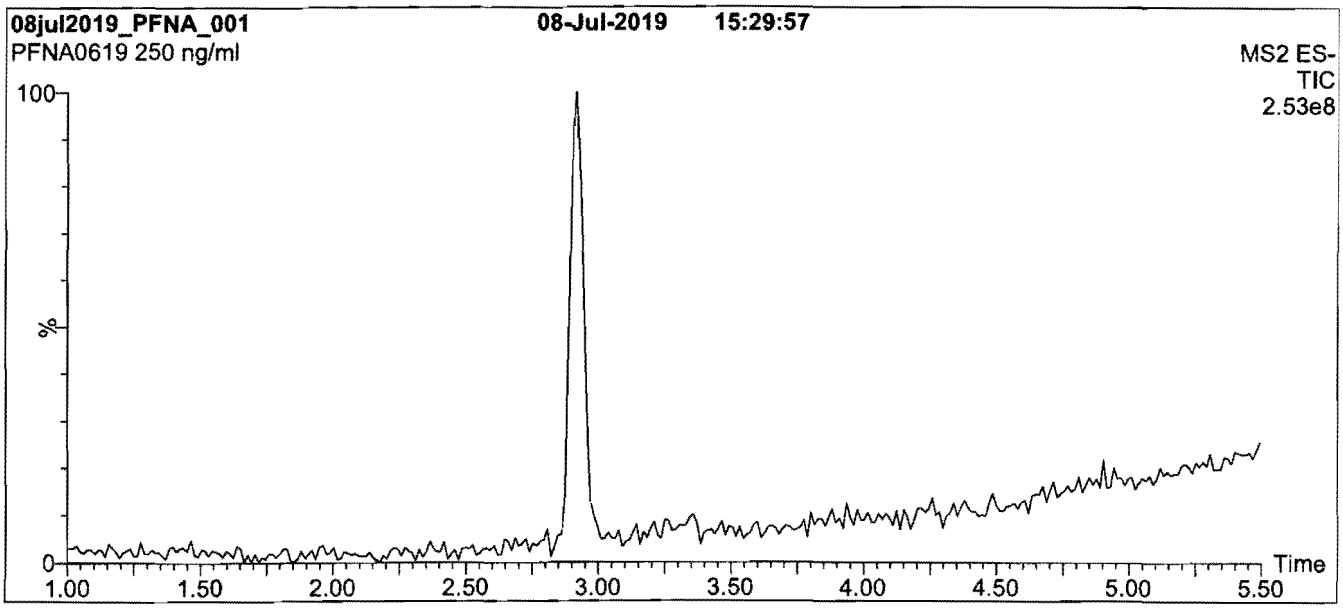
Mobile phase: Same as Figure 1

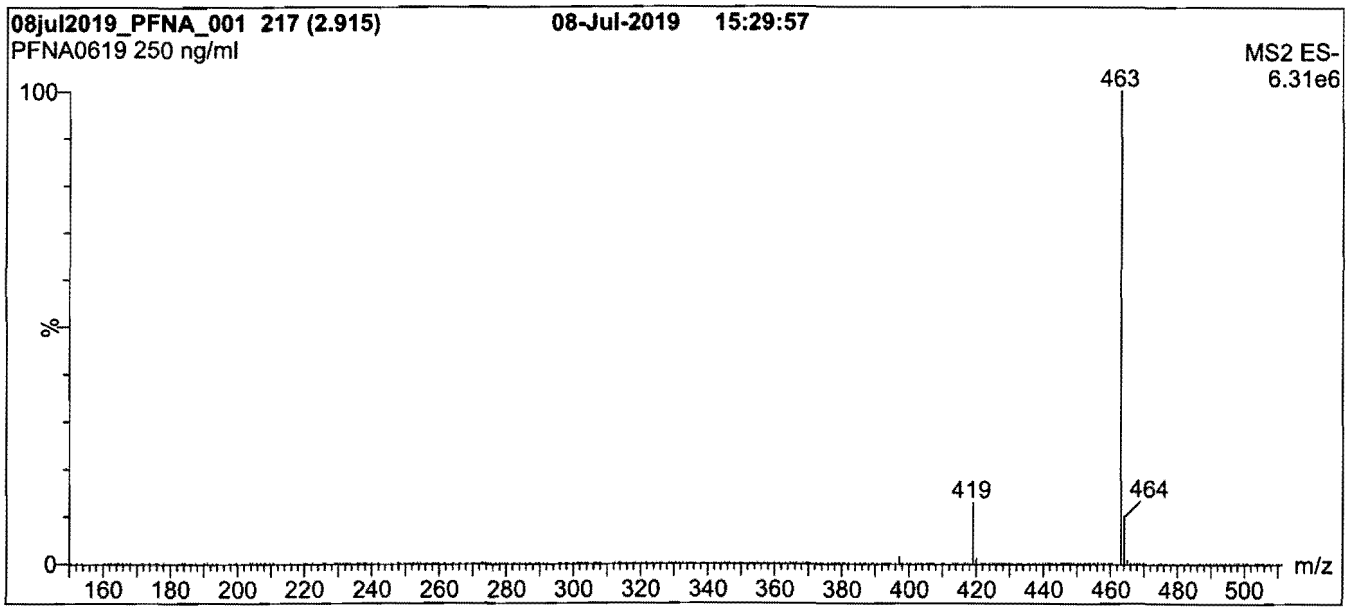
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 10

Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0644

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

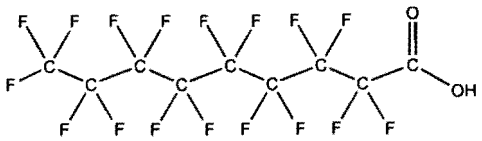
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0644

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
LOT NUMBER: PFNA0619
COMPOUND: Perfluoro-n-nonanoic acid
STRUCTURE:
CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
MOLECULAR WEIGHT: 464.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/08/2019
EXPIRY DATE: (mm/dd/yyyy) 07/08/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/11/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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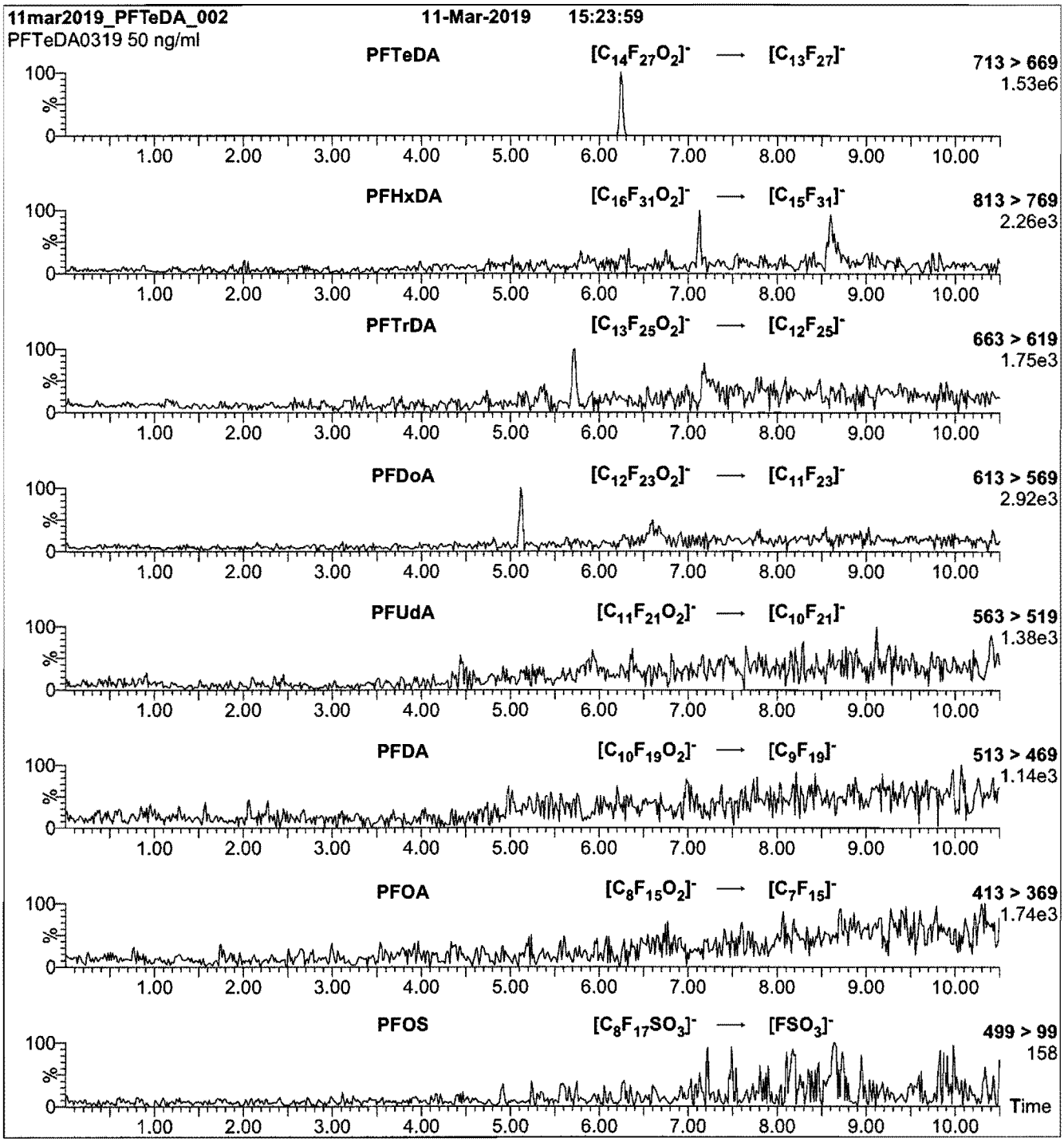
Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFTeDA)

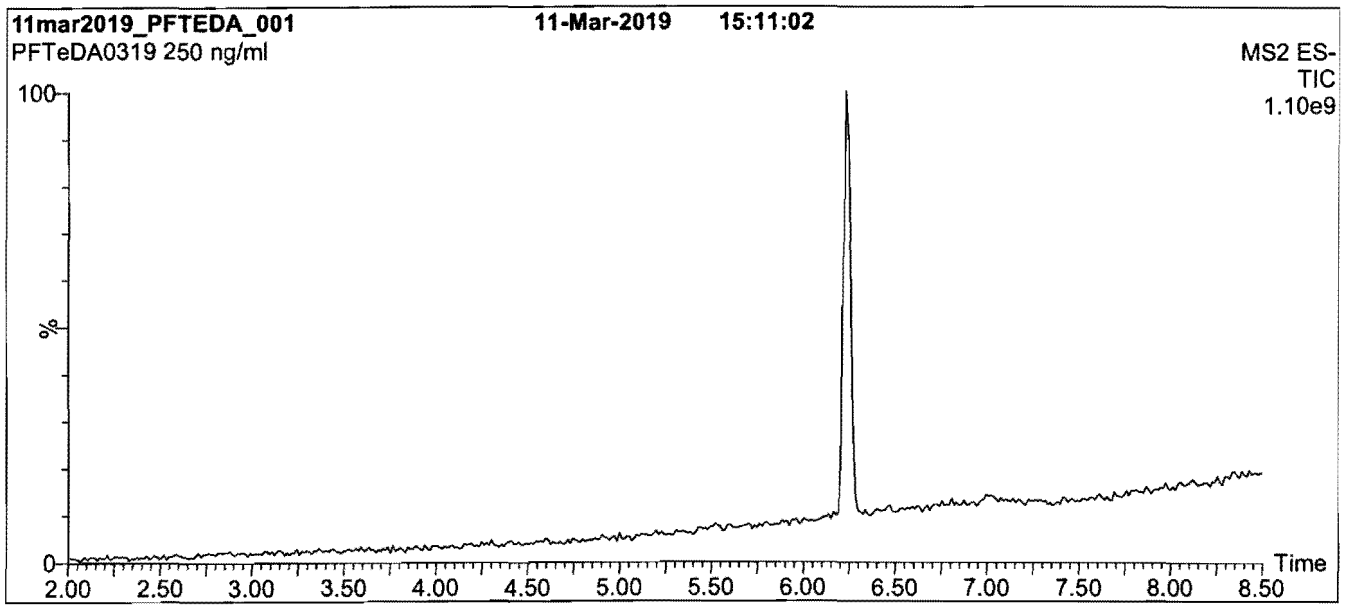
Mobile phase: Same as Figure 1

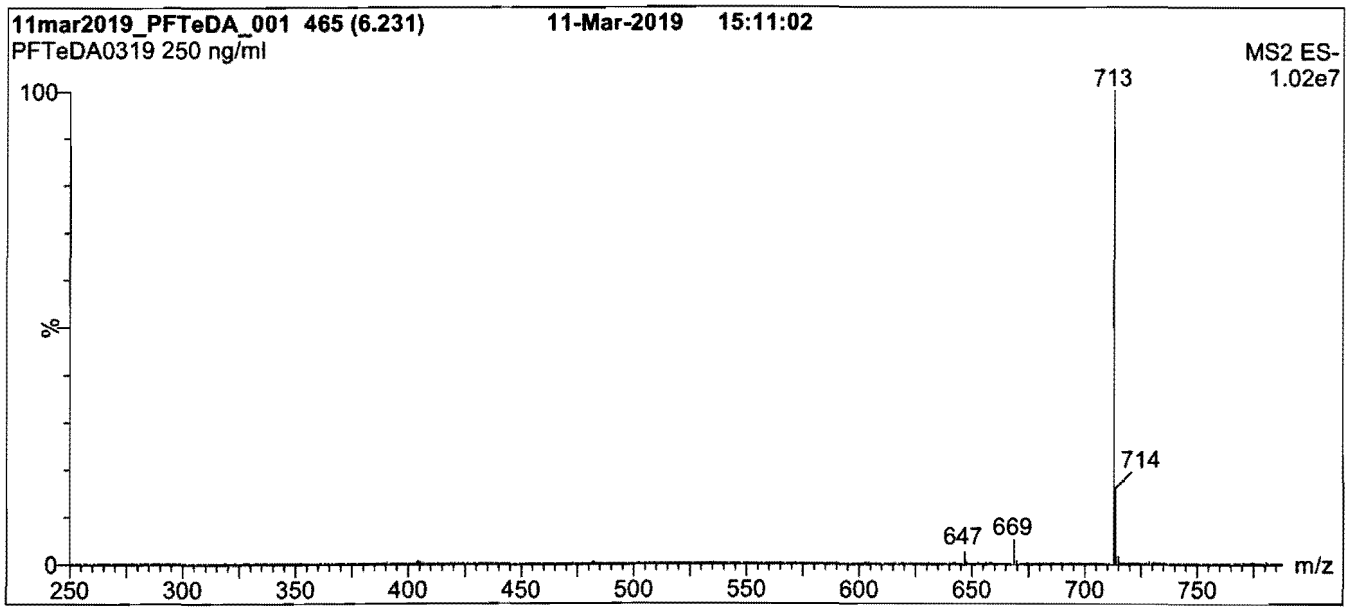
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.03e-3
Collision Energy (eV) = 14

Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1910645

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

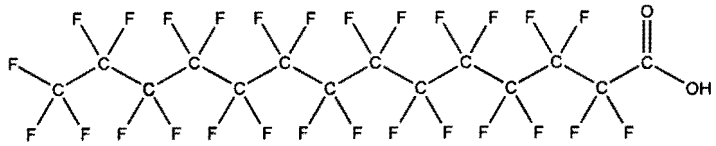
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0645

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0319
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/11/2019		
EXPIRY DATE: (mm/dd/yyyy)	03/11/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of PFDoA ($C_{12}HF_{23}O_2$), ~ 0.1% of PFTrDA ($C_{13}HF_{25}O_2$), and ~ 0.1% of PFHxDA ($C_{16}HF_{31}O_2$).

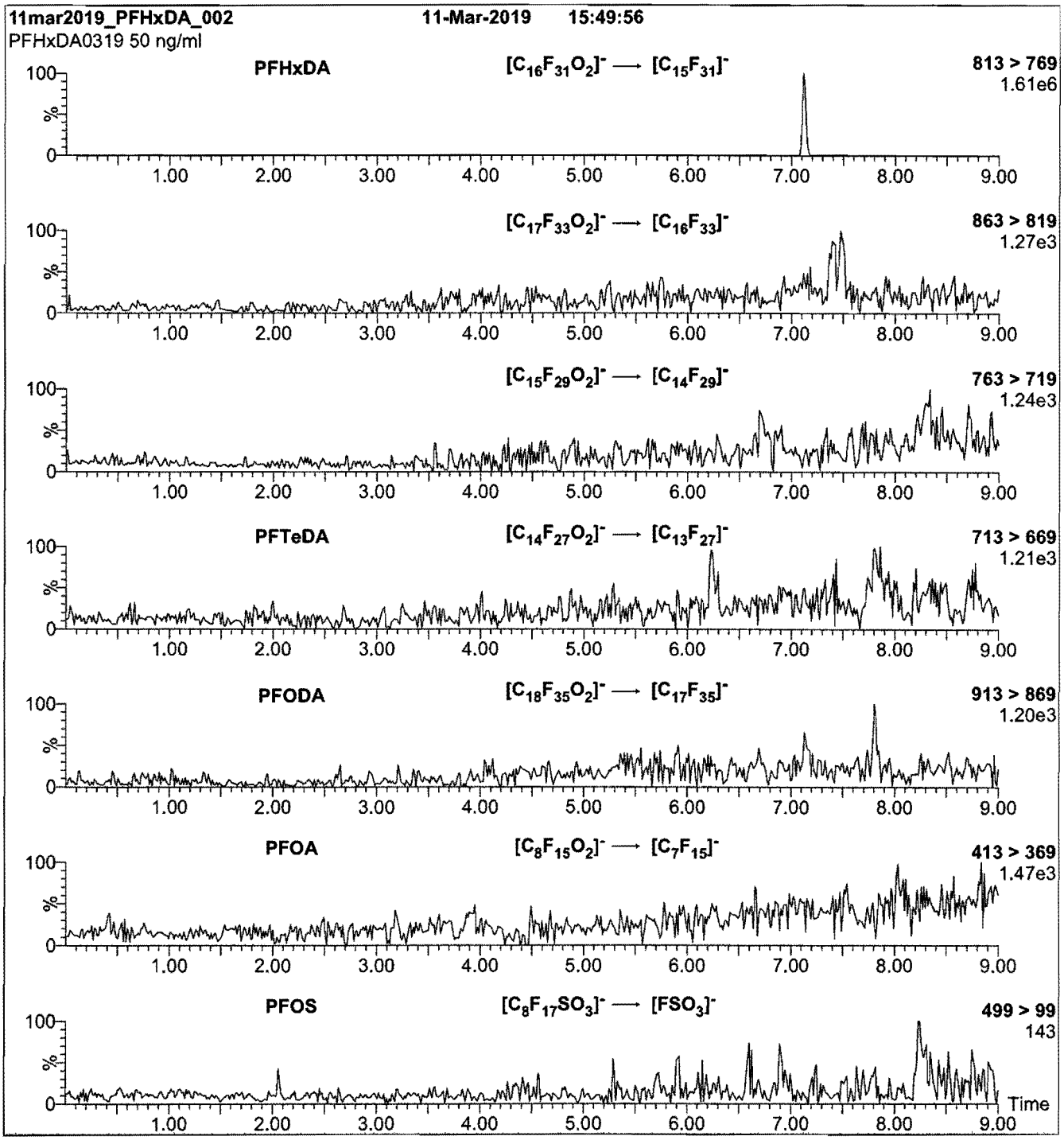
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/28/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0646

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFHxDA)

Mobile phase: Same as Figure 1

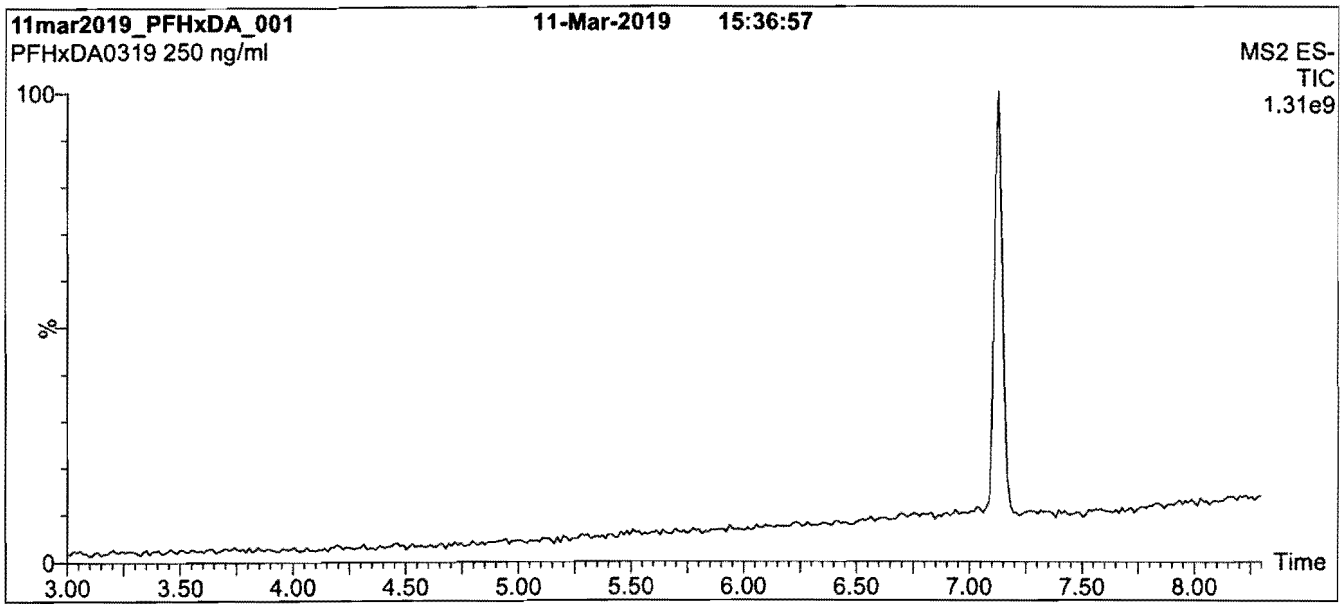
Flow: 300 µl/min

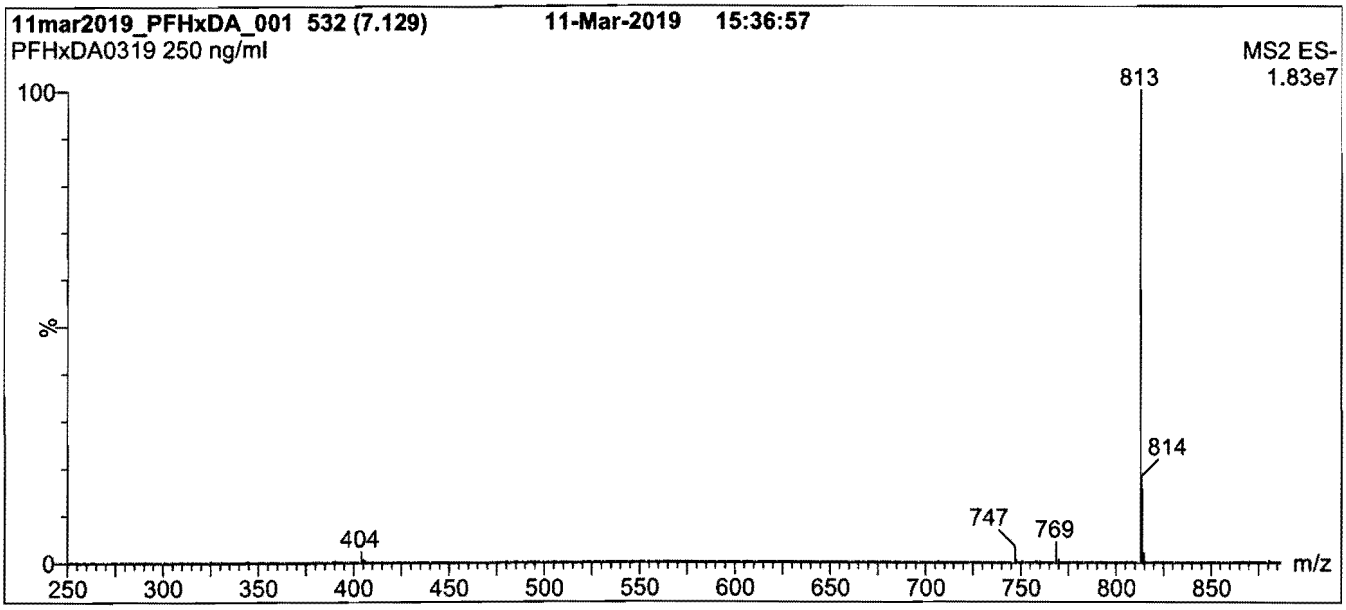
MS Parameters

Collision Gas (mbar) = 3.03e-3
Collision Energy (eV) = 15

19L0646

Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0646

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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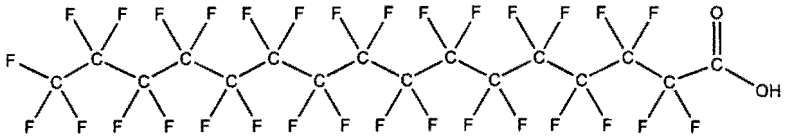
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA0319
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/11/2019
EXPIRY DATE: (mm/dd/yyyy) 03/11/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

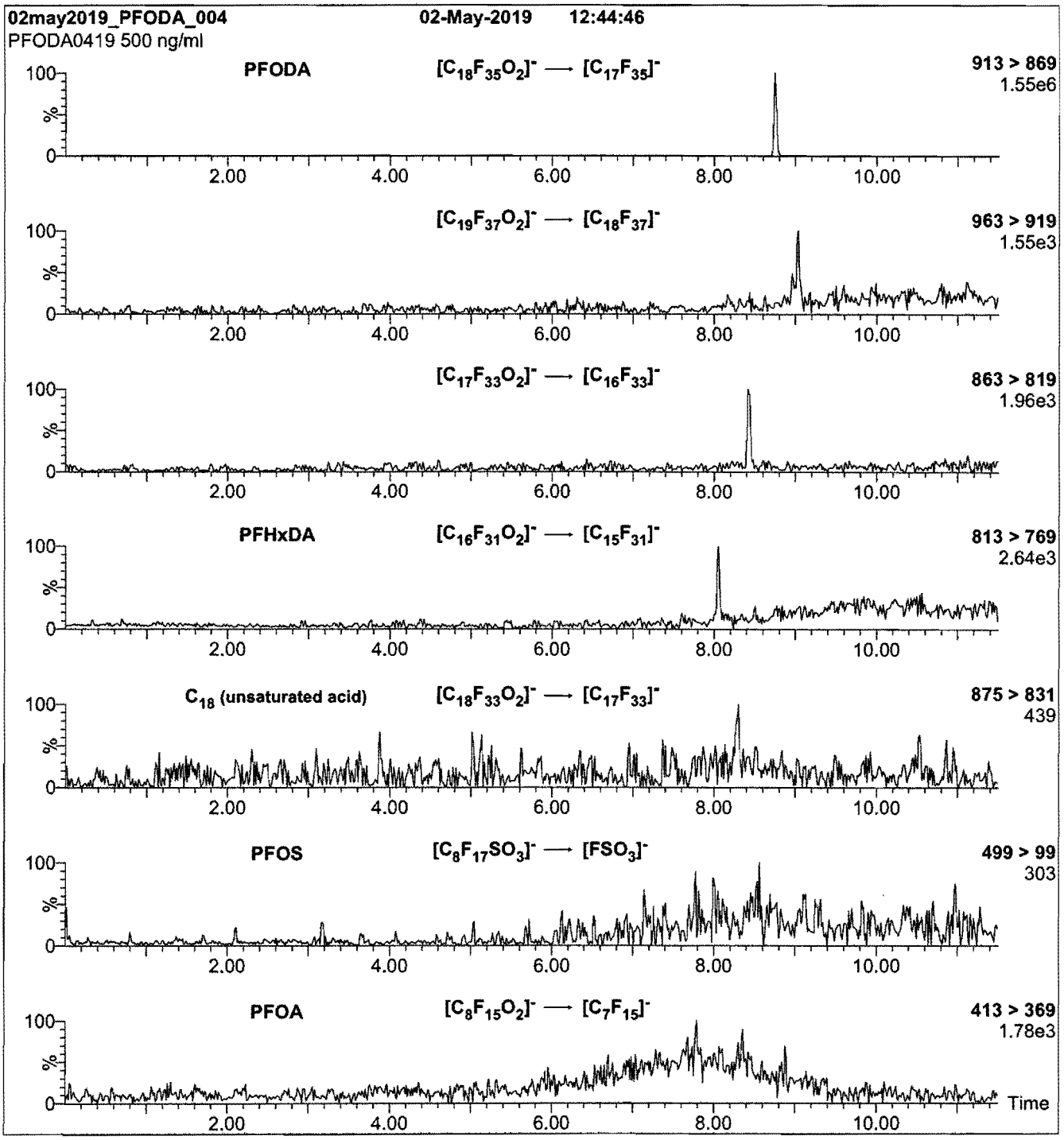
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/28/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0647

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFODA)

Mobile phase: Same as Figure 1

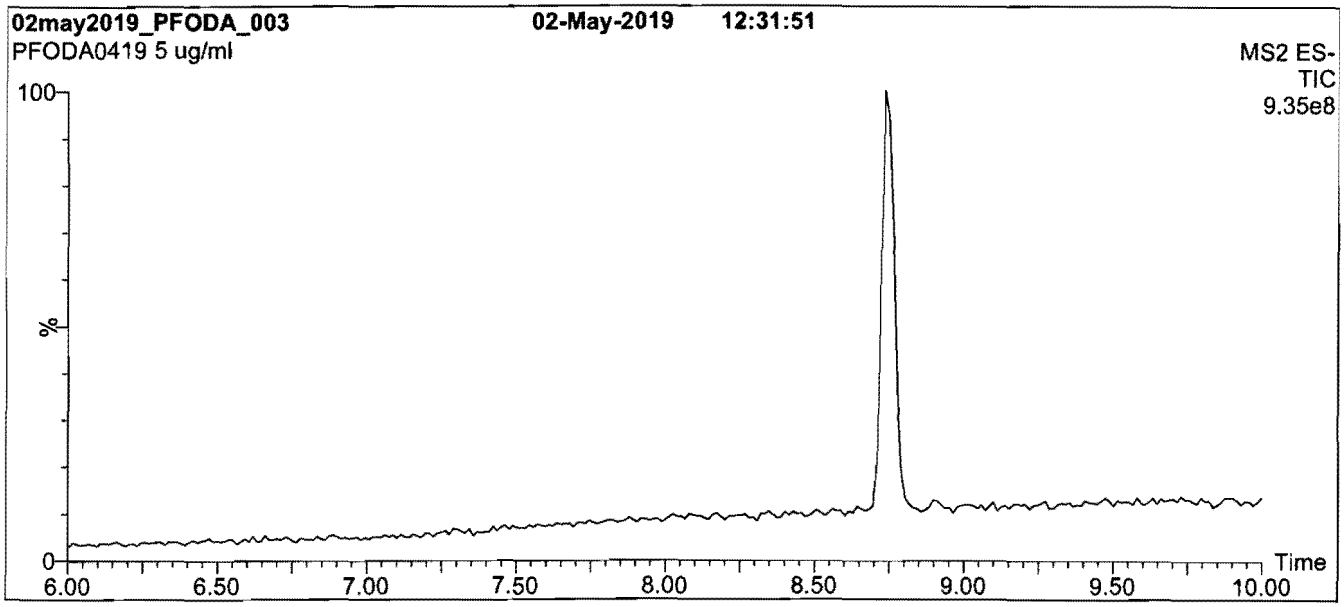
Flow: 300 µl/min

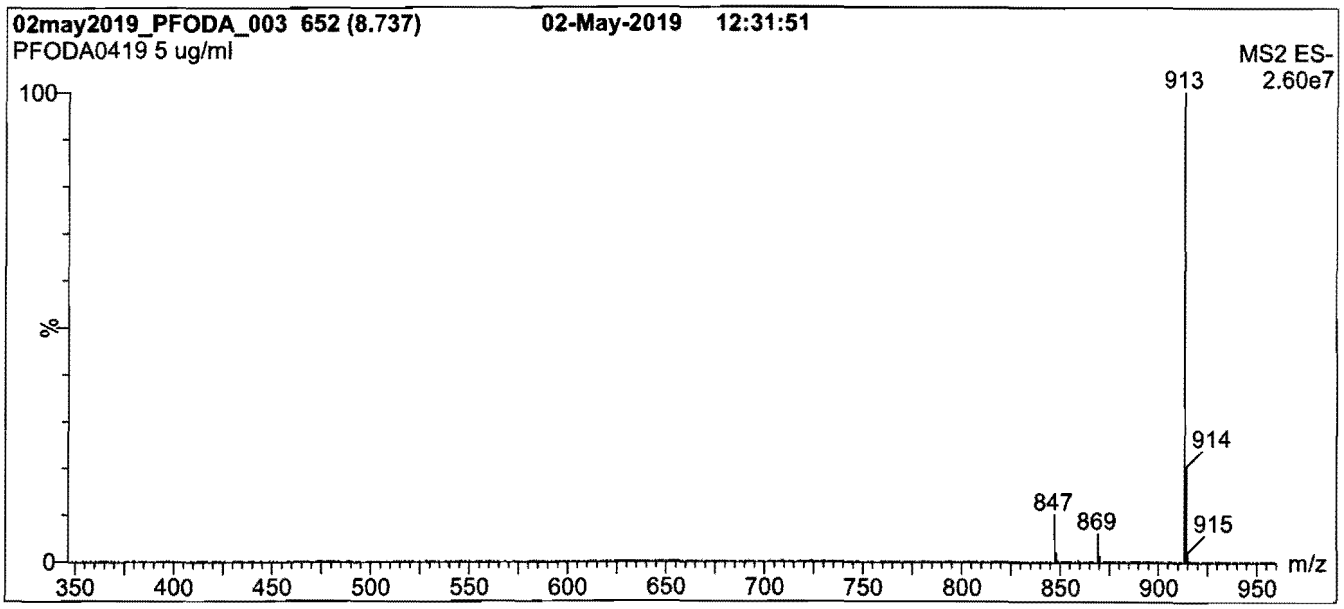
MS Parameters

Collision Gas (mbar) = 2.92e-3
Collision Energy (eV) = 15

19L0647

Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0647

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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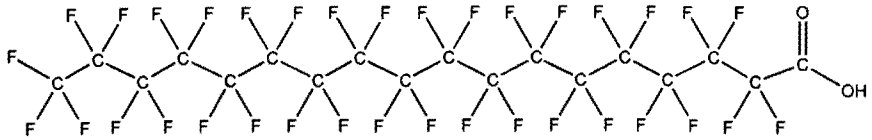
19L0647

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0419

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/02/2019
EXPIRY DATE: (mm/dd/yyyy) 05/02/2024
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFHxDA ($C_{16}HF_{31}O_2$) and ~ 0.1% of PFHpDA ($C_{17}HF_{33}O_2$)

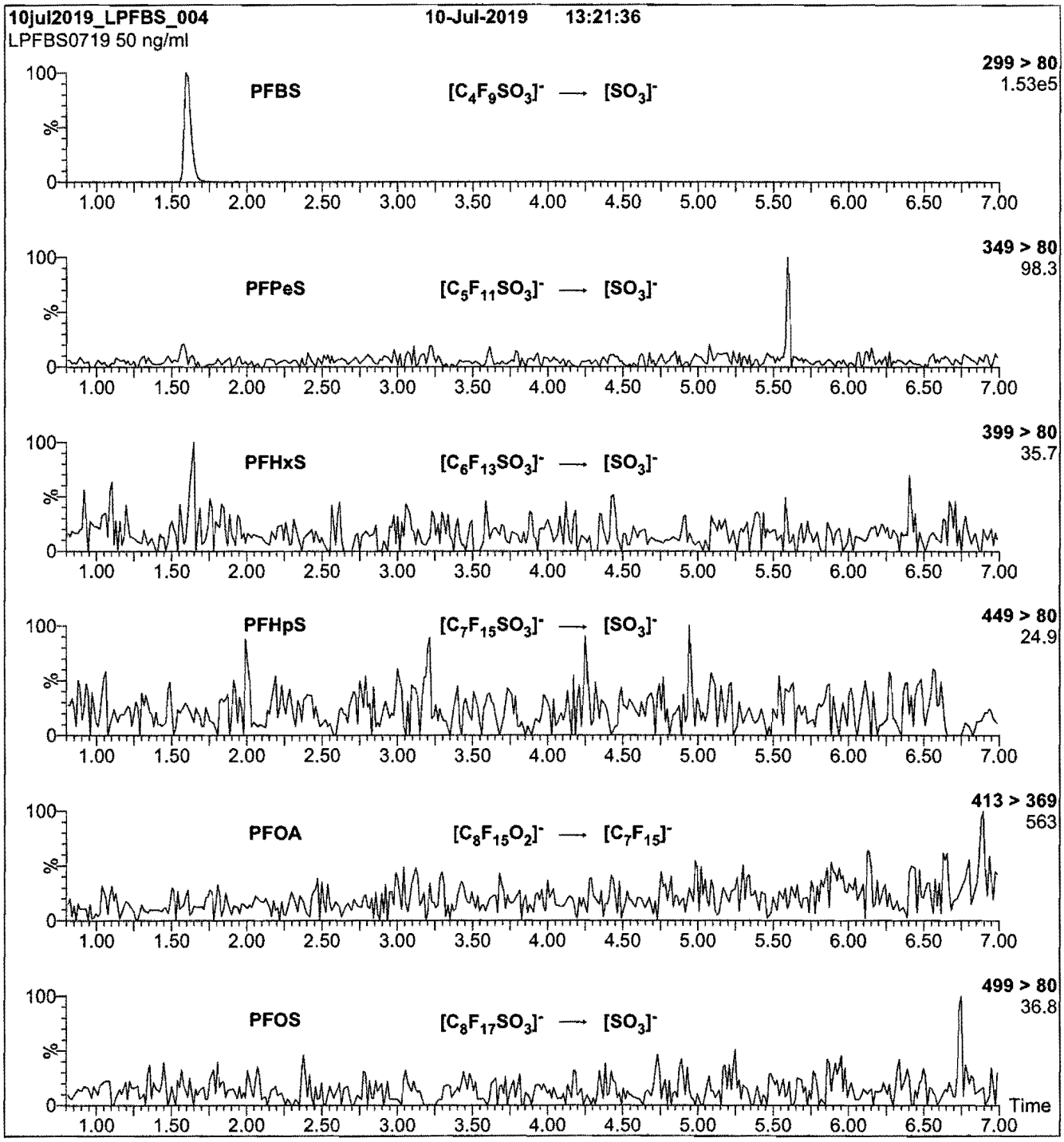
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/16/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0648

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (L-PFBS)

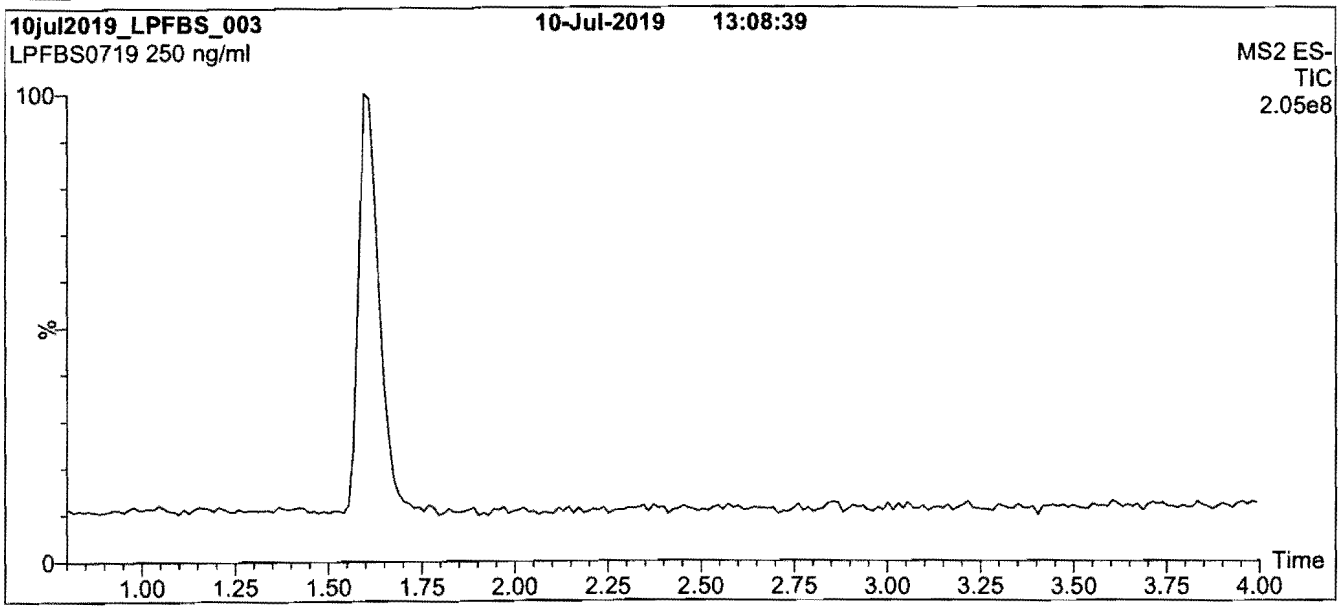
Mobile phase: Same as Figure 1

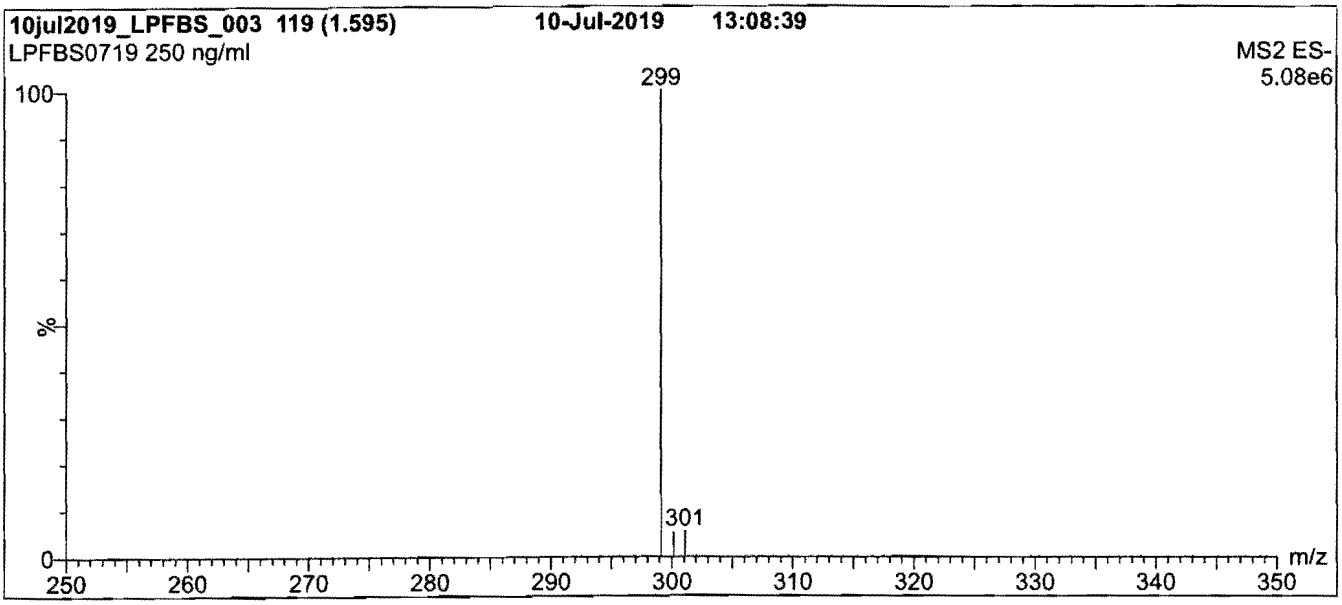
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.25e-3
Collision Energy (eV) = 30

Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 70% organic over 7 min, then ramp to 90% organic over 2 min and hold for 1.5 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0648

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

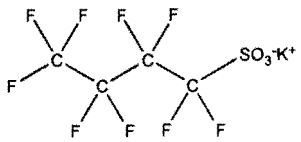
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0648

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0719
COMPOUND:	Potassium perfluoro-1-butanesulfonate		
STRUCTURE:		**CAS #:**	29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/10/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/10/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

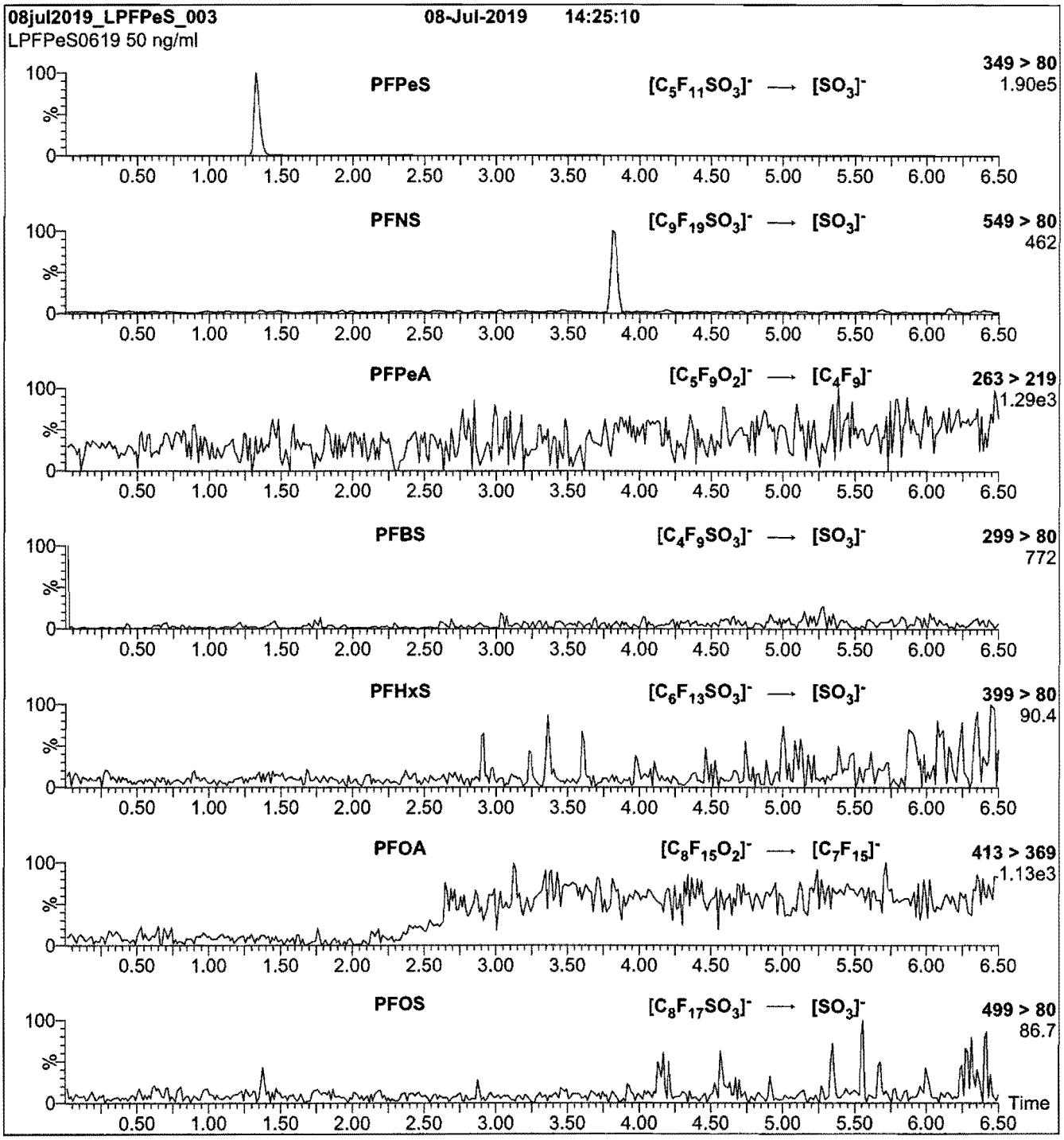
- See page 2 for further details.
- Contains ~ 0.2% of sodium perfluoro-1-nonanesulfonate (L-PFNS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/06/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (L-PFPeS)

Mobile phase: Same as Figure 1

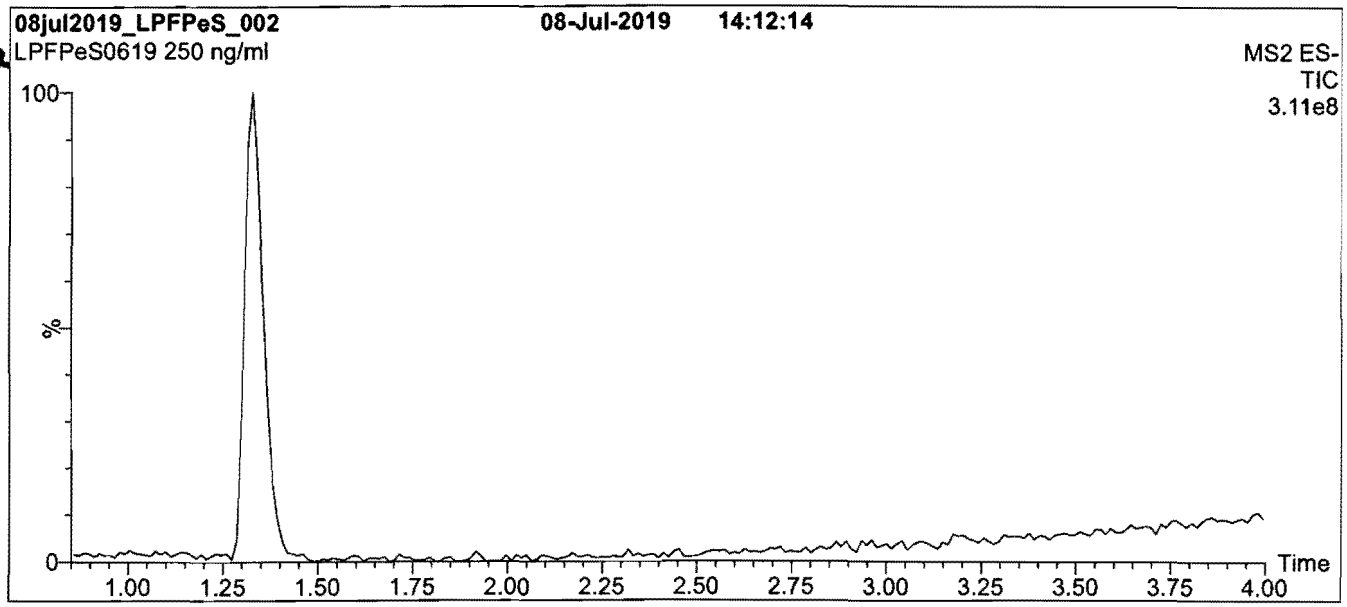
Flow: 300 µl/min

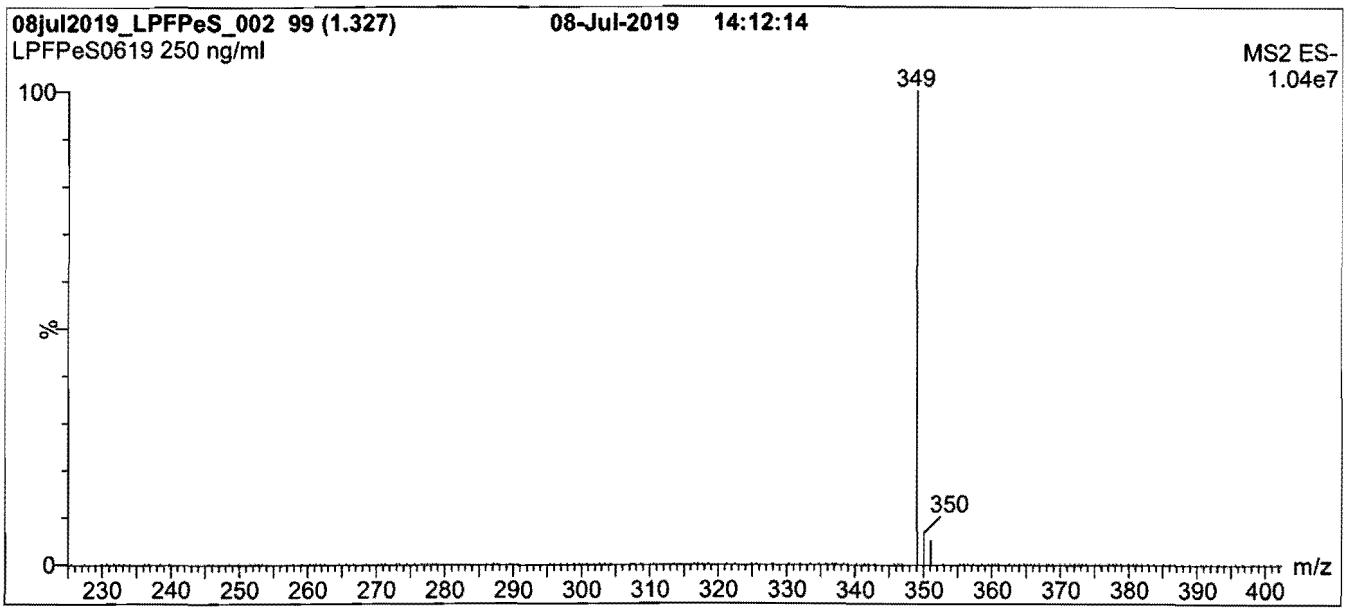
MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 32

19L0649

Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0649

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

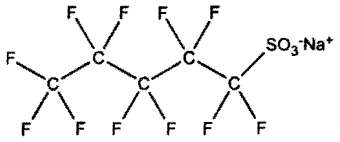
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0619

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFPeS	**LOT NUMBER:**	LPFPeS0619
COMPOUND:	Sodium perfluoro-1-pentanesulfonate		
STRUCTURE:		**CAS #:**	630402-22-1



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/08/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/08/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

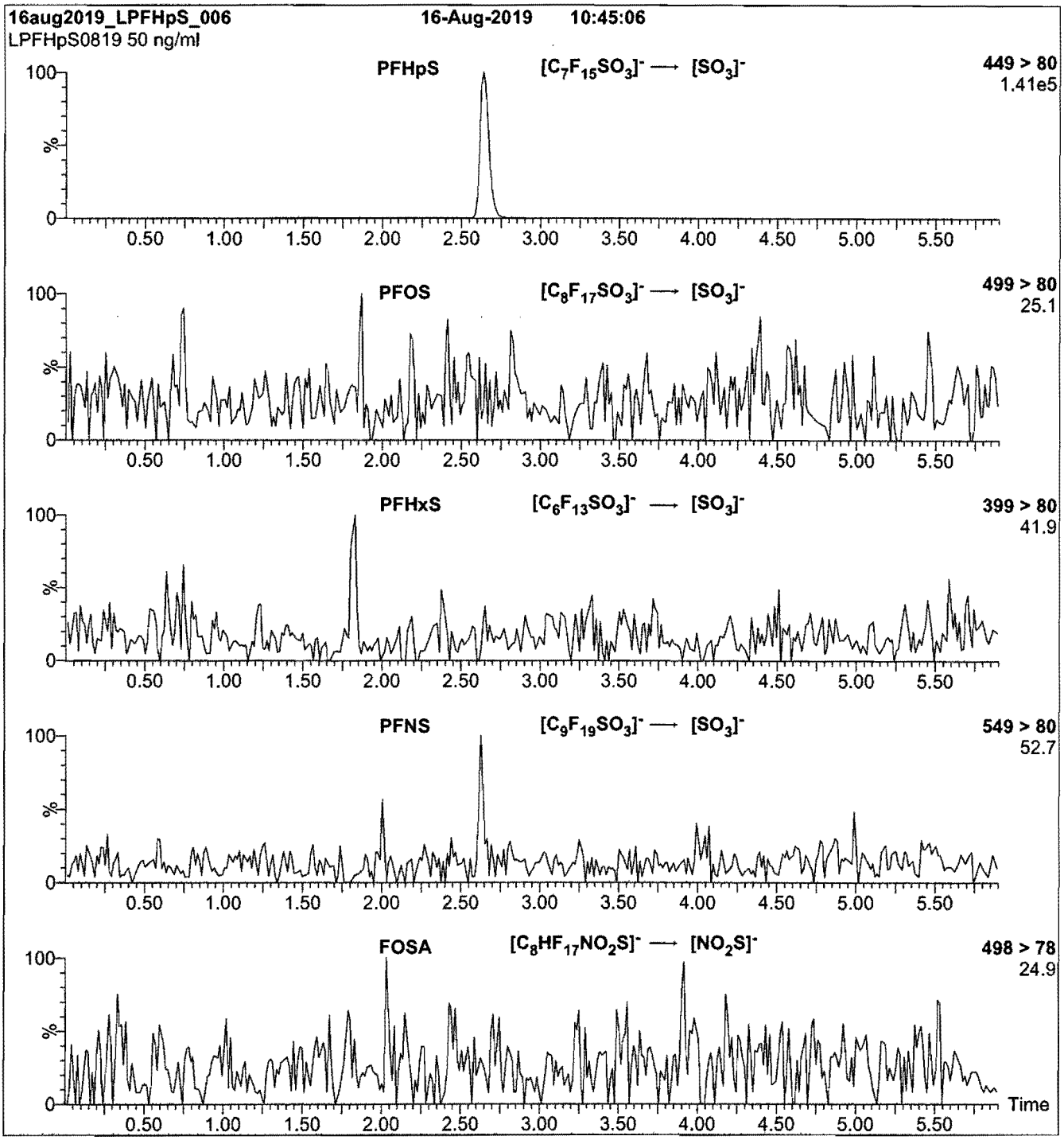
- See page 2 for further details.
- Contains ~ 0.3% of sodium perfluoro-1-nonanesulfonate (L-PFNS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/11/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

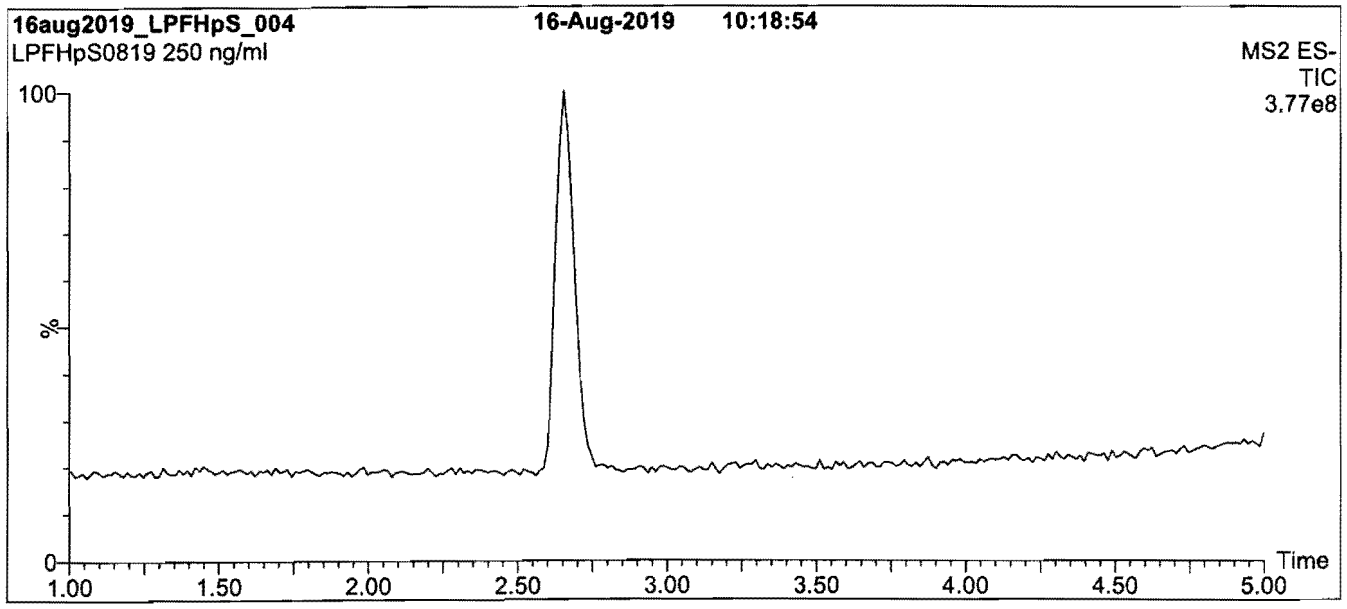
Injection: On-column (L-PFHpS)

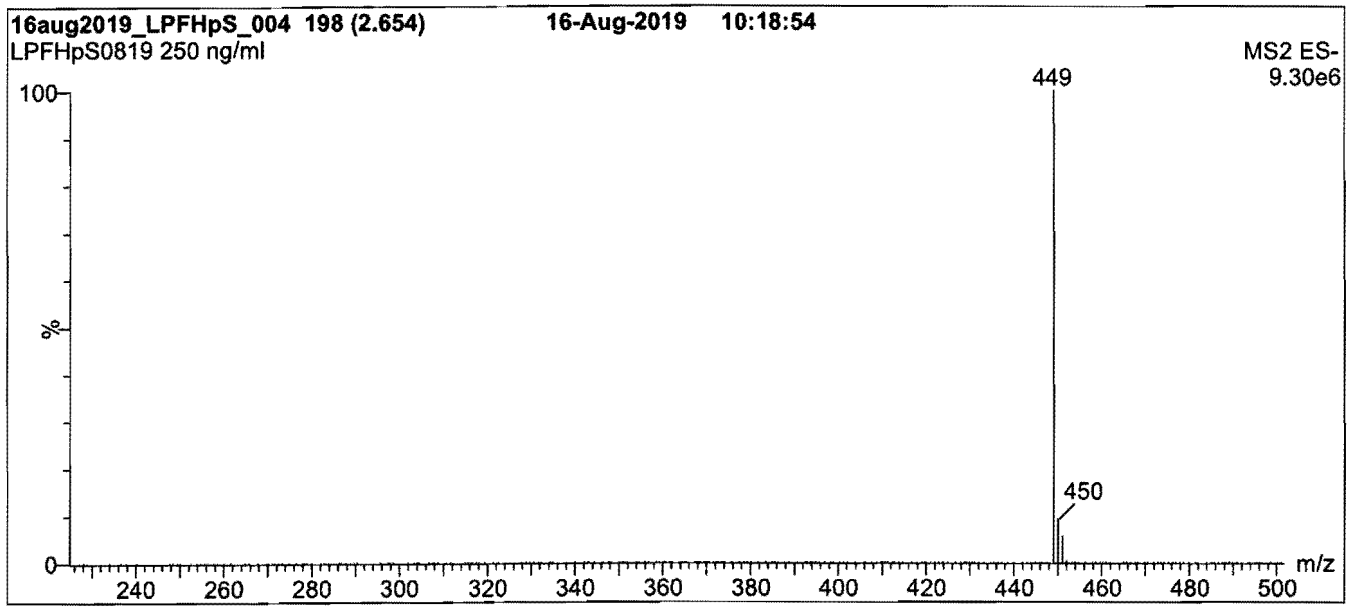
Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.61e-3
Collision Energy (eV) = 42

Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0650

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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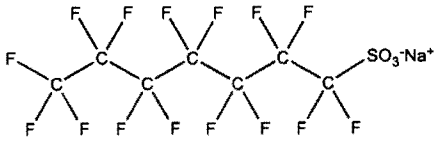
19L0650

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFHpS	**LOT NUMBER:**	LPFHpS0819
COMPOUND:	Sodium perfluoro-1-heptanesulfonate		
STRUCTURE:		**CAS #:**	21934-50-9



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.6 ± 2.4 µg/ml (PFHpS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/16/2019		
EXPIRY DATE: (mm/dd/yyyy)	08/16/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

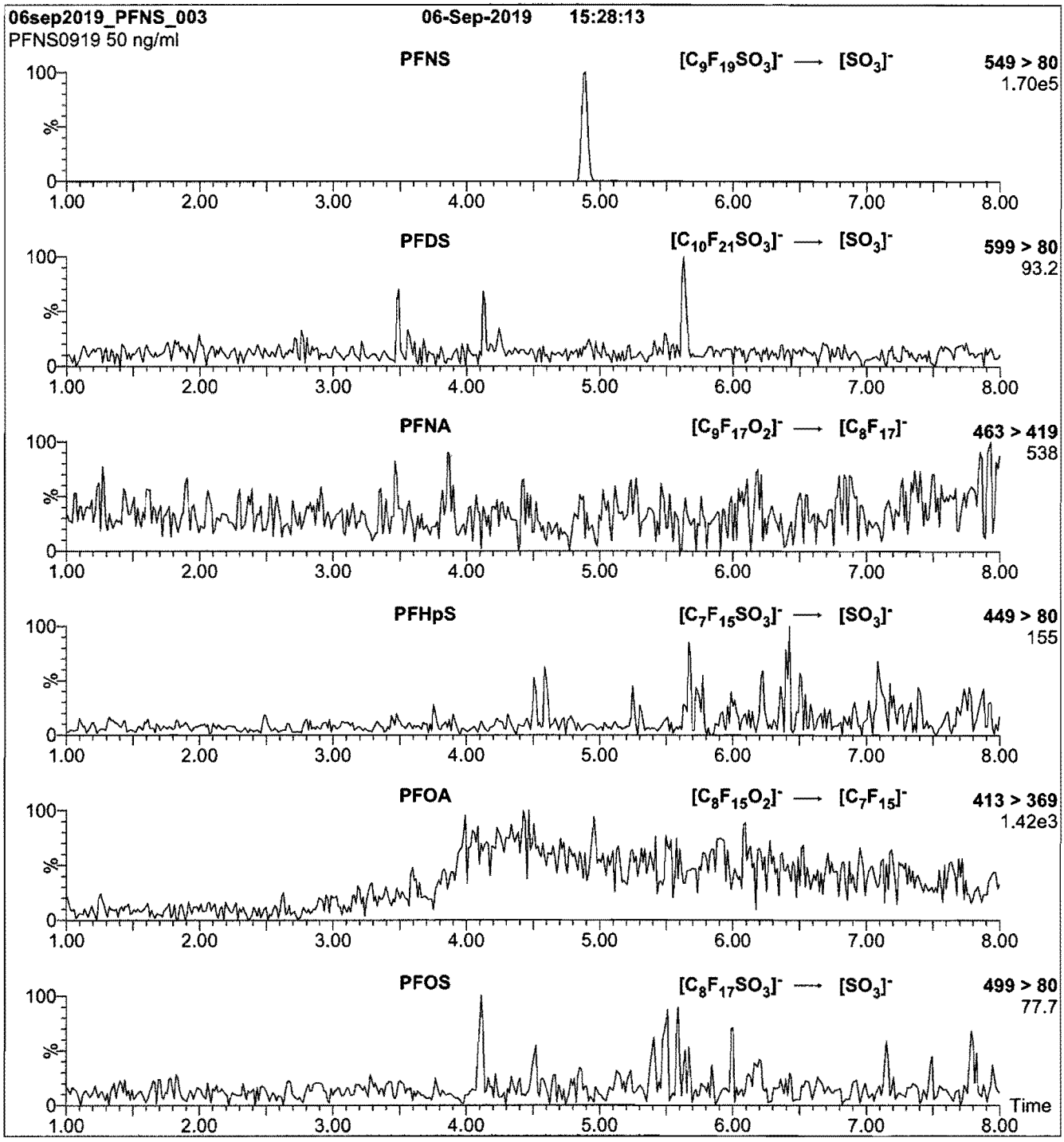
- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/29/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (L-PFNS)

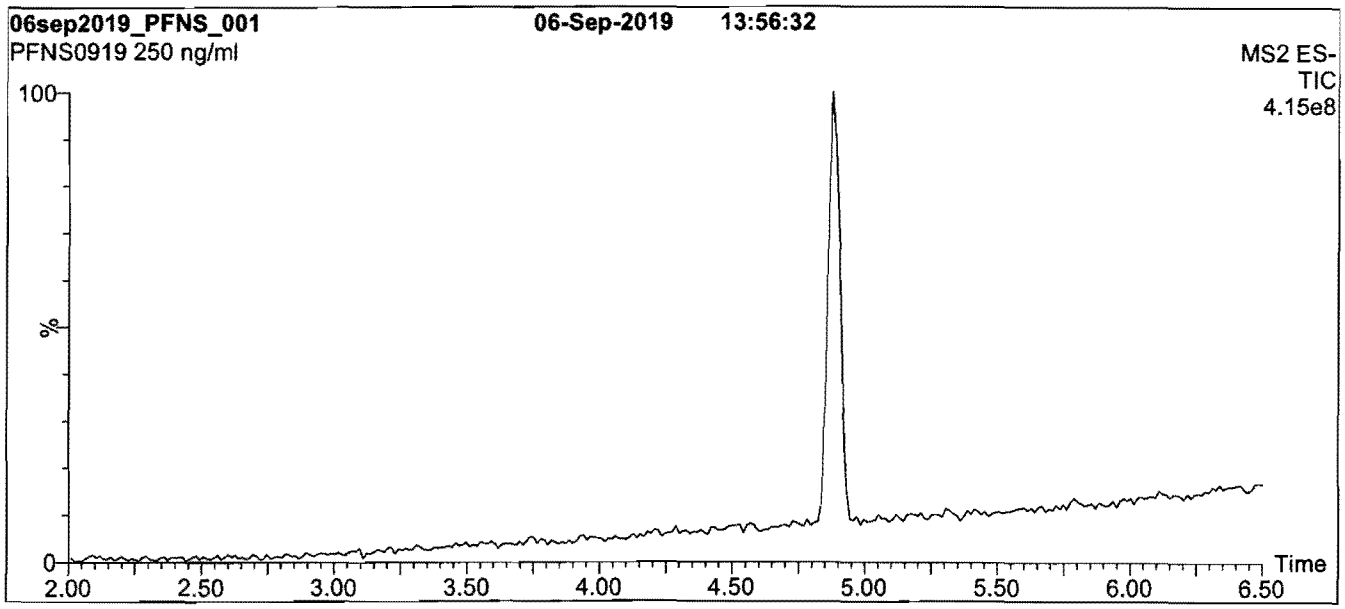
Mobile phase: Same as Figure 1

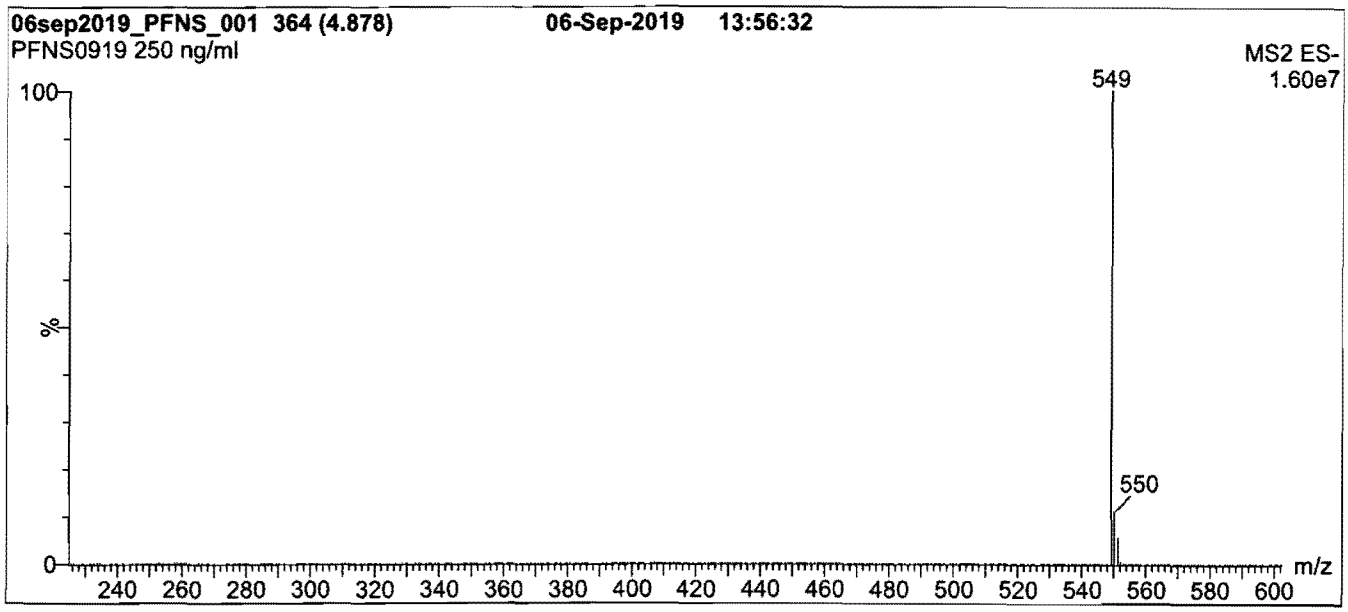
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.49e-3
Collision Energy (eV) = 64

Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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Start: 55% (80:20 MeOH:ACN) / 45% H_2O
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Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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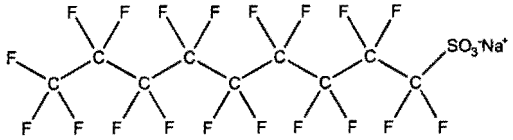
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFNS	**LOT NUMBER:**	LPFNS0919
COMPOUND:	Sodium perfluoro-1-nonanesulfonate		
STRUCTURE:		**CAS #:**	98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/06/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/06/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

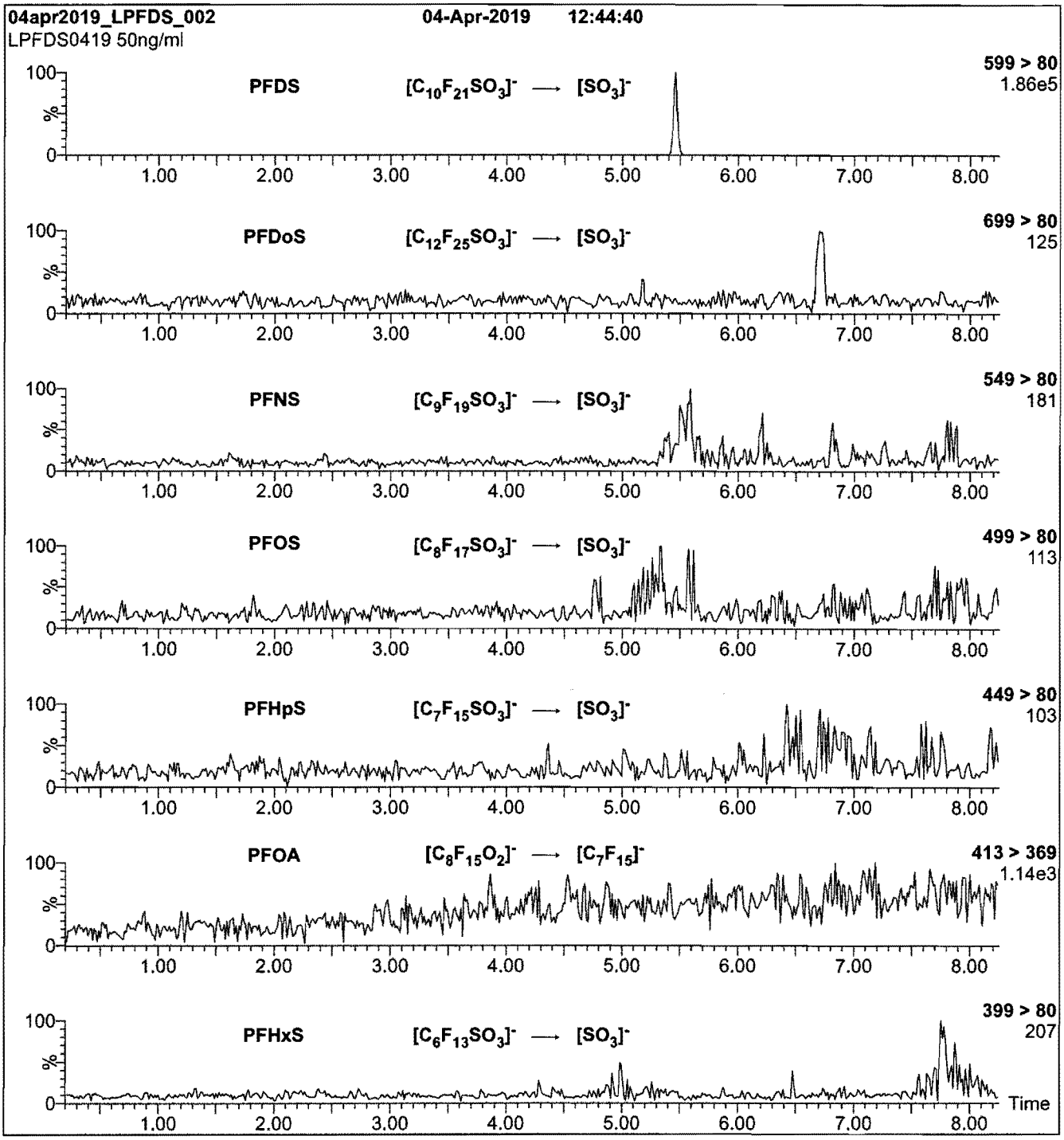
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0652

Figure 2: **L-PFDS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (L-PFDS)

Mobile phase: Same as Figure 1

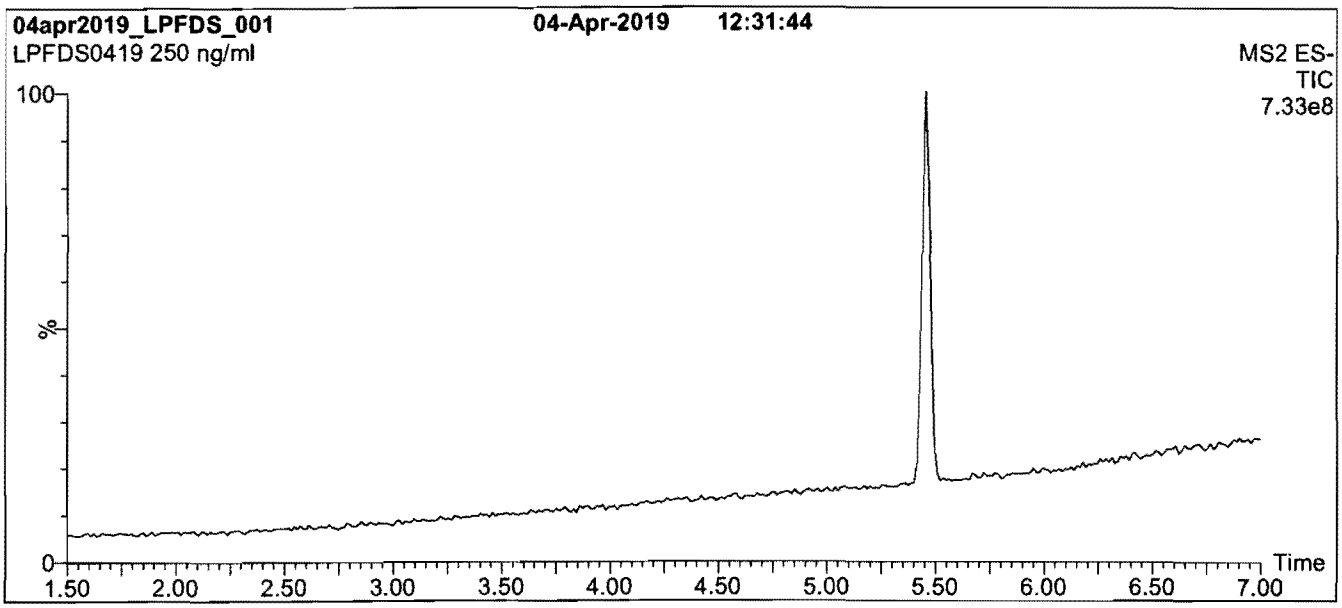
Flow: 300 µl/min

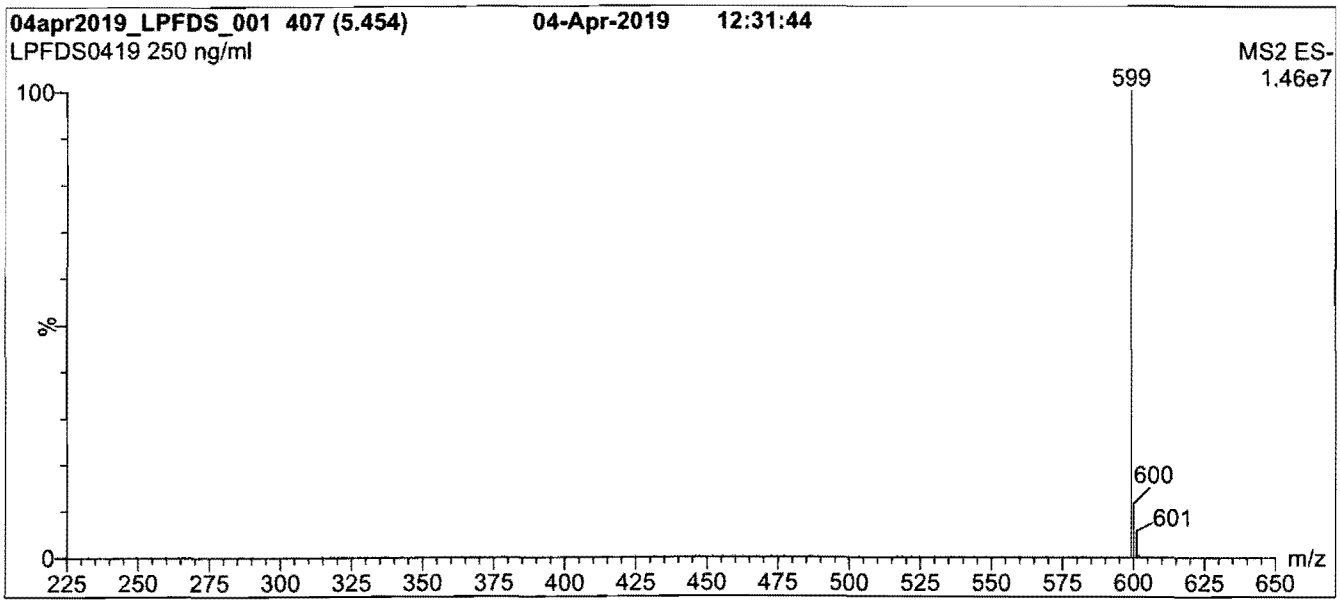
MS Parameters

Collision Gas (mbar) = 2.99e-3
Collision Energy (eV) = 56

19L0652

Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0652

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

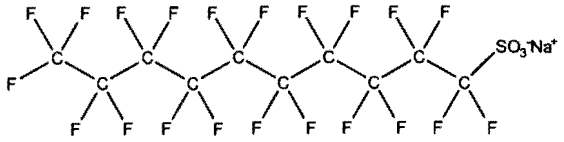
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0652

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS0419
COMPOUND:	Sodium perfluoro-1-decanesulfonate		
STRUCTURE:		**CAS #:**	2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/04/2019		
EXPIRY DATE: (mm/dd/yyyy)	04/04/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

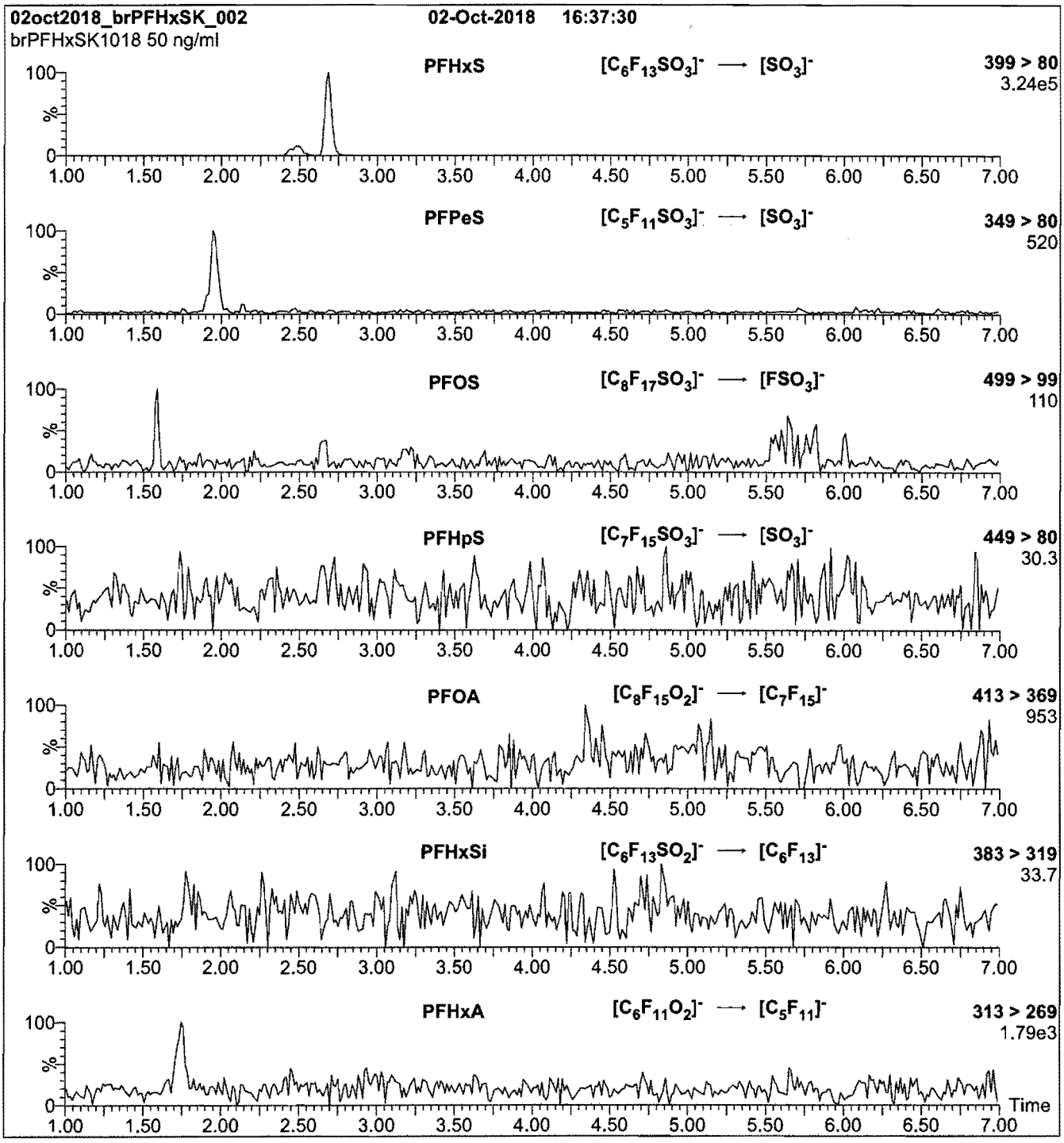
- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/30/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (br-PFHxSK)

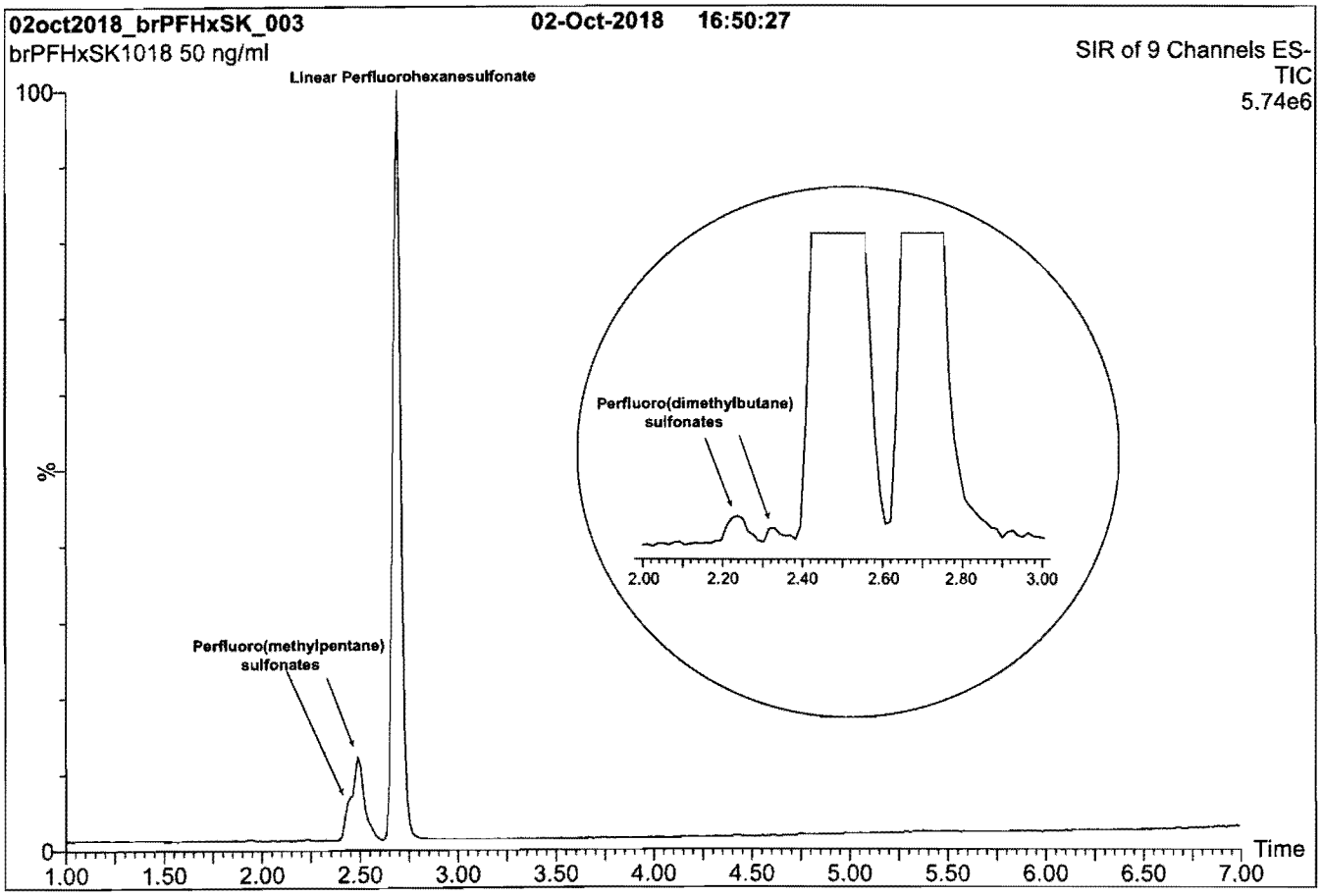
Mobile phase: Same as Figures 1 and 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.87e-3
Collision Energy (eV) = 42

Figure 2: **br-PFHxSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min. Hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

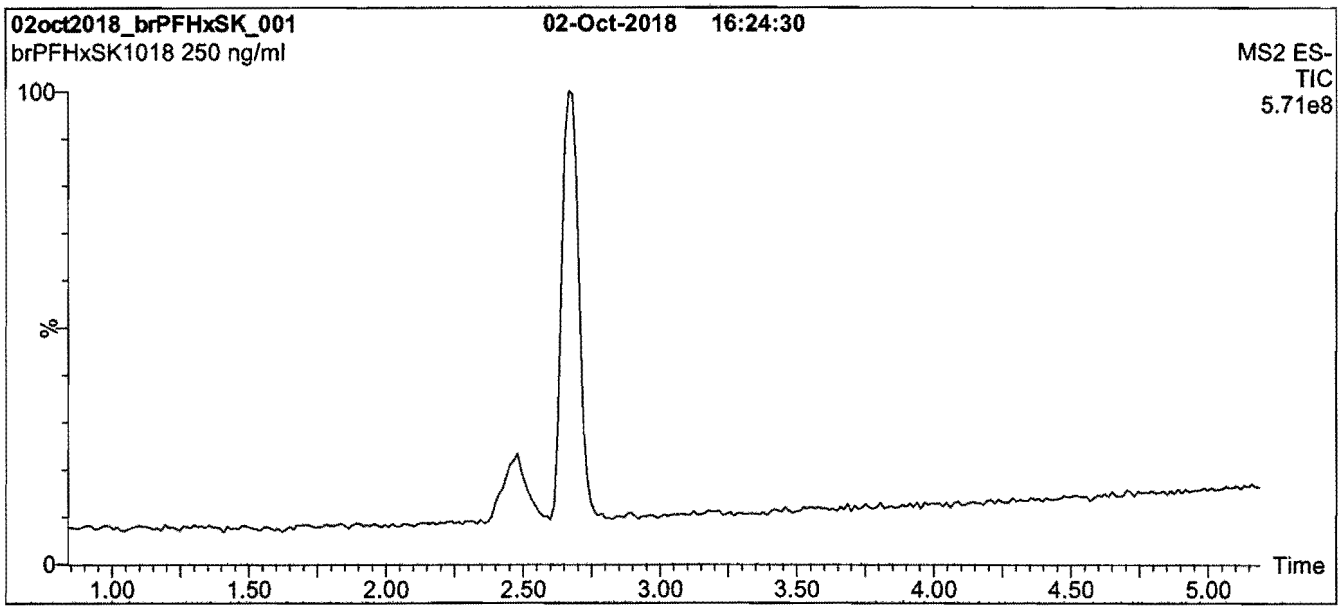
MS Parameters

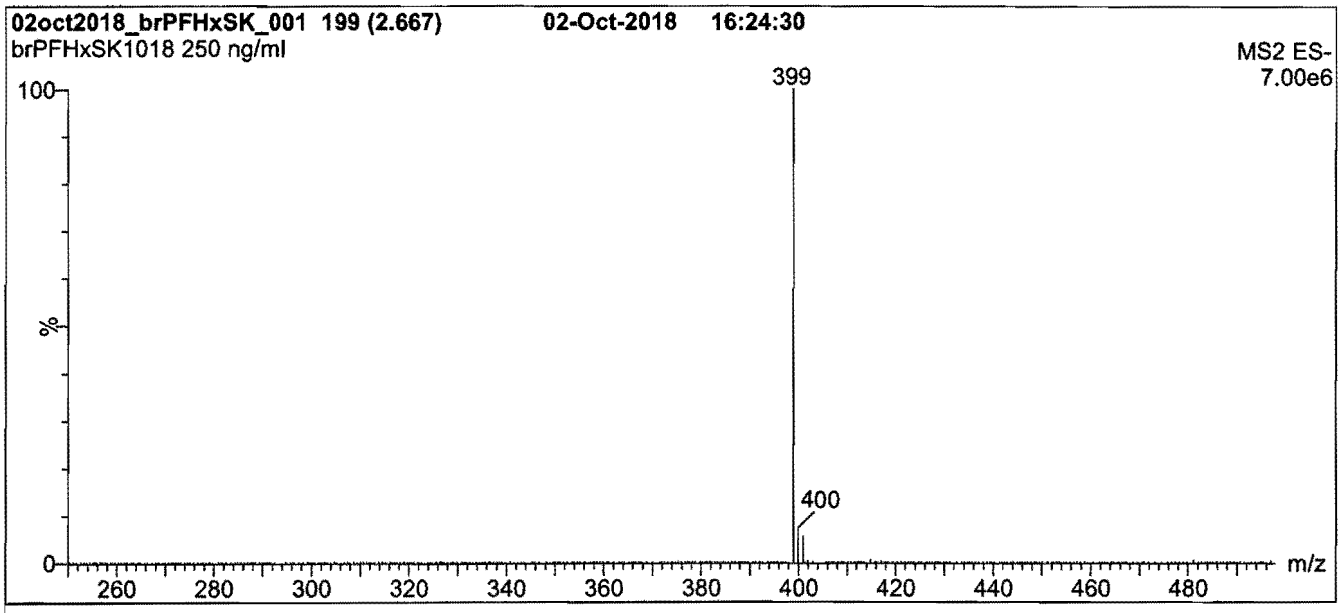
Experiment: SIR (9 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = variable (2 - 6)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0653

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min. Hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0653

Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: _____ **Date:** 10/05/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

19L0653

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0653

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK1018
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/01/2018
LAST TESTED: (mm/dd/yyyy)	10/02/2018
EXPIRY DATE: (mm/dd/yyyy)	10/02/2023
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.3% of perfluoro-n-hexanoic acid and ~ 0.15% of perfluoro-1-pentanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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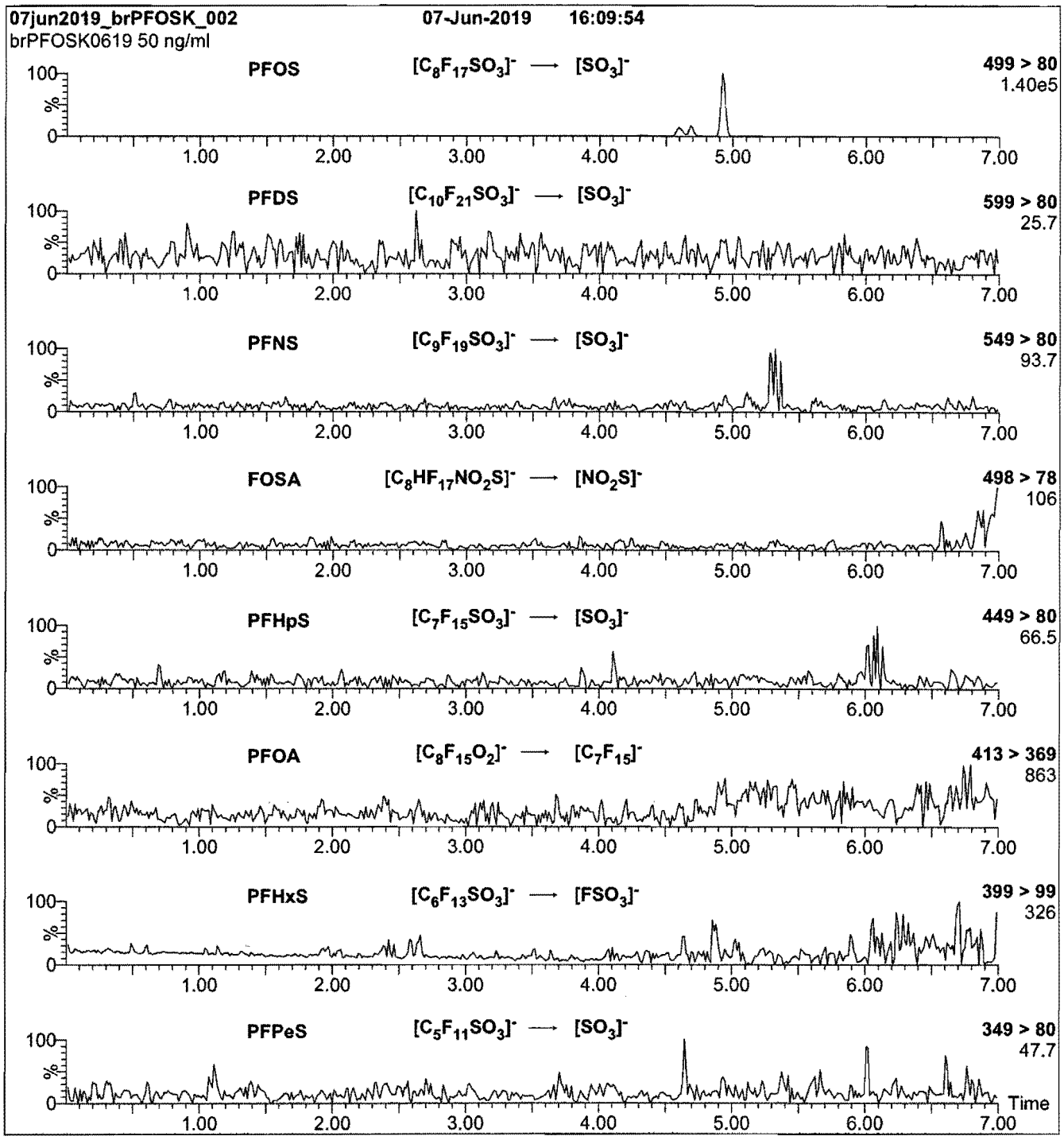
19L0654

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (br-PFOSK)

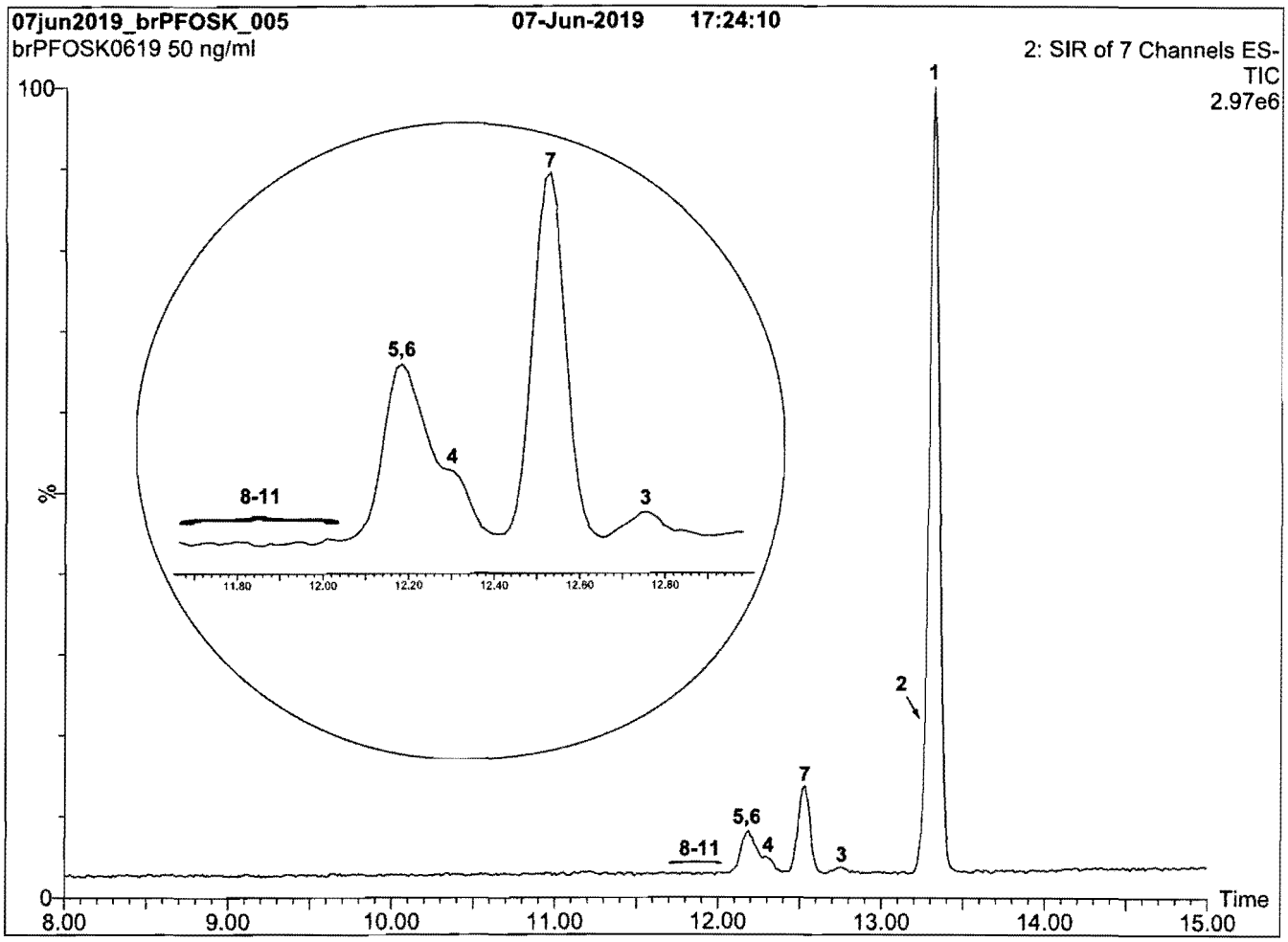
Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 64

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 50 ng/ml of br-PFOSK

Mobile Phase: Gradient
50% (80:20 MeOH:ACN) / 50% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min.
Return to initial conditions over 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 120 °C
Desolvation = 500 °C
Cone Voltage = 2.00V

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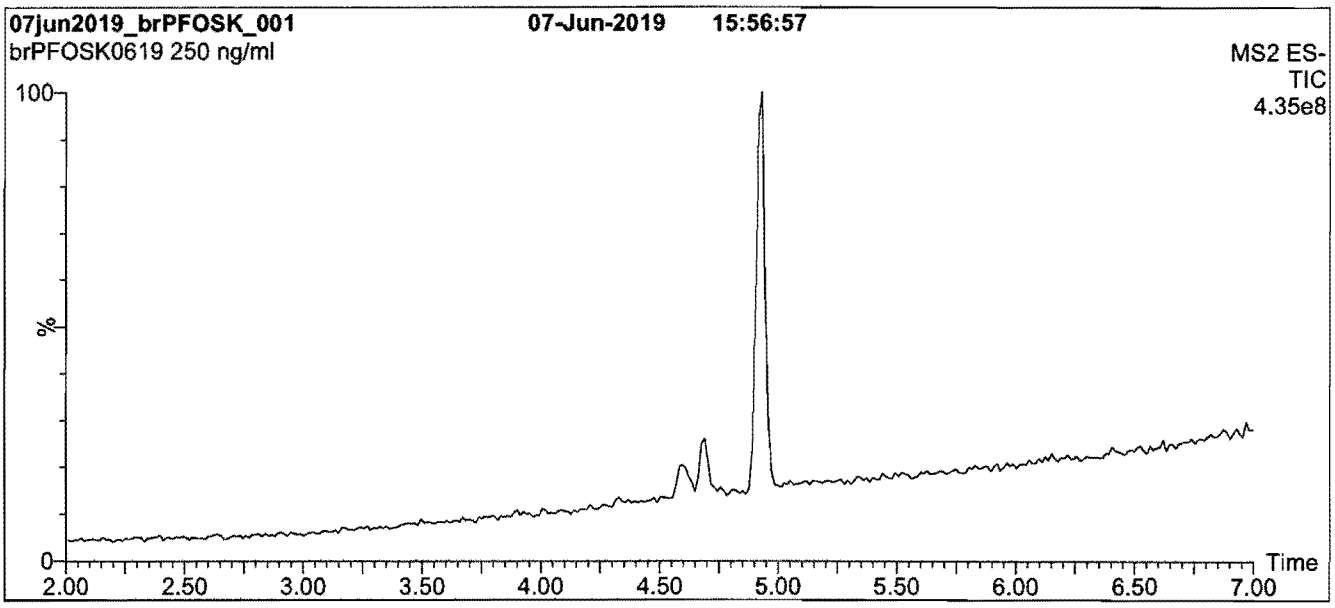
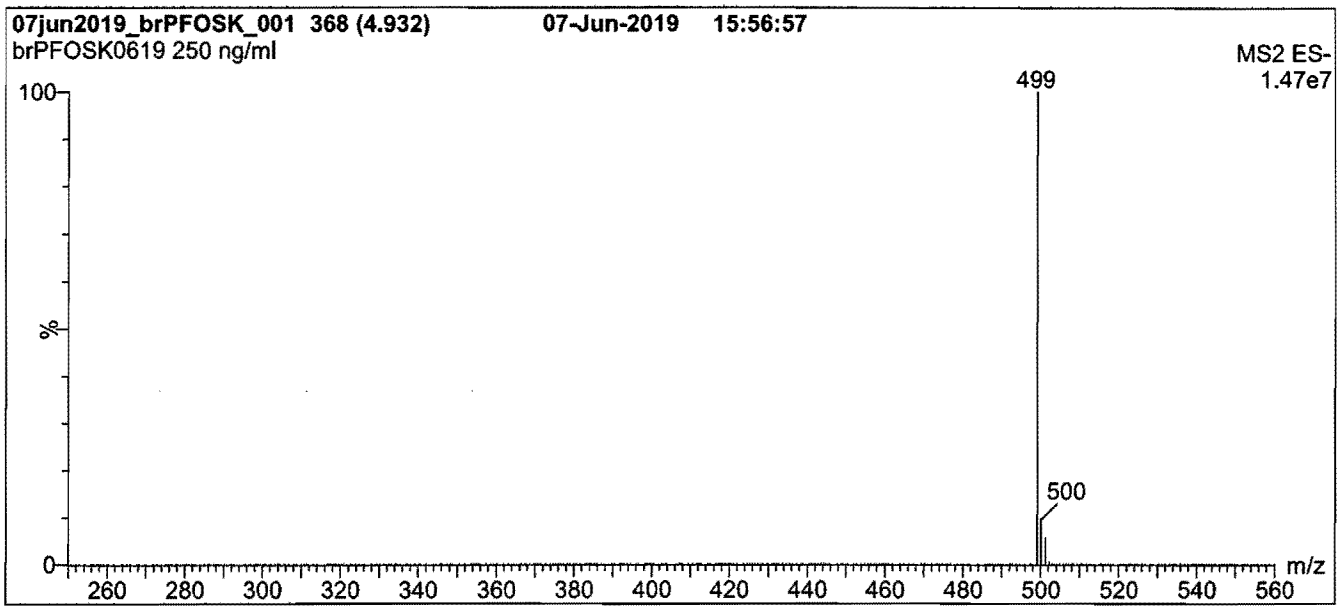
Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min.
Return to initial conditions over 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0654

Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 06/17/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

19L0654

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0654

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0619
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/03/2019
LAST TESTED: (mm/dd/yyyy)	06/07/2019
EXPIRY DATE: (mm/dd/yyyy)	06/07/2024
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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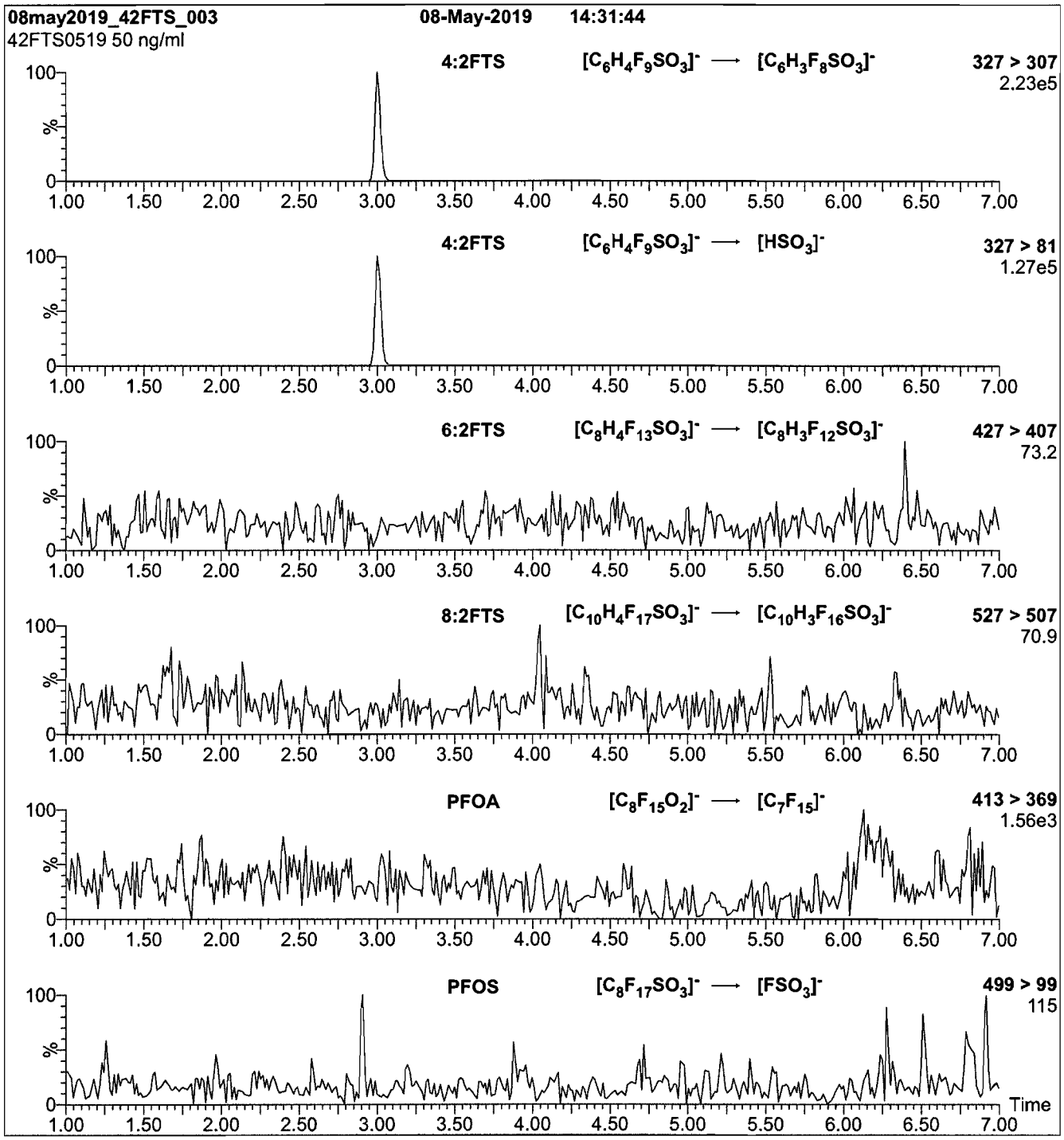
Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (4:2FTS)

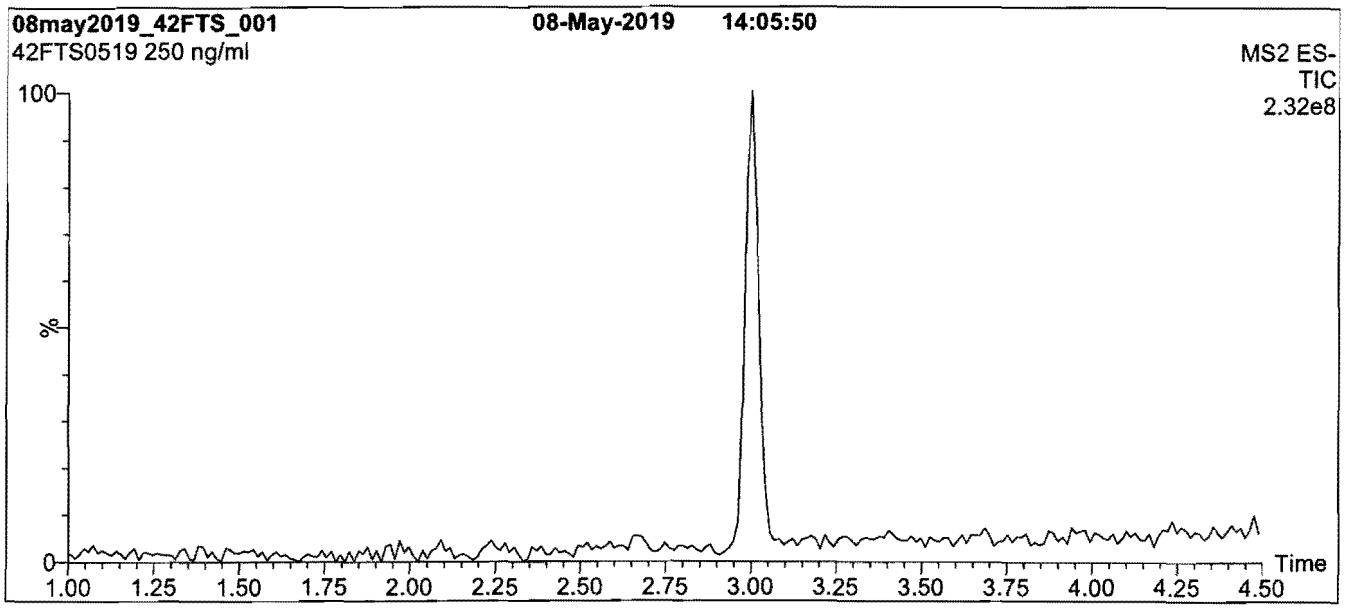
Mobile phase: Same as Figure 1

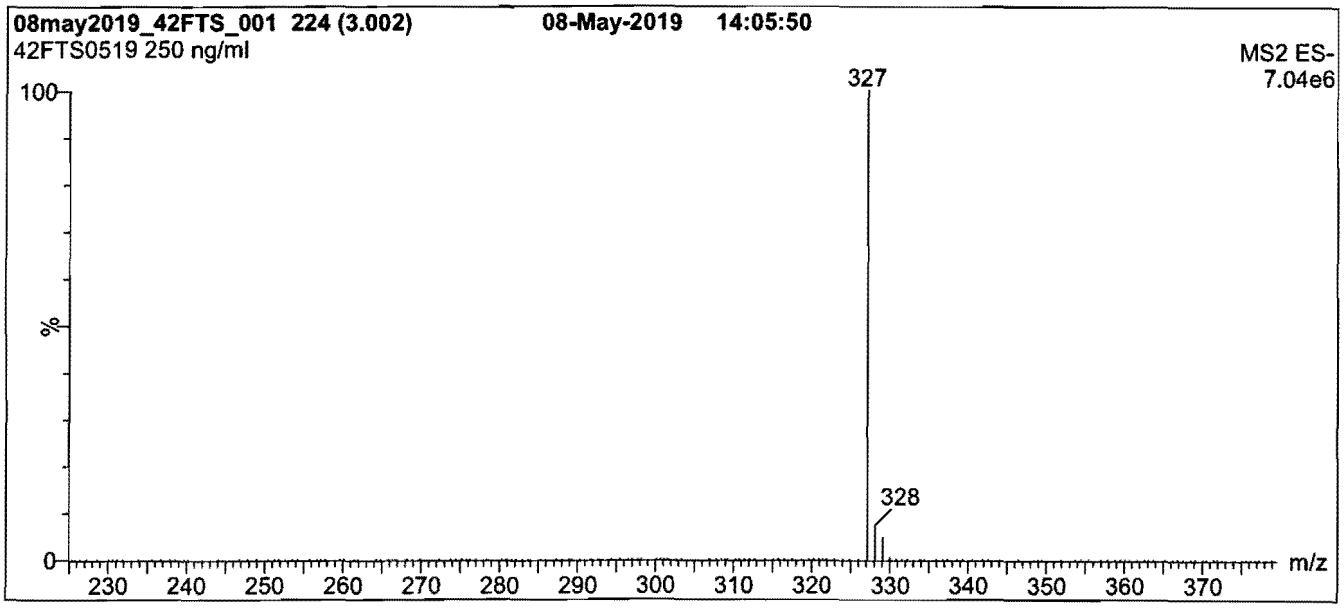
Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.07e-3
Collision Energy (eV) = 18

19L0655

Figure 1: 4:2FTS; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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19L0655

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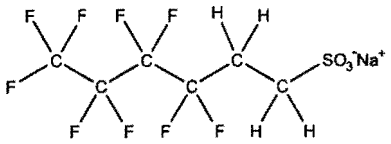
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	4:2FTS	**LOT NUMBER:**	42FTS0519
COMPOUND:	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate		
STRUCTURE:		**CAS #:**	27619-93-8



MOLECULAR FORMULA:	$C_6H_4F_9SO_3Na$	**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (4:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/08/2019		
EXPIRY DATE: (mm/dd/yyyy)	05/08/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 05/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

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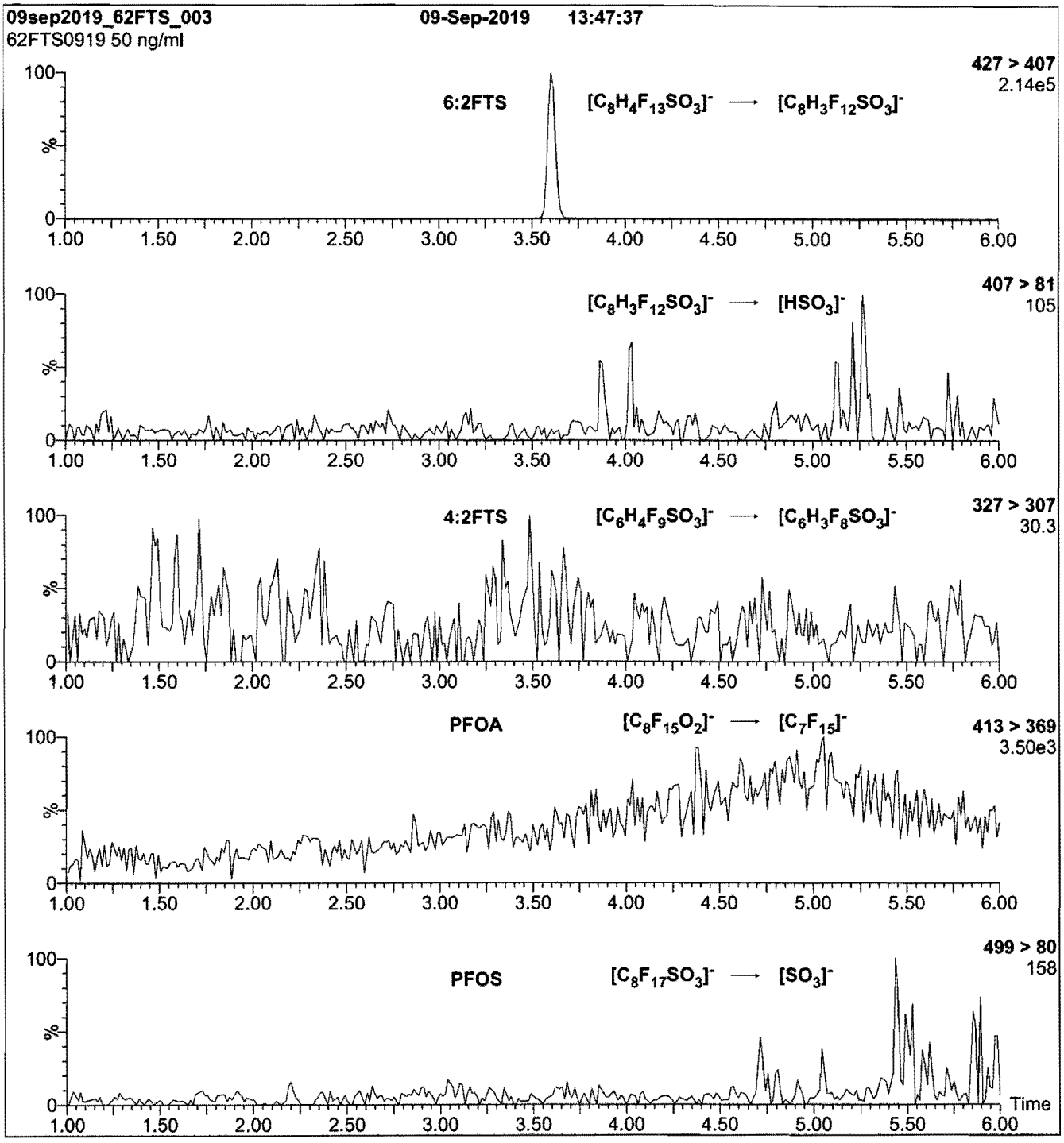
Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (6:2FTS)

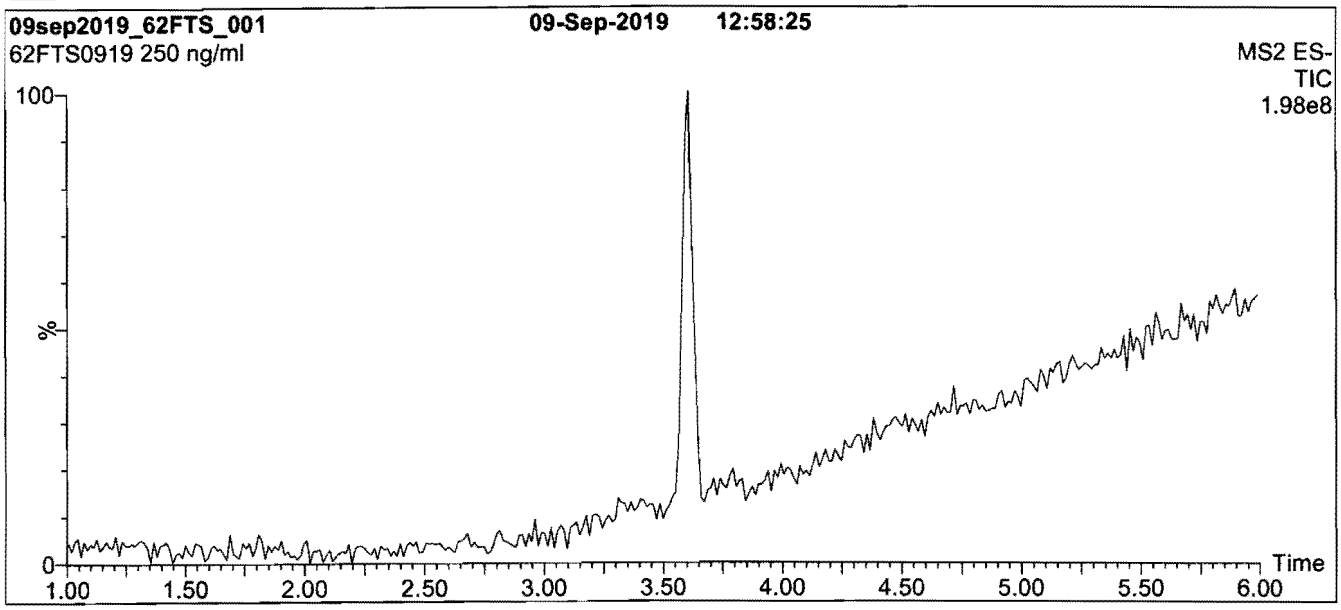
Mobile phase: Same as Figure 1

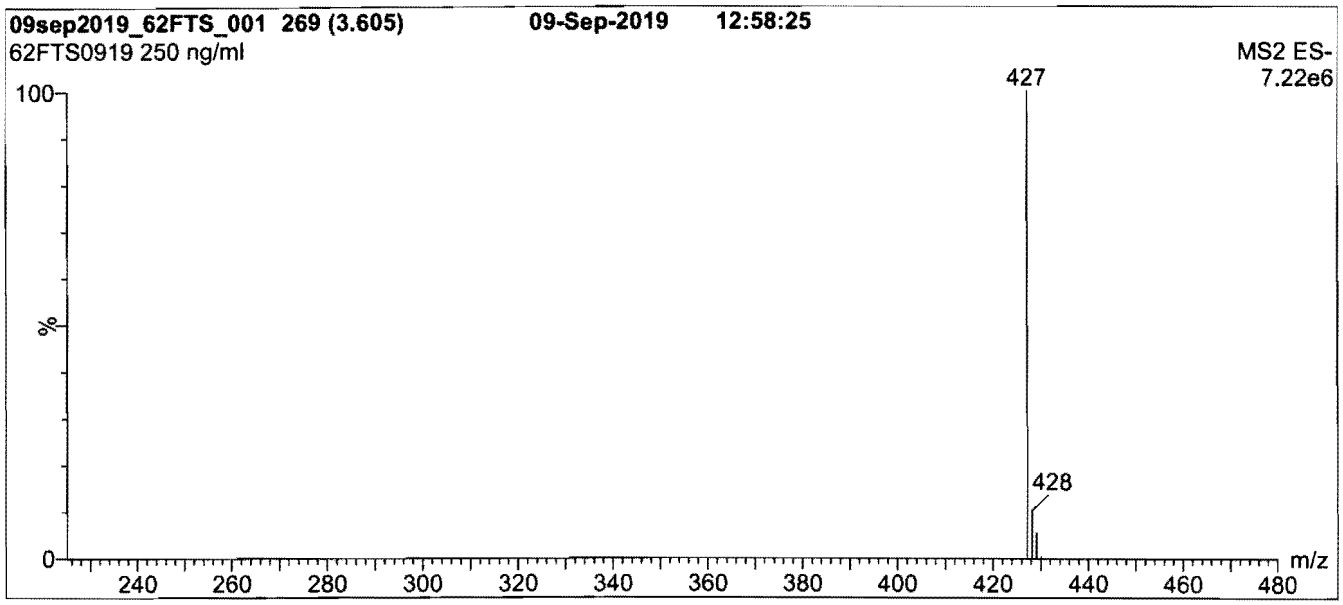
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.61e-3
Collision Energy (eV) = 20

Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED 10017034 REFERENCE MATERIAL PRODUCER

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19L0656

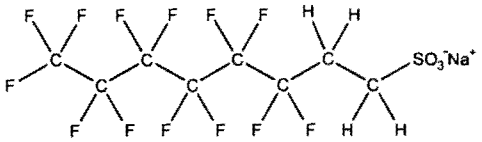
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0919

COMPOUND: Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE: **CAS #:** 27619-94-9



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$		**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml	(6:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	09/09/2019			
EXPIRY DATE: (mm/dd/yyyy)	09/09/2024			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

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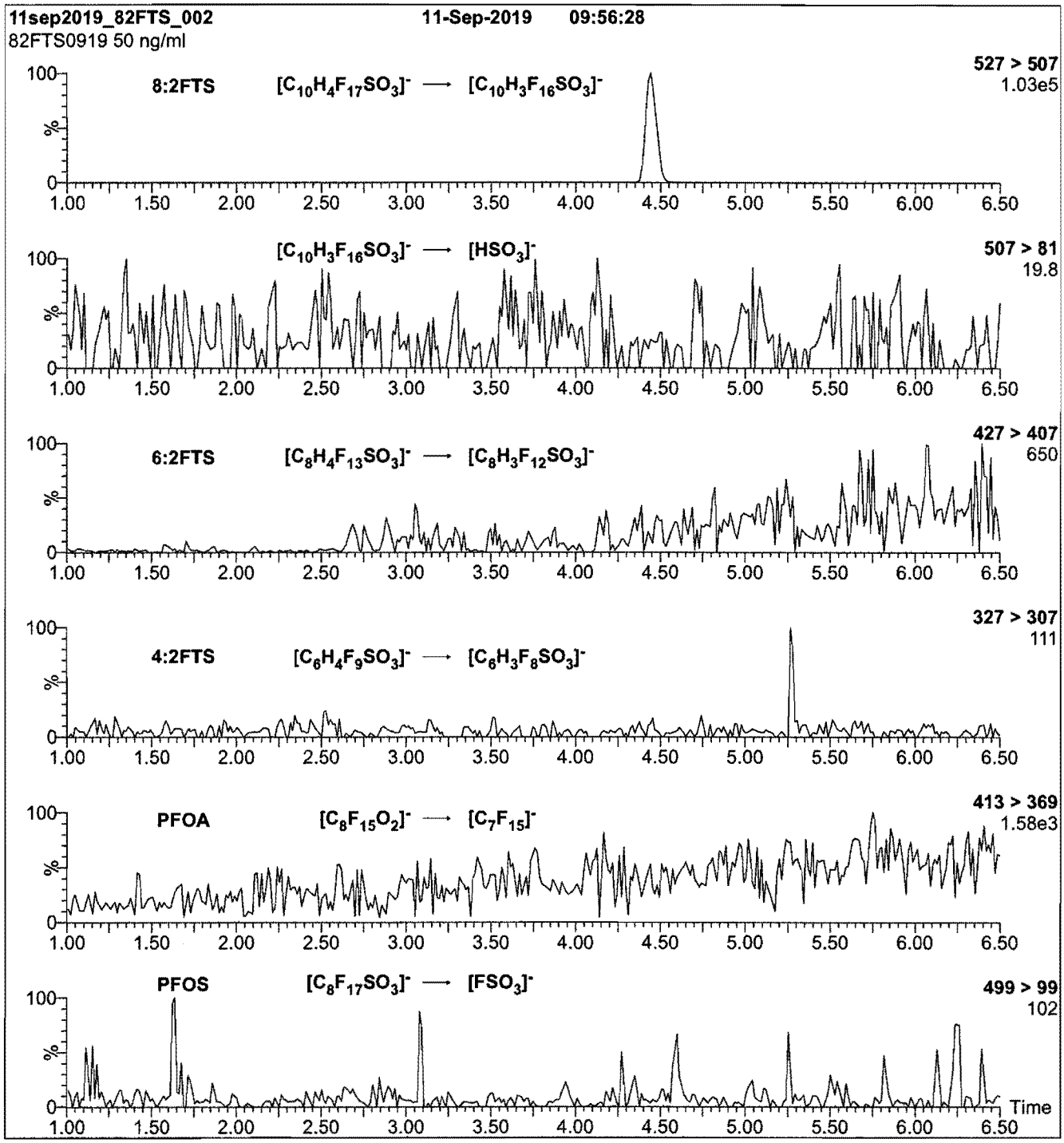
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (8:2FTS)

Mobile phase: Same as Figure 1

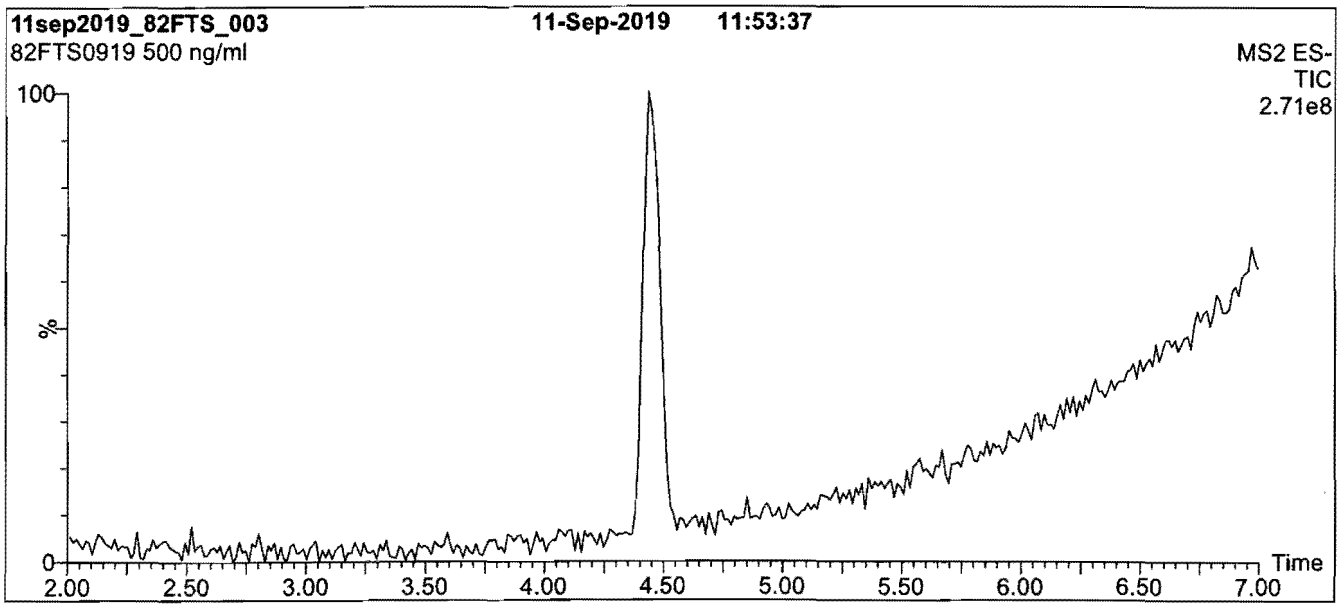
Flow: 300 µl/min

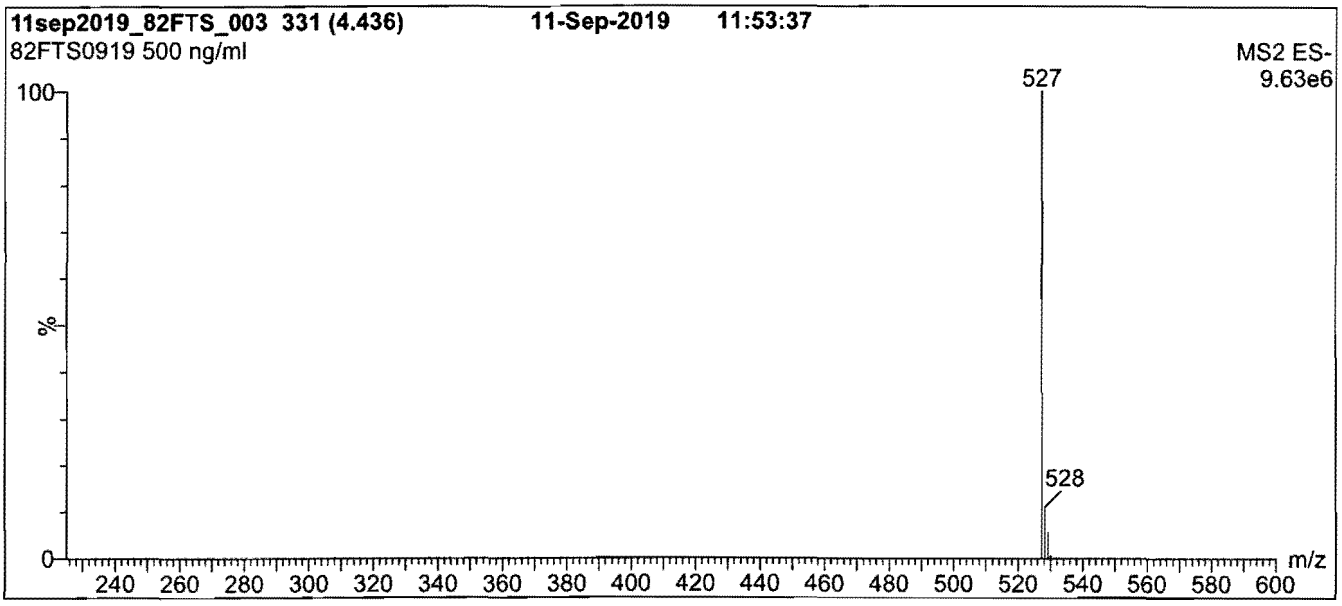
MS Parameters

Collision Gas (mbar) = 3.49e-3
Collision Energy (eV) = 26

19L0657

Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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Time: 12 min

Flow: 300 µl/min

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Experiment: Full Scan (225 - 850 amu)

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19L0657

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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19L0657

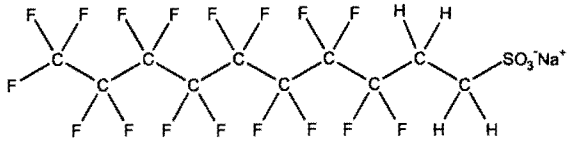
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS0919

COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** 27619-96-1



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$		**MOLECULAR WEIGHT:**	550.16
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml	(8:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	09/11/2019			
EXPIRY DATE: (mm/dd/yyyy)	09/11/2024			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/11/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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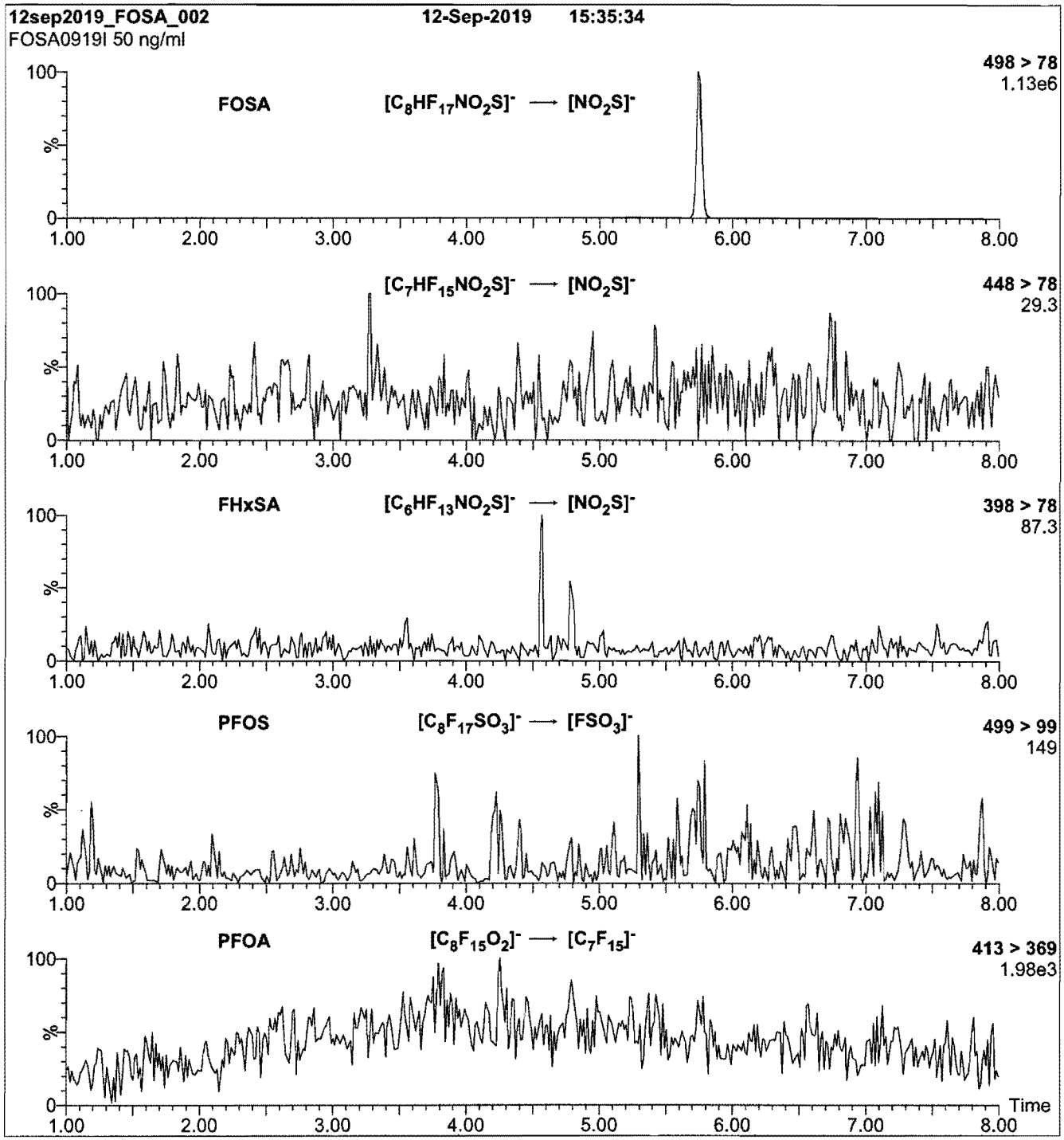
19L0658

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (FOSA-I)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

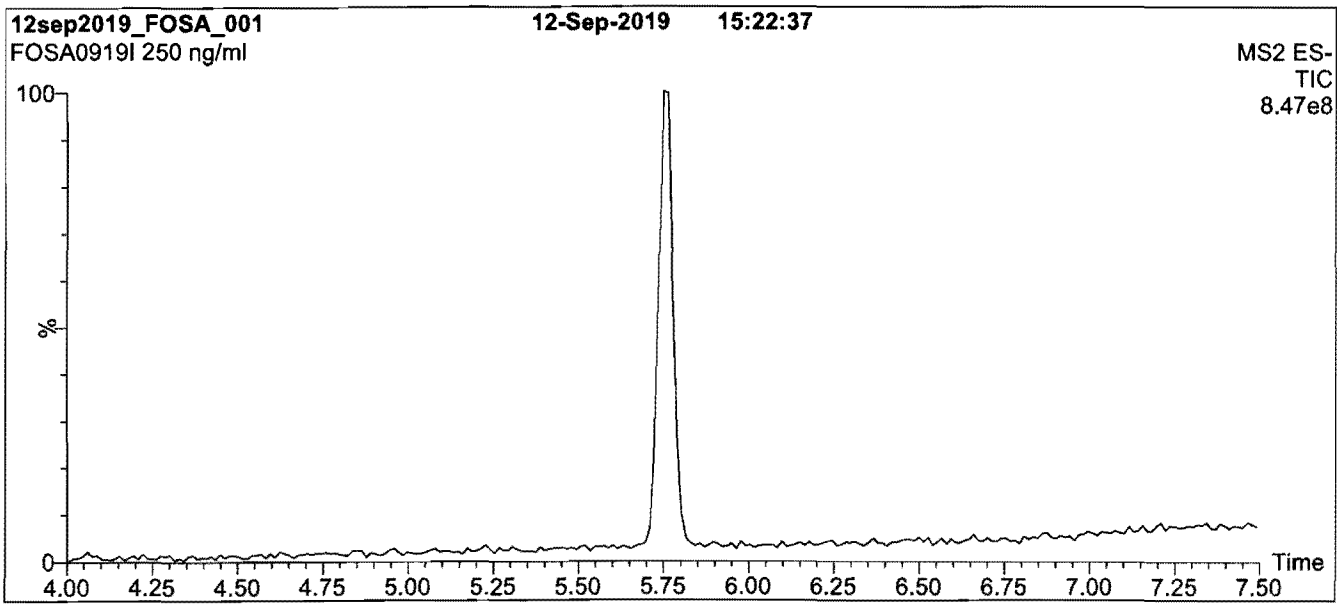
MS Parameters

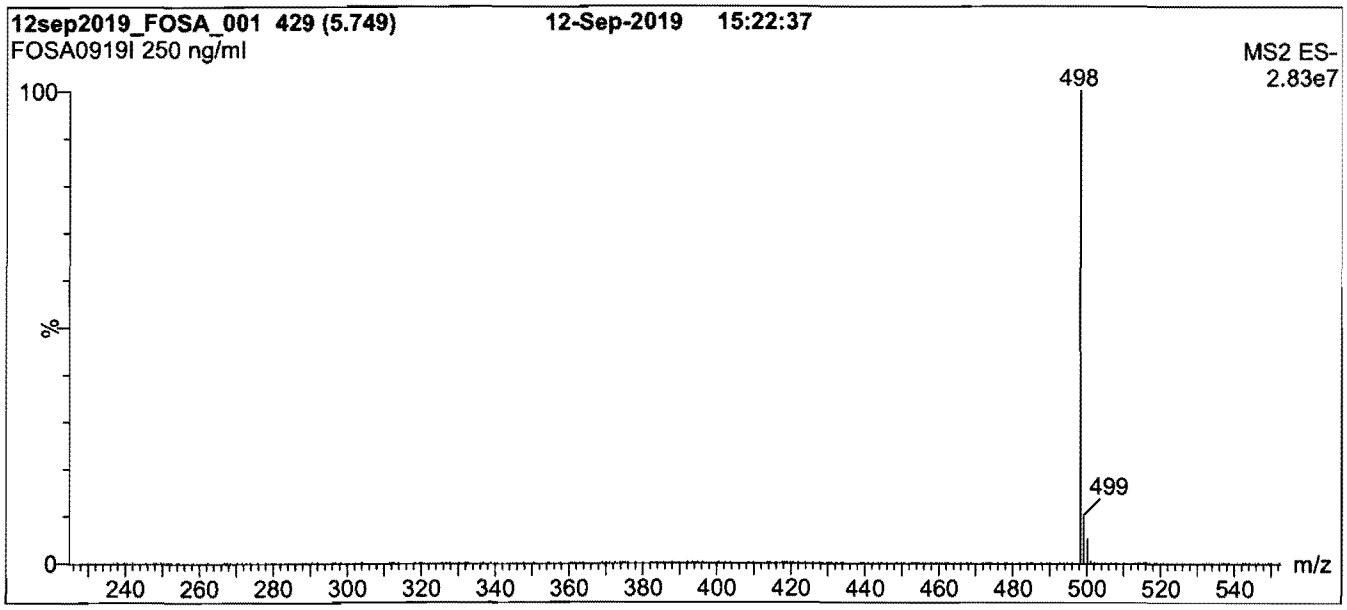
Collision Gas (mbar) = 3.57e-3

Collision Energy (eV) = 30

19L0658

Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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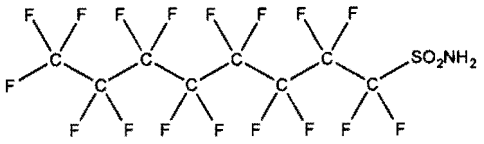
19L0658

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0919I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/12/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/12/2024		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/13/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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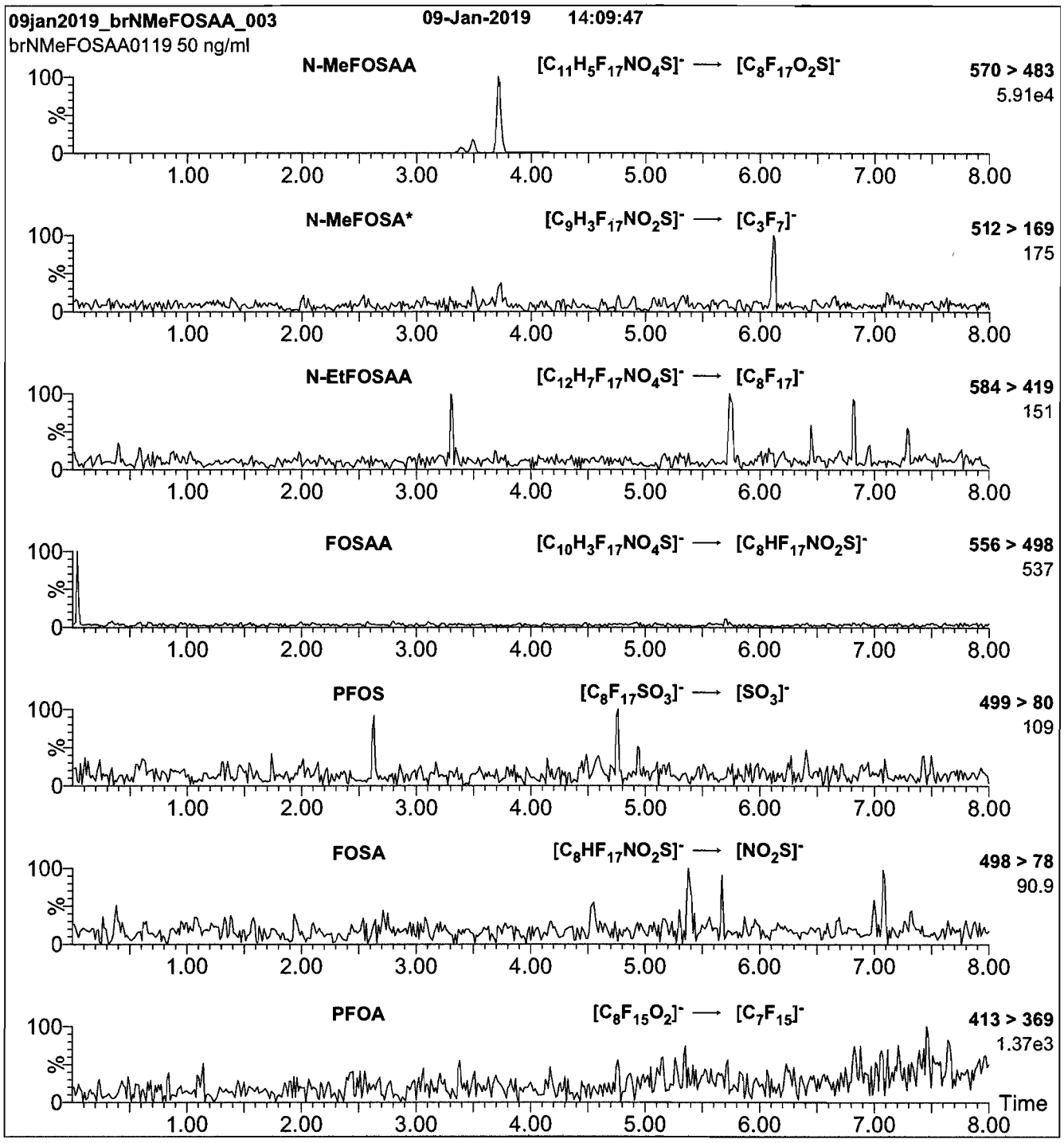
Figure 3: **br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*Note: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column (br-NMeFOSAA)

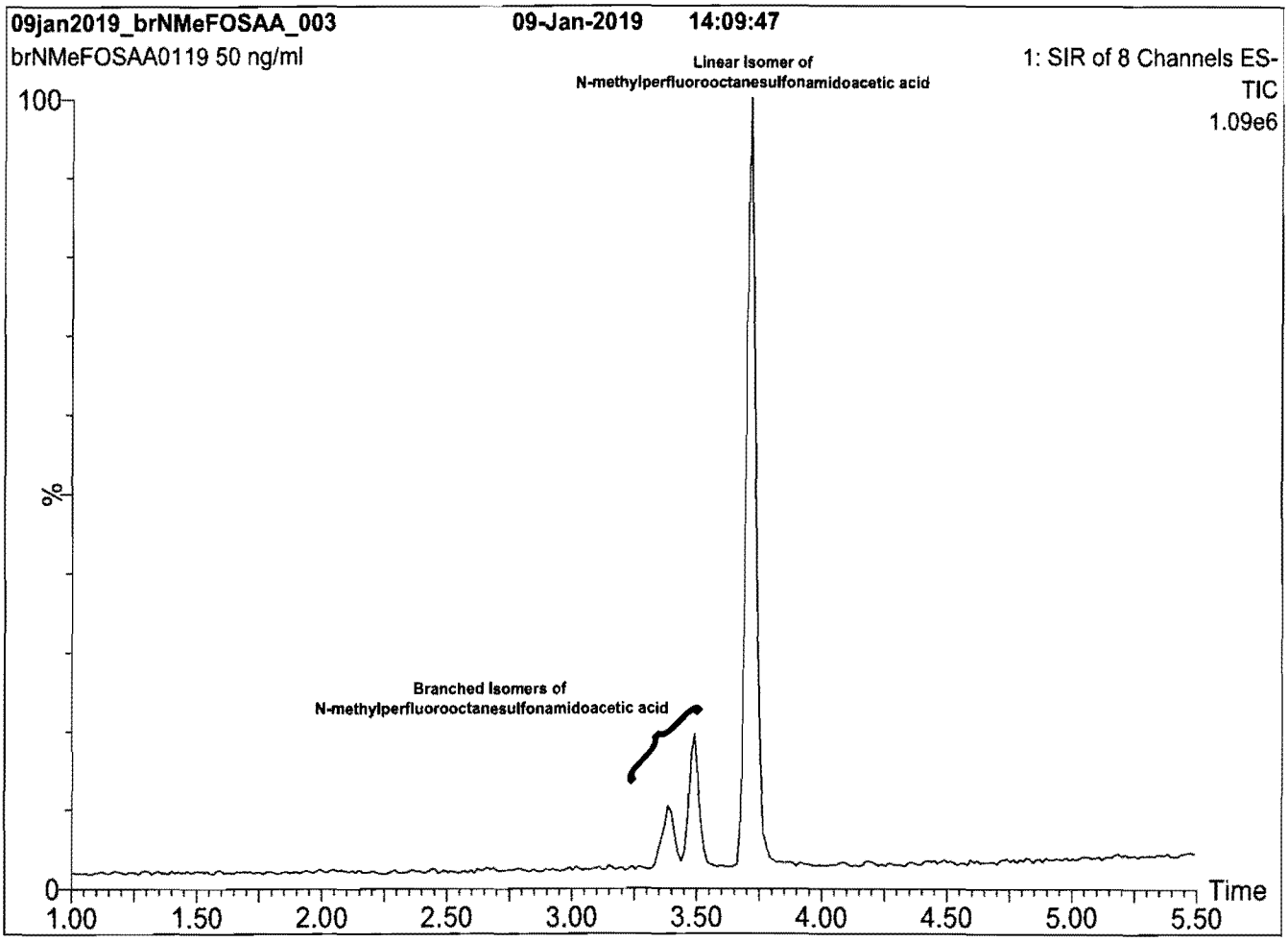
Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.79e-3
Collision Energy (eV) = 16

Figure 2: **br-NMeFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

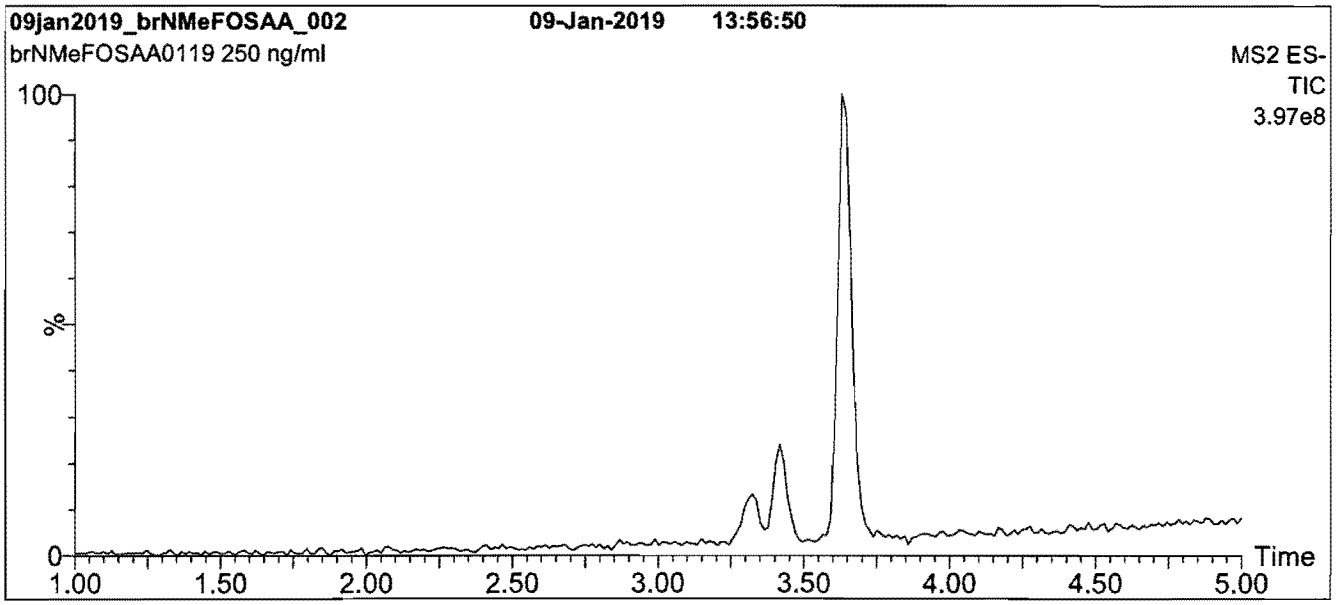
Flow: 300 µl/min

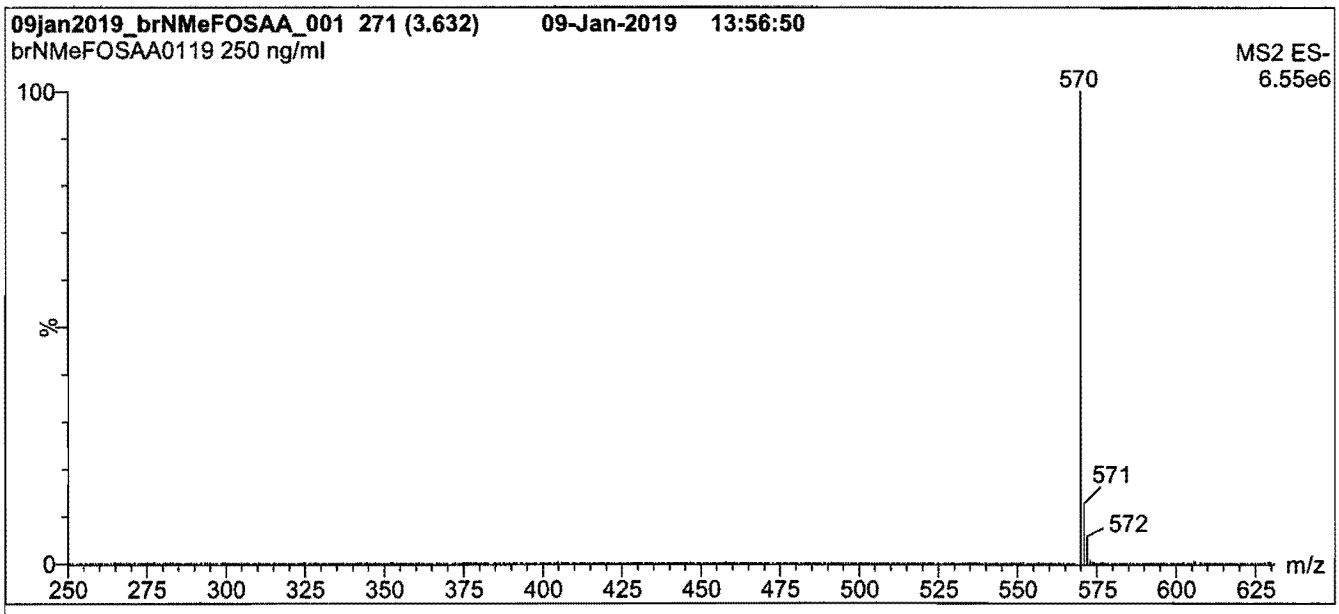
MS Parameters

Experiment: SIR (8 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 2-64
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

Figure 1: **br-NMeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

Table A: **br-NMeFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(CH_3)CH_2CO_2H$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(CH_3)CH_2CO_2H$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	0.2
7	Other Unidentified Isomers		1.1

* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 01/16/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

19L0659

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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19L0659

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0119
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/02/2019
LAST TESTED: (mm/dd/yyyy)	01/09/2019
EXPIRY DATE: (mm/dd/yyyy)	01/09/2024
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

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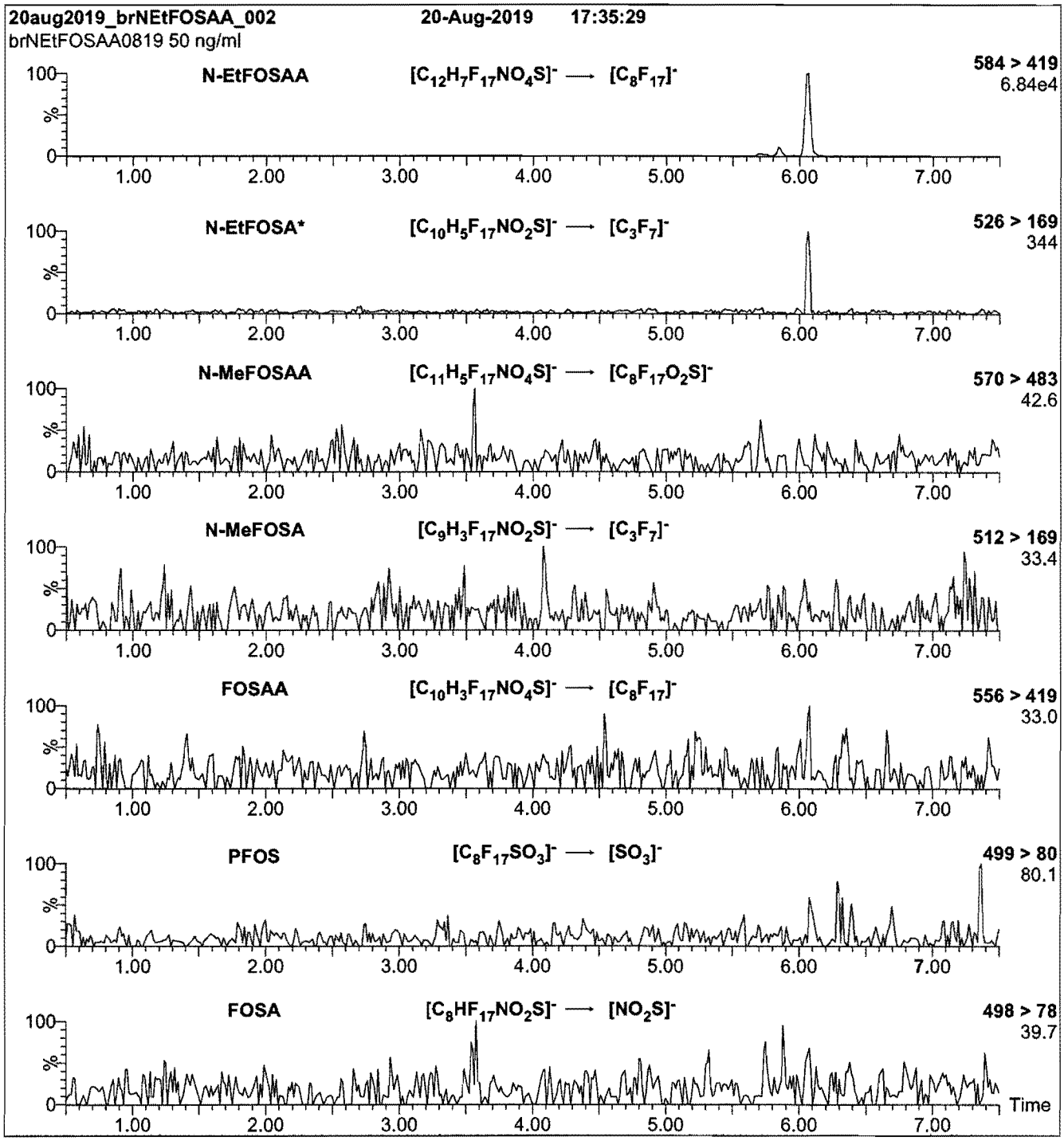
Figure 3: **br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*Note: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column (br-NEtFOSAA)

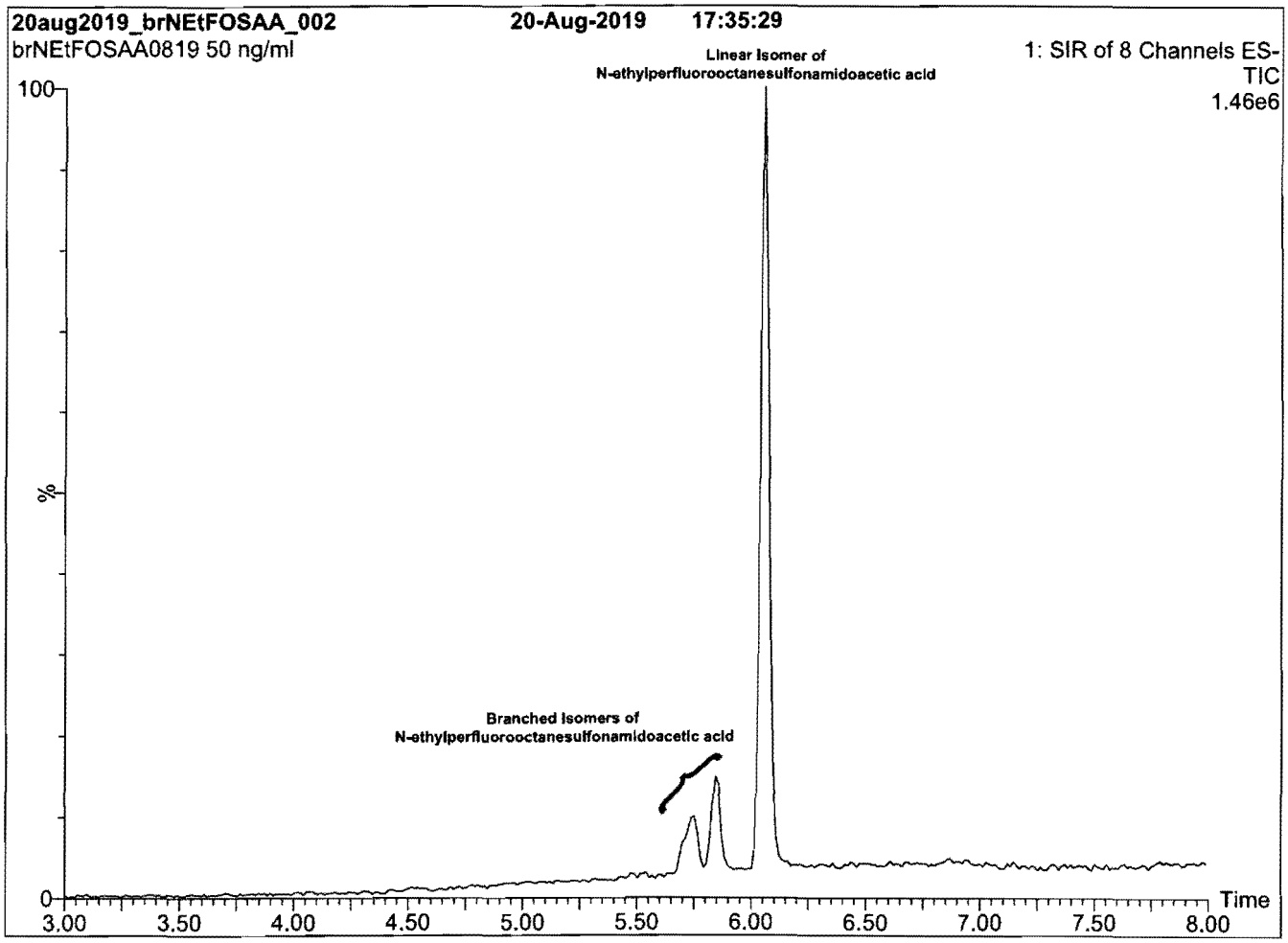
Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.53e-3
Collision Energy (eV) = 18

Figure 2: **br-NEtFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

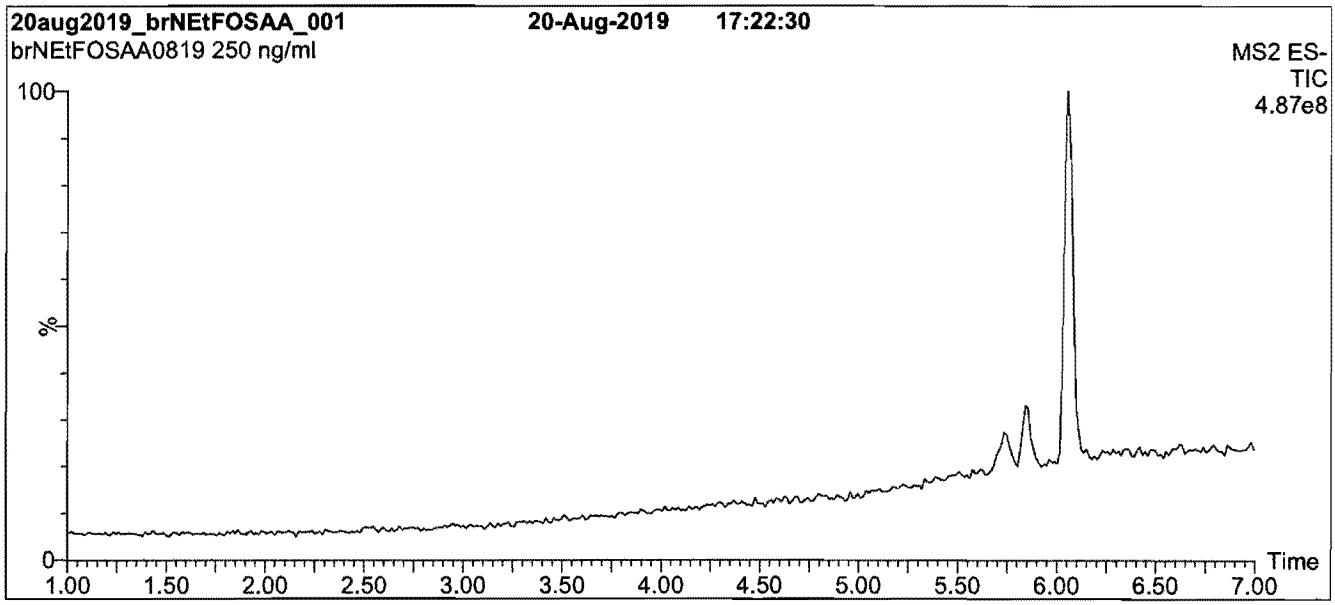
MS Parameters

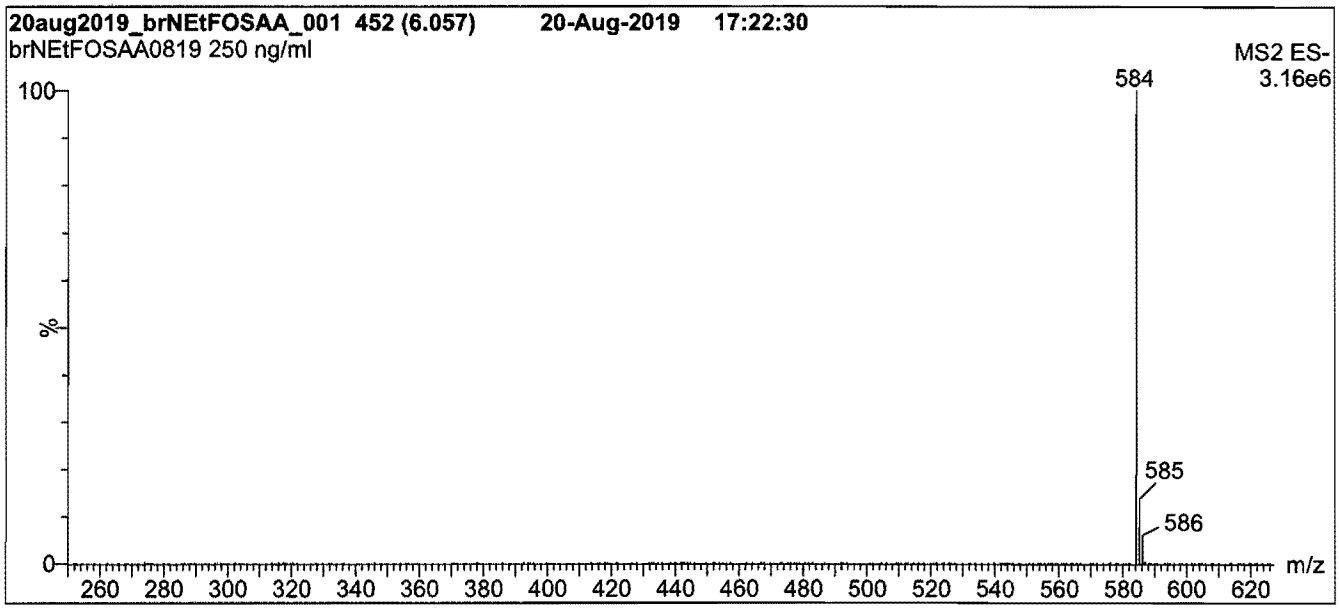
Experiment: SIR (8 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = variable (2-64)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0660

Figure 1: **br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

Table A: **br-NEtFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(C_2H_5)CH_2CO_2H$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF_2CF(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	0.3
9	Other Unidentified Isomers		1.3

* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 08/29/2019
(mm/dd/yyyy)

B.G. Chittim, General Manager

19L0660

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0819
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	08/20/2019
LAST TESTED: (mm/dd/yyyy)	08/20/2019
EXPIRY DATE: (mm/dd/yyyy)	08/20/2024
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

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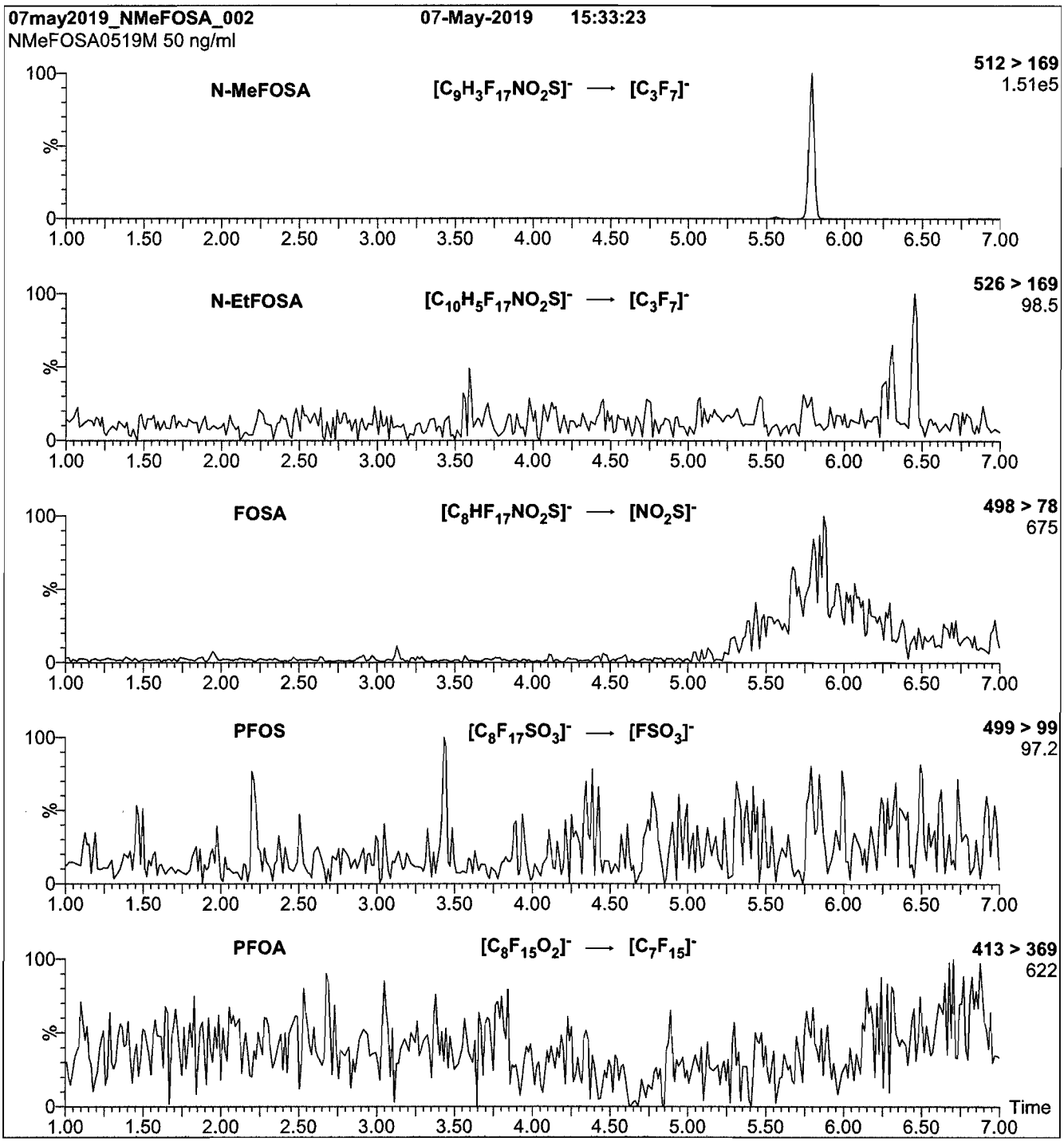
Figure 2: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

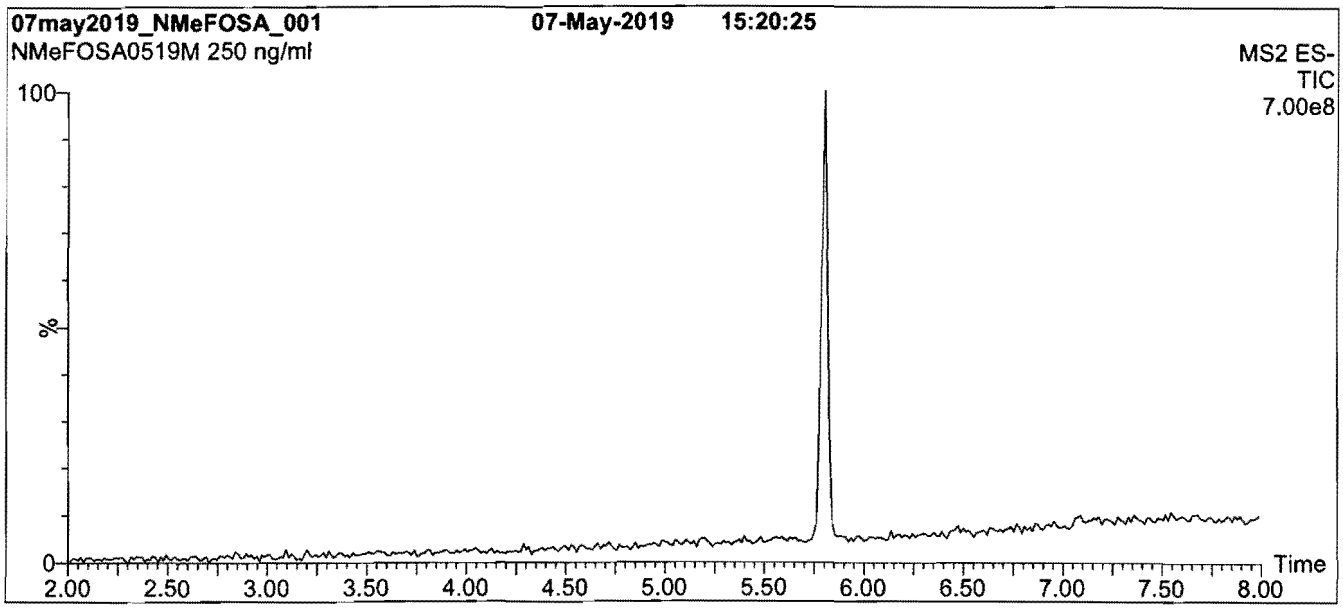
Flow: 300 µl/min

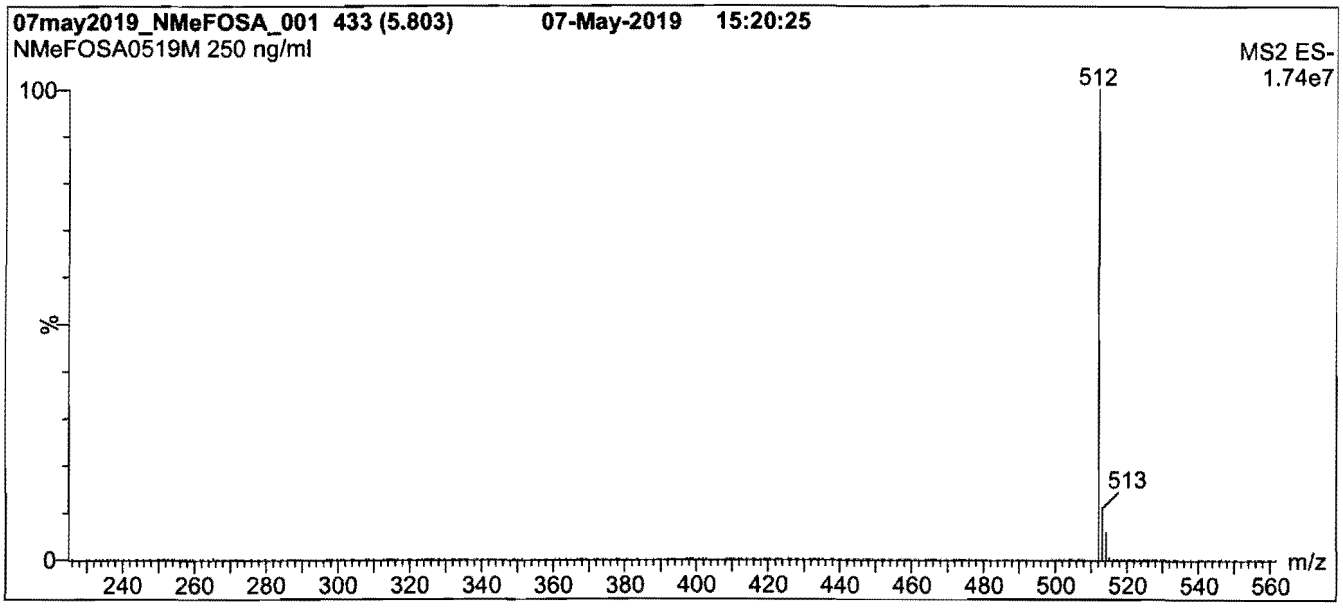
MS Parameters

Collision Gas (mbar) = 2.99e-3
Collision Energy (eV) = 24

19L0661

Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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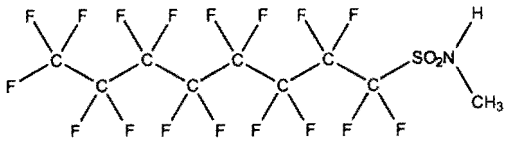
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0519M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/07/2019		
EXPIRY DATE: (mm/dd/yyyy)	05/07/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 05/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

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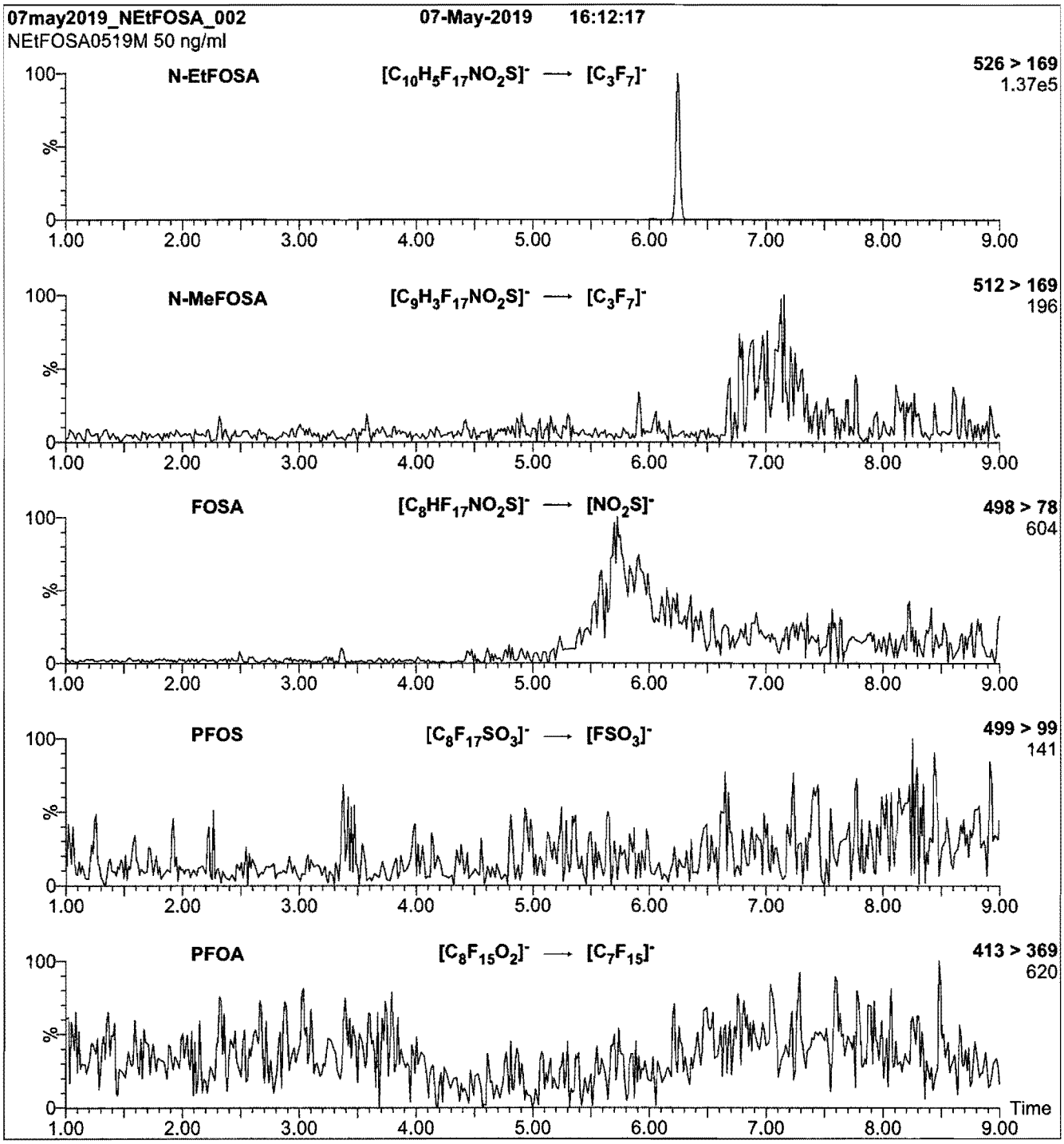
Figure 2: **N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (N-EtFOSA-M)

Mobile phase: Same as Figure 1

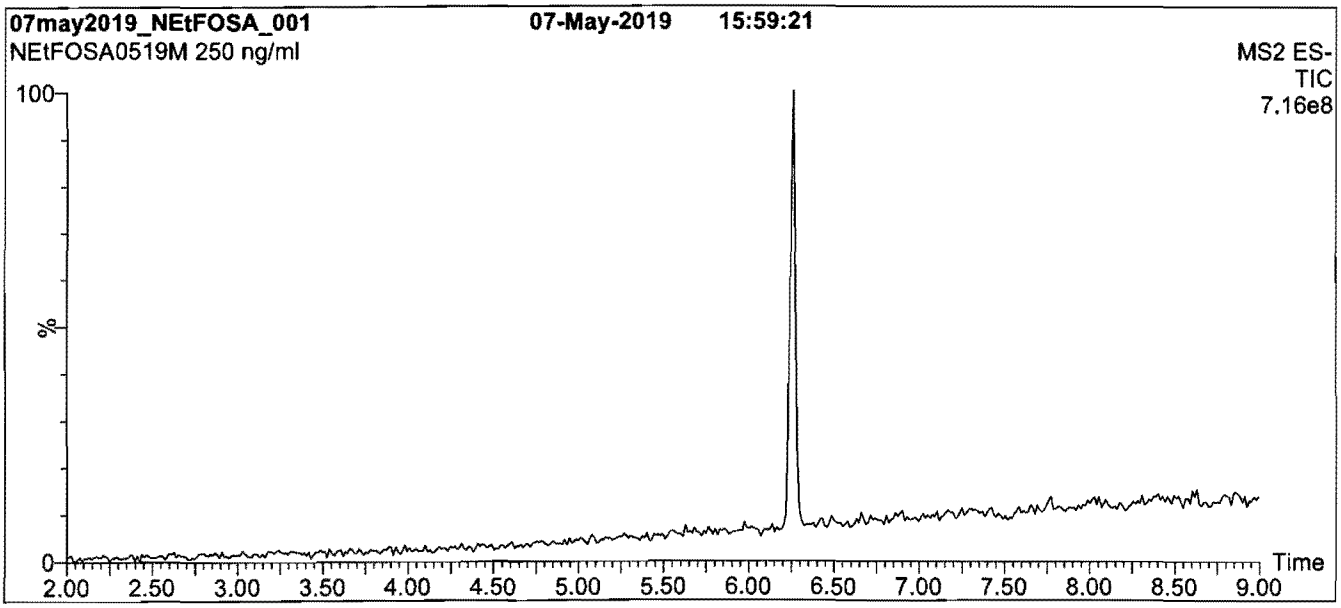
Flow: 300 µl/min

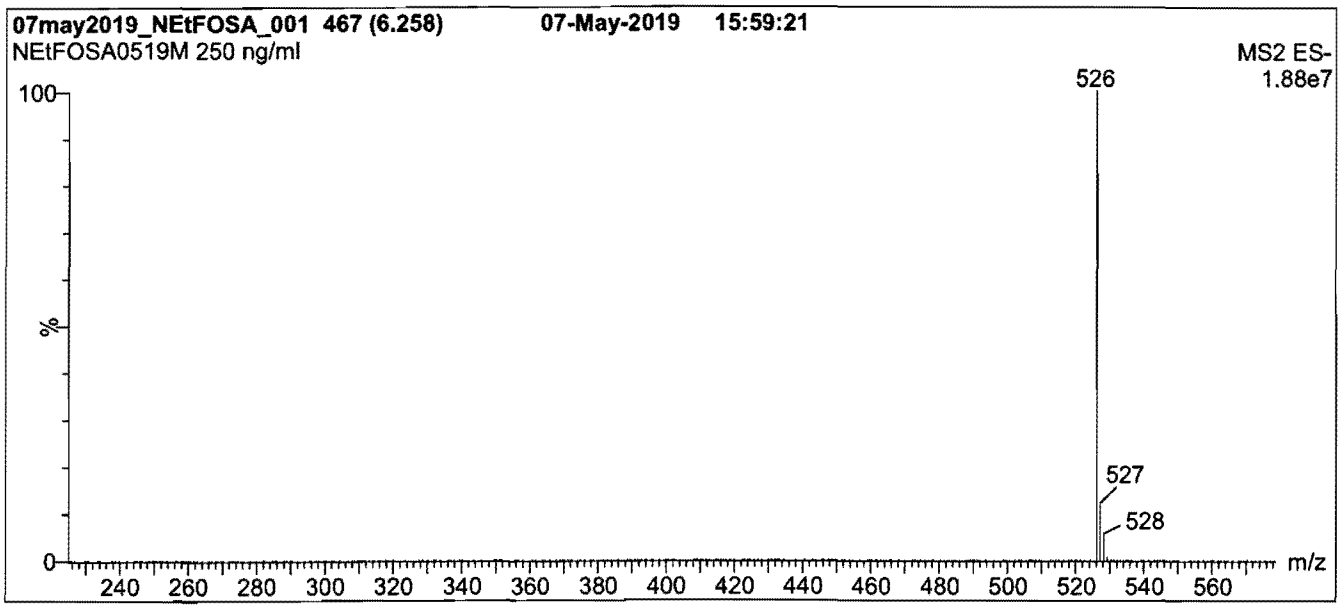
MS Parameters

Collision Gas (mbar) = 3.00e-3
Collision Energy (eV) = 24

19L0662

Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 11 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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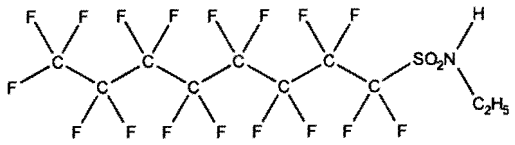
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide
LOT NUMBER: NEtFOSA0519M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/07/2019		
EXPIRY DATE: (mm/dd/yyyy)	05/07/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

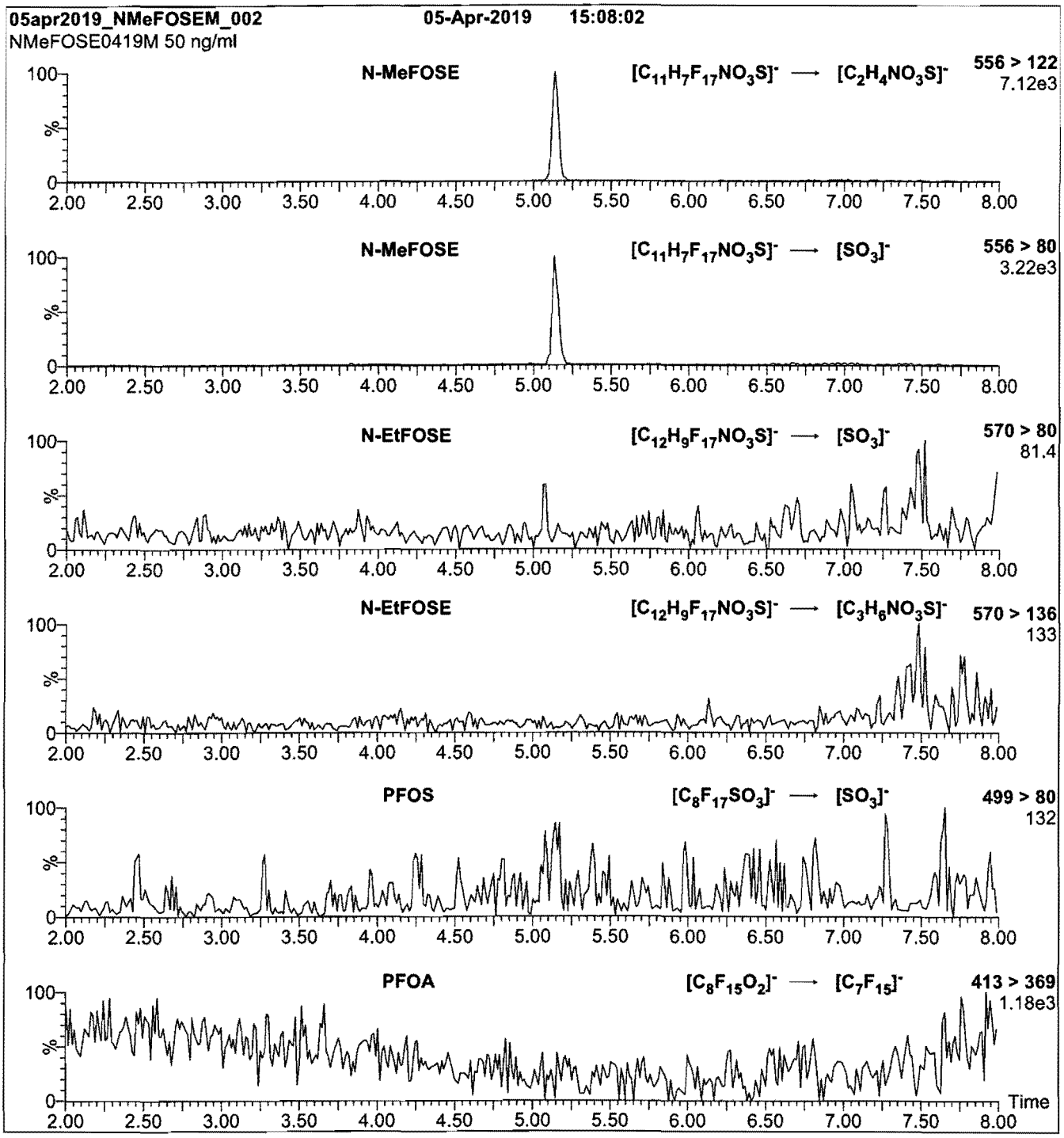
- See page 2 for further details.
- Contains ~ 0.5% branched isomers of N-ethylperfluorooctanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/09/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 3: **N-MeFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (N-MeFOSE-M)

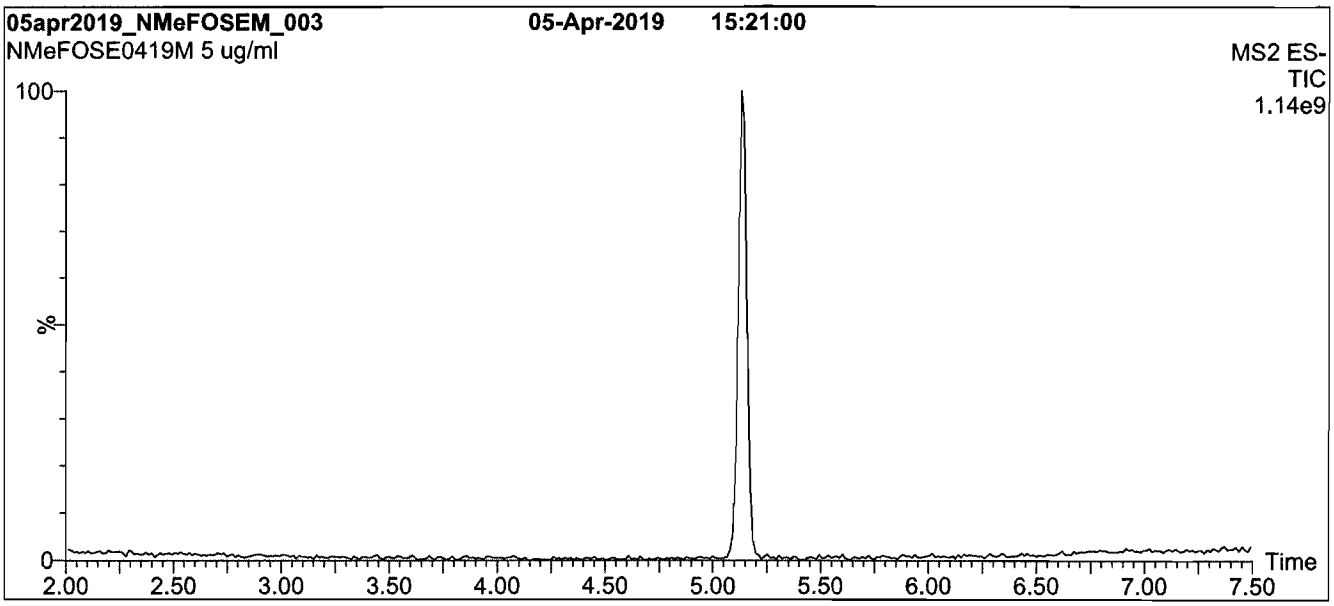
Mobile phase: Same as Figure 2

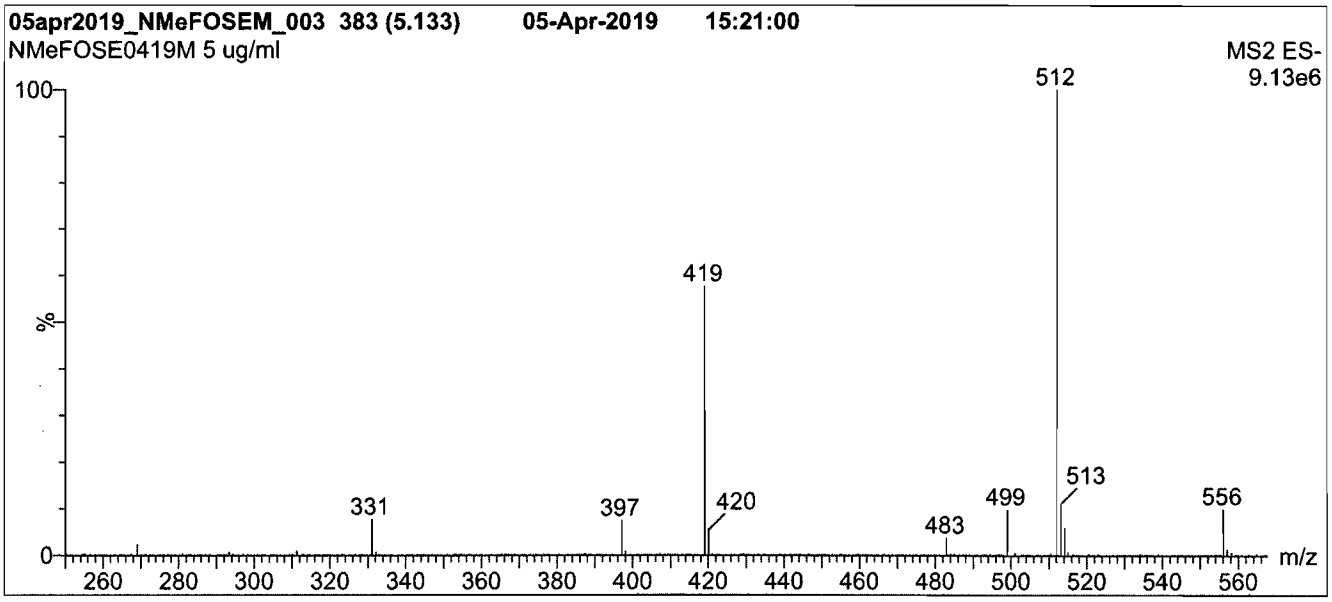
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.94e-3
Collision Energy (eV) = 36

Figure 2: **N-MeFOSE-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% MeOH / 35% H_2O
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

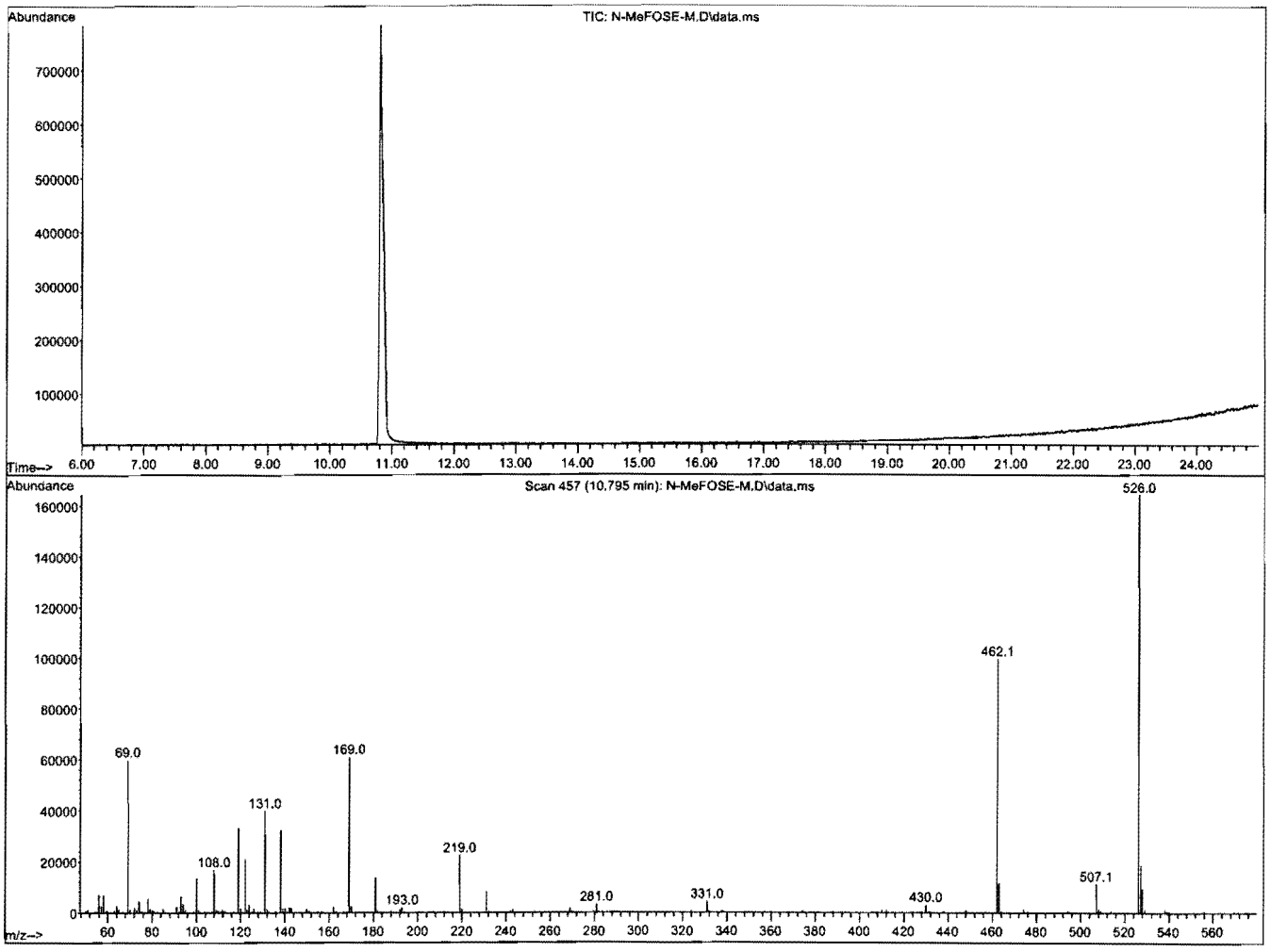
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (l/hr) = 1000

Figure 1: **N-MeFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

Chromatographic Conditions:

Column:	30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W
Injector:	250 °C (Splitless Injection)
Oven:	100 °C (5 min)
	10 °C/min to 325 °C
	325 °C (20 min)
Ionization:	EI+
Detector:	250 °C
	Full Scan (50-1000 amu)

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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1910663

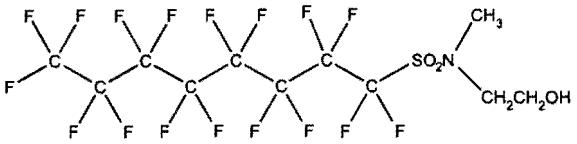
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE0419M

COMPOUND: 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_3S$	**MOLECULAR WEIGHT:**	557.22
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/08/2019 (HRGC/LRMS) 04/05/2019 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (TIC and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

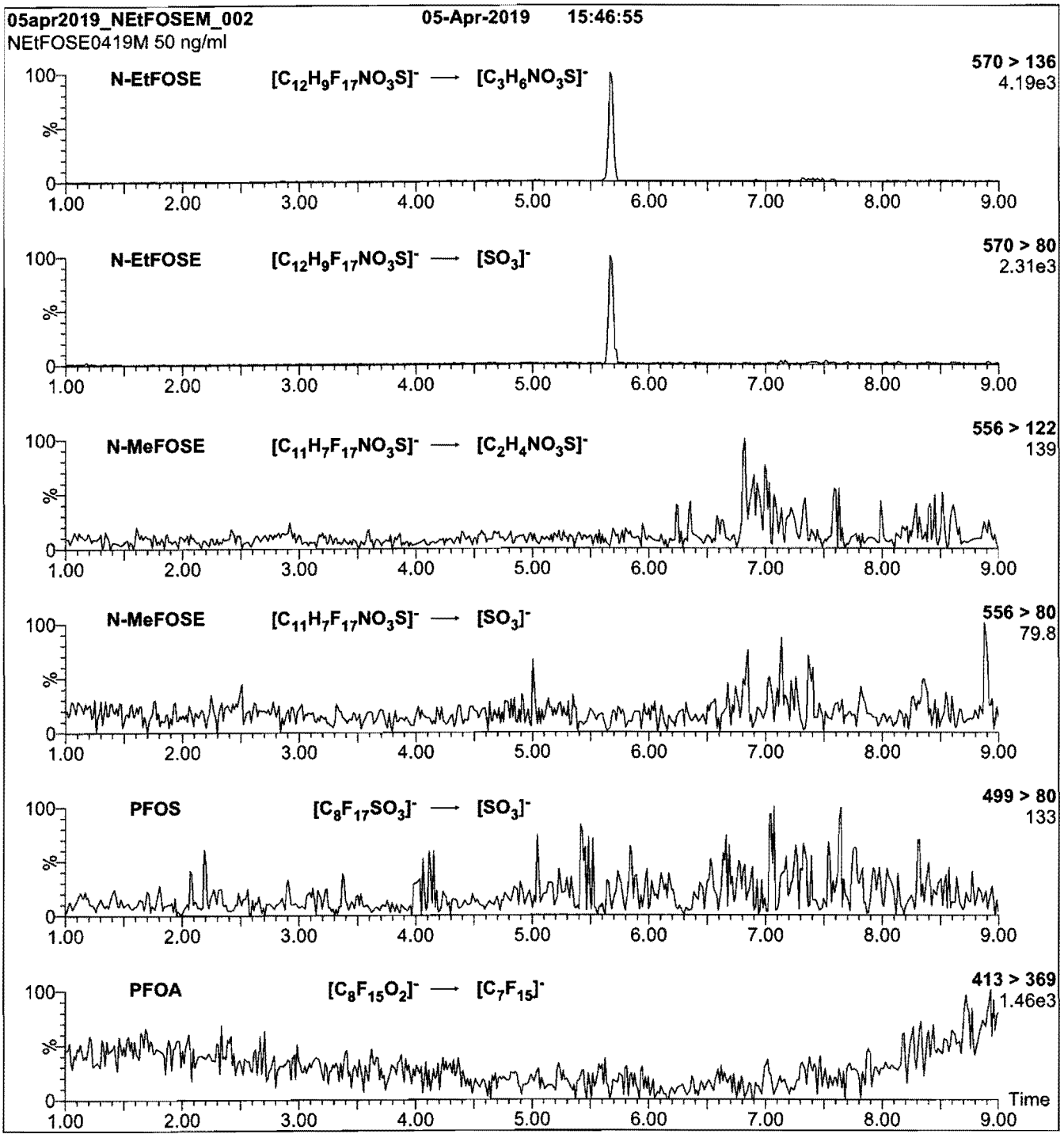
- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/12/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 3: **N-EtFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (N-EtFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.76e-3
Collision Energy (eV) = 32

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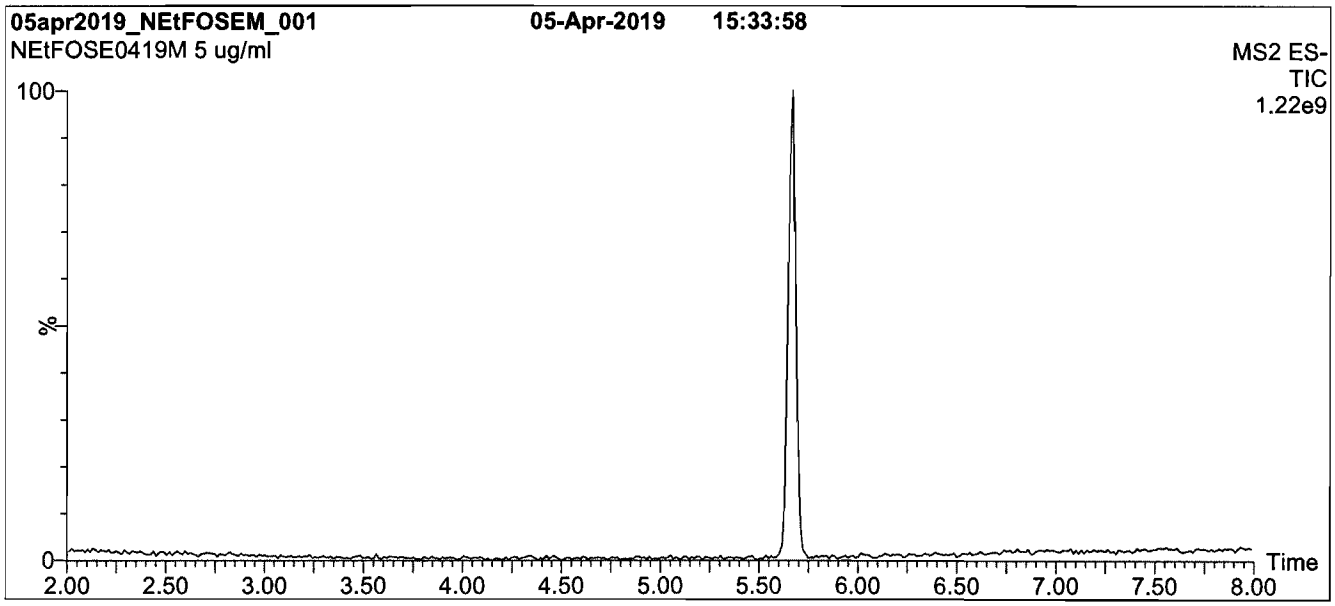
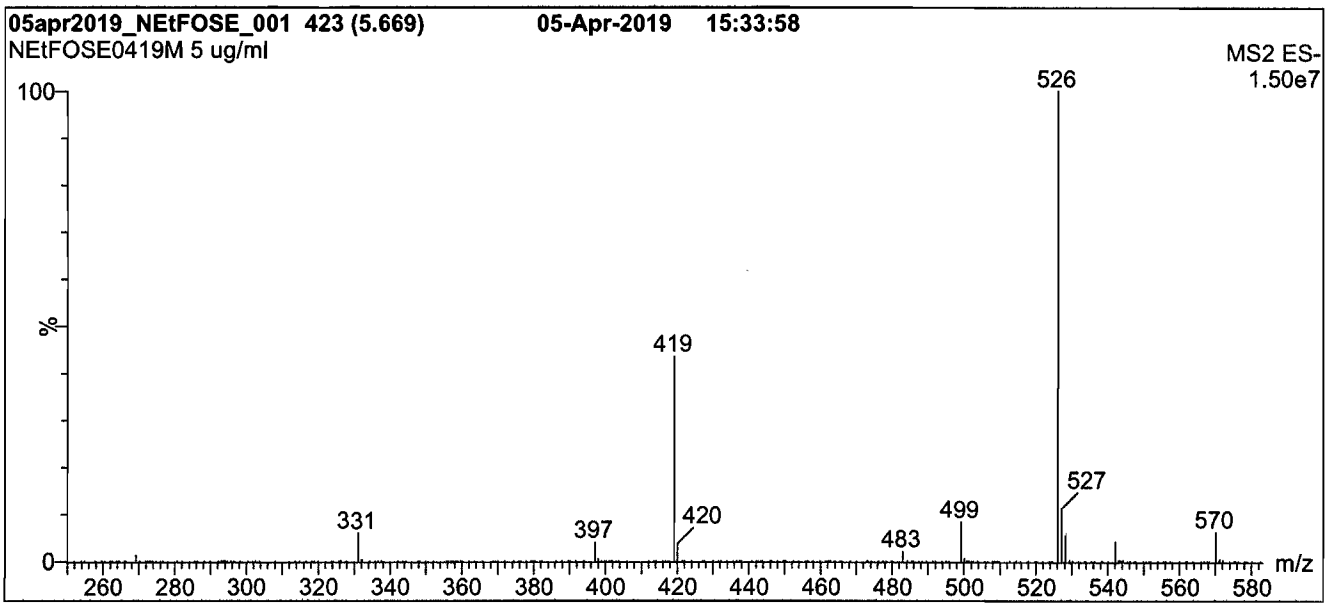
Figure 2: **N-EtFOSE-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% MeOH / 35% H_2O
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

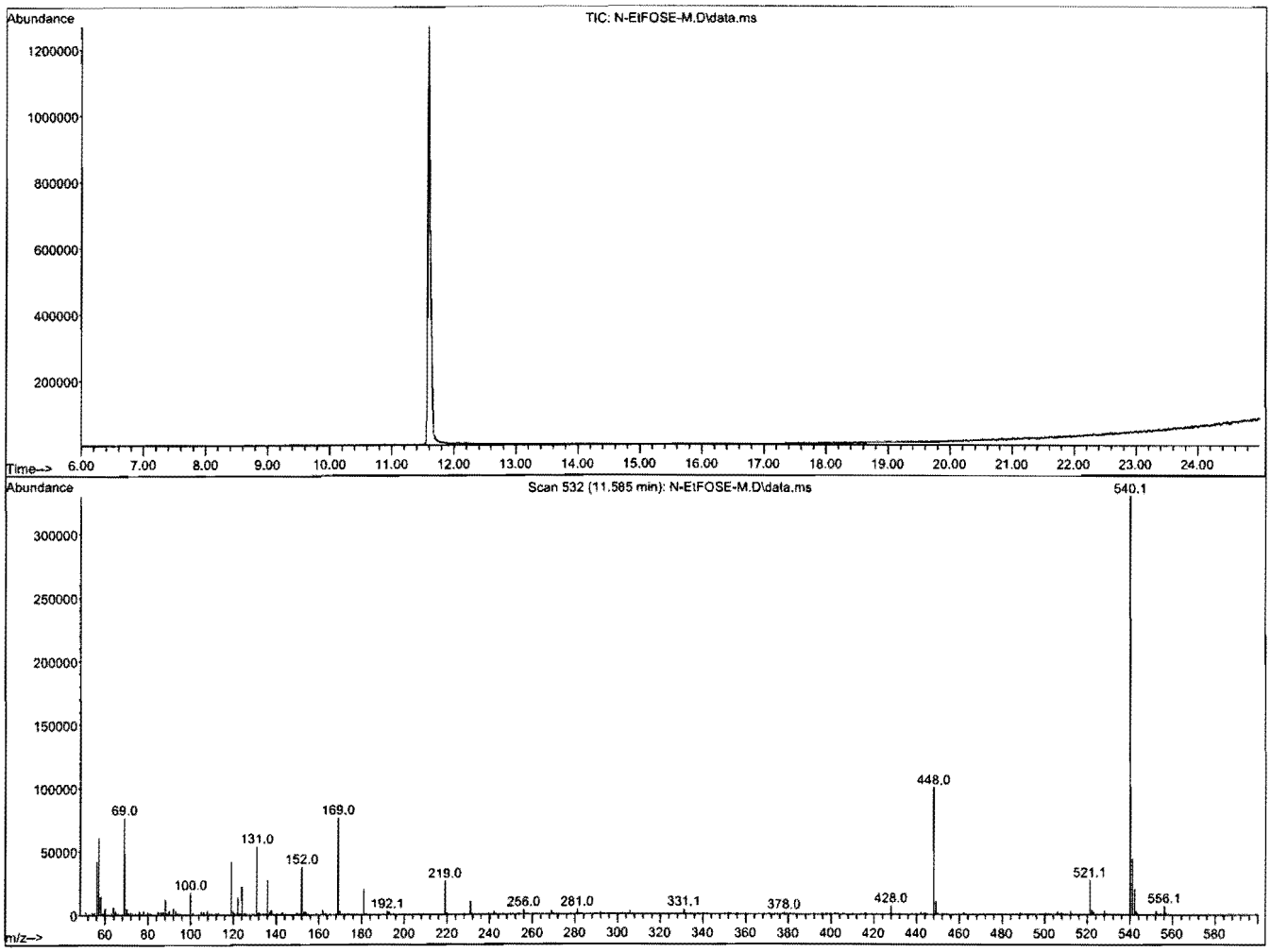
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (l/hr) = 1000

Figure 1: **N-EtFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

Chromatographic Conditions:

Column:	30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W
Injector:	250 °C (Splitless Injection)
Oven:	100 °C (5 min)
	10 °C/min to 325 °C
	325 °C (20 min)
Ionization:	EI+
Detector:	250 °C
	Full Scan (50-1000 amu)

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HANDLING:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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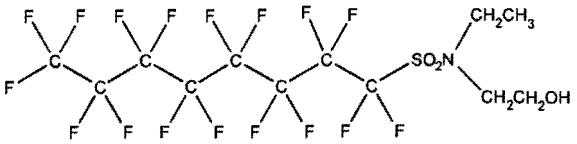
19L0664

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE0419M
COMPOUND: 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 1691-99-2



MOLECULAR FORMULA:	$C_{12}H_{10}F_{17}NO_3S$	**MOLECULAR WEIGHT:**	571.25
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/08/2019 (HRGC/LRMS) 04/05/2019 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (TIC and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/15/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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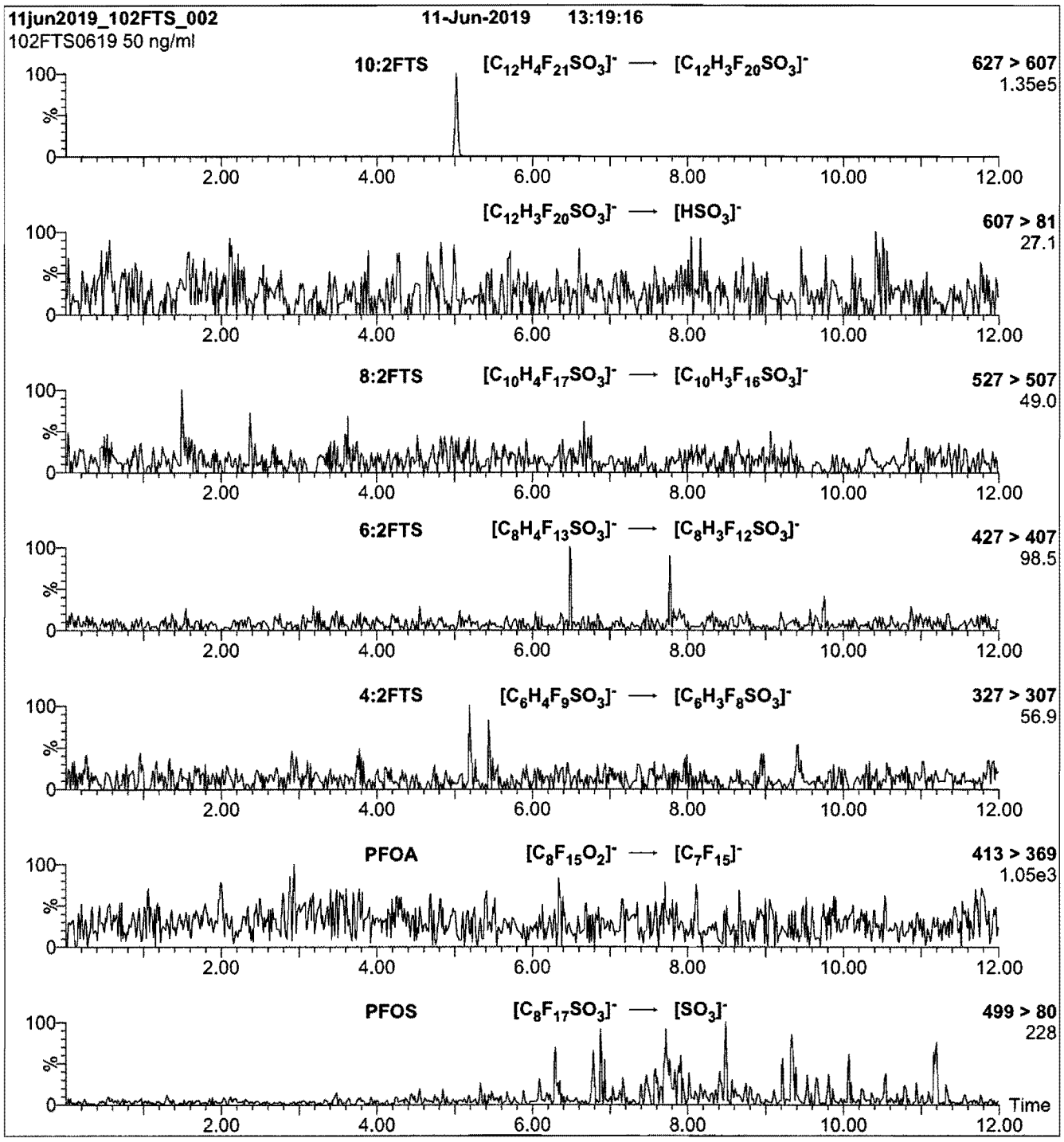
Figure 2: **10:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (10:2FTS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.92e-3
Collision Energy (eV) = 25

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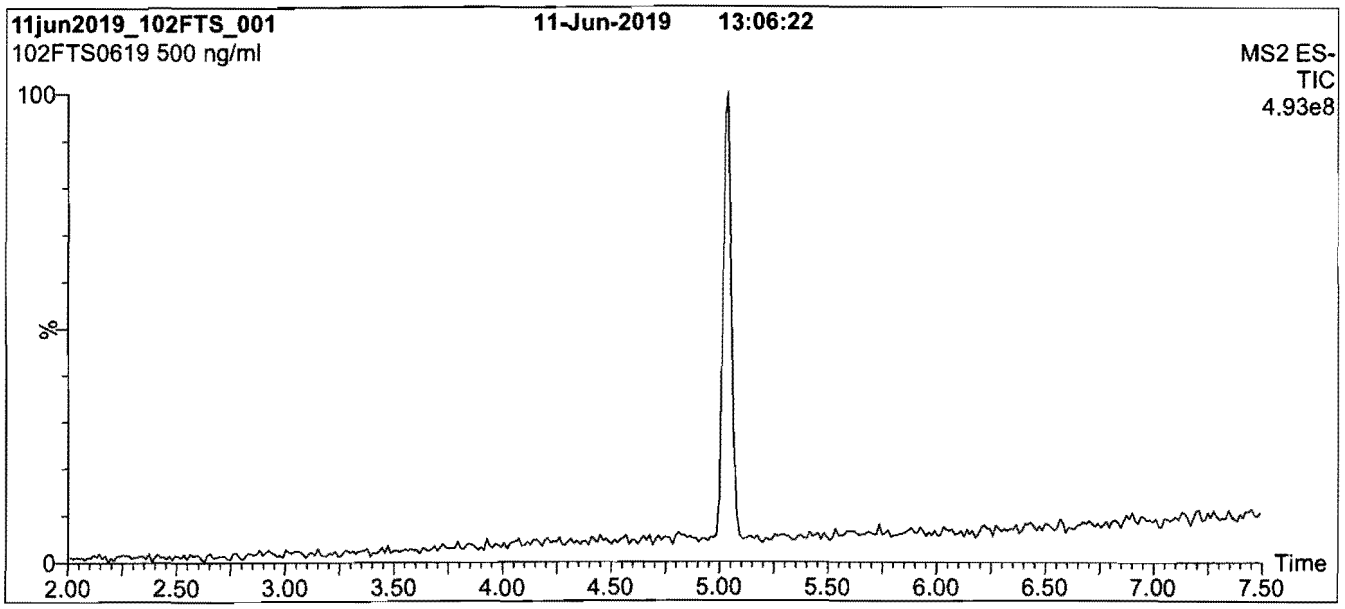
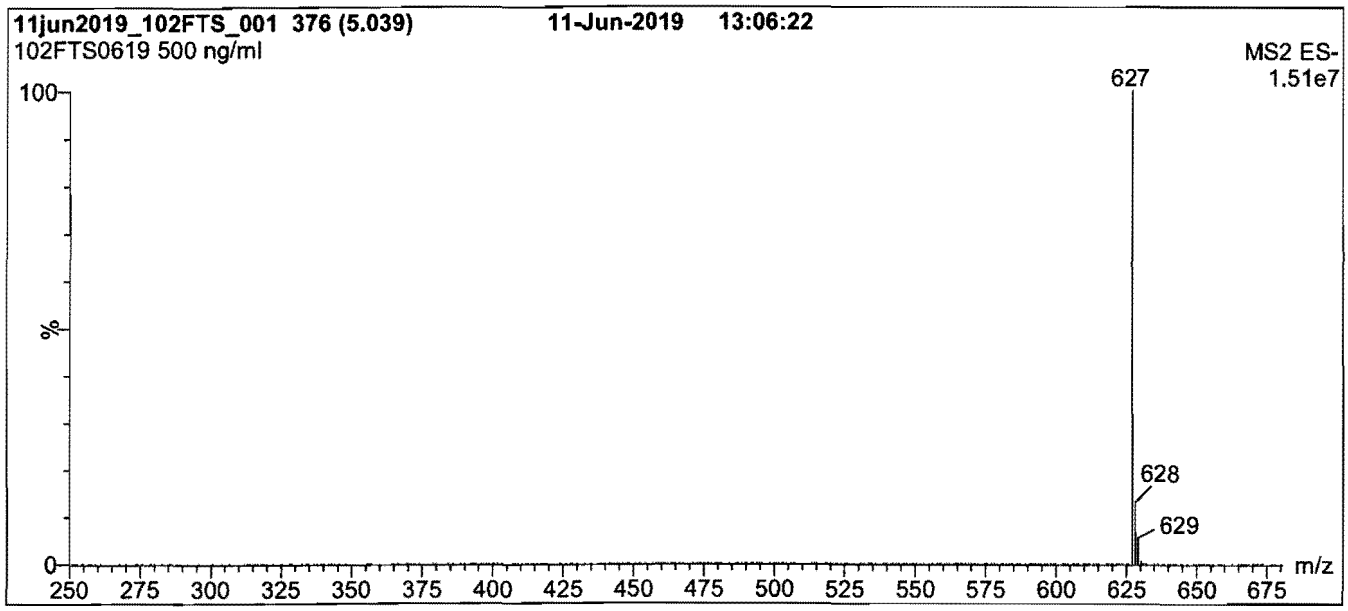
Figure 1: **10:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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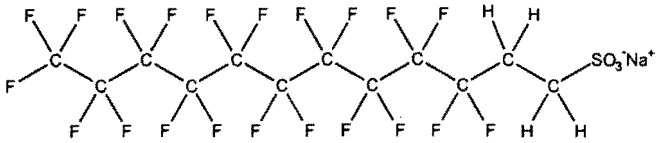
19L0665

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS0619
COMPOUND: Sodium 1H,1H,2H,2H-perfluorododecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}H_4F_{21}SO_3Na$		**MOLECULAR WEIGHT:**	650.18
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	48.2 ± 2.4 µg/ml	(10:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	06/11/2019			
EXPIRY DATE: (mm/dd/yyyy)	06/11/2022			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/18/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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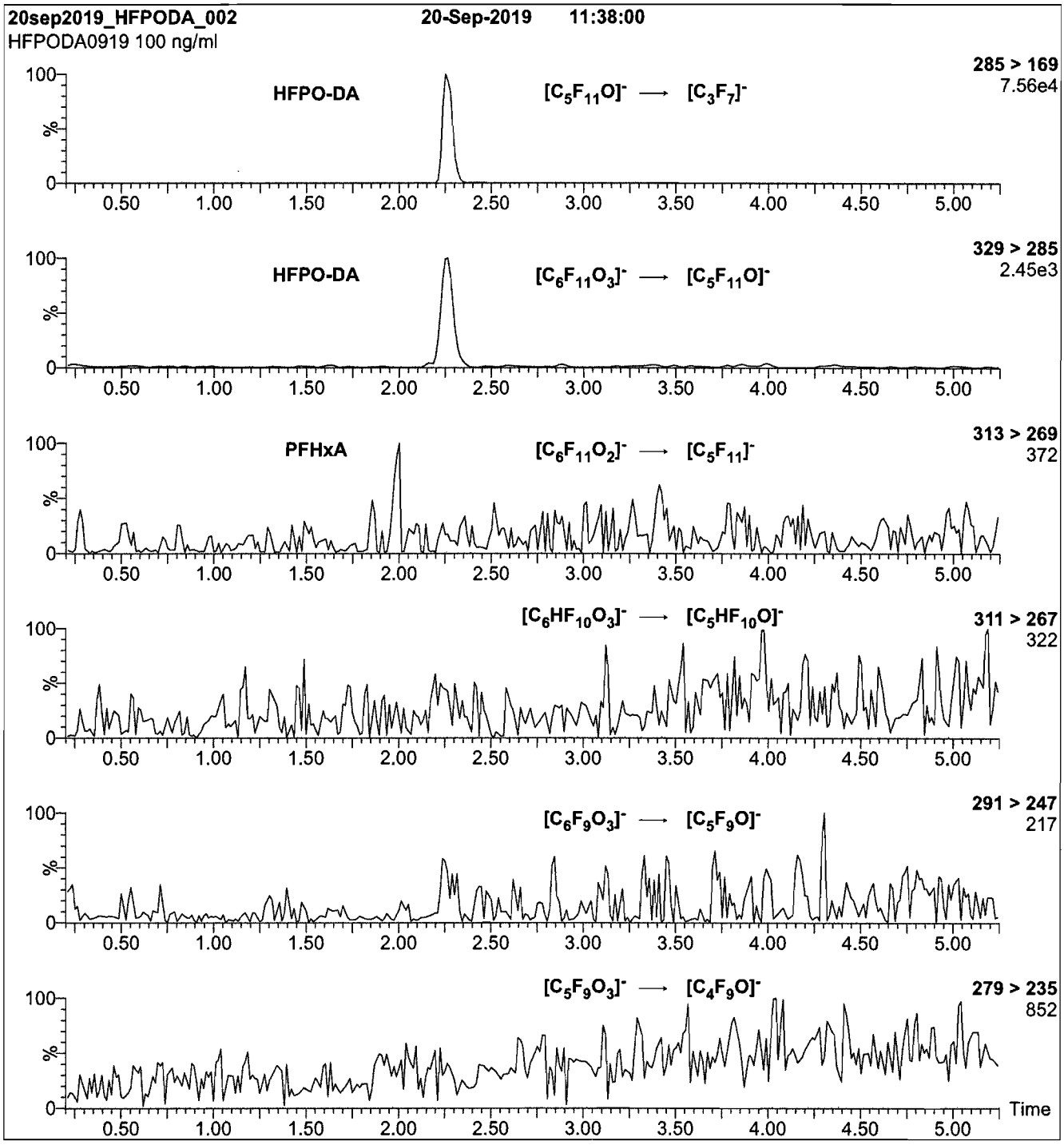
Figure 2: **HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.60e-3
Collision Energy (eV) = 8

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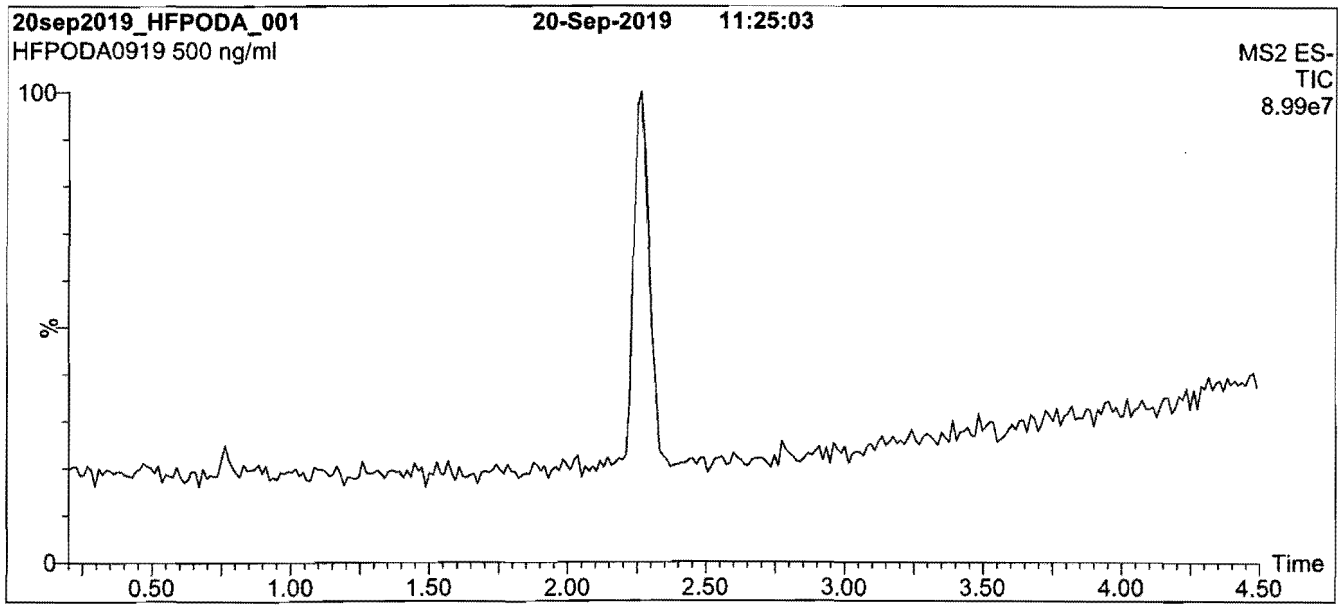
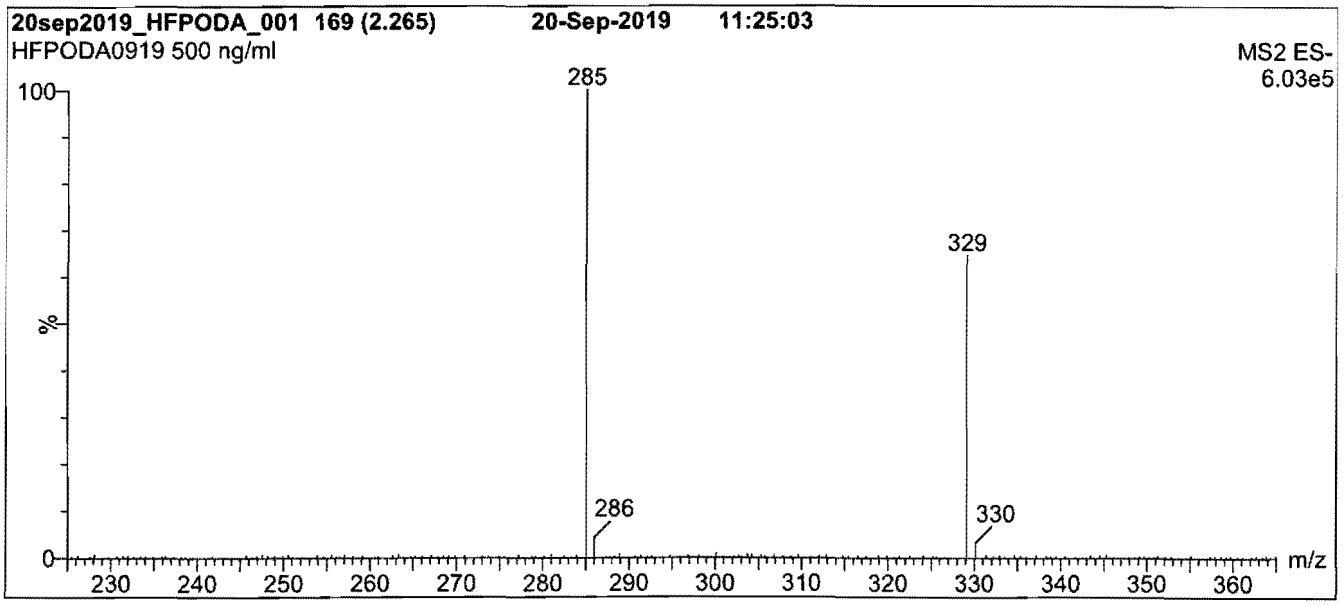
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Desolvation Temperature (°C) = 325
Desolvation Gas Flow (l/hr) = 1000

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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19L0666

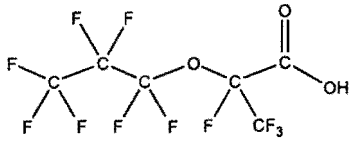
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA0919

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE: **CAS #:** 13252-13-6



MOLECULAR FORMULA:	$C_6HF_{11}O_3$	**MOLECULAR WEIGHT:**	330.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/20/2019		
EXPIRY DATE: (mm/dd/yyyy)	09/20/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

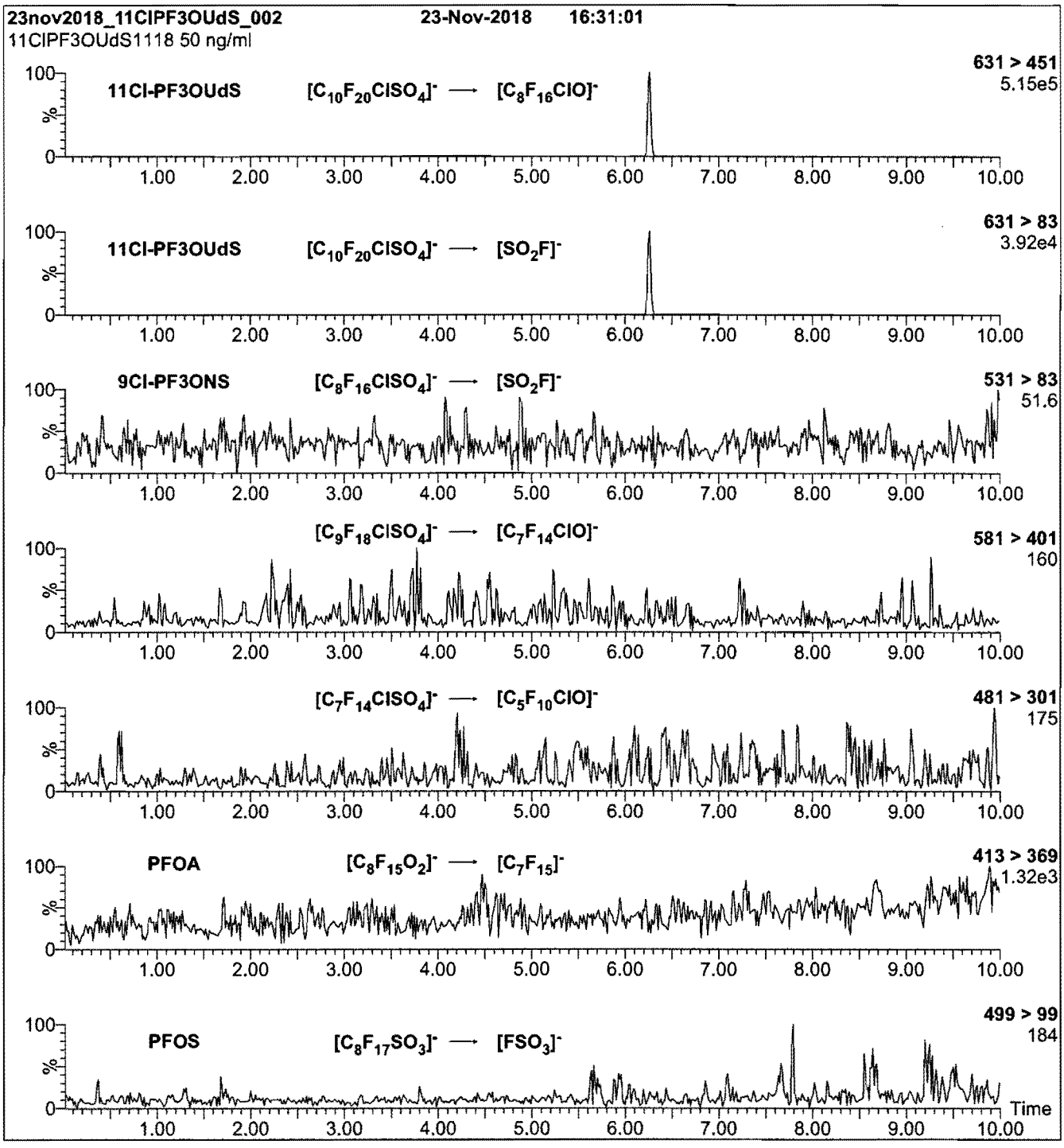
- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/30/2019
(mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **11Cl-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (11Cl-PF3OUdS)

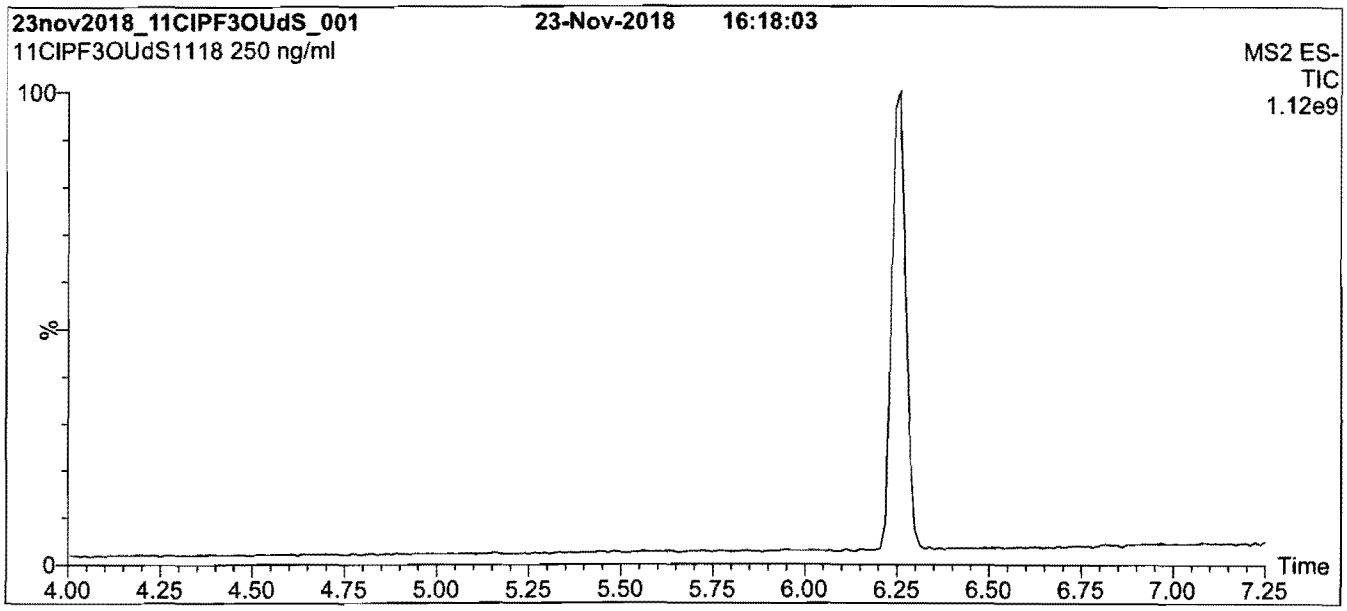
Mobile phase: Same as Figure 1

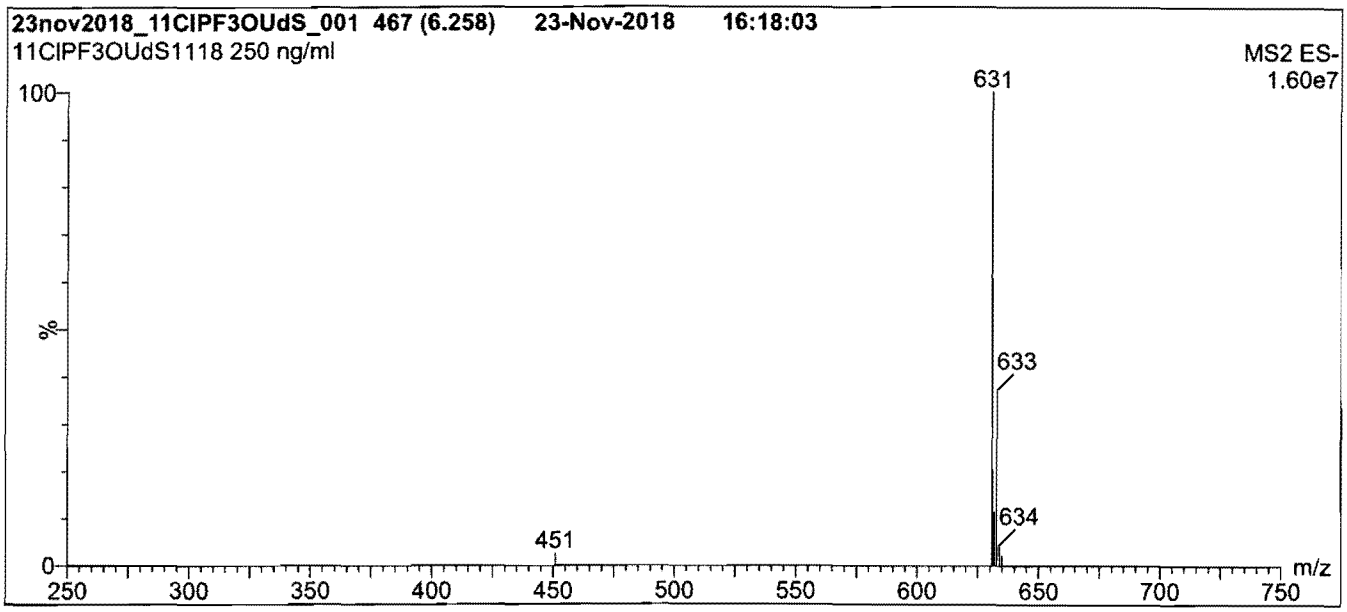
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.84e-3
Collision Energy (eV) = 24

Figure 1: **11Cl-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 70.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

19L0667

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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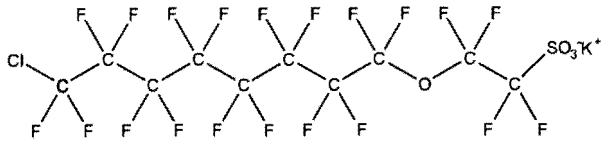
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 11Cl-PF3OUdS **LOT NUMBER:** 11ClPF3OUdS1118
COMPOUND: Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE: **CAS #:** 83329-89-9



MOLECULAR FORMULA: $C_{10}F_{20}ClSO_4K$ **MOLECULAR WEIGHT:** 670.69
CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol
47.1 ± 2.4 µg/ml (11Cl-PF3OUdS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/23/2018
EXPIRY DATE: (mm/dd/yyyy) 11/23/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is a minor component of the commercial formulation known as F-53B.

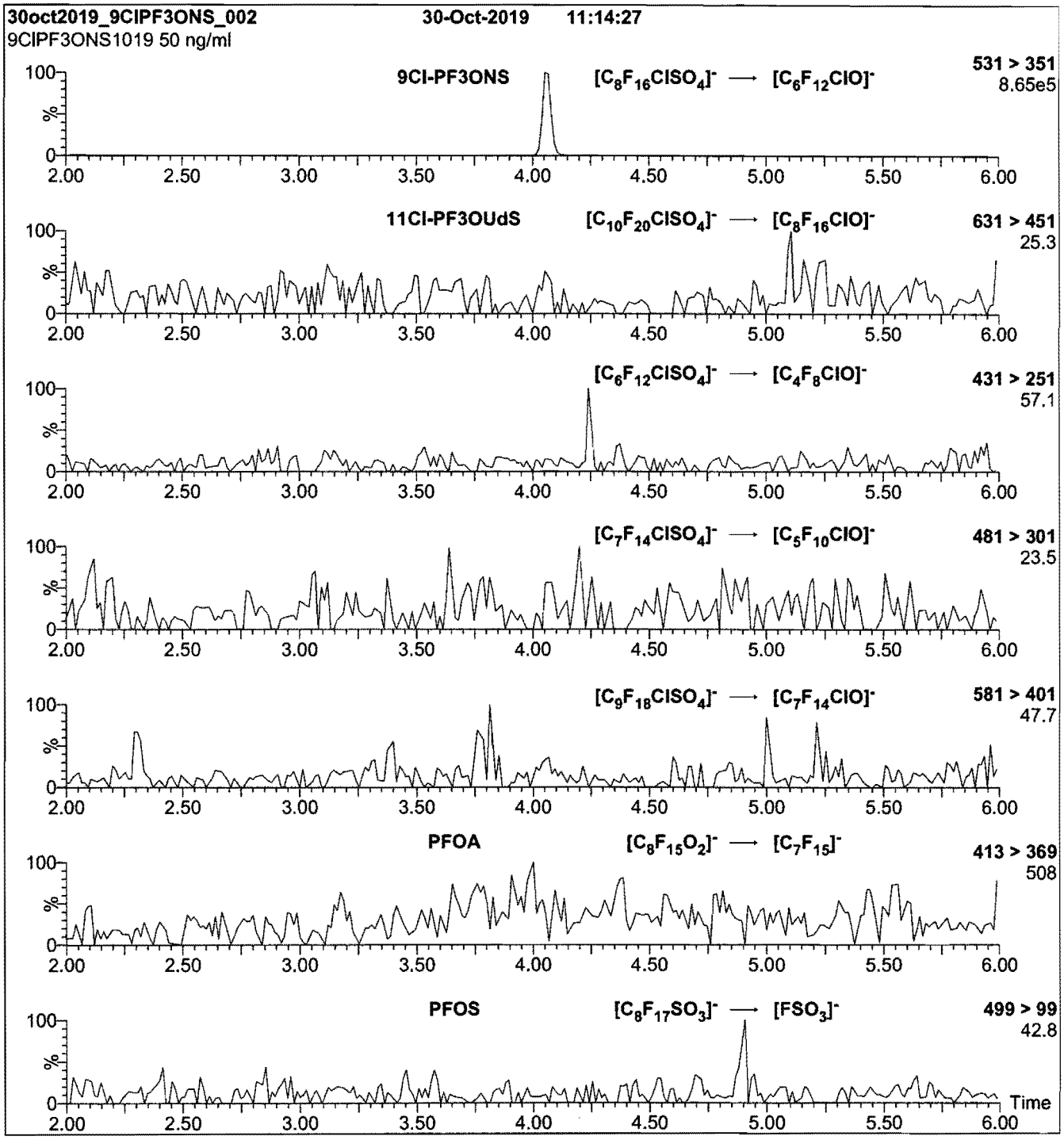
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/28/2018
(mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1910668

Figure 2: **9Cl-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (9Cl-PF3ONS)

Mobile phase: Same as Figure 1

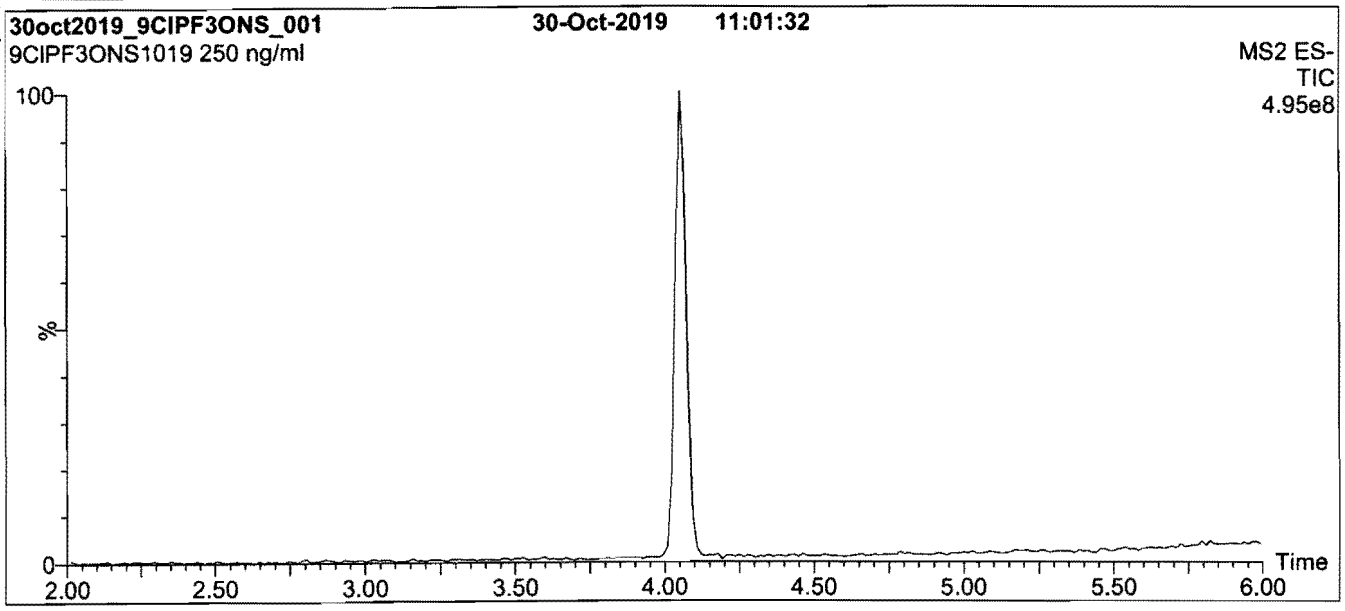
Flow: 300 µl/min

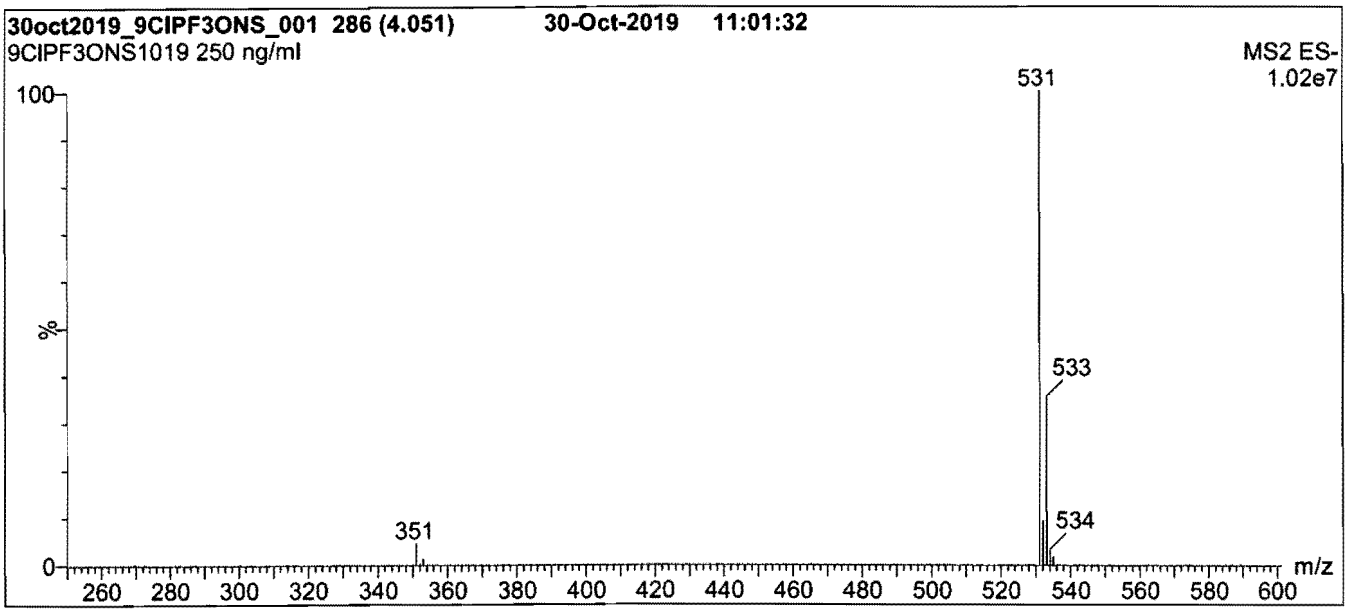
MS Parameters

Collision Gas (mbar) = 3.25e-3
Collision Energy (eV) = 20

19L0668

Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 70.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

19L0668

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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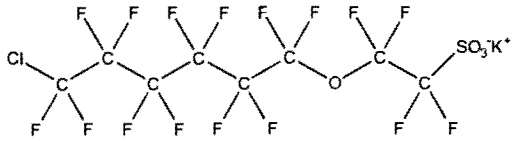
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 9Cl-PF3ONS **LOT NUMBER:** 9ClPF3ONS1019

COMPOUND: Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE: **CAS #:** 73606-19-6



MOLECULAR FORMULA:	$C_8F_{16}ClSO_4K$	**MOLECULAR WEIGHT:**	570.67
CONCENTRATION:	50.0 ± 2.5 µg/ml (K Salt) 46.6 ± 2.3 µg/ml (9Cl-PF3ONS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/30/2019		
EXPIRY DATE: (mm/dd/yyyy)	10/30/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

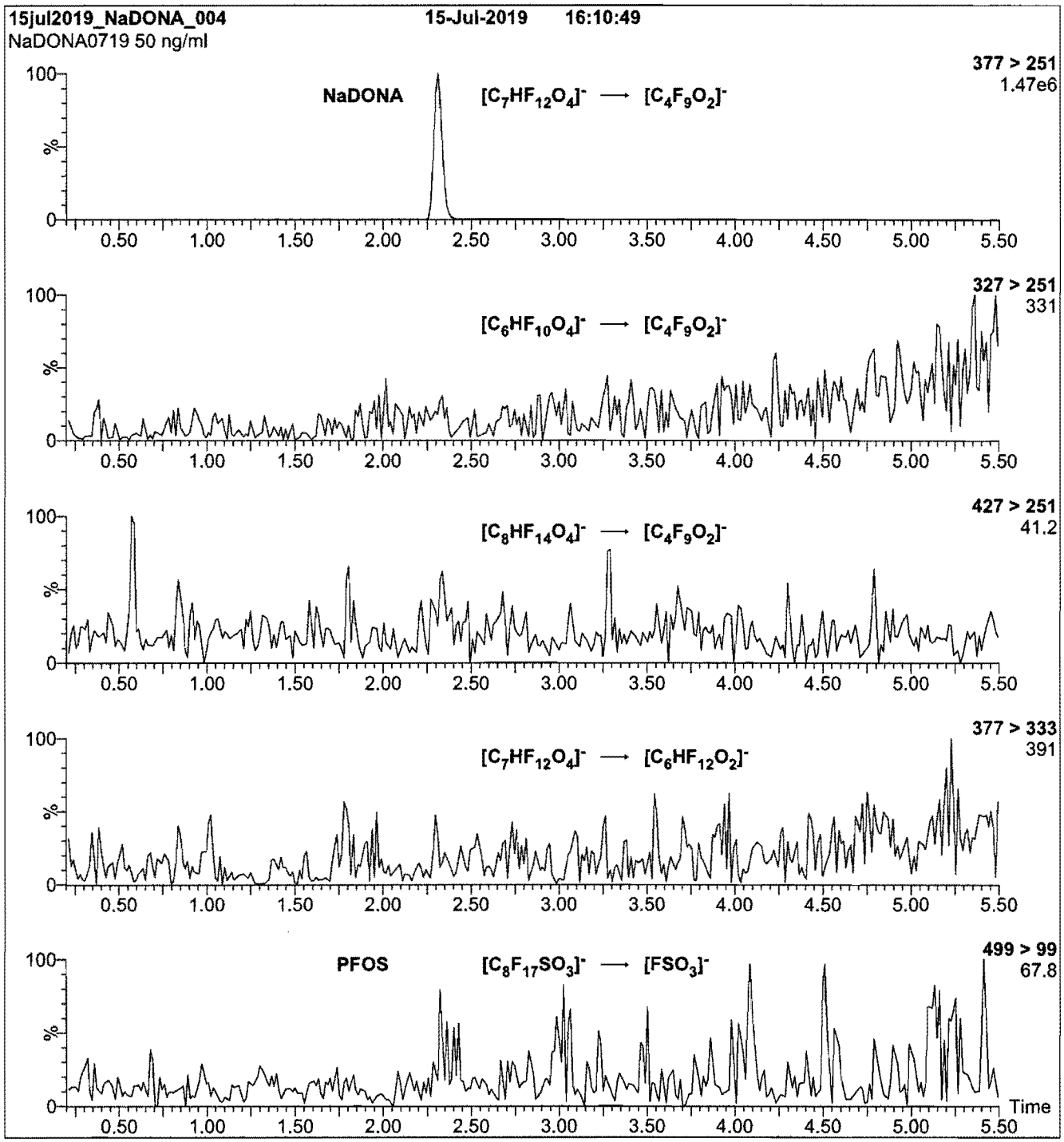
Certified By: _____ **Date:** 11/04/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L0669

Figure 2: **NaDONA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (NaDONA)

Mobile phase: Same as Figure 1

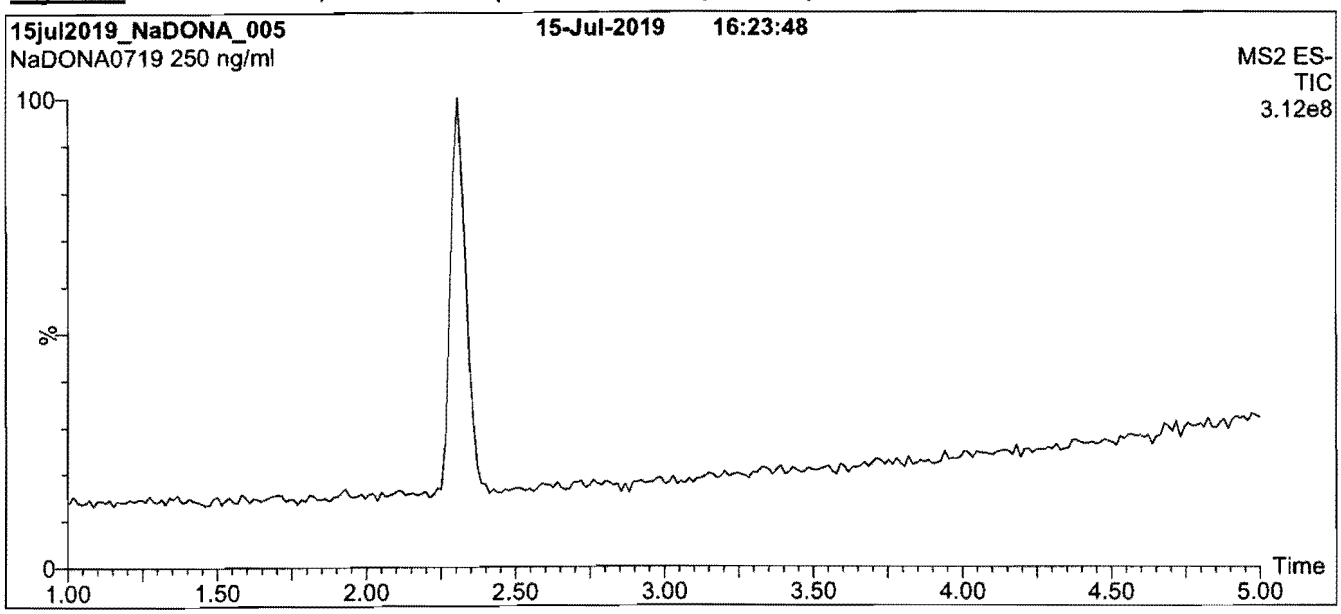
Flow: 300 µl/min

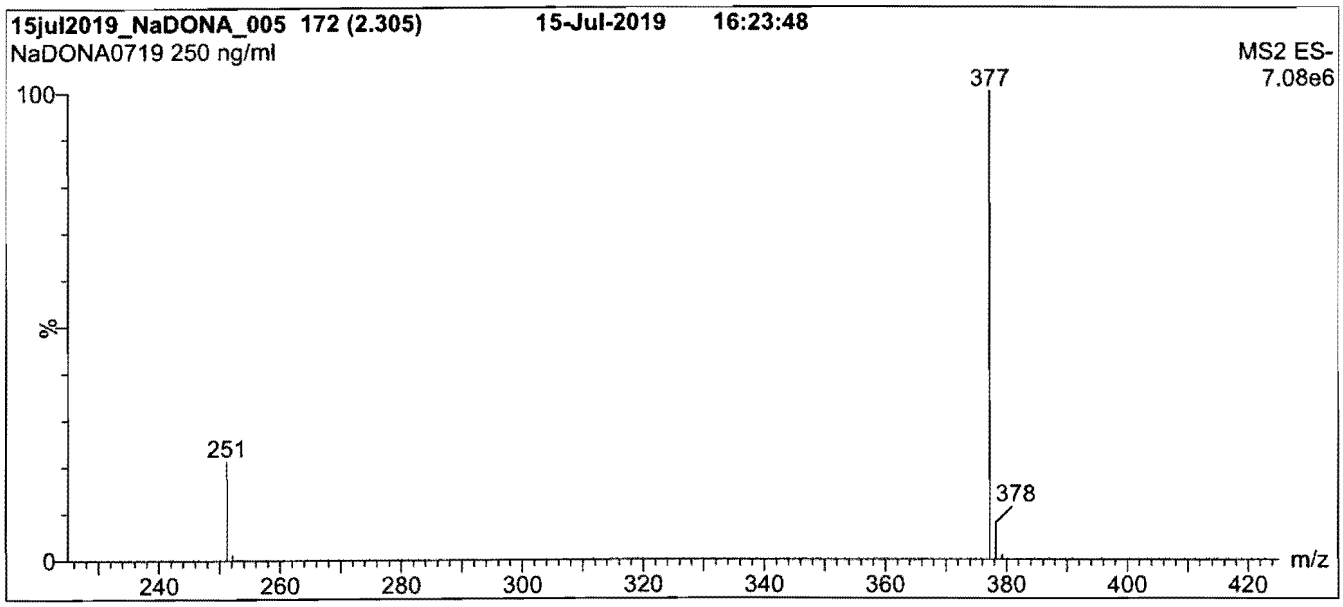
MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 10

19L0669

Figure 1: **NaDONA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L0669

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

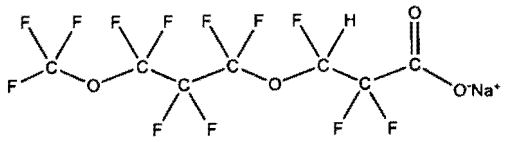
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

19L0669

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	NaDONA	**LOT NUMBER:**	NaDONA0719
COMPOUND:	Sodium dodecafluoro-3H-4,8-dioxanonanoate		
STRUCTURE:		**CAS #:**	958445-44-8 (ammonium salt)



MOLECULAR FORMULA:	$C_7HF_{12}O_4Na$	**MOLECULAR WEIGHT:**	400.05
CONCENTRATION:	50 ± 2.5 µg/ml (Na Salt)	**SOLVENT(S):**	Methanol
	47.1 ± 2.4 µg/ml (NaDONA anion)		Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/15/2019		
EXPIRY DATE: (mm/dd/yyyy)	07/15/2024		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

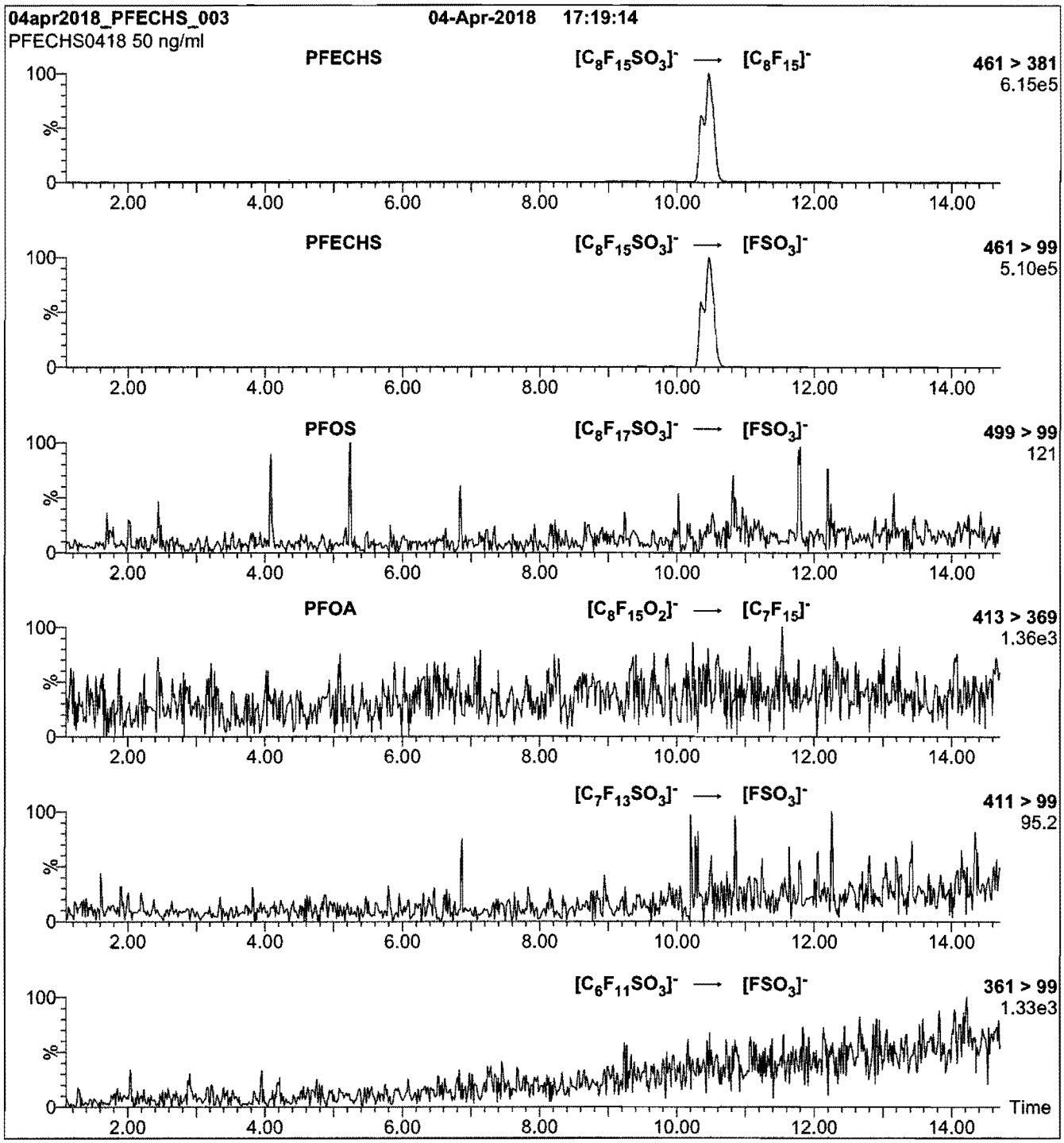
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/25/2019 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1910670

Figure 2: **PFECHS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFECHS)

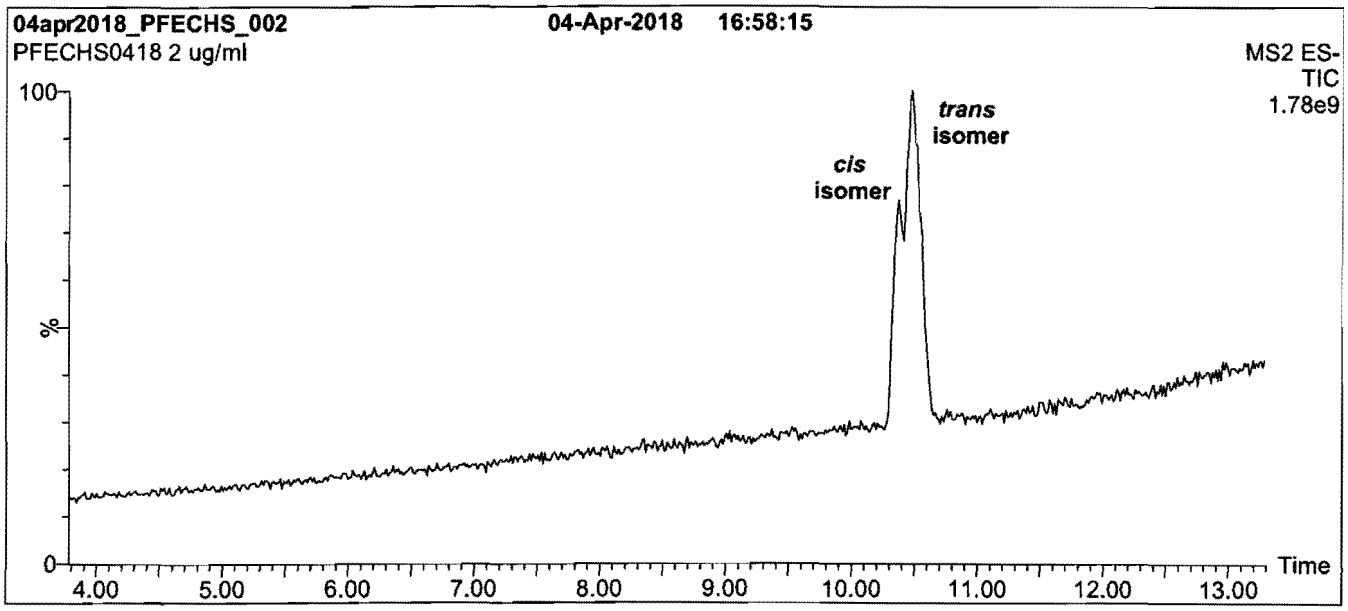
Mobile phase: Same as Figure 1

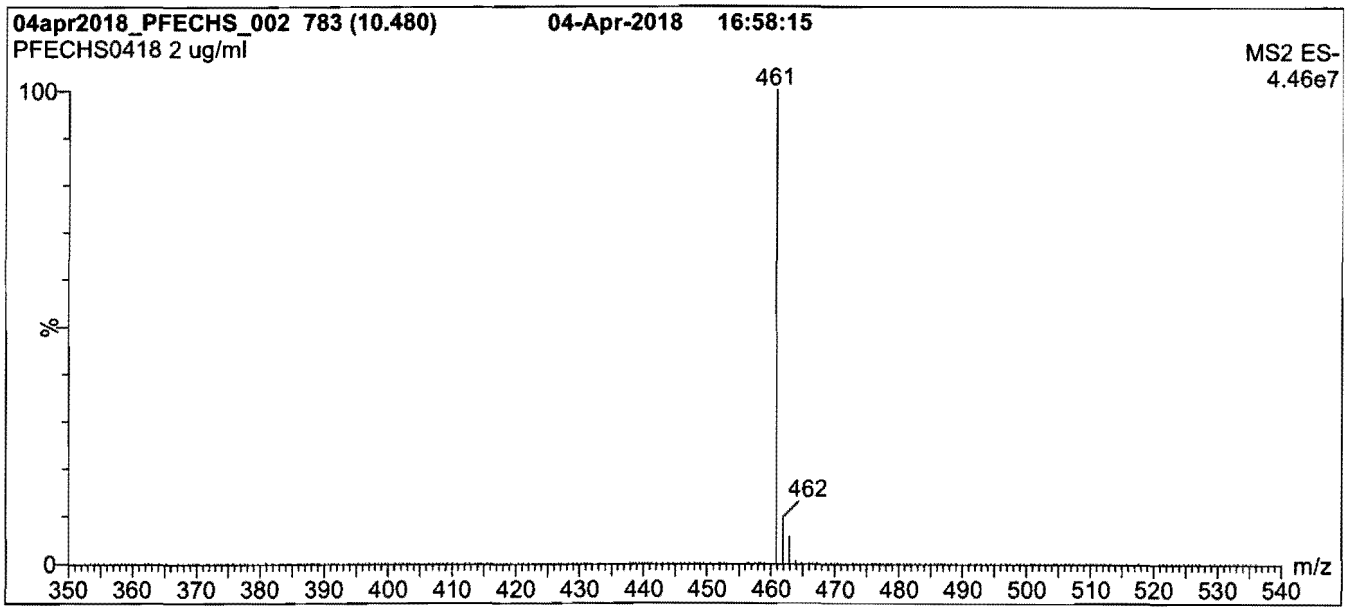
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

Figure 1: **PFECHS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity CSH Fluoro-Phenyl
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 25% (80:20 MeOH:ACN) / 75% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 60% organic over 13 min.
Ramp to 80% organic over 2 min and hold for
2 min before returning to initial conditions in 1 min.
Time: 20 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (350 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 45.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

1910670

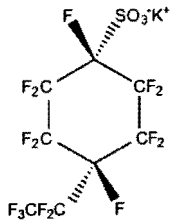
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

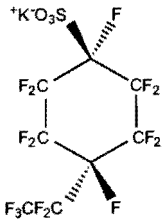
PRODUCT CODE: PFECHS **LOT NUMBER:** PFECHS0418

COMPOUND: Potassium perfluoro-4-ethylcyclohexanesulfonate (isomeric mixture)

STRUCTURE:



cis-isomer



trans-isomer

CAS #: 67584-42-3

MOLECULAR FORMULA: $C_8F_{15}SO_3K$ **MOLECULAR WEIGHT:** 500.22

CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt) **SOLVENT(S):** Methanol
46.1 ± 2.3 µg/ml (PFECHS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 04/04/2018

EXPIRY DATE: (mm/dd/yyyy) 04/04/2023

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

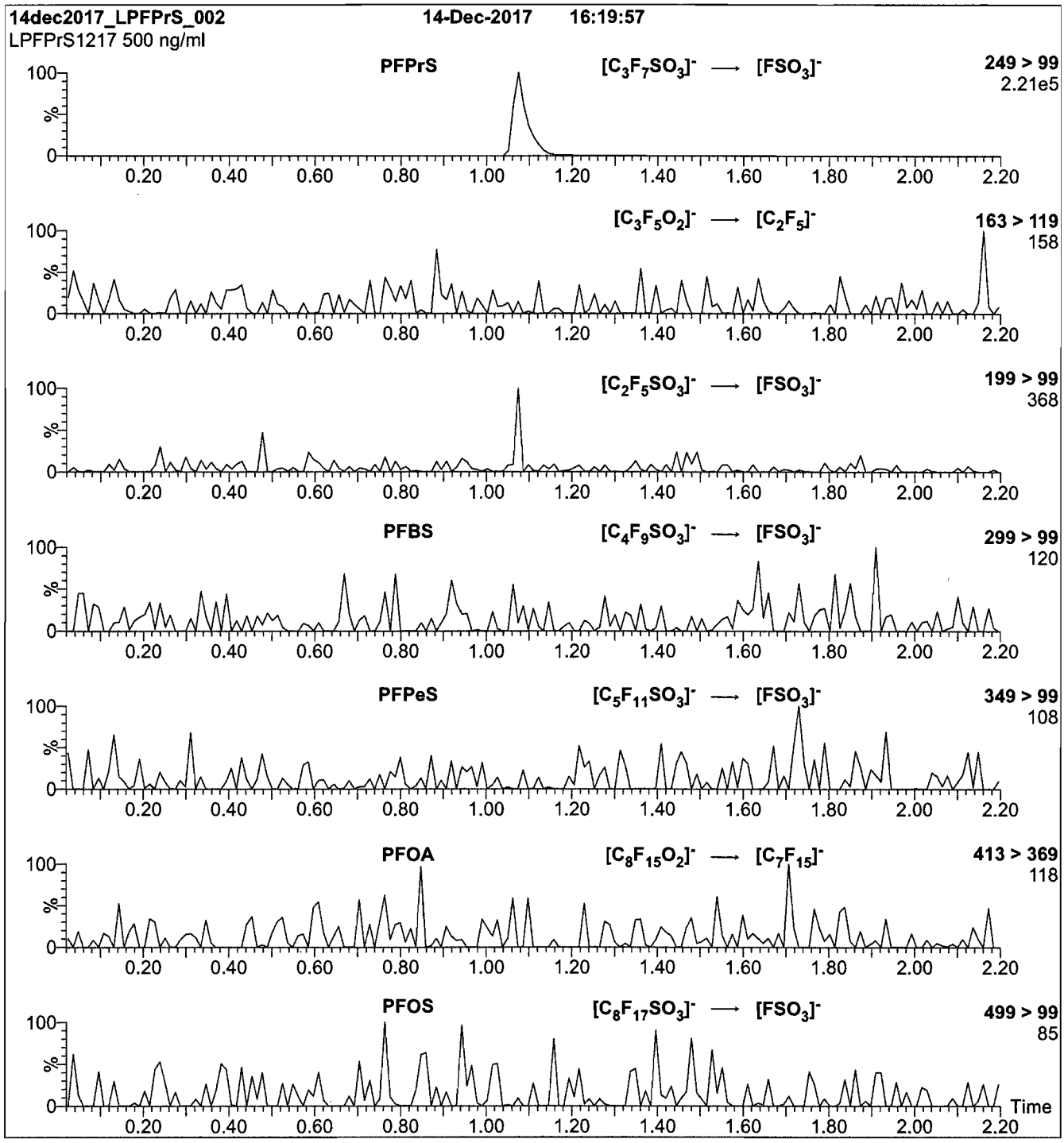
- See page 2 for further details.
- Contains a mixture of the *cis*/*trans* isomers of PFECHS at a ratio of 2:3 (*cis*:*trans*).
- Contains ~ 1.5% of other isomeric impurities.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/09/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **L-PFPrS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPrS)

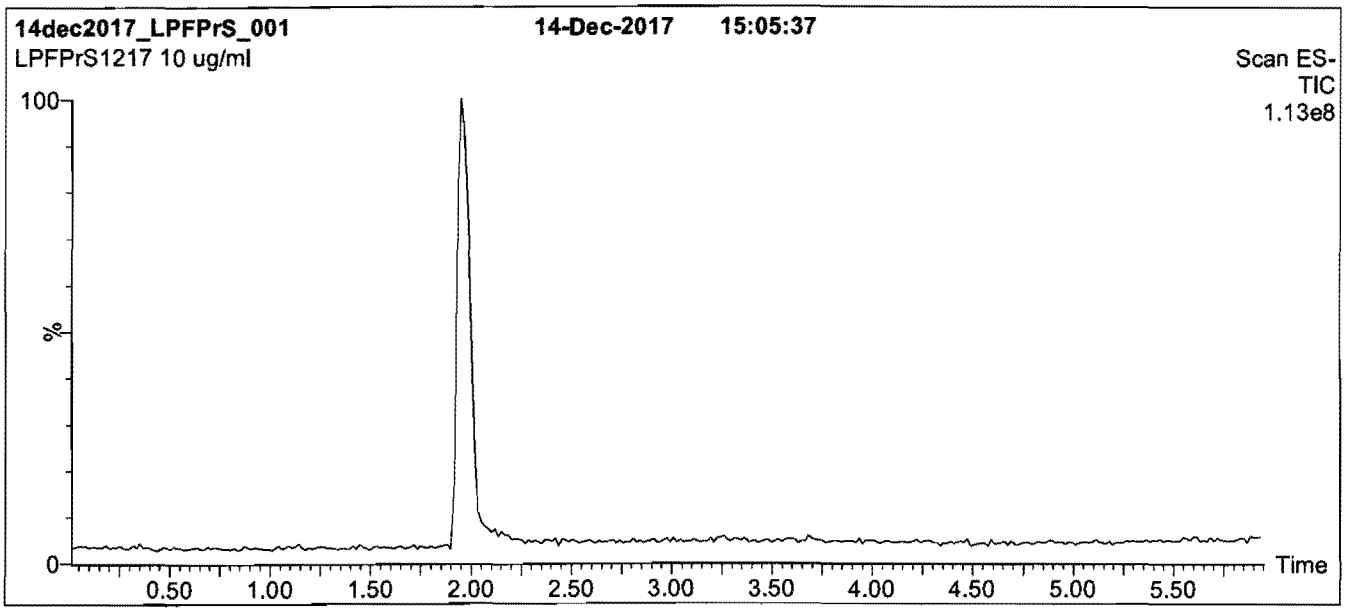
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

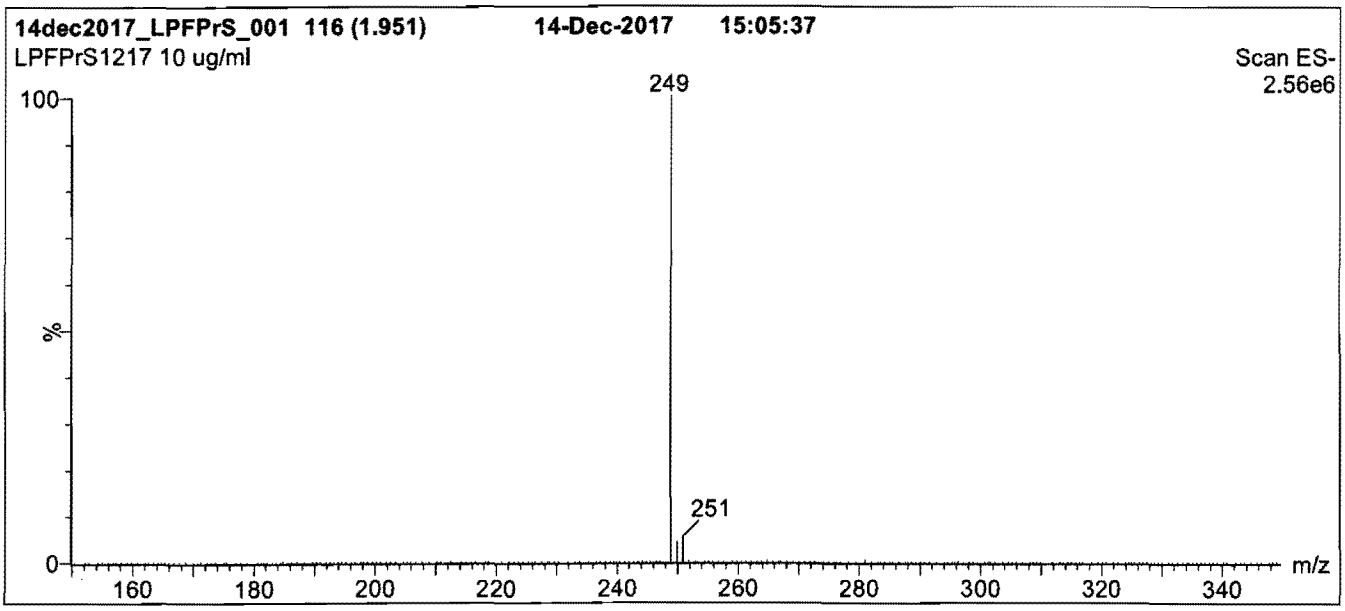
Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Figure 1: **L-PFPrS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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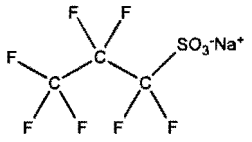
1L0671

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFPrS	**LOT NUMBER:**	LPFPrS1217
COMPOUND:	Sodium perfluoro-1-propanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_3F_7SO_3Na$	**MOLECULAR WEIGHT:**	272.07
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 45.8 ± 2.3 µg/ml (PFPrS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	12/14/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

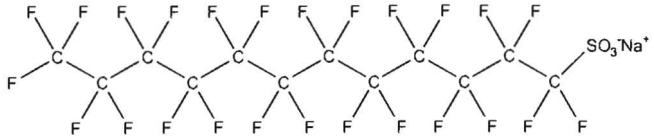
Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19L1707

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFDoS	**LOT NUMBER:**	LPFDoS1218
COMPOUND:	Sodium perfluoro-1-dodecanesulfonate		
STRUCTURE:		**CAS #:**	1260224-54-1



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.4 ± 2.4 µg/ml (PFDoS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/06/2018		
EXPIRY DATE: (mm/dd/yyyy)	12/06/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

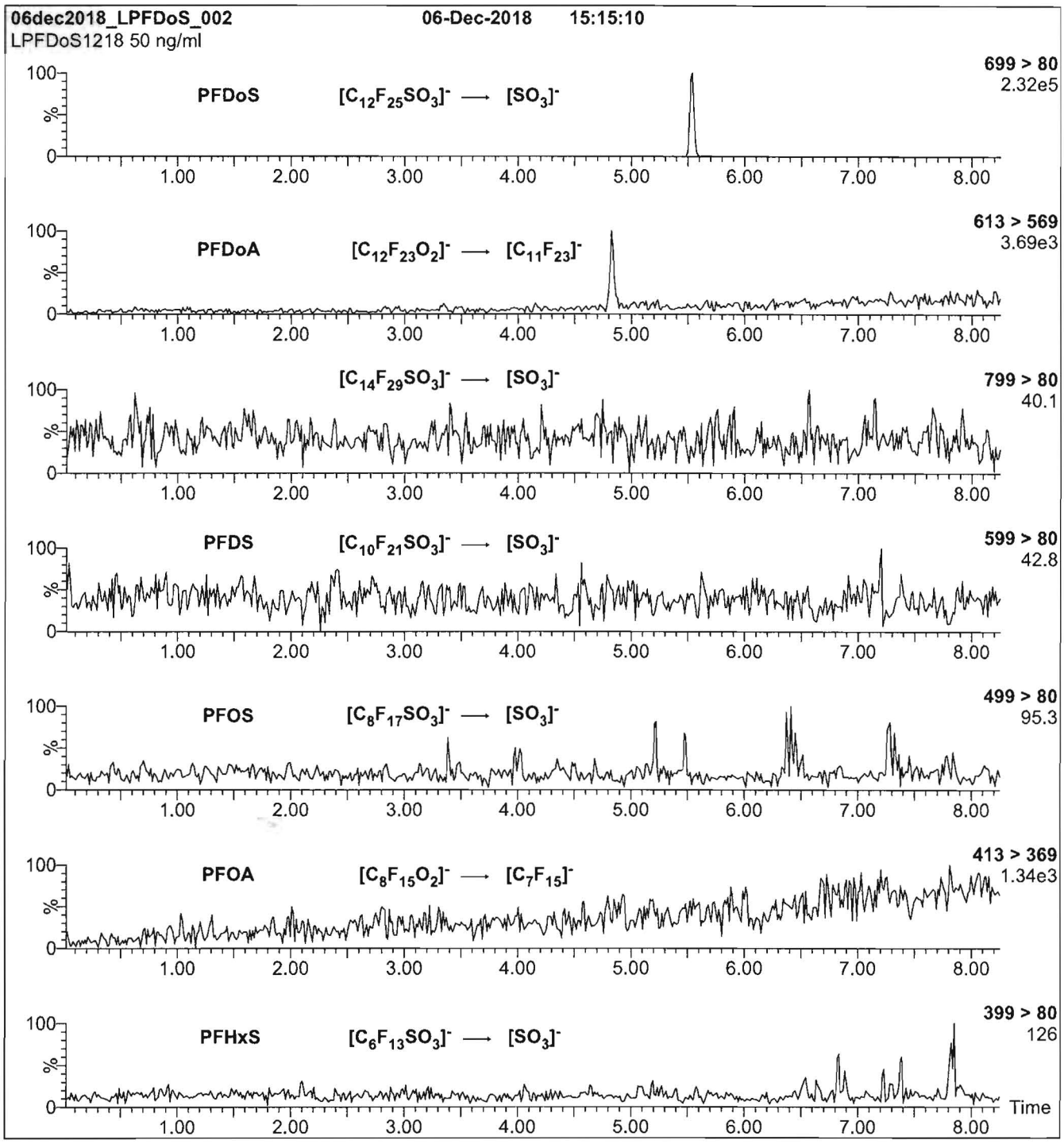
- See page 2 for further details.
- Contains ~ 0.2% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 2: **L-PFDoS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (L-PFDoS)

Mobile phase: Same as Figure 1

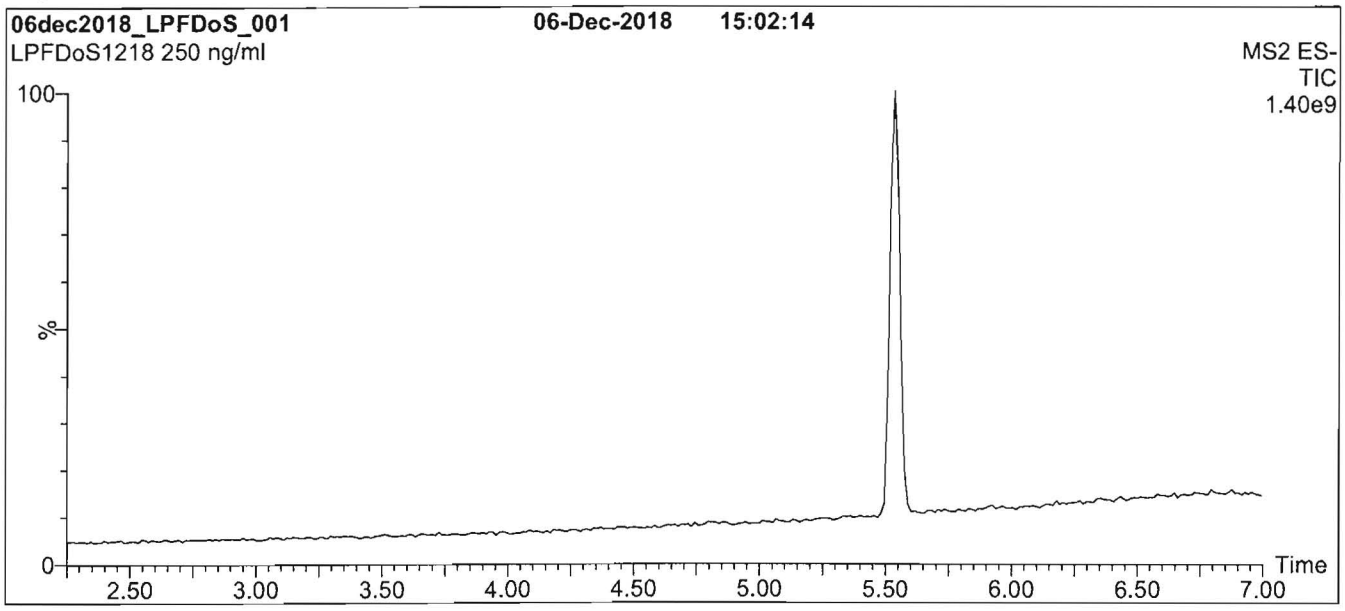
Flow: 300 µl/min

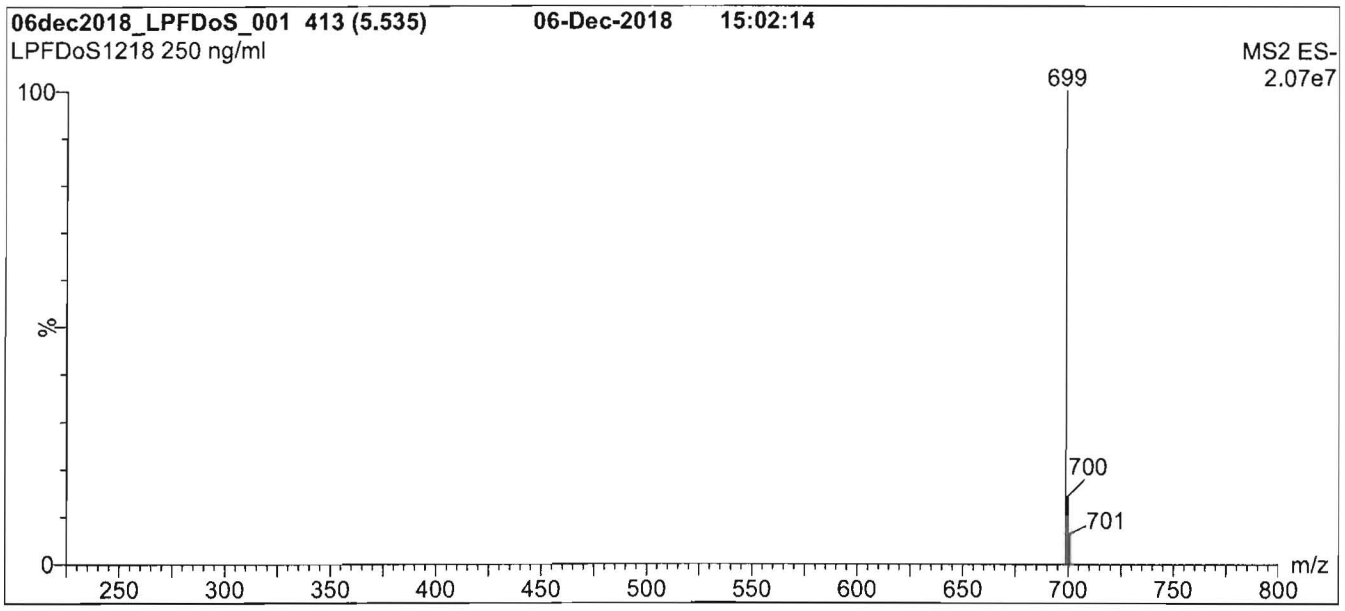
MS Parameters

Collision Gas (mbar) = 3.27e-3
Collision Energy (eV) = 60

19L1707

Figure 1: **L-PFDoS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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MS: **Waters Xevo TQ-S micro MS**

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

19L1707

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","375-85-9","PERFLUOROHEPTANOIC ACID
(PFHPA)","0.337","","TRG","Yes","Y","","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","919005-14-4","4,8-DIOXA-3H-PERFLUORONONANOIC ACID
(ADONA)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","355-46-4","PERFLUOROHEXANESULFONIC ACID
(PFHXS)","0.515","","TRG","Yes","Y","","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","335-67-1","PERFLUOROOCTANOIC ACID
(PFOA)","0.268","","TRG","Yes","Y","","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","375-95-1","PERFLUORONONANOIC ACID
(PFNA)","0.00443","","TRG","Yes","Y","","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","1763-23-1","HEPTADECAFLUOROACTANESULFONIC ACID SOLUTION
","0.0906","","TRG","Yes","Y","","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","756426-58-1","9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9Cl-PF3ONS)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","335-76-2","PERFLUORODECANOIC ACID
(PFDA)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","2355-31-9","MeFOSAA","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","2991-50-6","EtFOSAA","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","2058-94-8","PERFLUOROUNDECANOIC ACID
(PFUNA)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","763051-92-9","11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11Cl-PF3OUdS)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","

"","","","","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","307-55-
1","PERFLUORODODECANOIC ACID
(PFDOA)","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","","","","","","","","","","
","","","","","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","72629-94-
8","PFTrDA","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","","","","","","","","","","
","","","","","","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","376-06-
7","PFTeDA","","","TRG","Yes","N","U","Y","0.00134","0.00195","0.00391","UG_L","UG_L","","","","","","","","","","
","","","","","","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C3-PFBS","13C3-
PFBS","91.4","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","91.4","91.4","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C3-HFPO-DA","13C3-HFPO-
DA","89.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","89.0","89.0","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFHxA","13C2-
PFHxA","84.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","84.9","84.9","","","","","","50","150","
","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C4-PFHpA","13C4-
PFHpA","87.6","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","87.6","87.6","","","","","","50","150","
","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C3-PFHxS","13C3-
PFHxS","79.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","79.2","79.2","","","","","","50","150","
","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C5-PFNA","13C5-
PFNA","86.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","86.2","86.2","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFOA","13C2-
PFOA","83.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","83.2","83.2","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C8-PFOS","13C8-
PFOS","85.4","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","85.4","85.4","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFDA","13C2-
PFDA","78.3","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","78.3","78.3","","","","","","50","150","","
","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","d3-MeFOSAA","d3-
MeFOSAA","74.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","74.9","74.9","","","","","","50","15
0","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFUnA","13C2-
PFUnA","72.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","72.2","72.2","","","","","","50","150","
","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","d5-EtFOSAA","d5-
EtFOSAA","82.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","82.0","82.0","","","","","","50","150
","","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFDoA","13C2-
PFDoA","69.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","69.2","69.2","","","","","","50","150","
","","","","
"I006MW06S-20200624","537_MOD","07/06/20","20:37","N","NA","000","13C2-PFTeDA","13C2-
PFTeDA","64.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","64.0","64.0","","","","","","50","150"
,"","","","","
"DUP01-20200624","537_MOD","07/06/20","20:58","N","NA","000","375-73-

5","PFBS","0.0824","","TRG","Yes","Y","","Y","0.00135","0.00197","0.00394","UG_L","UG_L","","","

","","","","","","","","","
"DUP01-20200624","537_MOD","07/06/20","20:58","N","NA","000","72629-94-8","PFTrDA","","","TRG","Yes","N","U","Y","0.00135","0.00197","0.00394","UG_L","UG_L","","","","","","","","","

",""," ","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","13252-13-6","HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)","","","TRG","Yes","N","U","Y","0.00241","0.00300","0.00400","UG_L","UG_L","","","","","","","","","","","","
","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","375-85-9","PERFLUOROHEPTANOIC ACID (PFHPA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","
,"","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","919005-14-4","4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","",
"","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","355-46-4","PERFLUOROHEXANESULFONIC ACID (PFHXS)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","
,"","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","335-67-1","PERFLUOROOCTANOIC ACID (PFOA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","",
"","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","375-95-1","PERFLUORONONANOIC ACID (PFNA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","",
"","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","1763-23-1","HEPTADECAFLUOROACTANESULFONIC ACID SOLUTION
","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","","","","","
","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","756426-58-1","9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9Cl-PF3ONS)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","
","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","335-76-2","PERFLUORODECANOIC ACID (PFDA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","",
"","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","2355-31-9","MeFOSAA","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","
","","","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","2991-50-6","EtFOSAA","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","",
"","","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","2058-94-8","PERFLUOROUNDECANOIC ACID (PFUNA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","
","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","763051-92-9","11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11Cl-PF3OUdS)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","",
"","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","307-55-1","PERFLUORODODECANOIC ACID (PFDOA)","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","","
","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","72629-94-8","PFTrDA","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","","","","","","
","","","","","","","",""
"B0F0257-BLK1","537_MOD","07/06/20","19:03","N","NA","000","376-06-

7","PFTeDA","","","TRG","Yes","N","U","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","

"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","375-85-9","PERFLUOROHEPTANOIC ACID (PFHPA)","0.0414","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0414","104","","","","","","72","130","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","919005-14-4","4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)","0.0404","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0404","101","","","","","","70","130","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","355-46-4","PERFLUOROHEXANESULFONIC ACID (PFHXS)","0.0377","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0377","94.2","","","","","","68","131","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","335-67-1","PERFLUOROOCTANOIC ACID (PFOA)","0.0391","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0391","97.7","","","","","","71","133","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","375-95-1","PERFLUORONONANOIC ACID (PFNA)","0.0400","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0400","100","","","","","","69","130","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","1763-23-1","HEPTADECAFLUOROACTANESULFONIC ACID SOLUTION","0.0386","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0386","96.5","","","","","","65","140","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","756426-58-1","9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9Cl-PF3ONS)","0.0431","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0431","108","","","","","","70","130","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","335-76-2","PERFLUORODECANOIC ACID (PFDA)","0.0437","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0437","109","","","","","","71","129","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","2355-31-9","MeFOSAA","0.0434","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0434","108","","","","","","65","136","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","2991-50-6","EtFOSAA","0.0378","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0378","94.6","","","","","","61","135","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","2058-94-8","PERFLUOROUNDECANOIC ACID (PFUNA)","0.0431","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0431","108","","","","","","69","133","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","763051-92-9","11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11Cl-PF3OUdS)","0.0448","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0448","112","","","","","","70","130","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","307-55-1","PERFLUORODODECANOIC ACID (PFDOA)","0.0389","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0389","97.3","","","","","","72","134","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","72629-94-8","PFTrDA","0.0370","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0370","92.6","","","","","","65","144","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","376-06-7","PFTeDA","0.0418","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0418","105","","","","","","71","132","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C3-PFBS","13C3-PFBS","73.7","","IS","Yes","Y","","Y","","","","","PCT_REC","","","","","100","73.7","73.7","","","","","","50","150","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C3-HFPO-DA","13C3-HFPO-

DA","76.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","76.0","76.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFHxA","13C2-PFHxA","74.6","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","74.6","74.6","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C4-PFHpA","13C4-PFHpA","73.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","73.0","73.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C3-PFHxS","13C3-PFHxS","74.6","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","74.6","74.6","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C5-PFNA","13C5-PFNA","75.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","75.0","75.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFOA","13C2-PFOA","76.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","76.9","76.9","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C8-PFOS","13C8-PFOS","73.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","73.0","73.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFDA","13C2-PFDA","70.8","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","70.8","70.8","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","d3-MeFOSAA","d3-MeFOSAA","64.8","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","64.8","64.8","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFUnA","13C2-PFUnA","60.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","60.0","60.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","d5-EtFOSAA","d5-EtFOSAA","68.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","68.9","68.9","","","","","","50","150","","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFDoA","13C2-PFDoA","69.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","69.0","69.0","","","","","","50","150","","","","",""
"B0F0257-BS1","537_MOD","07/06/20","19:13","N","NA","000","13C2-PFTeDA","13C2-PFTeDA","61.2","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","61.2","61.2","","","","","","50","150","","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","375-73-5","PFBS","0.0412","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0412","103","","","","","4.63","72","130","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","307-24-4","PERFLUOROHEXANOIC ACID (PFHXA)","0.0395","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0395","98.8","","","","","","9.22","72","129","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13252-13-6","HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)","0.0448","","TRG","Yes","Y","","Y","0.00241","0.00300","0.00400","UG_L","UG_L","","","","0.0400","0.0448","112","","","","","","12.7","70","130","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","375-85-9","PERFLUOROHEPTANOIC ACID (PFHPA)","0.0383","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0383","95.7","","","","","","7.88","72","130","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","919005-14-4","4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)","0.0350","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0

.0350","87.4","","","","","14.5","70","130","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","355-46-4","PERFLUOROHEXANESULFONIC ACID
(PFHXS)","0.0398","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0398","99.5","","","","","5.50","68","131","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","335-67-1","PERFLUOROOCTANOIC ACID
(PFOA)","0.0393","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0393","98.2","","","","","0.463","71","133","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","375-95-1","PERFLUORONONANOIC ACID
(PFNA)","0.0400","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0400","100","","","","","0.00915","69","130","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","1763-23-
1","HEPTADECAFLUOROACTANESULFONIC ACID SOLUTION
","0.0384","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0384","96.1","","","","","0.435","65","140","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","756426-58-1","9-
CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9Cl-
PF3ONS)","0.0373","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0373","93.3","","","","","14.2","70","130","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","335-76-2","PERFLUORODECANOIC ACID
(PFDA)","0.0428","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0428","107","","","","","1.94","71","129","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","2355-31-
9","MeFOSAA","0.0408","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0408","102","","","","","6.11","65","136","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","2991-50-
6","EtFOSAA","0.0419","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0419","105","","","","","10.1","61","135","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","2058-94-8","PERFLUOROUNDECANOIC ACID
(PFUNA)","0.0406","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0406","101","","","","","6.07","69","133","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","763051-92-9","11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11Cl-
PF3OUdS)","0.0419","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0419","105","","","","","6.76","70","130","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","307-55-1","PERFLUORODODECANOIC ACID
(PFDOA)","0.0364","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0364","91.0","","","","","6.73","72","134","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","72629-94-
8","PFTrDA","0.0357","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0357","89.1","","","","","3.81","65","144","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","376-06-
7","PFTeDA","0.0395","","TRG","Yes","Y","","Y","0.00137","0.00200","0.00400","UG_L","UG_L","","","","0.0400","0.0395","98.8","","","","","5.62","71","132","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C3-PFBS","13C3-
PFBS","87.0","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","87.0","87.0","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C3-HFPO-DA","13C3-HFPO-
DA","77.1","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","77.1","77.1","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFHxA","13C2-
PFHxA","84.4","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","84.4","84.4","","","","","","50","150","","","","",""

"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C4-PFHpA","13C4-PFHpA","87.1","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","87.1","87.1","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C3-PFHxS","13C3-PFHxS","80.5","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","80.5","80.5","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C5-PFNA","13C5-PFNA","82.5","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","82.5","82.5","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFOA","13C2-PFOA","85.4","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","85.4","85.4","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C8-PFOS","13C8-PFOS","85.7","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","85.7","85.7","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFDA","13C2-PFDA","81.1","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","81.1","81.1","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","d3-MeFOSAA","d3-MeFOSAA","75.1","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","75.1","75.1","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFUnA","13C2-PFUnA","71.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","71.9","71.9","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","d5-EtFOSAA","d5-EtFOSAA","78.9","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","78.9","78.9","","","","","","50","150","","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFDoA","13C2-PFDoA","79.4","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","79.4","79.4","","","","","","50","150","","","","",""
"B0F0257-BSD1","537_MOD","07/06/20","19:24","N","NA","000","13C2-PFTeDA","13C2-PFTeDA","70.3","","IS","Yes","Y","","Y","","","","PCT_REC","","","","","100","70.3","70.3","","","","","","50","150","","","","","",""

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Wood Environment & Infrastructure Solutions, Inc.
7376 SW Durham Road
Portland, OR 97224
Attn: Ms. Kimberly Shiroodi
Kimberly.Shiroodi@woodplc.com

September 3, 2020

SUBJECT: Revised MCAS El Toro & Tustin PFAs, Data Validation

Dear Ms. Shiroodi,

Enclosed are the revised validation reports for the fraction listed below. These SDGs were received on August 4th and 19th, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48792_RV2:

SDG #	Fraction
2001357, 2001409, 2001417 2001436, 2001444, 2001472	Perfluoroalkyl & Polyfluoroalkyl Substances

The data validation was performed under Stage 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2,5,6 and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1; February 2020
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.3, 2019
- DoD General Validation Guidelines, February 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
Pgeng@lab-data.com
Project Manager/Senior Chemist

167 pages-ADV (100% Stage 4 for this job) (RV-F added) Attachment 1

Stage 2B/4 - do not validate QC samples **LDC #48792 (Wood/KMEA - National City, CA / MCAS El Toro & Tustin PFAs)** **PO001184**

LDC	SDG#	DATE REC'D	(2) DATE DUE	PFAs (537M/ QSM 5.3)																															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	2001357	08/04/20	08/18/20	2	0																														
B	2001409	08/04/20	08/18/20	12	0																														
C	2001417	08/04/20	08/18/20	4	0																														
D	2001436	08/04/20	08/18/20	6	0																														
E	2001444	08/04/20	08/18/20	7	0																														
F	2001472	08/19/20	09/02/20	4	0																														
Total	J/PG			35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Wood Environmental\El Toro\48792ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: August 25, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001357

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
I006MW06S-20200624	2001357-03	Water	06/24/20
DUP01-20200624	2001357-04	Water	06/24/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB01-20200624 was identified as an equipment blank. No contaminants were found.

Sample SB01-20200624 was identified as a source blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples I006MW06S-20200624 and DUP01-20200624 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	222MW09D-20200701	DUP02-20200701				
PFBS	0.0819	0.0824	1 (≤30)	-	-	-
PFHxA	0.6050	0.5880	3 (≤30)	-	-	-
PFHpA	0.3370	0.339	1 (≤30)	-	-	-
PFHxS	0.5150	0.5350	4 (≤30)	-	-	-
PFOA	0.2680	0.3150	16 (≤30)	-	-	-
PFNA	0.0044	0.0049	-	0.00049 (≤0.00394)	-	-
PFOS	0.0906	0.1060	16 (≤30)	-	-	-

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001357

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001357

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001357

No Sample Data Qualified in this SDG

LDC #: 48792A96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20

SDG #: 2001357 Stage 4 Page: 1 of 1

Laboratory: Vista Analytical Laboratory Reviewer: [signature]

2nd Reviewer: [signature]

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r TV/ICV ≤ 30
IV.	Continuing calibration/ISC	A/A	D ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	SB01-20200624 EB01-20200624
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	D= 1+2
X.	Labeled Compounds	A	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	I006MW06S-20200624	2001357-03	Water	06/24/20
2	DUP01-20200624	2001357-04	Water	06/24/20
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

	BOF0257						

LDC #: 48792A90

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of $\geq$ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) $\leq$30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification $\leq$ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration $\leq$ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check $\leq$ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 48792A96

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?	✓			
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF3ØNS		
R. 11Cl-PF3ØUdS		

LDC #: 48792A96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound	Concentration (ug/L)		RPD≤30	Difference (<5XLOQ)	Difference (<LOQ)	Qualification
	1	2				
A	0.0819	0.0824	1			
B	0.6050	0.5880	3			
C	0.3370	0.339	1			
D	0.5150	0.5350	4			
E	0.2680	0.3150	16			
F	0.0044	0.0049		0.00049	0.00394	
G	0.0906	0.1060	16			

LDC # 48792A96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/6/2020	SCN977	PFOA	1	0.0283	0.02	0.00040
			2	0.0513	0.04	0.0016
			3	0.0937	0.08	0.0064
			4	0.1952	0.16	0.0256
			5	0.4739	0.40	0.1600
			6	0.8828	0.80	0.6400
			7	4.5622	4.00	16.0000
			8	9.3191	8.00	64.0000
			9	20.7411	20.00	400.0000
			10	41.4806	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.09230	c	0.0543225
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.09128	-0.0014190	1.13013	-0.000202972
Std Err of Coef.				
Correlation Coefficient		0.999825		
Coefficient of Determination (r^2)		0.999651		0.999173

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/6/2020	SCN977	PFOS	1	0.0184	0.02	0.00040
			2	0.0397	0.04	0.0016
			3	0.0806	0.08	0.0064
			4	0.1980	0.16	0.0256
			5	0.4633	0.40	0.1600
			6	1.0057	0.80	0.6400
			7	4.8637	4.00	16.0000
			8	10.3716	8.00	64.0000
			9	24.6679	20.00	400.0000
			10	47.3616	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.03049	c	-0.0944633
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.28839	-0.0026132	1.27905	-0.0001870130
Std Err of Coef.				
Correlation Coefficient		0.999980		
Coefficient of Determination (r^2)		0.999959		0.999703

LDC #: 48792A96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200706P1_48	6/30/2020	PFOA (13C2-PFOA)	10.0	9.81	9.81	98.1	98.1
			PFOS (13C8-PFOS)	10.0	9.91	9.89	99.1	98.9
2			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
3			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
4			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
5			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
6			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					

LDC #: 48792A96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0F0257-BS/D1

Compound	SA (ug/L)		SSC (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400	0.0400	0.0391	0.0393	97.7	97.8	98.2	98.3	0.463	0.510
PFOS	0.0400	0.0400	0.0386	0.0384	96.5	96.5	96.1	96.0	0.435	0.519

LDC #: 47924B6

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (mL)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOS	5.670E+03	2.408E+03	12.5	1	curve	1	255.63	0.0906	0.0906	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: August 25, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001409

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
IS72MW16DR-20200701	2001409-02	Water	07/01/20
IS72MW15D-20200701	2001409-03	Water	07/01/20
222MW09D-20200701	2001409-04	Water	07/01/20
DUP02-20200701	2001409-05	Water	07/01/20
IS72MW17D-20200701	2001409-06	Water	07/01/20
DUP03-20200701	2001409-07	Water	07/01/20
I003MW01D-20200701	2001409-08	Water	07/01/20
I003MW02D-20200701	2001409-09	Water	07/01/20
DUP04-20200701	2001409-10	Water	07/01/20
I003MW05D-20200701	2001409-11	Water	07/01/20
TW07D-20200702	2001409-13	Water	07/02/20
TW05D-20200702	2001409-14	Water	07/02/20
IS72MW16DR-20200701MS	2001409-02MS	Water	07/01/20
IS72MW16DR-20200701MSD	2001409-02MSD	Water	07/01/20
I003MW01D-20200701MS	2001409-08MS	Water	07/01/20
I003MW01D-20200701MSD	2001409-08MSD	Water	07/01/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB02-20200701 and EB03-20200702 were identified as equipment blanks. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
I003MW01D-20200701MS/MSD (I003MW01D-20200701)	PFNA	133 (69-130)	-	J (all detects)	A

For I003MW01D-20200701MS/MSD, no data were qualified for PFBS and PFHpA percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

PFHxA, PFHxS, PFOA, and PFOS percent recoveries (%R) and PFHxA, PFHxS, and PFOS relative percent differences (RPD) were not within the QC limits for I003MW01D-20200701MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples 222MW09D-20200701 and DUP02-20200701, samples IS72MW17D-20200701 and DUP03-20200701, and samples I003MW02D-20200701 and DUP04-20200701 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	222MW09D-20200701	DUP02-20200701				
PFBS	0.0105	0.0105	-	0 (≤0.00405)	-	-
PFHxA	0.0207	0.0226	9 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	222MW09D-20200701	DUP02-20200701				
PFHpA	0.00555	0.00521	-	0.0003 (≤0.00405)	-	-
PFHxS	0.0702	0.0610	14 (≤30)	-	-	-
PFOA	0.0839	0.0822	2 (≤30)	-	-	-
PFOS	0.0150	0.0154	-	0.0004 (≤0.00405)	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	IS72MW17D-20200701	DUP03-20200701				
PFBS	0.0262	0.0285	8 (≤30)	-	-	-
PFHxA	0.185	0.189	2 (≤30)	-	-	-
PFHpA	0.0980	0.0945	4 (≤30)	-	-	-
PFHxS	0.0788	0.0737	7 (≤30)	-	-	-
PFOA	0.781	0.755	3 (≤30)	-	-	-
PFNA	0.00477	0.00546	-	0.00069 (≤0.00409)	-	-
PFOS	0.0432	0.0418	3 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	I003MW02D-20200701	DUP04-20200701				
PFBS	0.364	0.397	9 (≤30)	-	-	-
PFHxA	2.59	2.57	1 (≤30)	-	-	-
PFHpA	0.537	0.529	2 (≤30)	-	-	-
PFHxS	2.49	2.59	4 (≤30)	-	-	-
PFOA	11.1	11.0	1 (≤30)	-	-	-
PFNA	0.00392	0.00425	-	0.00033 (≤0.00400)	-	-
PFOS	0.879	0.972	10 (≤30)	-	-	-

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW07D-20200702	13C2-PFDoA 13C2-PFTeDA	46.2 (50-150) 12.6 (50-150)	PFDoA PFTrDA 11Cl-PF30UdS PFTeDA	NA	-
TW05D-20200702	13C2-PFTeDA	28.0 (50-150)	PFTeDA	NA	-

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria with the following exceptions:

Sample	Compound	Ion Abundance Ratio (Limits)	Flag	A or P
222MW09D-20200701	PFOS	3.506 (1.003-3.008)	J (all detects)	P
DUP02-20200701	PFOS	3.255 (1.003-3.008)	J (all detects)	P

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R and ion abundance ratio, data were qualified as estimated in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001409

Sample	Compound	Flag	A or P	Reason
I003MW01D-20200701	PFNA	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
222MW09D-20200701 DUP02-20200701	PFOS	J (all detects)	P	Target compound identification (ion abundance ratio)

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001409

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001409

No Sample Data Qualified in this SDG

LDC #: 48792B96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20

SDG #: 2001409 Stage 4 Page: 1 of 2

Laboratory: Vista Analytical Laboratory Reviewer: M

2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D TV/ICV ≤ 30
IV.	Continuing calibration/ISC	A/A	%D ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB02-20200701, EB03-20200702
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D = 3+4, 5+6, 8+9
X.	Labeled Compounds	SW	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	SW	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	IS72MW16DR-20200701	2001409-02	Water	07/01/20
2	IS72MW15D-20200701	2001409-03	Water	07/01/20
3	222MW09D-20200701	2001409-04	Water	07/01/20
4	DUP02-20200701	2001409-05	Water	07/01/20
5	IS72MW17D-20200701	2001409-06	Water	07/01/20
6	DUP03-20200701	2001409-07	Water	07/01/20
7	I003MW01D-20200701	2001409-08	Water	07/01/20
8	I003MW02D-20200701	2001409-09	Water	07/01/20
9	DUP04-20200701	2001409-10	Water	07/01/20
10	I003MW05D-20200701	2001409-11	Water	07/01/20
11	TW07D-20200702	2001409-13	Water	07/02/20
12	TW05D-20200702	2001409-14	Water	07/02/20
13	IS72MW16DR-20200701MS	2001409-02MS	Water	07/01/20
14	IS72MW16DR-20200701MSD	2001409-02MSD	Water	07/01/20
15	I003MW01D-20200701MS	2001409-08MS	Water	07/01/20

LDC #: 48792B96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20

SDG #: 2001409 Stage 4 Page: 2 of 2

Laboratory: Vista Analytical Laboratory Reviewer:

2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

16	I003MW01D-20200701MSD	2001409-08MSD	Water	07/01/20
17				
18				
19				

Notes:

	BOGD034						

LDC #: 48795B96

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of $\geq$ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) $\leq$30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification $\leq$ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration $\leq$ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check $\leq$ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 46792B96

VALIDATION FINDINGS CHECKLIST

Reviewer: IV
2nd Reviewer: IV

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?		✓		
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF30NS		
R. 11Cl-PF30UdS		

LDC #: 49792B96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DOD QSM 5.1
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) or duplicate sample analyzed for each matrix in this SDG?
(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		15/16	A		48.3 (72-130)		7 (dets)	No qual. >4x
			C	250 (72-130)	265 ↓			↓
			F	133 (69-130				J dets/A
		15/16 (10x)	B, D, E, G	%RS out			7 (dets)	No qual. >4x
			B			32 (≤30)		
			D			39 ↓		
			G			31		

Reported RPDs based on %RS. RPDs evaluated using conc.

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SC
2nd Reviewer: [illegible]

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.1

Compound	Concentration (ug/L)		RPD≤30	Difference (<5XLOQ)	Difference (<LOQ)	Qualification
	1	2				
A	0.0105	0.0105		0	0.00405	
B	0.0207	0.0226	9			
C	0.00555	0.00521		0.0003	0.00405	
D	0.0702	0.0610	14			
E	0.0839	0.0822	2			
G	0.0150	0.0154		0.0004	0.00405	

Compound	Concentration (ug/L)		RPD≤30	Difference (<5XLOQ)	Difference (<LOQ)	Qualification
	5	6				
A	0.0262	0.0285	8			
B	0.185	0.189	2			
C	0.0980	0.0945	4			
D	0.0788	0.0737	7			
E	0.781	0.755	3			
F	0.00477	0.00546		0.00069	0.00409	
G	0.0432	0.0418	3			

Compound	Concentration (ug/L)		RPD≤30	Difference (<5XLOQ)	Difference (<LOQ)	Qualification
	8	9				
A	0.364	0.397	9			
B	2.59	2.57	1			
C	0.537	0.529	2			
D	2.49	2.59	4			
E	11.1	11.0	1			
F	0.00392	0.00425		0.00033	0.00400	
G	0.879	0.972	10			

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Reviewer: π
2nd Reviewer: T

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		11TB4 (ND)	DDA	46.2 (50-150)	Jdet/P (L, M, R)
			TDA	12.6	(N)
		12TB4		28.0	(N)

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was the signal to noise (S/N) ratio for all compounds within the validation criteria?
Y (N) N/A Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?
Y (N) N/A Were ion ratios within QC limits and between 50-150%?

#	Date	Sample ID	Associated Compound	Ion ratio (~~%D≤50~~ limit)	Qualifications
		3	G	3.506 (1.003-3.008)	J (det)/P
		↓	↓	↓	↓
		4	↓	3.255	↓

LDC # 48792B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/14/2020	SCN945/960	PFOA	1	0.0391	0.02	0.00040
			2	0.0607	0.04	0.0016
			3	0.1111	0.08	0.0064
			4	0.2362	0.16	0.0256
			5	0.6220	0.40	0.1600
			6	1.1520	0.80	0.6400
			7	6.2166	4.00	16.0000
			8	11.3946	8.00	64.0000
			9	26.3657	20.00	400.0000
			10	53.5565	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.15850	c	0.1102520
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.36351	-0.0006947	1.42944	-0.000207503
Std Err of Coef.				
Correlation Coefficient		0.999826		
Coefficient of Determination (r^2)		0.999652		0.99882

LDC #: 18792B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/14/2020	SCN945/960	PFOS	1	0.0227	0.02	0.00040
			2	0.0317	0.04	0.0016
			3	0.0814	0.08	0.0064
			4	0.1498	0.16	0.0256
			5	0.4309	0.40	0.1600
			6	0.7906	0.80	0.6400
			7	4.2751	4.00	16.0000
			8	8.1452	8.00	64.0000
			9	19.0425	20.00	400.0000
			10	38.9489	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.08248	c	-0.0037090
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.970908	0.0000222	1.008000	-0.0000832828
Std Err of Coef.				
Correlation Coefficient		0.999885		
Coefficient of Determination (r^2)		0.999771		0.998246

LDC # 47862 B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/15/2020	SCN945/960	PFOA	1	0.0339	0.02	0.00040
			2	0.0701	0.04	0.0016
			3	0.1254	0.08	0.0064
			4	0.2383	0.16	0.0256
			5	0.6010	0.40	0.1600
			6	1.2023	0.80	0.6400
			7	6.0452	4.00	16.0000
			8	11.7530	8.00	64.0000
			9	27.7324	20.00	400.0000
			10	51.9259	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.03546	c	0.0669438
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.49055	-0.0048287	1.50337	-0.000416136
Std Err of Coef.				
Correlation Coefficient		0.999991		
Coefficient of Determination (r^2)		0.999981		0.999939

LDC #: 48972B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/15/2020	SCN945/960	PFOS	1	0.0161	0.02	0.00040
			2	0.0303	0.04	0.0016
			3	0.0746	0.08	0.0064
			4	0.1589	0.16	0.0256
			5	0.4236	0.40	0.1600
			6	0.8187	0.80	0.6400
			7	4.1694	4.00	16.0000
			8	7.9315	8.00	64.0000
			9	20.4718	20.00	400.0000
			10	38.8811	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.03613	c	-0.0860112
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.051162	-0.0019514	1.03891	-0.0001274520
Std Err of Coef.				
Correlation Coefficient		0.999955		
Coefficient of Determination (r^2)		0.999911		0.999761

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/16/2020	SCN945/960	PFOA	1	0.0305	0.02	0.00040
			2	0.0521	0.04	0.0016
			3	0.1192	0.08	0.0064
			4	0.2380	0.16	0.0256
			5	0.5742	0.40	0.1600
			6	1.1541	0.80	0.6400
			7	5.8217	4.00	16.0000
			8	11.3244	8.00	64.0000
			9	26.9039	20.00	400.0000
			10	49.4671	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.00837	c	-0.0054419
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.45774	-0.0055315	1.46173	-0.000451650
Std Err of Coef.				
Correlation Coefficient		0.999999		
Coefficient of Determination (r^2)		0.999998		0.999976

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/16/2020	SCN945/960	PFOS	1	0.0152	0.02	0.00040
			2	0.0407	0.04	0.0016
			3	0.0966	0.08	0.0064
			4	0.1510	0.16	0.0256
			5	0.4276	0.40	0.1600
			6	0.7511	0.80	0.6400
			7	4.2366	4.00	16.0000
			8	7.8487	8.00	64.0000
			9	18.9035	20.00	400.0000
			10	38.4993	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.06995	c	0.0058948
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.95629	0.0001198	0.98734	-0.0000616685
Std Err of Coef.				
Correlation Coefficient		0.999926		
Coefficient of Determination (r^2)		0.999853		0.999295

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200714M1_63	7/15/2020	PFOA (13C2-PFOA)	1.00	0.997	0.997	99.4	99.7
			PFOS (13C8-PFOS)	1.00	1.160	1.159	115.9	115.9
2	200714M1_83	7/15/2020	PFOA (13C2-PFOA)	10.00	9.23	9.23	92.3	92.3
			PFOS (13C8-PFOS)	10.00	11.6	11.6	116.3	116.2
3	200716M1_27	7/16/2020	PFOA (13C2-PFOA)	10.00	10.50	10.49	104.9	104.9
			PFOS (13C8-PFOS)	10.00	10.20	10.20	102.1	102.0
4			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
5			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
6			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					

LDC #: 45792B96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked concentration; SA = Spike added; SC = Sample concentration

RPD = | MS - MSD | * 2/(MS + MSD)

MS = Matrix spike recovery; MSD = Matrix spike duplicate recovery

MS/MSD ID: 13/14

Compound	SA (ug/L)		SC (ug/L)	SSC (ug/L)		MS Percent Recovery		MSD Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0414	0.0409	0.1670	0.2120	0.2060	109	109	95.0	95.4	13.7	2.87
PFOS	0.0414	0.0409	0.0650	0.1150	0.1070	121	121	102	103	17.0	7.21

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0G0034-BS1

Compound	SA (ng/L)		SSC (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400		0.0414		104	104				
PFOS	0.0400		0.0355		88.7	88.8				

LDC #: 48792B96

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SG
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (L)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOA	6.129E+04	1.362E+04	12.5	1	curve	1	236.45	0.167	0.167	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: August 25, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001417

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TW06D-20200706	2001417-02	Water	07/06/20
TW25D-20200706	2001417-03	Water	07/06/20
TW26D-20200706	2001417-04	Water	07/06/20
TW08D-20200706	2001417-05	Water	07/06/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB04-20200706 was identified as an equipment blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
BOG0039-BS1/BSD1 (All samples in SDG 2001417)	PFTeDA	35.7 (≤30)	NA	-

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW06D-20200706	13C2-PFTeDA	27.0 (50-150)	PFTeDA	NA	-
TW25D-20200706	d5-EtFOSAA 13C2-PFDoA 13C2-PFTeDA	46.4 (50-150) 42.7 (50-150) 17.3 (50-150)	EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS PFTeDA	NA	-
TW26D-20200706	13C2-PFTeDA	24.3 (50-150)	PFTeDA	NA	-

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001417

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001417

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001417

No Sample Data Qualified in this SDG

LDC #: 48792C96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20

SDG #: 2001417 Stage 4 Page: 1 of 1

Laboratory: Vista Analytical Laboratory Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r² ≥0.99 ≤30
IV.	Continuing calibration/ISC	A/A	D ≤30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB04-20200706
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; SB=Source blank
N = Not provided/applicable; R = Rinsate; TB = Trip blank; OTHER:
SW = See worksheet; FB = Field blank; EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	TW06D-20200706	2001417-02	Water	07/06/20
2	TW25D-20200706	2001417-03	Water	07/06/20
3	TW26D-20200706	2001417-04	Water	07/06/20
4	TW08D-20200706	2001417-05	Water	07/06/20
5				
6				
7				
8				
9				
10				

Notes:

	B0G0039						

LDC #: 48792Q96

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?		✓	✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification ≤ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check ≤ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	•	✓		
Were target compounds detected in the field duplicates?			✓	
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF30NS		
R. 11Cl-PF30UdS		

LDC #: 48792C96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DOD QSM 5.3

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	BOG0039-BS/BSD1	N			35.7 (≤30)	All (ND)	Jdets/P

LDC #: 48792C96

VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		1 (ND)	TDA	27.0 (50-150)	Jdets/P (N)
		2	EFOS	46.4	(J)
			DDA	42.7	(L, M, R)
			TDA	17.3	(N)
		3 (ND)	TDA	24.3	

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

LDC # 48792096

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/10/2020	SCN982	PFOA	1	0.0371	0.02	0.00040
			2	0.0615	0.04	0.0016
			3	0.1197	0.08	0.0064
			4	0.2327	0.16	0.0256
			5	0.6277	0.40	0.1600
			6	1.1434	0.80	0.6400
			7	5.5884	4.00	16.0000
			8	11.6240	8.00	64.0000
			9	26.4062	20.00	400.0000
			10	51.9666	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.08117	c	0.1077220
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.38891	-0.0022976	1.42034	-0.000256585
Std Err of Coef.				
Correlation Coefficient		0.999908		
Coefficient of Determination (r^2)		0.999815		0.999514

LDC #: 48192096

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/10/2020	SCN982	PFOS	1	0.0181	0.02	0.00040
			2	0.0367	0.04	0.0016
			3	0.0751	0.08	0.0064
			4	0.1287	0.16	0.0256
			5	0.4089	0.40	0.1600
			6	0.8490	0.80	0.6400
			7	4.3716	4.00	16.0000
			8	8.7038	8.00	64.0000
			9	21.4254	20.00	400.0000
			10	38.6788	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.06963	c	-0.0940027
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.153191	-0.0046289	1.126310	-0.0003080400
Std Err of Coef.				
Correlation Coefficient		0.999967		
Coefficient of Determination (r^2)		0.999933		0.999556

LDC #: 48792 c96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200710M1_109	7/11/2020	PFOA (13C2-PFOA)	10.00	10.7	10.7	106.5	106.5
			PFOS (13C8-PFOS)	10.00	8.57	8.55	85.7	85.5
2			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
3			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
4			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
5			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
6			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					

LDC #: 48792C96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/16/2020	SCN945/960	PFOA	1	0.0307	0.02	0.00040
			2	0.0628	0.04	0.0016
			3	0.1341	0.08	0.0064
			4	0.2594	0.16	0.0256
			5	0.5827	0.40	0.1600
			6	1.2264	0.80	0.6400
			7	6.2227	4.00	16.0000
			8	11.8314	8.00	64.0000
			9	27.9818	20.00	400.0000
			10	55.1083	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.09022	c	0.0619264
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.45746	-0.0020386	1.49503	-0.000249651
Std Err of Coef.				
Correlation Coefficient		0.999949		
Coefficient of Determination (r^2)		0.999898		0.99964

LDC #: 48792C9v

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer: [illegible]

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/16/2020	SCN982	PFOS	1	0.0183	0.02	0.00040
			2	0.0368	0.04	0.0016
			3	0.0855	0.08	0.0064
			4	0.1639	0.16	0.0256
			5	0.4212	0.40	0.1600
			6	0.8879	0.80	0.6400
			7	4.2126	4.00	16.0000
			8	8.8898	8.00	64.0000
			9	20.8350	20.00	400.0000
			10	37.5574	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.03856	c	-0.0882230
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.14010	-0.0050221	1.12687	-0.0003708350
Std Err of Coef.				
Correlation Coefficient		0.999978		
Coefficient of Determination (r^2)		0.999957		0.999734

LDC #: 48792C96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer: CJ

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0G0039-BS/D

Compound	SA (ug/L)		SSC (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400	0.0400	0.0431	0.0411	108	108	103	103	4.76	4.75
PFOS	0.0400	0.0400	0.0397	0.0398	99.1	99.3	99.4	99.5	0.260	0.252

LDC #: 48792096

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SC
2nd Reviewer: 9

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (L)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOS	4.907E+02	3.402E+03	12.5	1	curve	1	261.96	0.00643	0.00643	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: September 3, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001436

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TW21D-20200707	2001436-02	Water	07/07/20
TW09D-20200707	2001436-03	Water	07/07/20
TW22D-20200707	2001436-04	Water	07/07/20
TW23D-20200708	2001436-06	Water	07/08/20
TW24D-20200708	2001436-07	Water	07/08/20
TW17D-20200708	2001436-08	Water	07/08/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB05-20200707 and EB06-20200708 were identified as equipment blanks. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW21D-20200707	13C2-PFTeDA	32.1 (50-150)	PFTeDA	NA	-
TW09D-20200707	d5-EtFOSAA 13C2-PFDoA 13C2-PFTeDA	42.0 (50-150) 38.5 (50-150) 11.4 (50-150)	EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS PFTeDA	NA	-
TW22D-20200707	d3-MeFOSAA 13C2-PFUnA d5-EtFOSAA 13C2-PFDoA	30.9 (50-150) 35.7 (50-150) 23.3 (50-150) 13.5 (50-150)	MeFOSAA PFUnA EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW22D-20200707	13C2-PFTeDA	6.30 (50-150)	PFTeDA	X	P
TW23D-20200708	d5-EtFOSAA 13C2-PFDoA	48.0 (50-150) 35.0 (50-150)	EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW23D-20200708	13C2-PFTeDA	5.40 (50-150)	PFTeDA	X	P

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW24D-20200708	13C2-PFDoA	45.9 (50-150)	PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW24D-20200708	13C2-PFTeDA	7.80 (50-150)	PFTeDA	X	P
TW17D-20200708	13C3-PFBS 13C2-PFHxA 13C4-PFHpA 13C3-PFHxS 13C5-PFNA 13C8-PFOS	44.4 (50-150) 42.2 (50-150) 45.2 (50-150) 44.2 (50-150) 41.9 (50-150) 45.5 (50-150)	PFBS PFHxA PFHpA PFHxS PFNA PFOS	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
TW17D-20200708	13C3-HFPO-DA 13C4-PFHpA 13C8-PFOS 13C2-PFDA D3-MeFOSAA 13C2-PFUnA D5-EtFOSAA 13C2-PFDoA	39.6 (50-150) 45.2 (50-150) 45.5 (50-150) 39.0 (50-150) 27.8 (50-150) 28.3 (50-150) 22.3 (50-150) 15.3 (50-150)	HFPO-DA ADONA 9Cl-PF30NS PFDA MeFOSAA PFUnA EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW17D-20200708	13C2-PFTeDA	3.30 (50-150)	PFTeDA	X	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to labeled compound %R, data were qualified for recommended exclusion in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001436

Sample	Compound	Flag	A or P	Reason
TW22D-20200707 TW23D-20200708 TW24D-20200708 TW17D-20200708	PFTeDA	X	P	Labeled compounds (%R)
TW17D-20200708	PFBS PFHxA PFHpA PFHxS PFNA PFOS	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Labeled compounds (%R)

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001436

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001436

No Sample Data Qualified in this SDG

LDC #: 48792D96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20

SDG #: 2001436 Stage 4 Page: 1 of 1

Laboratory: Vista Analytical Laboratory Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%r TV/ICV ≤ 30
IV.	Continuing calibration/ISC	A/A	D ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB05-20200707, EB06-20200708
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCSD
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	TW21D-20200707	2001436-02	Water	07/07/20
2	TW09D-20200707	2001436-03	Water	07/07/20
3	TW22D-20200707	2001436-04	Water	07/07/20
4	TW23D-20200708	2001436-06	Water	07/08/20
5	TW24D-20200708	2001436-07	Water	07/08/20
6	TW17D-20200708	2001436-08	Water	07/08/20
7				
8				
9				
10				

Notes:

	B0G0058						

LDC #: 48192D96

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification ≤ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check ≤ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 48792D96

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?	✓			
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF30NS		
R. 11Cl-PF30UdS		

LDC #: 48793D96

VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		1 (ND)	TDA	32.1 (50-150)	J (all ts/p) (N)
		2	EFOS	42.0	(J)
			DDA	38.5	(L, M, R)
			TDA	11.4	
		3 (ND)	MFOS	30.9	(I)
			UDA	35.7	(k)
			EFOS	23.3	
			DDA	13.5	
			TDA	6.30	J (all ts/p) x/p
		4 (ND)	EFOS	48.0	J (all ts/p)
			DDA	35.0	
			TDA	5.40	J (all ts/p) x/p
		5 (ND)	DDA	45.9	J (all ts/p)
			TDA	7.80	J (all ts/p) x/p

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

LDC #: 48792D96

VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		6 (dets/~~ND~~)	BS	44.4 (50-150)	J dets/P (A)
		(ND)	13C3-HFPO-DA	39.6	(O)
	~~C(dets), P(ND)~~	(dets)	HXA	42.2	(B)
	C(dets), P(ND)		HPA	45.2	(C, P)
		(dets)	HXS	44.2	(D)
			NA	41.9	(F)
			OA	47.8	No qual. 5x (E)
	G(dets), Q(ND)	~~(dets)~~	OS	45.5	J dets/P (G, Q)
		(ND)	DA	39.0	(H)
			MFOS	27.8	(I)
			UDA	28.3	(K)
			EFOS	22.3	(J)
			DDA	15.3	(L, M, R)
		(ND)	TDA	3.30	~~J/X/P~~ ~~D~~ J/X/P (N)

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

LDC # 48792D96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/14/2020	SCN977	PFOA	1	0.0152	0.02	0.00040
			2	0.0354	0.04	0.0016
			3	0.0774	0.08	0.0064
			4	0.1611	0.16	0.0256
			5	0.3921	0.40	0.1600
			6	0.7570	0.80	0.6400
			7	3.7452	4.00	16.0000
			8	7.3709	8.00	64.0000
			9	18.0513	20.00	400.0000
			10	35.0945	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.01292	c	-0.0058451
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.93049	-0.0013317	0.93654	-0.000120375
Std Err of Coef.				
Correlation Coefficient		0.999999		
Coefficient of Determination (r^2)		0.999998		0.999948

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/14/2020	SCN977	PFOS	1	0.0189	0.02	0.00040
			2	0.0436	0.04	0.0016
			3	0.0960	0.08	0.0064
			4	0.2164	0.16	0.0256
			5	0.4446	0.40	0.1600
			6	1.0272	0.80	0.6400
			7	5.1463	4.00	16.0000
			8	9.7792	8.00	64.0000
			9	23.9122	20.00	400.0000
			10	52.3992	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.11969	c	-0.0060877
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.132454	0.0043764	1.186310	0.0002266170
Std Err of Coef.				
Correlation Coefficient		0.999890		
Coefficient of Determination (r^2)		0.999781		0.999166

LDC # 48792D96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer: 4

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/15/2020	SCN977	PFOA	1	0.0206	0.02	0.00040
			2	0.0425	0.04	0.0016
			3	0.0812	0.08	0.0064
			4	0.1617	0.16	0.0256
			5	0.3638	0.40	0.1600
			6	0.7654	0.80	0.6400
			7	3.8409	4.00	16.0000
			8	7.7159	8.00	64.0000
			9	18.3778	20.00	400.0000
			10	33.7891	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.01377	c	0.0065121
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.99146	-0.0036659	0.98500	-0.000278493
Std Err of Coef.				
Correlation Coefficient		0.999998		
Coefficient of Determination (r^2)		0.999996		0.999925

LDC #: 48792D96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer: A

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/15/2020	SCN977	PFOS	1	0.0194	0.02	0.00040
			2	0.0507	0.04	0.0016
			3	0.0999	0.08	0.0064
			4	0.2036	0.16	0.0256
			5	0.5553	0.40	0.1600
			6	1.0030	0.80	0.6400
			7	5.2162	4.00	16.0000
			8	10.0225	8.00	64.0000
			9	22.5872	20.00	400.0000
			10	48.0572	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.17286	c	0.0162657
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.138001	0.0014902	1.214650	-0.0000566898
Std Err of Coef.				
Correlation Coefficient		0.999708		
Coefficient of Determination (r^2)		0.999416		0.998321

LDC #: 48792D96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer: A

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200714P1_42	7/15/2020	PFOA	(13C2-PFOA)	10.00	9.99	9.99	99.9	99.9
			PFOS	(13C8-PFOS)	10.00	10.70	10.75	107.2	107.5
2			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
3			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
4			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
5			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
6			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					

LDC #: 48792D96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0G0058-BS/D

Compound	SA (ug/L)		SSC (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400	0.0400	0.0380	0.0422	95.1	95.0	105	106	10.4	10.5
PFOS	0.0400	0.0400	0.0365	0.0485	91.2	91.3	121.0	121	28.4	28.2

LDC #: 48792B9C

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (L)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOA	4.611E+03	1.596E+04	12.5	1	curve	1	246.85	0.0157	0.0157	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: September 3, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001444

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TW27S-20200709	2001444-02	Water	07/09/20
TW22S-20200709	2001444-03	Water	07/09/20
TW10D-20200709	2001444-04	Water	07/09/20
TW11D-20200709	2001444-05	Water	07/09/20
TW12D-20200709	2001444-06	Water	07/09/20
TW13D-20200709	2001444-07	Water	07/09/20
TW14D-20200709	2001444-08	Water	07/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB07-20200709 was identified as an equipment blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW10D-20200709	13C2-PFTeDA	14.5 (50-150)	PFTeDA	NA	-
TW11D-20200709	d3-MeFOSAA 13C2-PFUnA d5-EtFOSAA 13C2-PFDoA	40.0 (50-150) 43.6 (50-150) 42.9 (50-150) 27.5 (50-150)	MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW11D-20200709	13C2-PFTeDA	6.00 (50-150)	PFTeDA	X	P
TW12D-20200709	d3-MeFOSAA 13C2-PFUnA d5-EtFOSAA 13C2-PFDoA	44.9 (50-150) 42.9 (50-150) 41.2 (50-150) 24.1 (50-150)	MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW12D-20200709	13C2-PFTeDA	5.20 (50-150)	PFTeDA	X	P
TW13D-20200709	13C2-PFTeDA	10.8 (50-150)	PFTeDA	NA	-

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria with the following exceptions:

Sample	Compound	Ion Abundance Ratio (Limits)	Flag	A or P
TW13D-20200709	PFNA	26.223 (6.217-18.651)	J (all detects)	P

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to labeled compound %R, data were qualified for recommended exclusion in two samples.

Due to labeled compounds %R and ion abundance ratio, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001444

Sample	Compound	Flag	A or P	Reason
TW11D-20200709 TW12D-20200709	PFTeDA	X	P	Labeled compounds (%R)
TW13D-20200709	PFNA	J (all detects)	P	Target compound identification (ion abundance ratio)

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001444

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001444

No Sample Data Qualified in this SDG

LDC #: 48792E96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/14/20
SDG #: 2001444 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer:
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r² TV/CV ≤ 30
IV.	Continuing calibration/ISC	A / A	≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB07-20200709
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	SW	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	TW27S-20200709	2001444-02	Water	07/09/20
2	TW22S-20200709	2001444-03	Water	07/09/20
3	TW10D-20200709	2001444-04	Water	07/09/20
4	TW11D-20200709	2001444-05	Water	07/09/20
5	TW12D-20200709	2001444-06	Water	07/09/20
6	TW13D-20200709	2001444-07	Water	07/09/20
7	TW14D-20200709	2001444-08	Water	07/09/20
8				
9				
10				

Notes:

	BOG0090						

LDC #: 48792E96

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of $\geq$ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) $\leq$30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification $\leq$ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration $\leq$ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check $\leq$ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 48792E96

VALIDATION FINDINGS CHECKLIST

Reviewer: MK
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?		✓		
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF30NS		
R. 11Cl-PF30UdS		

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Reviewer: M
2nd Reviewer: A

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		3 (NB)	TDA	14.5 (50-150)	Jdets/P (N)
		4 (NB)	MFOS	40.0	(I)
			UDA	43.6	(K)
			EFOS	42.9	(J)
			DDA	27.5	(L, M, R)
			TDA	6.00	~~J-det/P~~ ~~J-det/P~~
		5 (NB)	MFOS	44.9	Jdets/P
			UDA	42.9	
			EFOS	41.2	
			DDA	24.1	
			TDA	5.20	~~J-det/P~~ ~~J-det/P~~
		6 (NB)	TDA	10.8	Jdets/P

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

M N N/A Was the signal to noise (S/N) ratio for all compounds within the validation criteria?
Y N N/A Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?
Y N N/A Were ion ratios within QC limits and between 50-150%?

#	Date	Sample ID	Associated Compound	Ion ratio (%D≤50) limit	Qualifications
		6	F	26.223 (6.217-8.651)	Jdets/A

LDC # 48792E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer: A

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/21/2020	SCN977	PFOA	1	0.0278	0.02	0.00040
			2	0.0469	0.04	0.0016
			3	0.0823	0.08	0.0064
			4	0.1593	0.16	0.0256
			5	0.3971	0.40	0.1600
			6	0.7486	0.80	0.6400
			7	3.7233	4.00	16.0000
			8	7.8135	8.00	64.0000
			9	18.9803	20.00	400.0000
			10	36.5156	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.01706	c	0.0565111
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.98243	-0.0017341	0.972216	-0.000115660
Std Err of Coef.				
Correlation Coefficient		0.999989		
Coefficient of Determination (r^2)		0.999978		0.999818

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/21/2020	SCN977	PFOS	1	0.0210	0.02	0.00040
			2	0.0340	0.04	0.0016
			3	0.1120	0.08	0.0064
			4	0.1911	0.16	0.0256
			5	0.5292	0.40	0.1600
			6	0.9517	0.80	0.6400
			7	5.0005	4.00	16.0000
			8	10.7860	8.00	64.0000
			9	25.6408	20.00	400.0000
			10	52.0437	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.00376	c	-0.0631930
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.287640	0.0003101	1.292200	0.0000147461
Std Err of Coef.				
Correlation Coefficient		0.999957		
Coefficient of Determination (r^2)		0.999913		0.99958

LDC # 48792E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/23/2020	SCN977	PFOA	1	0.0232	0.02	0.00040
			2	0.0463	0.04	0.0016
			3	0.0863	0.08	0.0064
			4	0.1615	0.16	0.0256
			5	0.3900	0.40	0.1600
			6	0.7723	0.80	0.6400
			7	3.8020	4.00	16.0000
			8	7.3944	8.00	64.0000
			9	19.1260	20.00	400.0000
			10	36.7968	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.02577	c	0.0499833
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.97078	-0.0012466	0.956964	-0.0000683589
Std Err of Coef.				
Correlation Coefficient		0.999962		
Coefficient of Determination (r^2)		0.999925		0.999795

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/23/2020	SCN977	PFOS	1	0.0175	0.02	0.00040
			2	0.0388	0.04	0.0016
			3	0.1035	0.08	0.0064
			4	0.2072	0.16	0.0256
			5	0.5466	0.40	0.1600
			6	0.8809	0.80	0.6400
			7	5.1093	4.00	16.0000
			8	9.5918	8.00	64.0000
			9	25.5339	20.00	400.0000
			10	60.0403	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.10878	c	0.0102665
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.089828	0.0102330	1.138060	0.0007079480
Std Err of Coef.				
Correlation Coefficient		0.999939		
Coefficient of Determination (r^2)		0.999877		0.999249

LDC # 48792E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/24/2020	SCN977	PFOA	1	0.0257	0.02	0.00040
			2	0.0357	0.04	0.0016
			3	0.0821	0.08	0.0064
			4	0.1614	0.16	0.0256
			5	0.4081	0.40	0.1600
			6	0.7089	0.80	0.6400
			7	3.6827	4.00	16.0000
			8	7.6180	8.00	64.0000
			9	19.7474	20.00	400.0000
			10	38.9385	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.04915	c	0.0306828
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.97842	-0.0000964	0.955014	0.0000457658
Std Err of Coef.				
Correlation Coefficient		0.999962		
Coefficient of Determination (r^2)		0.999925		0.999663

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/24/2020	SCN977	PFOS	1	0.0154	0.02	0.00040
			2	0.0500	0.04	0.0016
			3	0.0828	0.08	0.0064
			4	0.2236	0.16	0.0256
			5	0.4951	0.40	0.1600
			6	0.9308	0.80	0.6400
			7	4.7375	4.00	16.0000
			8	9.4045	8.00	64.0000
			9	27.8957	20.00	400.0000
			10	50.8200	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.24946	c	-0.0790602
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.386808	-0.0027533	1.278740	0.0000281280
Std Err of Coef.				
Correlation Coefficient		0.999343		
Coefficient of Determination (r^2)		0.998686		0.996689

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200721P1_38	7/21/2020	PFOA	(13C2-PFOA)	10.00	9.17	9.17	91.7	91.7
			PFOS	(13C8-PFOS)	10.00	9.15	9.16	91.5	91.6
2	200724P1_48	7/24/2020	PFOA	(13C2-PFOA)	10.00	9.37	9.35	93.7	93.5
			PFOS	(13C8-PFOS)	10.00	9.19	9.19	91.9	91.9
3			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
4			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
5			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					
6			PFOA	(13C2-PFOA)					
			PFOS	(13C8-PFOS)					

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0G0090-BS/D

Compound	SA (ug/L)		SSC (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400	0.0400	0.0381	0.0380	95.3	95.3	94.9	95.0	0.339	0.263
PFOS	0.0400	0.0400	0.0417	0.0357	104	104	89.2	89.3	15.6	15.5

LDC #: 48792E96

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (mL)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOS	5.300E+04	1.611E+02	12.5	15	curve	1	247.75	12.2	12.2	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS El Toro and Tustin PFAS

LDC Report Date: September 3, 2020

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 2001472

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TW23S-20200710	2001472-02	Water	07/10/20
TW24S-20200710	2001472-03	Water	07/10/20
TW15D-20200710	2001472-04	Water	07/10/20
TW16D-20200710	2001472-05	Water	07/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 2, 5, 6, and 9 and Groundwater and Surface Water Near Operable Unit 3, Former Marine Corps Air Station Tustin, Tustin, California, with Addendum #02 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (February 2020), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 (2019), and the DoD General Validation Guidelines (February 2018). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified and LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the methods.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were within 70-130% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

Retention time windows were established as required by the methods.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration and Instrument Sensitivity Check

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the instrument sensitivity check (ISC) were less than or equal to 30.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample 08-2020710 was identified as an equipment blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (Limits)	Affected Compound	Flag	A or P
TW24S-20200710	13C2-PFTeDA	36.1 (50-150)	PFTeDA	NA	-
TW15D-20200710	13C2-PFDoA	46.9 (50-150)	PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW15D-20200710	13C2-PFTeDA	6.90 (50-150)	PFTeDA	X	P
TW16D-20200710	d3-MeFOSAA 13C2-PFUnA d5-EtFOSAA 13C2-PFDoA	49.9 (50-150) 44.2 (50-150) 46.5 (50-150) 28.8 (50-150)	MeFOSAA PFUnA EtFOSAA PFDoA PFTrDA 11Cl-PF30UdS	NA	-
TW16D-20200710	13C2-PFTeDA	5.50 (50-150)	PFTeDA	X	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to labeled compounds %R, data were qualified for recommended exclusion in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 2001472

Sample	Compound	Flag	A or P	Reason
TW15D-20200710 TW16D-20200710	PFTeDA	X	P	Labeled compounds (%R)

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 2001472

No Sample Data Qualified in this SDG

MCAS El Toro and Tustin PFAS
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 2001472

No Sample Data Qualified in this SDG

LDC #: 48792F96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/30/20
SDG #: 2001472 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: M
2nd Reviewer: G

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M/QSM 5.3 Table B-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r TN/10/≤30
IV.	Continuing calibration/ISC	A/A	D≤30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB08-20200710
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
VI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TW23S-20200710	2001472-02	Water	07/10/20
2	TW24S-20200710	2001472-03	Water	07/10/20
3	TW15D-20200710	2001472-04	Water	07/10/20
4	TW16D-20200710	2001472-05	Water	07/10/20
5				
6				
7				
8				
9				
10				

Notes:

	BoG0090						

LDC #: 48792F9C

VALIDATION FINDINGS CHECKLIST

Reviewer: N
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Were cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
III. Initial calibration and Initial calibration verification				
Did the laboratory perform a 5-point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the coefficient of determination (r^2) criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were the retention time windows properly established?	✓			
Was an initial calibration verification (ICV) standard analyzed after each initial calibration for each instrument?	✓			
Were all ICV percent differences (%D) of the initial calibration verification ≤ 30%?	✓			
IV. Continuing calibration and Instrument sensitivity check				
Was a continuing calibration analyzed prior to sample analysis, after every 10 samples and at the end of the analytical sequence?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 30%?	✓			
Were all the retention times within the acceptance windows?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check ≤ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

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VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
Were retention times within 0.4 minutes of the associated calibration standard?	✓			
XI. Compound quantitation				
Did the laboratory reporting limits (i.e. DL, LOD, LOQ) meet the QAPP?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound retention times within 0.1 minutes of the associated labeled compound for compounds with a labeled analog?	✓			
Were compound quantitation and reporting limits adjusted to reflect all sample dilutions and dry weight factors applicable to Stage 4 validation?	✓			
XII. Target compound identification				
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
Were ion ratios between 50-150%?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of Data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFBS		
B. PFHxA		
C. PFHpA		
D. PFHxS		
E. PFOA		
F. PFNA		
G. PFOS		
H. PFDA		
I. MeFOSAA		
J. EtFOSAA		
K. PFUnA		
L. PFDoA		
M. PFTrDA		
N. PFTeDA		
O. HFPO-DA		
P. ADONA		
Q. 9Cl-PF30NS		
R. 11Cl-PF30UdS		

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VALIDATION FINDINGS WORKSHEET
Labeled Compounds

Page: 1 of 1
Reviewer: X
2nd Reviewer: [illegible]

METHOD: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were all labeled compound recoveries within the QC criteria?

#	Date	Lab ID/Reference	Labeled Compound	% Recovery (Limit)	Qualifications
		2 (ND)	TDA	36.1 (50-150)	Jdyk/P (N)
		3	DDA	46.9	
			TDA	6.90	J/X/P
		4	MFOS	49.9	(I)
			UDA	44.2	(K)
			EFOS	46.5	(J)
			DDA	28.8	(L, M, R)
			TDA	5.50	J/X/P (N)

BS = 13C3-PFBS HXS = 13C3-PFHxS OS = 13C8-PFOS TDA = 13C2-PFTeDA EFOS = d5-EtFOSAA
HXA = 13C2-PFHxA NA = 13C5-PFNA DA = 13C2-PFDA DDA = 13C2-PFDoA
HPA = 13C4-PFHpA OA = 13C2-PFOA UDA = 13C2-PFUnA MFOS = d3-MeFOSAA

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VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/21/2020	SCN977	PFOA	1	0.0278	0.02	0.00040
			2	0.0469	0.04	0.0016
			3	0.0823	0.08	0.0064
			4	0.1593	0.16	0.0256
			5	0.3971	0.40	0.1600
			6	0.7486	0.80	0.6400
			7	3.7233	4.00	16.0000
			8	7.8135	8.00	64.0000
			9	18.9803	20.00	400.0000
			10	36.5156	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.01706	c	0.0565111
Std Err of Y Est				.
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.98243	-0.0017341	0.972216	-0.000115660
Std Err of Coef.				
Correlation Coefficient		0.999989		
Coefficient of Determination (r^2)		0.999978		0.999818

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VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/21/2020	SCN977	PFOS	1	0.0210	0.02	0.00040
			2	0.0340	0.04	0.0016
			3	0.1120	0.08	0.0064
			4	0.1911	0.16	0.0256
			5	0.5292	0.40	0.1600
			6	0.9517	0.80	0.6400
			7	5.0005	4.00	16.0000
			8	10.7860	8.00	64.0000
			9	25.6408	20.00	400.0000
			10	52.0437	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.00376	c	-0.0631930
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.287640	0.0003101	1.292200	0.0000147461
Std Err of Coef.				
Correlation Coefficient		0.999957		
Coefficient of Determination (r^2)		0.999913		0.99958

LDC # 48792F96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/23/2020	SCN977	PFOA	1	0.0232	0.02	0.00040
			2	0.0463	0.04	0.0016
			3	0.0863	0.08	0.0064
			4	0.1615	0.16	0.0256
			5	0.3900	0.40	0.1600
			6	0.7723	0.80	0.6400
			7	3.8020	4.00	16.0000
			8	7.3944	8.00	64.0000
			9	19.1260	20.00	400.0000
			10	36.7968	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	-0.02577	c	0.0499833
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.97078	-0.0012466	0.956964	-0.0000683589
Std Err of Coef.				
Correlation Coefficient		0.999962		
Coefficient of Determination (r^2)		0.999925		0.999795

LDC #: 48792F96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/23/2020	SCN977	PFOS	1	0.0175	0.02	0.00040
			2	0.0388	0.04	0.0016
			3	0.1035	0.08	0.0064
			4	0.2072	0.16	0.0256
			5	0.5466	0.40	0.1600
			6	0.8809	0.80	0.6400
			7	5.1093	4.00	16.0000
			8	9.5918	8.00	64.0000
			9	25.5339	20.00	400.0000
			10	60.0403	40.00	1600.0000

Regression Output	Calculated		Reported	
Constant	c	0.10878	c	0.0102665
Std Err of Y Est				
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.089828	0.0102330	1.138060	0.0007079480
Std Err of Coef.				
Correlation Coefficient		0.999939		
Coefficient of Determination (r^2)		0.999877		0.999249

LDC #: 48792F9b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (aveRRF - RRF)/aveRRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
aveRRF = initial calib average RRF
RRF = continuing calib RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Conc	Reported Conc	Recalculated Conc	Reported %R	Recalculated %R
1	200721P1_38	7/21/2020	PFOA (13C2-PFOA)	10.00	9.17	9.17	91.7	91.7
			PFOS (13C8-PFOS)	10.00	9.15	9.16	91.5	91.6
2			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
3			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
4			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
5			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					
6			PFOA (13C2-PFOA)					
			PFOS (13C8-PFOS)					

LDC #: 4792F96

VALIDATION FINDINGS WORKSHEET
LCS Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: B0G0090-BS/D

Compound	SA (ug/L)		SSC (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.0400	0.0400	0.0381	0.0380	95.3	95.3	94.9	95.0	0.339	0.263
PFOS	0.0400	0.0400	0.0417	0.0357	104	104	89.2	89.3	15.6	15.5

LDC #: 48792F96

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

Reviewer: SC
2nd Reviewer:

Method: LC/MS/MS and Isotope Dilution Compliant with Table B-15 of DoD QSM 5.3

Compound results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)\,(Cis)\,(Vt)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where:

Ax = Area or height of the peak for the compound to be measured
Ais = Area or height of the peak for the internal standard
Cis = Concentration of the internal standard
DF = Dilution factor
Vt = Volume of extract in milliters (mL)
RRF = Average relative response factor
Vo = Volume of sample in liters (L)

Sample #	Compound	Ax	Ais	Cis	DF	RRF	Vt (mL)	Vo (mL)	Calculated Concentration (ug/L)	Reported Concentration (ug/L)	% Diff
1	PFOA	3.013E+05	1.304E+03	12.5	10	curve	1	241.84	18.2	18.2	0

INSTALLATION_ID	SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC	SDG
TUSTIN_MCAS	SITE 00006	I006MW06S	Well	6082976.03	2201056.72	DUP01-20200624_	Ground water	24-Jun-20	Perfluoroalkyl Compounds	2001357
TUSTIN_MCAS	SITE 00006	I006MW06S	Well	6082976.03	2201056.72	DUP01-20200624_	Ground water	24-Jun-20	Perfluoroalkyl Compounds	2001357
TUSTIN_MCAS	SITE 00006	I006MW06S	Well	6082976.03	2201056.72	DUP01-20200624_	Ground water	24-Jun-20	Perfluoroalkyl Compounds	2001357
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