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NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Report, SDG 1901922

Marine Corps Air Station Yuma
Yuma, Arizona

November 2019

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

July 16, 2019

Vista Work Order No. 1901922

Ms. Lisa Bienkowski
Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614

Dear Ms. Bienkowski,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on July 03, 2019 under your Project Name '4663.3803'.

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. 1901922
Case Narrative

Sample Condition on Receipt:

Two aqueous 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 Method

Sample "CAOA-B02-GW" contained particulate and were centrifuged prior to extraction.

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). 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 method 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 outside the acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
B9G0062-BLK1	B9G0062-BLK1	PFAS Isotope Dilution Method	13C2-PFTeDA	H	46.6
B9G0062-BSD1	B9G0062-BSD1	PFAS Isotope Dilution Method	13C2-PFDoA	H	45.8
B9G0062-BSD1	B9G0062-BSD1	PFAS Isotope Dilution Method	13C2-PFTeDA	H	41.4

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1901922-01	FRB-07022019	02-Jul-19 12:30	03-Jul-19 09:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1901922-02	CAOA-B02-GW	02-Jul-19 13:15	03-Jul-19 09:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL

Vista Project: 1901922

ANALYTICAL RESULTS

Sample ID: Method Blank — **PFAS Isotope Dilution Method**

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Matrix: Aqueous

Laboratory Data

Lab Sample: B9G0062-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	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFHxA	307-24-4	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFHpA	375-85-9	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFHxS	355-46-4	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFOA	335-67-1	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFNA	375-95-1	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFOS	1763-23-1	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFDA	335-76-2	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
MeFOSAA	2355-31-9	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
EtFOSAA	2991-50-6	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFUnA	2058-94-8	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFDoA	307-55-1	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFTrDA	72629-94-8	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
PFTeDA	376-06-7	ND	0.00274	0.00400	0.00800	U	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	103	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFHxA	IS	93.3	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C4-PFHpA	IS	86.3	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C3-PFHxS	IS	95.6	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFOA	IS	78.8	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C5-PFNA	IS	77.7	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C8-PFOS	IS	73.5	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFDA	IS	70.1	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
d3-MeFOSAA	IS	63.6	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
d5-EtFOSAA	IS	65.1	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFUnA	IS	71.1	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFDoA	IS	59.6	50 - 150		B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	1
13C2-PFTeDA	IS	46.6	50 - 150	H	B9G0062	10-Jul-19	0.125 L	12-Jul-19 03:38	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 Method**

Name:	Tetra Tech EC, Inc.	Lab Sample:	B9G0062-BS1/B9G0062-BSD1		
Project:	4663.3803	QC Batch:	B9G0062	Date Extracted:	10-Jul-19
Matrix:	Aqueous	Samp Size:	0.125/0.125 L	Column:	BEH C18

Analyte	CAS Number	LCS (ug/L)	LCS Spike Amt	LCS % Rec	LCS Quals	LCSD (ug/L)	LCSD Spike Amt	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	0.0806	0.0800	101		0.0817	0.0800	102	1.31		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFHxA	307-24-4	0.0850	0.0800	106		0.0890	0.0800	111	4.67		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFHpA	375-85-9	0.0930	0.0800	116		0.0834	0.0800	104	10.9		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFHxS	355-46-4	0.0995	0.0800	124		0.0894	0.0800	112	10.7		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFOA	335-67-1	0.0870	0.0800	109		0.0846	0.0800	106	2.89		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFNA	375-95-1	0.0840	0.0800	105		0.0831	0.0800	104	1.12		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFOS	1763-23-1	0.0880	0.0800	110		0.0817	0.0800	102	7.33		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFDA	335-76-2	0.0844	0.0800	106		0.0808	0.0800	101	4.37		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
MeFOSAA	2355-31-9	0.103	0.0800	129		0.0845	0.0800	106	19.8		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
EtFOSAA	2991-50-6	0.0901	0.0800	113		0.0910	0.0800	114	1.06		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFUnA	2058-94-8	0.0827	0.0800	103		0.0860	0.0800	108	4.01		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFDoA	307-55-1	0.0925	0.0800	116		0.0862	0.0800	108	7.04		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFTrDA	72629-94-8	0.0869	0.0800	109		0.0817	0.0800	102	6.11		60-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1
PFTeDA	376-06-7	0.0906	0.0800	113		0.0883	0.0800	110	2.54		70-130	30	12-Jul-19 03:16	1	12-Jul-19 03:27	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	95.8		100		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFHxA	IS	97.5		100		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C4-PFHpA	IS	85.1		97.7		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C3-PFHxS	IS	82.4		84.2		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFOA	IS	82.8		80.0		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C5-PFNA	IS	78.9		71.0		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C8-PFOS	IS	67.8		72.8		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFDA	IS	70.9		67.0		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
d3-MeFOSAA	IS	60.3		68.3		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
d5-EtFOSAA	IS	69.6		59.3		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFUnA	IS	63.0		59.0		50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFDoA	IS	52.5		45.8	H	50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1
13C2-PFTeDA	IS	52.0		41.4	H	50-150	12-Jul-19 03:16	1	12-Jul-19 03:27	1

Sample ID: FRB-07022019 **PFAS Isotope Dilution Method**

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: Yuma, AZ
Matrix: Aqueous
Date Collected: 02-Jul-19 12:30

Laboratory Data

Lab Sample: 1901922-01
Date Received: 03-Jul-19 09:10
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFHxA	307-24-4	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFHpA	375-85-9	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFHxS	355-46-4	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFOA	335-67-1	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFNA	375-95-1	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFOS	1763-23-1	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFDA	335-76-2	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
MeFOSAA	2355-31-9	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
EtFOSAA	2991-50-6	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFUnA	2058-94-8	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFDoA	307-55-1	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFTrDA	72629-94-8	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
PFTeDA	376-06-7	ND	0.00320	0.00467	0.00934	U	B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.0	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFHxA	IS	90.0	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C4-PFHpA	IS	88.0	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C3-PFHxS	IS	89.2	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFOA	IS	93.3	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C5-PFNA	IS	88.1	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C8-PFOS	IS	87.9	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFDA	IS	76.8	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
d3-MeFOSAA	IS	66.5	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
d5-EtFOSAA	IS	72.8	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFUnA	IS	85.0	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFDoA	IS	75.1	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	1
13C2-PFTeDA	IS	83.9	50 - 150		B9G0062	10-Jul-19	0.107 L	12-Jul-19 03:48	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: CAOA-B02-GW

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: Yuma, AZ
Matrix: Aqueous
Date Collected: 02-Jul-19 13:15

Laboratory Data

Lab Sample: 1901922-02
Date Received: 03-Jul-19 09:10
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0233	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFHxA	307-24-4	0.0807	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFHpA	375-85-9	0.0191	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFHxS	355-46-4	0.259	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFOA	335-67-1	0.0776	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFNA	375-95-1	0.0712	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFOS	1763-23-1	0.168	0.00284	0.00413	0.00830		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFDA	335-76-2	0.00366	0.00284	0.00413	0.00830	J	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
MeFOSAA	2355-31-9	ND	0.00284	0.00413	0.00830	U	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
EtFOSAA	2991-50-6	ND	0.00284	0.00413	0.00830	U	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFUnA	2058-94-8	0.00490	0.00284	0.00413	0.00830	J	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFDoA	307-55-1	ND	0.00284	0.00413	0.00830	U	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFTrDA	72629-94-8	ND	0.00284	0.00413	0.00830	U	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
PFTeDA	376-06-7	ND	0.00284	0.00413	0.00830	U	B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	94.8	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFHxA	IS	100	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C4-PFHpA	IS	96.5	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C3-PFHxS	IS	86.2	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFOA	IS	102	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C5-PFNA	IS	92.7	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C8-PFOS	IS	103	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFDA	IS	86.3	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
d3-MeFOSAA	IS	59.1	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
d5-EtFOSAA	IS	80.6	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFUnA	IS	80.4	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFDoA	IS	65.9	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	1
13C2-PFTeDA	IS	75.5	50 - 150		B9G0062	10-Jul-19	0.121 L	12-Jul-19 03:59	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
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
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
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	E87777-21
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
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 Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1901922 Temp: 0.7 °C
Storage ID: R-13, WR-2 Storage Secured: Yes ☑ No ☐

Project ID: 4663.3803 PO#: 1164824 Sampler: McKinstry (name)

TAT (check one): Standard: ☐ 21 days Rush (surcharge may apply) ☐ 14 days ☐ 7 days Specify: 10 BD

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Accts Payable	Tetra Tech EC, Inc.	1230 Columbia St. Suite 750	San Diego	CA	619-234-8696	

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Jeremy McKinstry	7/2/19	1620	FEDEX	7/2/19	1620
Fed Ex	07/03/19	0910	Ashley Mason	07/03/19	0910

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

ATTN: SAMPLE RECEIVING

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	Mod. EPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	537 List: 14	Full List of 26	Other: Please List Below	EPA Method 537(DW only): PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
FRB-07022019	7/02/19	1230	YUMA, AZ	2	P	AQ			X						
CAOA-B02-GW	7/02/19	1315	Yuma, AZ	2	P	AQ			X						
					P										
					P										
					P										
					P										

NEA 7/2/19

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: Lisa Bienkowski
Company: Tetra Tech EC, Inc.
Address: 17885 Von Karman Avenue, Suite 500
City: Irvine State: CA Zip: 92614
Phone: 949-809-5028 Fax:
Email: lisa.bienkowski@tetratech.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1901922 TAT 14 days

Samples Arrival:	**Date/Time** 07/03/19 0910	**Initials:** ajm	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 07/03/19 1515	**Initials:** ajm	**Location:** R-13 / WR-2 **Shelf/Rack:** A-1 / E-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 0.7 (uncorrected)	**Probe used:** Y / (N)	**Thermometer ID:** IR-3
Temp °C: 0.7 (corrected)		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill → Trk # 7882 5501 7542			✓
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?			✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$ Trizma (None) Other				Yes	No	(NA)
Shipping Container	(Vista)	Client	(Retain)	Return	Dispose	

Comments:

ORIGIN ID:YUMA (619) 200-6897
TETRA TECH
JEREMY MCKINSTRY
1230 COLUMBIA ST STE 750
106-4663.3803.1400.0100
SAN DIEGO, CA 92101
UNITED STATES US
SHIP DATE: 02JUL19
ACTWGT: 45.70 LB
CAD: 006995179/SSFE2002
DIMS: 24x13x14 IN
BILL THIRD PARTY
TO ATTN SAMPLE RECVING
VISTA ANALYTICAL LAB
1104 WINDFIELD WAY
EL DORADO HILLS CA 95762
(916) 673-1520
INV:
PO:
REF:
DEPT:
FedEx
Express
TRK# 0201 7882 5501 7542
WED - 03 JUL 10:30A
PRIORITY OVERNIGHT
WD MHRA
95762
CA-US SMF
RT 757
ST 1
1
10:30
A
7542
07.03

ORIGIN ID:YUMA (619) 200-6897
TETRA TECH
JEREMY MCKINSTRY
1230 COLUMBIA ST STE 750
106-4663.3803.1400.0100
SAN DIEGO, CA 92101
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TO ATTN SAMPLE RECVING
VISTA ANALYTICAL LAB
1104 WINDFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520

INV:
PO:
REF:
DEPT:

FedEx Express

TRK# 0201 7882 5501 7542

WED - 03 JUL 10:30A
PRIORITY OVERNIGHT

WD MHRA

95762
CA-US SMF

RT 757 1
10:30 A
7542
07.03
ST 1

EXTRACTION INFORMATION

Process Sheet

Workorder: 1901922

Prep Expiration: 2019-07-16
Client: Tetra Tech EC, Inc.

Workorder Due: 17-Jul-19 00:00
TAT: 14

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

Prep Batch: B9G0062

Prep Data Entered: MP 07/11/19
Date and Initials

Version: 537 (14 Analyte) - DoD Limits
DoD: DoD QSM 5.1

Initial Sequence: 59G0025

LabSampID	A/B	Prep Rec	Spike Rec	ClientSampleID	Comments	Location	Container
1901922-01	"A"	☑	☑	FRB-07022019		R-13 A-1	HDPE Bottle, 125 mL
1901922-02	"	☑	☑	CAOA-B02-GW		R-13 A-1	HDPE Bottle, 125 mL

WO Comments: **Internal COC**

Pre-Prep Check Out: DNL 07/10/19
Pre-Prep Check In: N/A
Prep Check Out: N/A
Prep Check In: N/A
Prep Reconciled Initals/Date: DNL 07/10/19
Spike Reconciled Initals/Date: HR 07/10/19
VialBoxID: Future

Matrix: Aqueous

Method: 537M PFAS DOD (LOQ as mRL)

PREPARATION BENCH SHEET

B9G0062

Chemist: ONL

Prep Date: 07/10/19

Prep Time: 06:42

Prepared using: ☐ Sonication Shaker ☒ SPE Extraction ☒ Centrifuge ID: C3/C5

Date/Initals: ONL 07/10/19 | BalanceID: HRMS-9

Cen	VISTA Sample ID	pH Before	pH After	Chlorine (Cl)	Drops HCl Added	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE	ENVI-Carb	RS CHEM/WIT DATE
☒	B9G0062-BLK1	5	2	0	1	N/A	N/A	(0.125)	ONL HR 07/10/19	OPV 07/10/19	OPV 07/10/19	OPV ONL 07/10/19
☒	B9G0062-BS1	5	2	0	1	↓	↓	(0.125)	↓	↓	↓	↓
☒	B9G0062-BSD1	5	2	0	1	↓	↓	(0.125)	↓	↓	↓	↓
☒	1901920-02 (3)	7	2	0	3	160.44	27.26	0.13318	↓	↓	↓	↓
☐	1901920-03	6	2	0	1	141.39	27.10	0.11429	↓	↓	↓	↓
☐	1901920-04	5	2	0	1	142.55	26.79	0.11576	↓	↓	↓	↓
☒	1901920-05	7	2*	0	2	148.75	26.71	0.12204	↓	↓	↓	↓
☒	1901920-06	7	2	0	1	153.09	26.70	0.12639	↓	↓	↓	↓
☒	1901920-11	6	2	0	3	148.84	26.84	0.12200	↓	↓	↓	↓
☐	1901920-12	5	2	0	1	138.69	27.14	0.11155	↓	↓	↓	↓
☐	1901920-14	5	2	0	1	143.19	26.76	0.11643	↓	↓	↓	↓
☒	1901920-16	7	2	0	3	156.13	26.73	0.12940	↓	↓	↓	↓
☒	1901920-17 (4)(6)(3)	6	2	0	3	164.60	26.92	0.13768	↓	↓	↓	↓
☐	1901920-20	5	2	0	1	143.24	26.80	0.11644	↓	↓	↓	↓
☐	1901922-01	5	2	0	1	133.70	26.61	0.10709	↓	↓	↓	↓

IS: 19E2201, 10mL, (V4)

IS SUP: N/A

NS: 19E2204, 10mL, (V3)

NS SUP: N/A

RS: 19E2202, 10µL (V4)

SPE Chem: Strata-X-AW 33µm, 200mg/6mL

SPE Lot#: 518-006880

ENVI-Carb Lot#: 1115550

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s): 1 mL

Notes: * OPV 07/10/19

(4) OPV 07/10/19

(6) OPV 07/10/19

(3) OPV 07/10/19

Comments: Assume 1 g = 1 mL

Cen = Centrifuged

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 (LOQ as mRL)

PREPARATION BENCH SHEET

B9G0062

Chemist: ONL

Prep Date: 07/10/19

Prep Time: 06:42

Prepared using: ☐ Sonication Shaker ☒ SPE Extraction ☑ Centrifuge ID: C3/C5

Date/Initals: ONL 07/10/19 | BalanceID: HRMS-9

Cen	VISTA Sample ID	pH Before	pH After	Chlorine (Cl)	Drops HCl Added	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE	ENVI-Carb	RS CHEM/WIT DATE
☒	1901922-02	6	2	0	2	147.37	26.87	0.12050	ONL HR 07/10/19	GPV 07/10/19	GPV 07/10/19	GPV ONL 07/10/19

IS: 19E2201, 10uL (V4)

IS SUP: N/A

NS: 19E2204, 10uL (V3)

NS SUP: N/A

RS: 19E2202, 10uL (V4)

SPE Chem: Strata-X-AW 33µm 200mg/6mL

SPE Lot#: 518-006880

ENVI-Carb Lot#: 111555 01

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s) 1 mL

Notes:

Comments: Assume 1 g = 1 mL
Cen = Centrifuged

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 (LOQ as mRL)

Vista Internal Chain-of-Custody

B9G0062

Vista Analytical Laboratory

	Location		L2	R12	L2	R12	L4				
	Reason		R4	R9	R6	R9	R8				
	Initials		ONL	ONL	HR	OPV	CLH				
	Date/Time	07/10/19	ONL 05:42	07/10/19 15:14	07/11/19 06:20	07/11/19 13:57	07/11/19 1649				
Initial Storage	LabNumber	Cont									
R-13 A-1	1901920-02	A	O	E	E	E	E				
R-13 A-1	1901920-03	A	↓	↓	↓	↓	↓				
R-13 A-1	1901920-04	A									
R-13 A-1	1901920-05	A									
R-13 A-1	1901920-06	A									
R-13 A-1	1901920-11	A									
R-13 A-1	1901920-12	A									
R-13 A-1	1901920-14	A									
R-13 A-1	1901920-16	A									
R-13 A-1	1901920-17	A									
R-13 A-1	1901920-20	A									
R-13 A-1	1901922-01	A									
R-13 A-1	1901922-02	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

Batch: B9G0062

Matrix: Aqueous

LabNumber	WetWeight (Initial)	% Solids (Extraction Solids)	DryWeight	Final	Extracted	Ext By	Spike	SpikeAmount	ClientMatrix	Analysis
1901920-02	0.13318	NA	NA	1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-03	0.11429			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-04	0.11576			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-05	0.12204			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-06	0.12639			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-11	0.122			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-12	0.11155			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-14	0.11643			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-16	0.1294			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-17	0.13768			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901920-20	0.11644			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901922-01	0.10709			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
1901922-02	0.1205			1000	10-Jul-19 06:42	ONL			Aqueous	537M PFAS DOD (LOQ as
B9G0062-BLK1	0.125			1000	10-Jul-19 06:42	ONL				QC
B9G0062-BS1	0.125			1000	10-Jul-19 06:42	ONL	19E2204	10		QC
B9G0062-BSD1	0.125			1000	10-Jul-19 06:42	ONL	19E2204	10		QC

All bolded data on report verified against written benchsheet by (initial/date) Ug 07/11/19

Printed: 7/11/2019 8:56:44AM
Page 1 of 1

Sample Data – PFAS Isotope Dilution Method

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, 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 > 79.7		6.10e2	0.125		2.46						
2	7	PFHxA	313.0 > 269.0		2.86e3	0.125		2.97						
3	11	PFHpA	363.0 > 318.9		3.26e3	0.125		3.59						
4	13	L-PFHxS	398.9 > 79.6		1.39e3	0.125		3.74						
5	80	Total PFHxS	398.9 > 79.6	0.00e0	1.39e3	0.125		3.83		0.000				
6	49	13C3-PFBS	302.0 > 98.8	6.10e2	5.72e2	0.125	1.035	2.46	2.46	13.3	103.0347	103.0		
7	52	13C2-PFHxA	315.0 > 270.0	2.86e3	9.67e3	0.125	0.792	2.96	2.97	3.70	37.3272	93.3		
8	53	13C4-PFHpA	367.2 > 321.8	3.26e3	9.67e3	0.125	0.391	3.58	3.59	4.22	86.2635	86.3		
9	54	13C3-PFHxS	401.8 > 79.9	1.39e3	5.72e2	0.125	2.547	3.74	3.74	30.4	95.5685	95.6		
10	54	13C3-PFHxS	401.8 > 79.9	1.39e3	5.72e2	0.125	2.547	3.74	3.74	30.4	95.5685	95.6		
11	-1													
12	16	L-PFOA	412.8 > 368.9		6.46e3	0.125		4.11						
13	81	Total PFOA	412.8 > 368.9	0.00e0	6.46e3	0.125		4.21		0.000				
14	21	PFNA	463.0 > 418.8	8.36e0	6.38e3	0.125		4.56	4.55	0.0164			24.507	YES
15	23	L-PFOS	498.9 > 79.9		1.08e3	0.125		4.64						
16	82	Total PFOS	498.9 > 79.9	0.00e0	1.08e3	0.125		4.74		0.000				
17	58	13C2-PFOA	414.9 > 369.7	6.46e3	1.45e4	0.125	0.564	4.11	4.11	5.56	78.7847	78.8		
18	58	13C2-PFOA	414.9 > 369.7	6.46e3	1.45e4	0.125	0.564	4.11	4.11	5.56	78.7847	78.8		
19	56	13C5-PFNA	468.2 > 422.9	6.38e3	8.35e3	0.125	0.983	4.56	4.56	9.55	77.7289	77.7		
20	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.38e3	0.125	1.060	4.64	4.64	9.73	73.4587	73.5		
21	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.38e3	0.125	1.060	4.64	4.64	9.73	73.4587	73.5		
22	-1													
23	26	PFDA	513 > 468.8		4.77e3	0.125		4.94						
24	29	L-MeFOSAA	570 > 419		1.01e3	0.125		5.08						
25	83	Total N-MeFOSAA	570. > 419	0.00e0	1.01e3	0.125		5.19		0.000				
26	33	PFUdA	563.0 > 518.9		7.52e3	0.125		5.27						
27	37	PFDoA	612.9 > 569.0		7.52e3	0.125		5.55						
28	60	13C2-PFDA	515.1 > 469.9	4.77e3	1.03e4	0.125	0.662	4.94	4.94	5.80	70.0682	70.1		
29	62	d3-N-MeFOSAA	573.3 > 419	1.01e3	1.23e4	0.125	0.129	5.09	5.08	1.03	63.5568	63.6		
30	62	d3-N-MeFOSAA	573.3 > 419	1.01e3	1.23e4	0.125	0.129	5.09	5.08	1.03	63.5568	63.6		
31	63	13C2-PFUdA	565 > 519.8	7.52e3	1.23e4	0.125	0.857	5.26	5.27	7.62	71.1167	71.1		
32	65	13C2-PFDoA	614.7 > 569.7	7.52e3	1.03e4	0.125	1.229	5.55	5.55	9.15	59.5502	59.6		
33	-1													
34	31	L-EtFOSAA	584.1 > 419		1.18e3	0.125		5.25						
35	84	Total N-EtFOSAA	584.1 > 419	0.00e0	1.18e3	0.125		5.33		0.000				
36	39	PFTrDA	662.9 > 618.9		7.52e3	0.125		5.80						

FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	41	PFTeDA	713.0 > 669.0		2.94e3	0.125		6.03						
38	85	TDCA	498.3>106.9			0.125		5.45						
39	64	d5-N-EtFOSAA	589.3 > 419	1.18e3	1.23e4	0.125	0.147	5.24	5.25	1.20	65.1203	65.1		
40	64	d5-N-EtFOSAA	589.3 > 419	1.18e3	1.23e4	0.125	0.147	5.24	5.25	1.20	65.1203	65.1		
41	65	13C2-PFDoA	614.7 > 569.7	7.52e3	1.03e4	0.125	1.229	5.55	5.55	9.15	59.5502	59.6		
42	67	13C2-PFTeDA	715.1 > 669.7	2.94e3	1.23e4	0.125	0.511	6.02	6.03	2.98	46.6375	46.6		
43	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.38e3	0.125	1.060	4.64	4.64	9.73	73.4587	73.5		
44	-1													
45	73	13C5-PFHxA	318.0 > 272.9	9.67e3	9.67e3	0.125	1.000	2.96	2.97	12.5	100.0000	100.0		
46	75	13C8-PFOA	420.9 > 376.0	1.45e4	1.45e4	0.125	1.000	4.11	4.11	12.5	100.0000	100.0		
47	74	18O2-PFHxS	403.0 > 102.6	5.72e2	5.72e2	0.125	1.000	3.74	3.74	12.5	100.0000	100.0		
48	76	13C9-PFNA	472.2 > 426.9	8.35e3	8.35e3	0.125	1.000	4.55	4.56	12.5	100.0000	100.0		
49	77	13C4-PFOS	503 > 79.9	1.38e3	1.38e3	0.125	1.000	4.64	4.64	12.5	100.0000	100.0		
50	78	13C6-PFDA	519.1 > 473.7	1.03e4	1.03e4	0.125	1.000	4.93	4.94	12.5	100.0000	100.0		
51	79	13C7-PFUdA	570.1 > 524.8	1.23e4	1.23e4	0.125	1.000	5.26	5.26	12.5	100.0000	100.0		

FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

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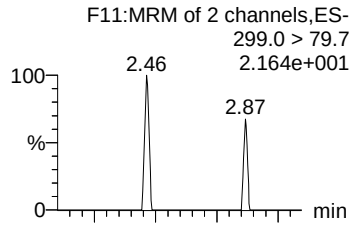
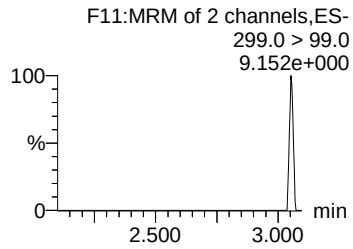
Calibration: Z:\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

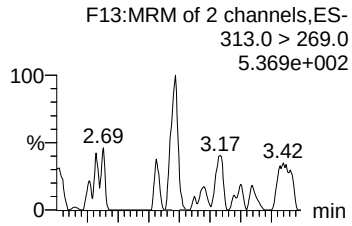
Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

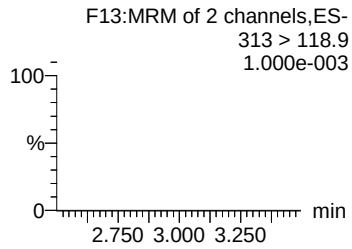
PFBS



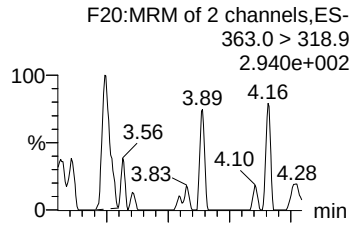


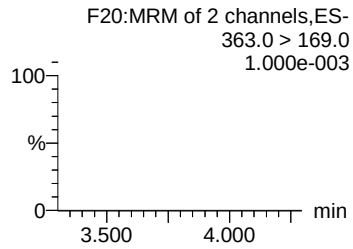
PFHxA





PFHpA





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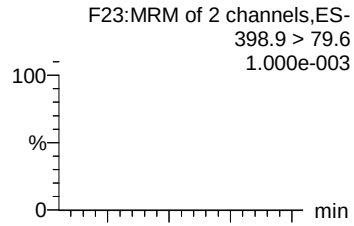

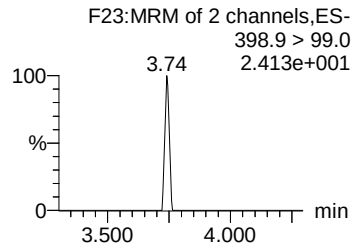

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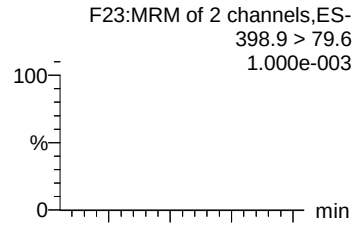

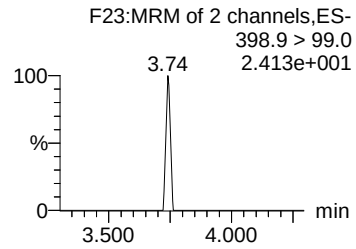

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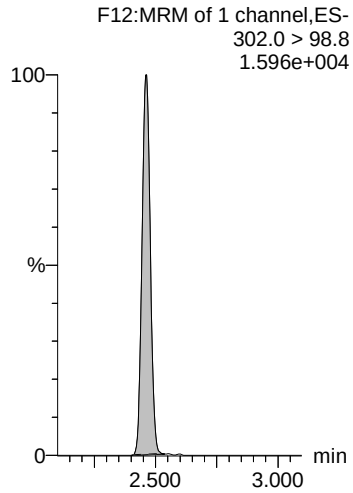

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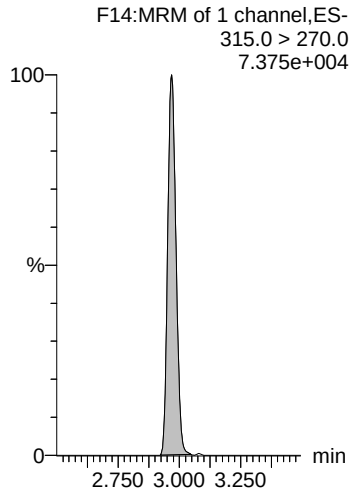

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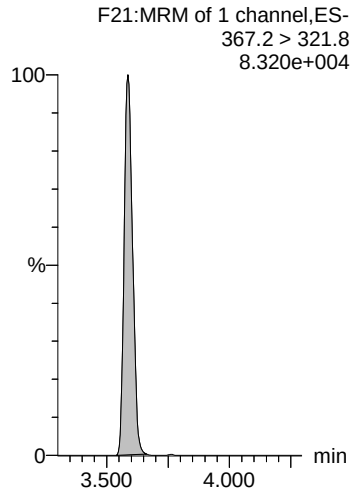

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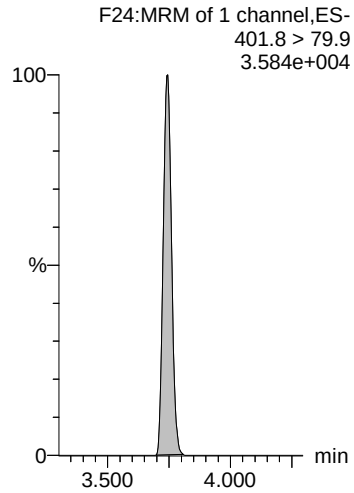

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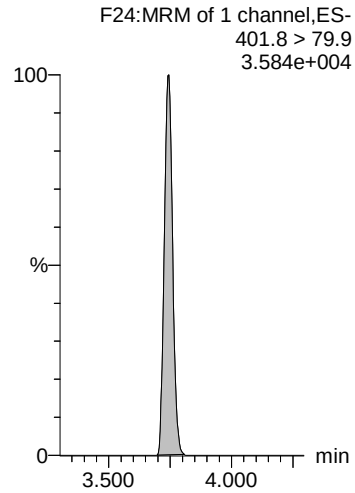


FBR 7/15/2019

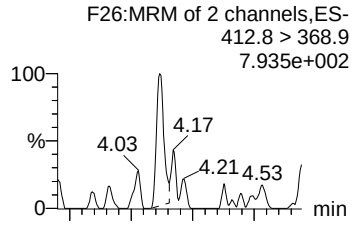
Review: AMR 7/16/2019

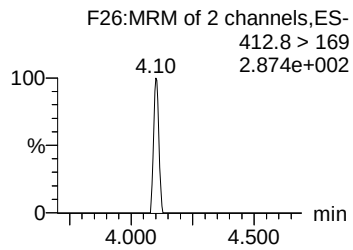
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

L-PFOA





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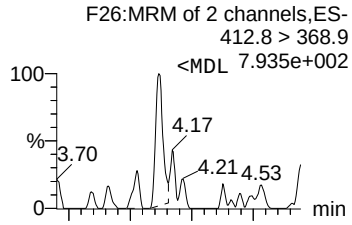

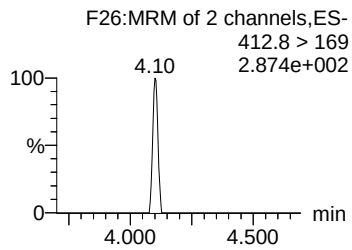

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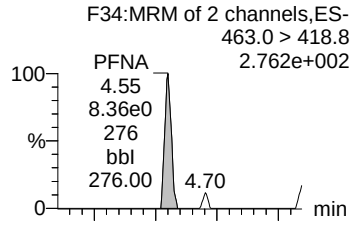
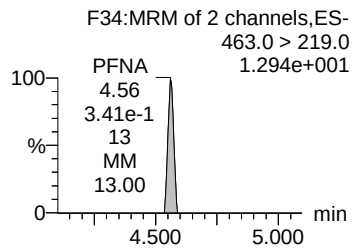
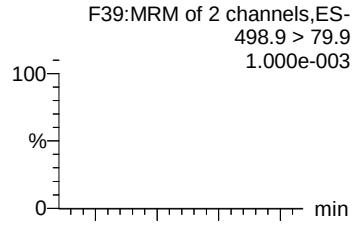
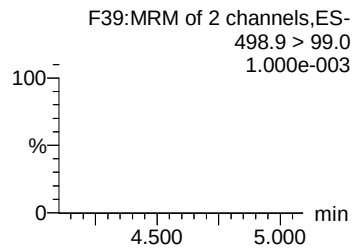


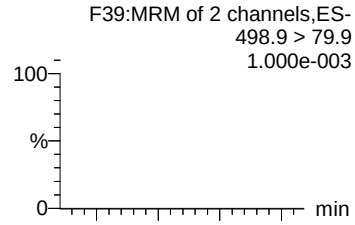


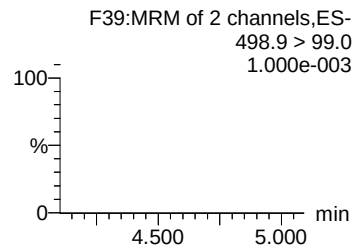
L-PFOS





Total PFOS





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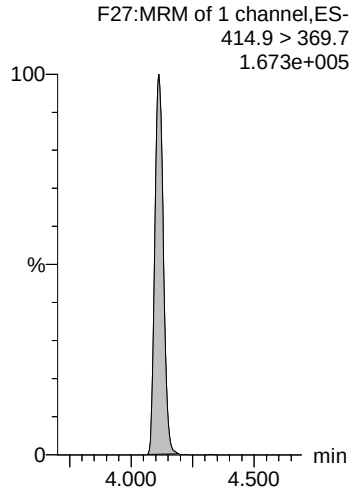

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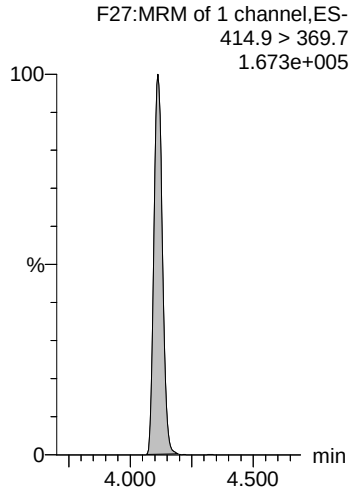

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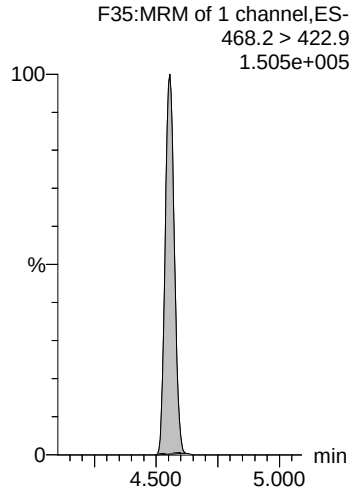

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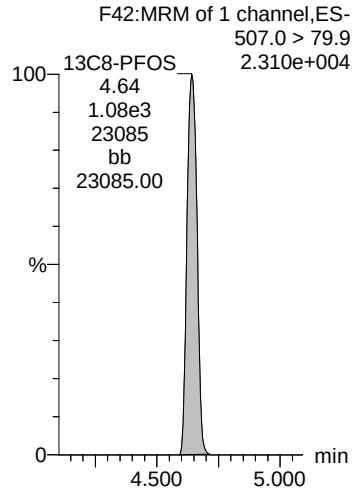

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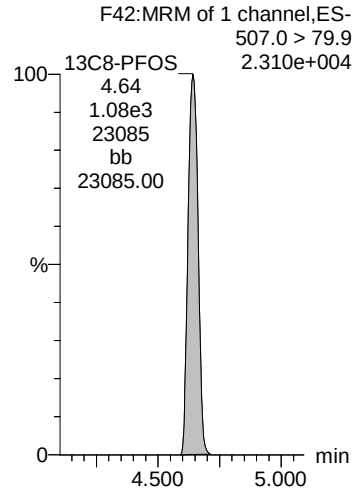

FBR 7/15/2019

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

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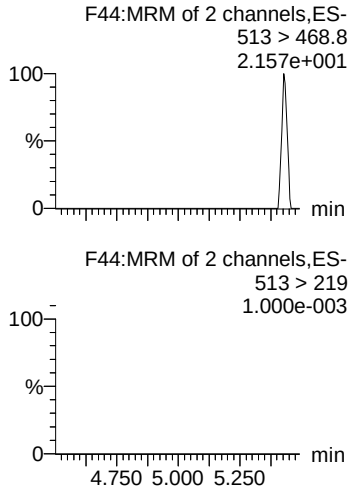
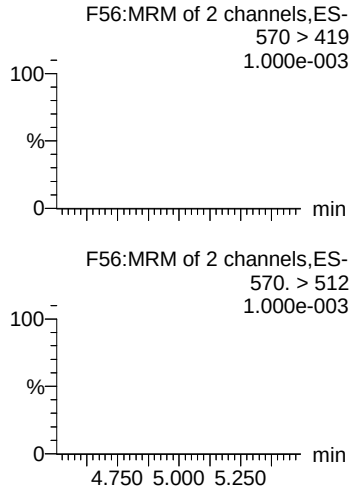


L-MeFOSAA



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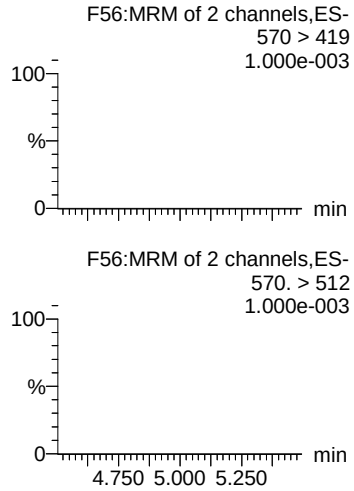

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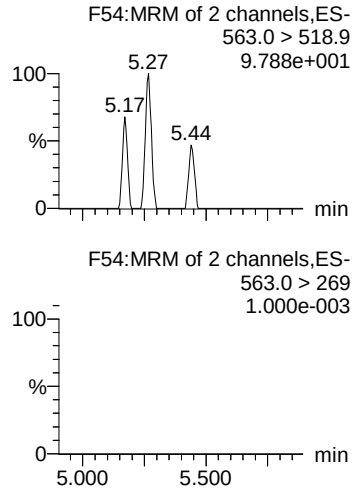
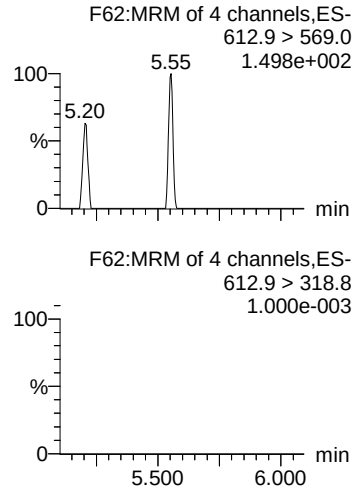


PFDoA



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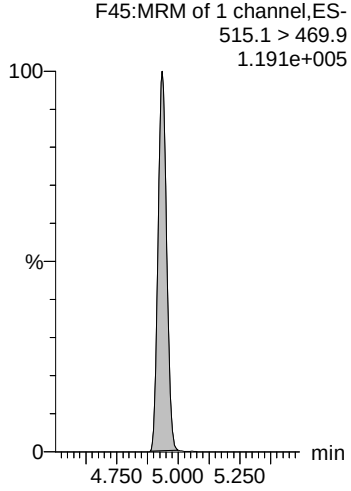

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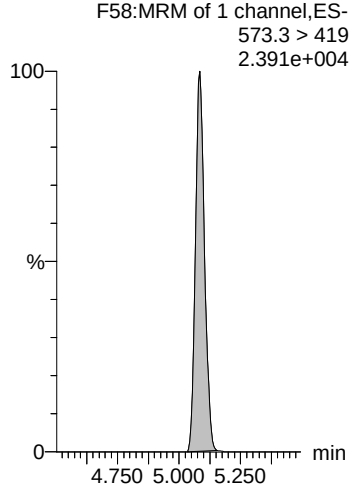

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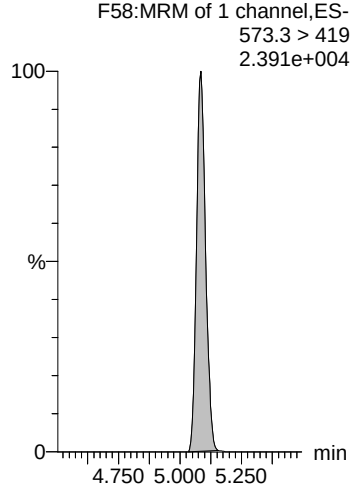

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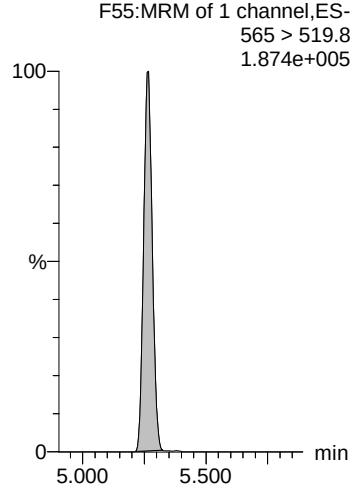

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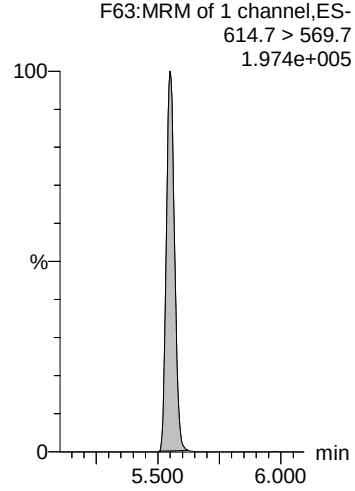


FBR 7/15/2019

Vista Analytical Laboratory L14

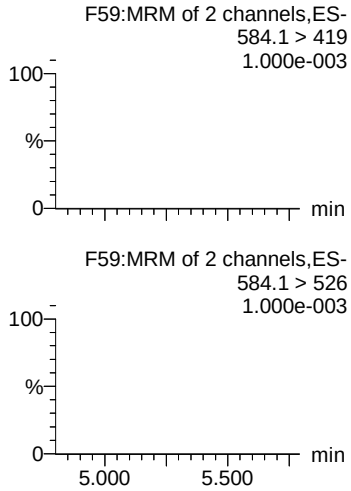
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

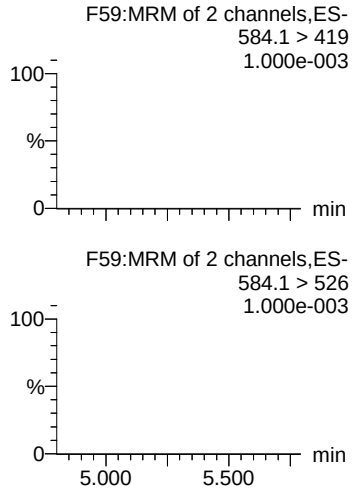
Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

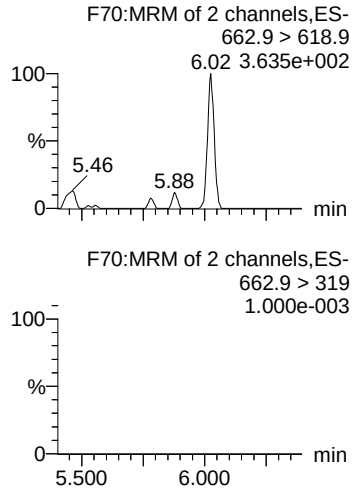
L-EtFOSAA



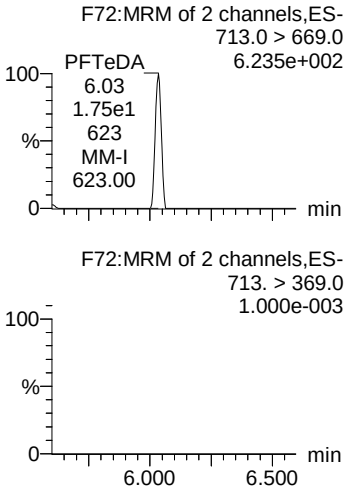
Total N-EtFOSAA



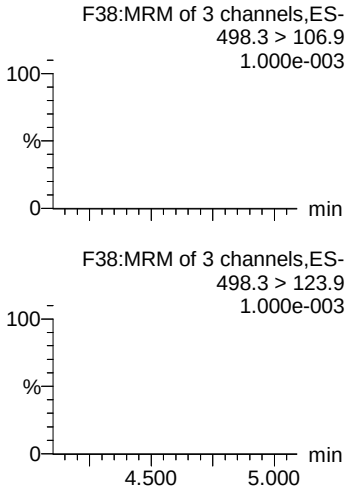
PFTrDA



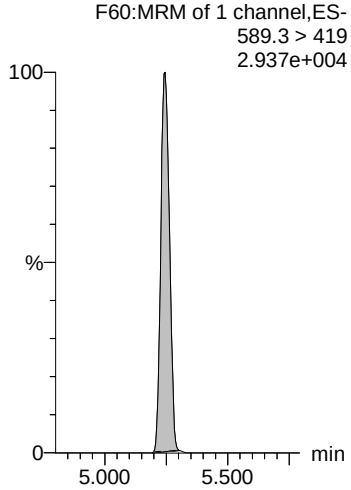
PFTeDA



TDCA



d5-N-EtFOSAA



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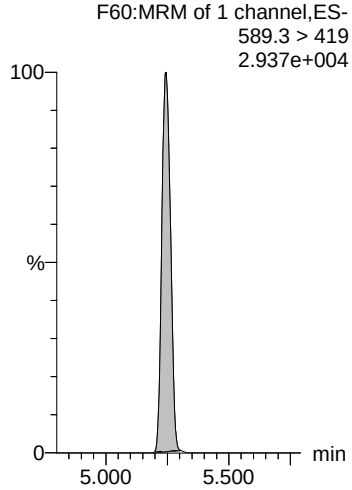
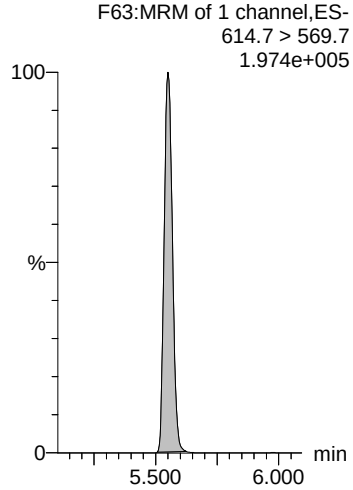
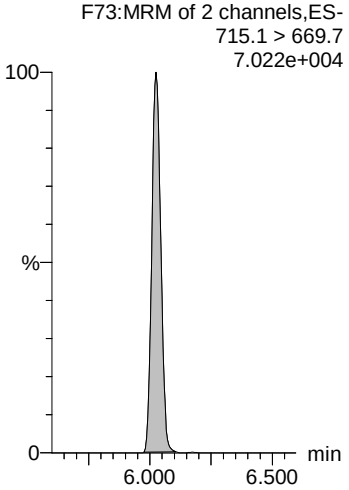


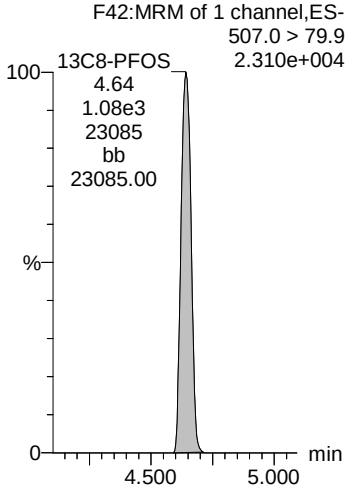
13C2-PFDoA



13C2-PFTeDA



13C8-PFOS



FBR 7/15/2019

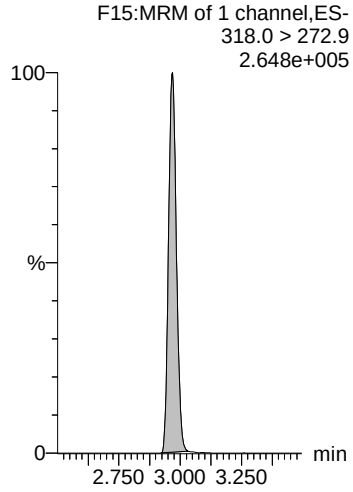
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-36.qld

Last Altered: Monday, July 15, 2019 09:48:57 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:51:39 Pacific Daylight Time

Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

13C5-PFHxA



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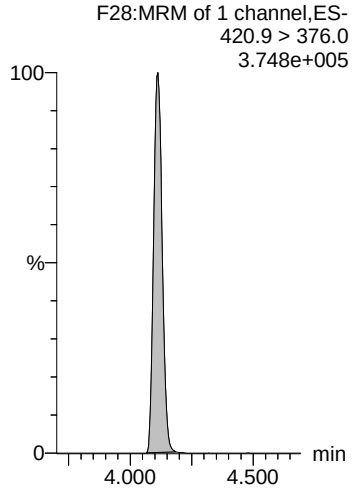
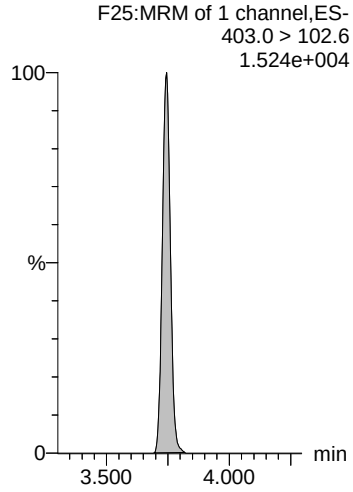
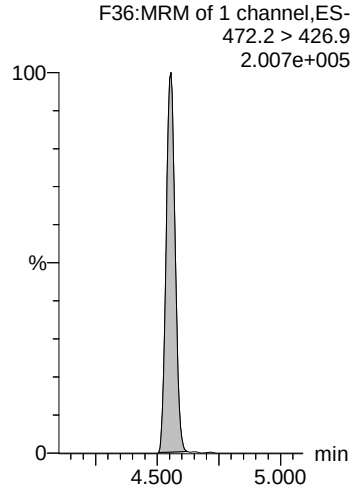


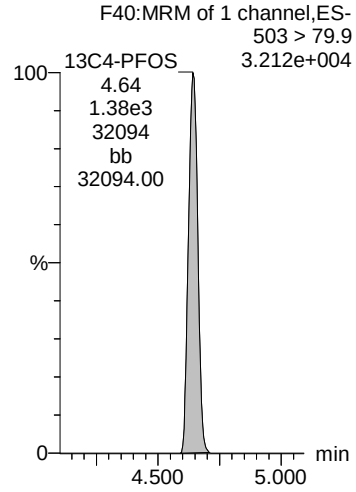
18O2-PFHxS



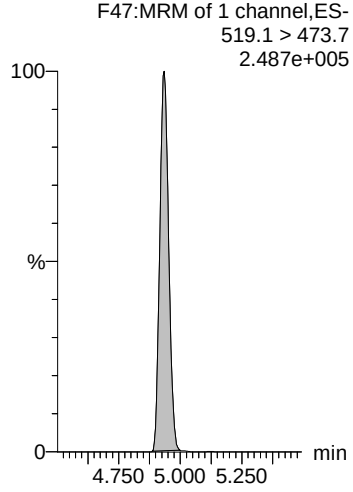
13C9-PFNA



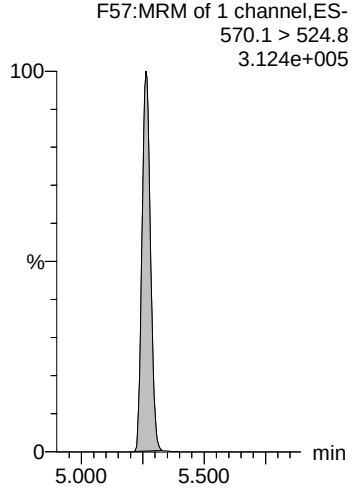
13C4-PFOS



13C6-PFDA



13C7-PFUdA



FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, 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 > 79.7	1.12e3	6.06e2	0.125		2.46	2.46	23.1	80.6279	100.8	2.625	NO
2	7	PFHxA	313.0 > 269.0	7.24e3	2.93e3	0.125		2.96	2.96	12.3	84.9841	106.2	13.650	NO
3	11	PFHpA	363.0 > 318.9	3.61e3	3.16e3	0.125		3.58	3.58	14.3	93.0186	116.3	5.367	NO
4	13	L-PFHxS	398.9 > 79.6	1.07e3	1.28e3	0.125		3.74	3.74	10.4	99.4572	124.3	2.100	NO
5	80	Total PFHxS	398.9 > 79.6	1.07e3	1.28e3	0.125		3.83		10.4	99.4572			
6	49	13C3-PFBS	302.0 > 98.8	6.06e2	6.11e2	0.125	1.035	2.46	2.46	12.4	95.7834	95.8		
7	52	13C2-PFHxA	315.0 > 270.0	2.93e3	9.48e3	0.125	0.792	2.96	2.96	3.86	39.0093	97.5		
8	53	13C4-PFHpA	367.2 > 321.8	3.16e3	9.48e3	0.125	0.391	3.58	3.58	4.16	85.1160	85.1		
9	54	13C3-PFHxS	401.8 > 79.9	1.28e3	6.11e2	0.125	2.547	3.74	3.74	26.2	82.4096	82.4		
10	54	13C3-PFHxS	401.8 > 79.9	1.28e3	6.11e2	0.125	2.547	3.74	3.74	26.2	82.4096	82.4		
11	-1													
12	16	L-PFOA	412.8 > 368.9	9.31e3	5.78e3	0.125		4.11	4.11	20.1	87.0351	108.8	3.506	NO
13	81	Total PFOA	412.8 > 368.9	9.31e3	5.78e3	0.125		4.21		20.1	87.0351			
14	21	PFNA	463.0 > 418.8	5.09e3	5.51e3	0.125		4.55	4.55	11.5	84.0315	105.0	2.839	NO
15	23	L-PFOS	498.9 > 79.9	1.12e3	1.02e3	0.125		4.64	4.64	13.8	87.9616	110.0	2.454	NO
16	82	Total PFOS	498.9 > 79.9	1.12e3	1.02e3	0.125		4.74		13.8	87.9616			
17	58	13C2-PFOA	414.9 > 369.7	5.78e3	1.24e4	0.125	0.564	4.11	4.11	5.84	82.7667	82.8		
18	58	13C2-PFOA	414.9 > 369.7	5.78e3	1.24e4	0.125	0.564	4.11	4.11	5.84	82.7667	82.8		
19	56	13C5-PFNA	468.2 > 422.9	5.51e3	7.11e3	0.125	0.983	4.56	4.55	9.69	78.9171	78.9		
20	59	13C8-PFOS	507.0 > 79.9	1.02e3	1.42e3	0.125	1.060	4.64	4.64	8.98	67.7766	67.8		
21	59	13C8-PFOS	507.0 > 79.9	1.02e3	1.42e3	0.125	1.060	4.64	4.64	8.98	67.7766	67.8		
22	-1													
23	26	PFDA	513 > 468.8	5.98e3	4.26e3	0.125		4.93	4.93	17.5	84.4337	105.5	4.949	NO
24	29	L-MeFOSAA	570 > 419	2.72e3	8.79e2	0.125		5.08	5.09	38.6	103.1149	128.9	2.657	NO
25	83	Total N-MeFOSAA	570. > 419	2.72e3	8.79e2	0.125		5.19		38.6	103.1149			
26	33	PFUdA	563.0 > 518.9	4.70e3	6.10e3	0.125		5.26	5.26	9.63	82.6629	103.3	6.352	NO
27	37	PFDoA	612.9 > 569.0	5.17e3	5.86e3	0.125		5.55	5.55	11.0	92.4785	115.6	7.877	NO
28	60	13C2-PFDA	515.1 > 469.9	4.26e3	9.08e3	0.125	0.662	4.94	4.93	5.87	70.9011	70.9		
29	62	d3-N-MeFOSAA	573.3 > 419	8.79e2	1.13e4	0.125	0.129	5.09	5.08	0.972	60.2513	60.3		
30	62	d3-N-MeFOSAA	573.3 > 419	8.79e2	1.13e4	0.125	0.129	5.09	5.08	0.972	60.2513	60.3		
31	63	13C2-PFUdA	565 > 519.8	6.10e3	1.13e4	0.125	0.857	5.26	5.26	6.75	62.9969	63.0		
32	65	13C2-PFDoA	614.7 > 569.7	5.86e3	9.08e3	0.125	1.229	5.55	5.55	8.07	52.5479	52.5		
33	-1													
34	31	L-EtFOSAA	584.1 > 419	2.07e3	1.16e3	0.125		5.24	5.25	22.3	90.0928	112.6	1.573	NO
35	84	Total N-EtFOSAA	584.1 > 419	2.07e3	1.16e3	0.125		5.33		22.3	90.0928			
36	39	PFTrDA	662.9 > 618.9	5.40e3	5.86e3	0.125		5.80	5.80	11.5	86.8878	108.6	16.865	NO

FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	41	PFTeDA	713.0 > 669.0	4.08e3	3.00e3	0.125		6.02	6.02	17.0	90.5921	113.2	13.511	NO
38	85	TDCA	498.3>106.9			0.125		5.45						
39	64	d5-N-EtFOSAA	589.3 > 419	1.16e3	1.13e4	0.125	0.147	5.24	5.24	1.28	69.5703	69.6		
40	64	d5-N-EtFOSAA	589.3 > 419	1.16e3	1.13e4	0.125	0.147	5.24	5.24	1.28	69.5703	69.6		
41	65	13C2-PFDoA	614.7 > 569.7	5.86e3	9.08e3	0.125	1.229	5.55	5.55	8.07	52.5479	52.5		
42	67	13C2-PFTeDA	715.1 > 669.7	3.00e3	1.13e4	0.125	0.511	6.02	6.02	3.32	51.9704	52.0		
43	59	13C8-PFOS	507.0 > 79.9	1.02e3	1.42e3	0.125	1.060	4.64	4.64	8.98	67.7766	67.8		
44	-1													
45	73	13C5-PFHxA	318.0 > 272.9	9.48e3	9.48e3	0.125	1.000	2.96	2.96	12.5	100.0000	100.0		
46	75	13C8-PFOA	420.9 > 376.0	1.24e4	1.24e4	0.125	1.000	4.11	4.11	12.5	100.0000	100.0		
47	74	18O2-PFHxS	403.0 > 102.6	6.11e2	6.11e2	0.125	1.000	3.74	3.74	12.5	100.0000	100.0		
48	76	13C9-PFNA	472.2 > 426.9	7.11e3	7.11e3	0.125	1.000	4.55	4.55	12.5	100.0000	100.0		
49	77	13C4-PFOS	503 > 79.9	1.42e3	1.42e3	0.125	1.000	4.64	4.64	12.5	100.0000	100.0		
50	78	13C6-PFDA	519.1 > 473.7	9.08e3	9.08e3	0.125	1.000	4.93	4.93	12.5	100.0000	100.0		
51	79	13C7-PFUdA	570.1 > 524.8	1.13e4	1.13e4	0.125	1.000	5.26	5.26	12.5	100.0000	100.0		

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Vista Analytical Laboratory L14

Review: AMR 7/16/2019

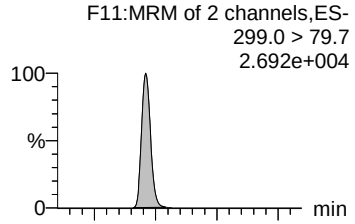
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

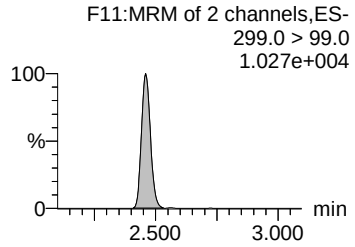
Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

Method: Z:\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: Z:\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

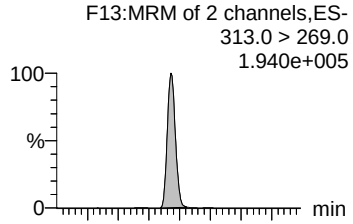
Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

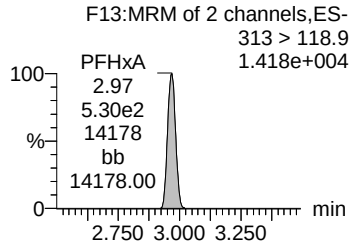
PFBS



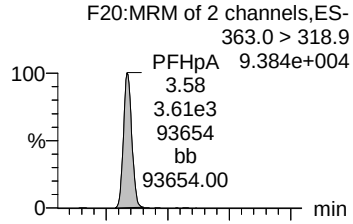


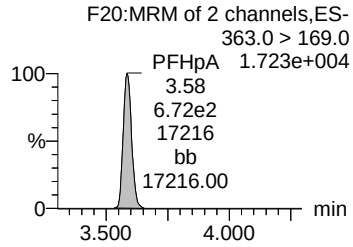
PFHxA



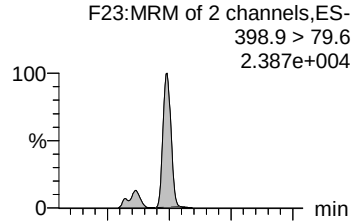


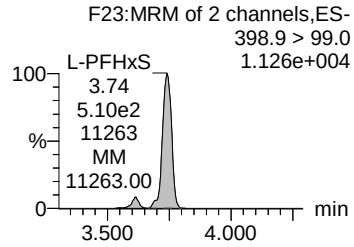
PFHpA



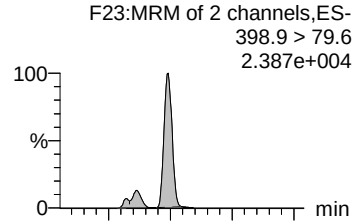


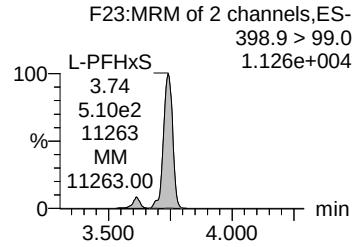
L-PFHxS



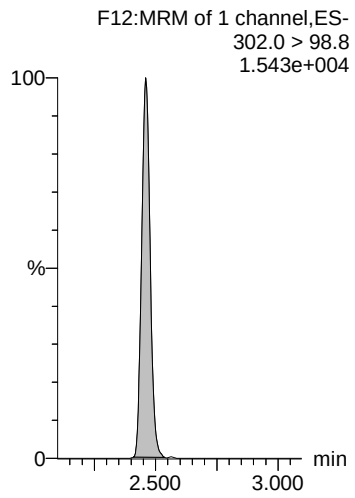


Total PFHxS

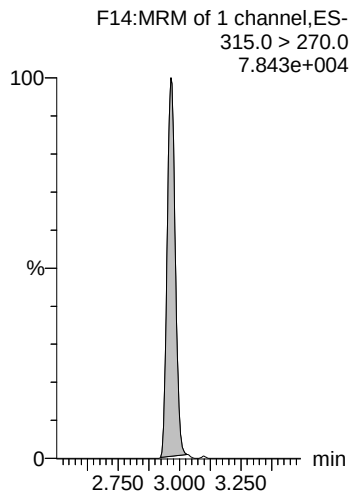




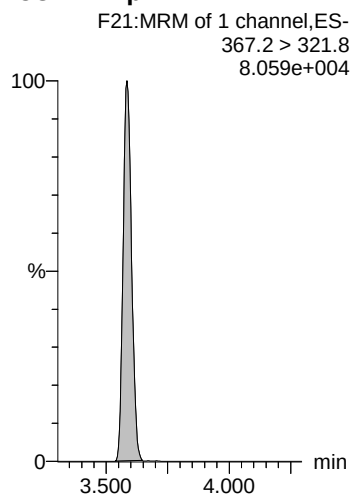
13C3-PFBS



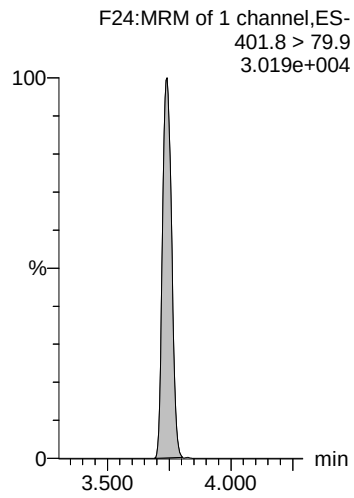
13C2-PFHxA



13C4-PFHpA



13C3-PFHxS



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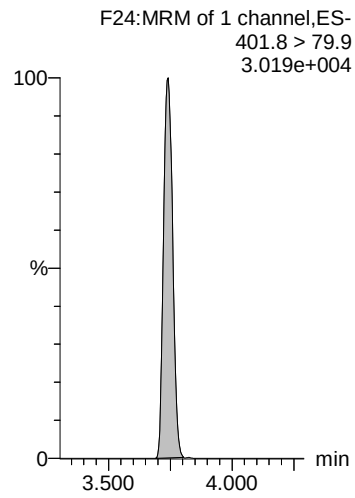


FBR 7/15/2019

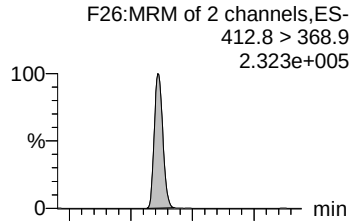
Review: AMR 7/16/2019

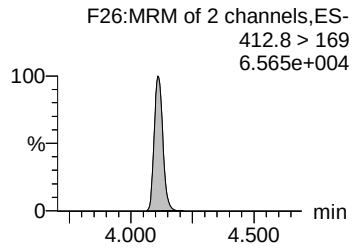
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

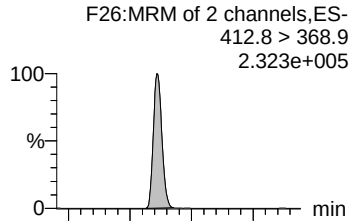
Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

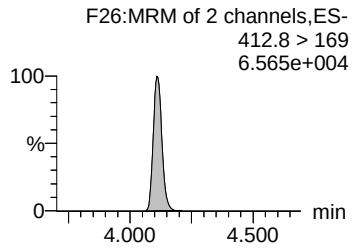
L-PFOA





Total PFOA





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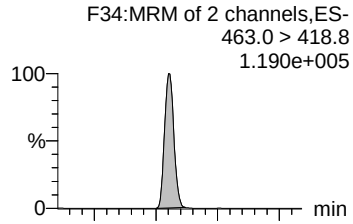
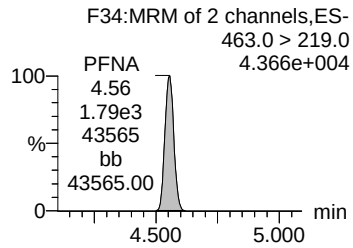
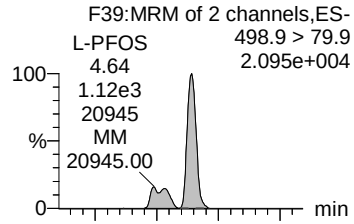
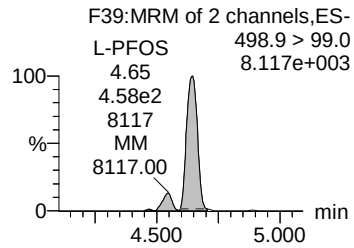


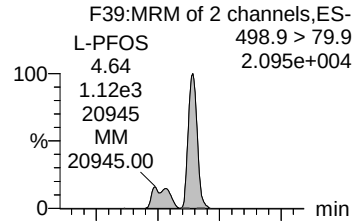


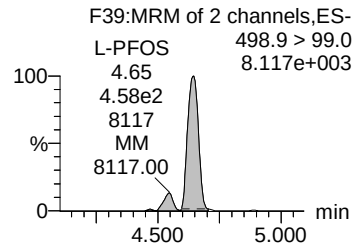
L-PFOS



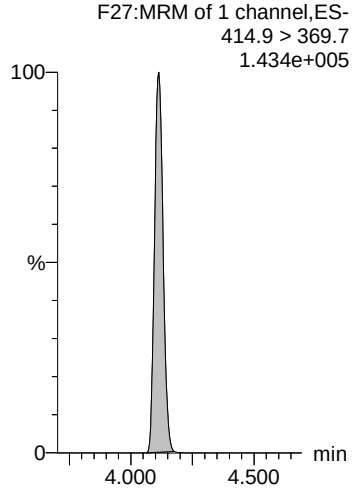


Total PFOS





13C2-PFOA



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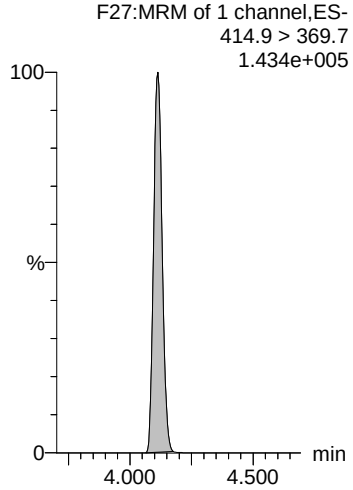
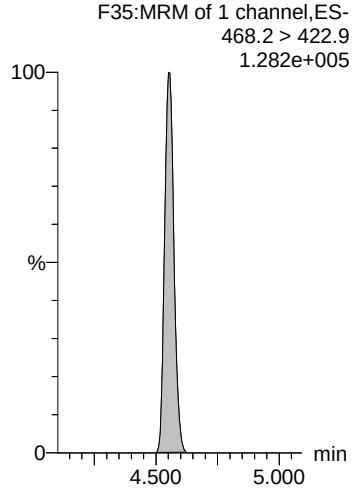
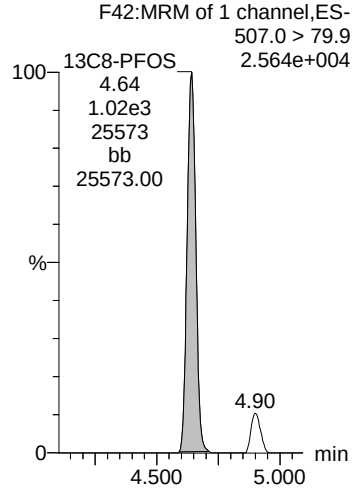


13C5-PFNA



13C8-PFOS



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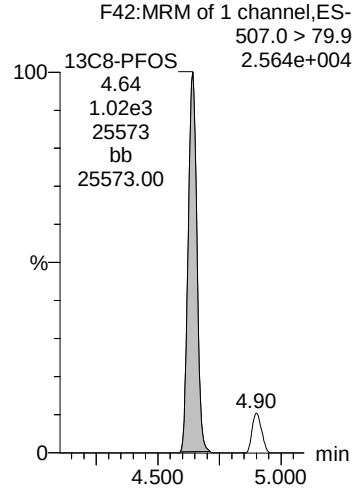


FBR 7/15/2019

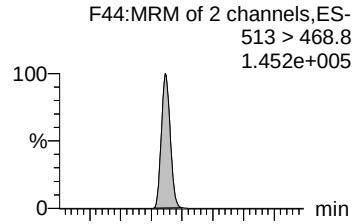
Review: AMR 7/16/2019

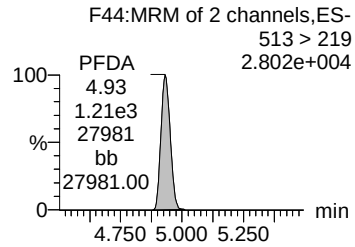
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

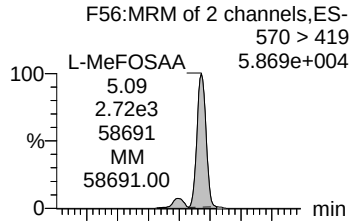
Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

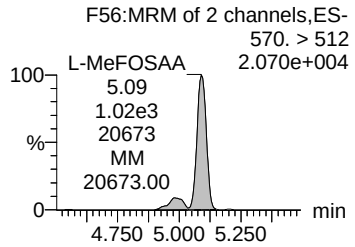
PFDA



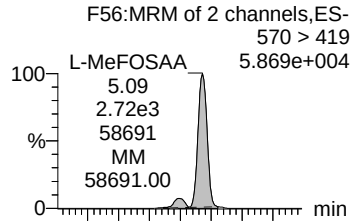


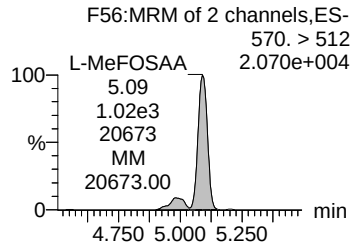
L-MeFOSAA



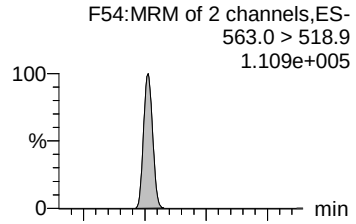


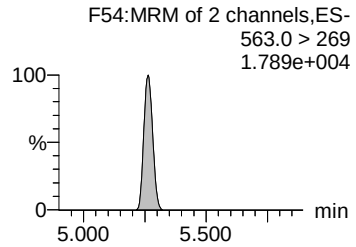
Total N-MeFOSAA



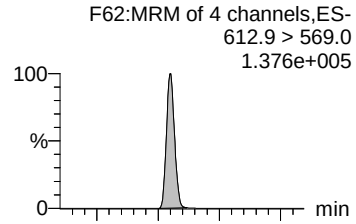


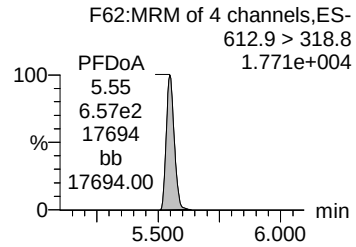
PFUdA



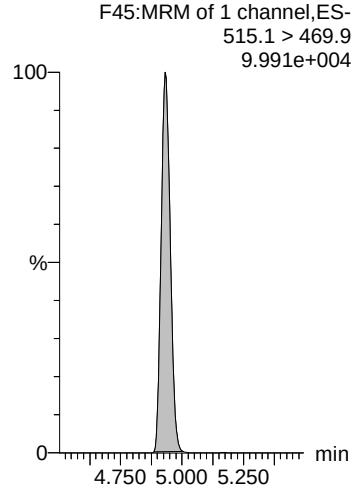


PFDoA

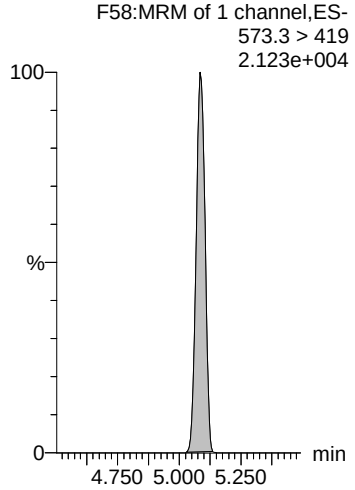




13C2-PFDA



d3-N-MeFOSAA



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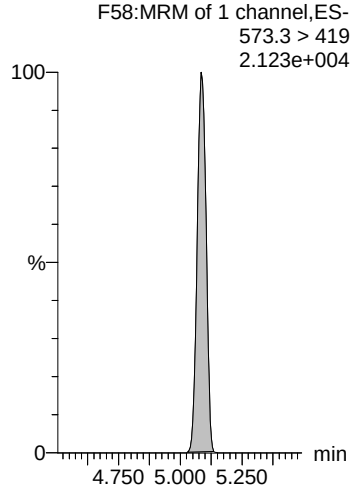
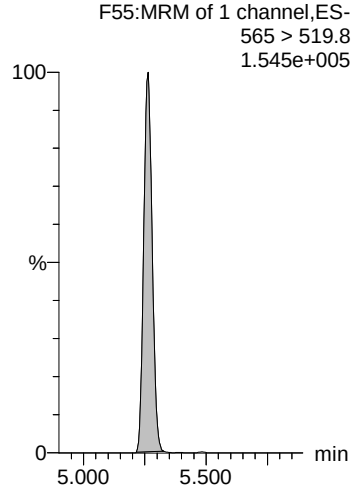
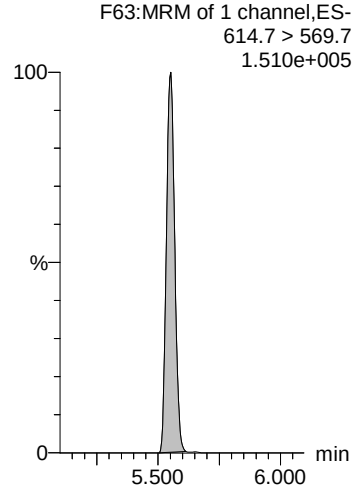


13C2-PFUdA



13C2-PFDoA



FBR 7/15/2019

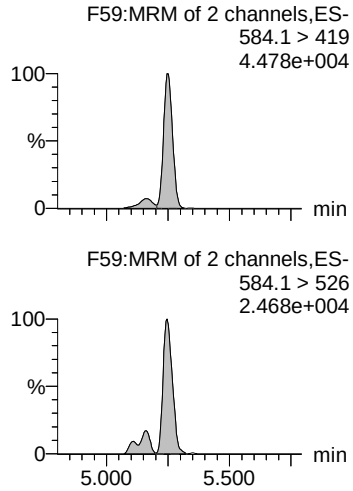
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

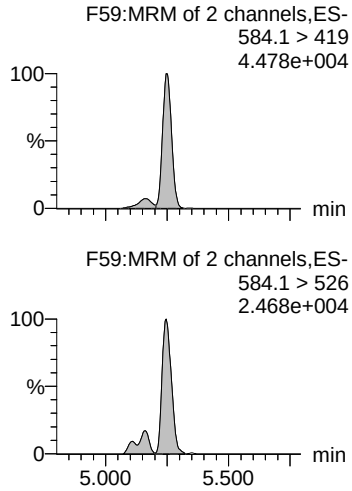
Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

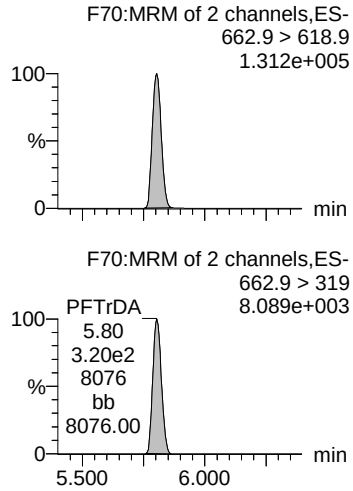
L-EtFOSAA



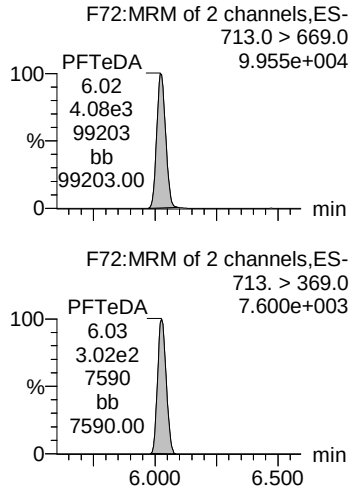
Total N-EtFOSAA



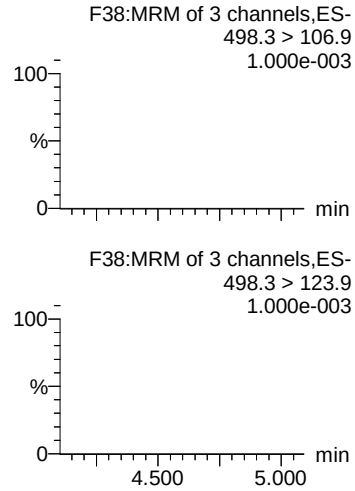
PFTrDA



PFTeDA



TDCA



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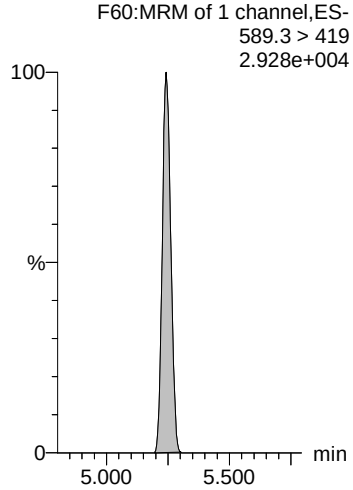

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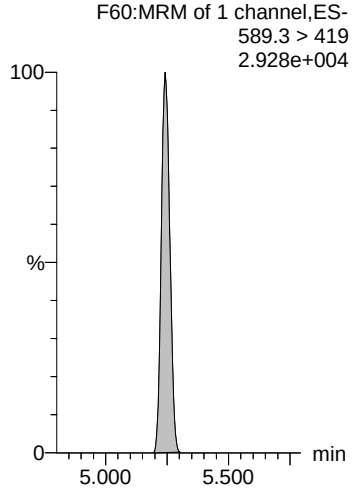
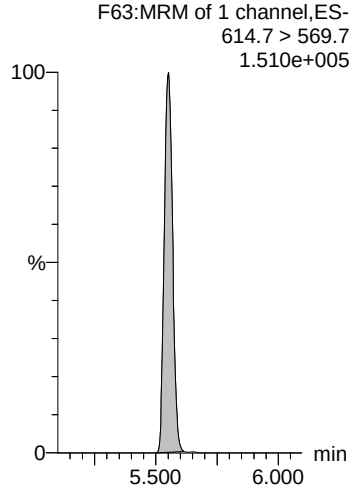
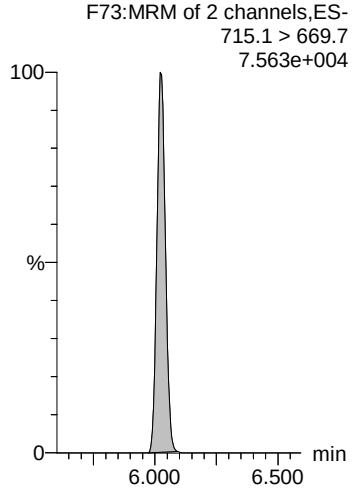


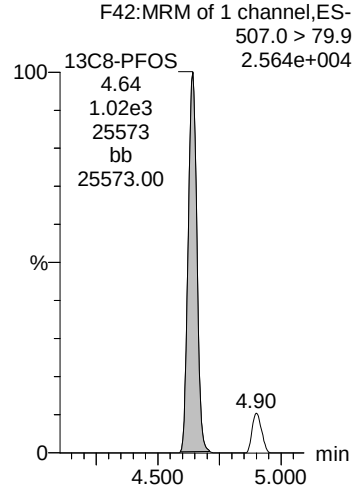
13C2-PFDoA



13C2-PFTeDA



13C8-PFOS



FBR 7/15/2019

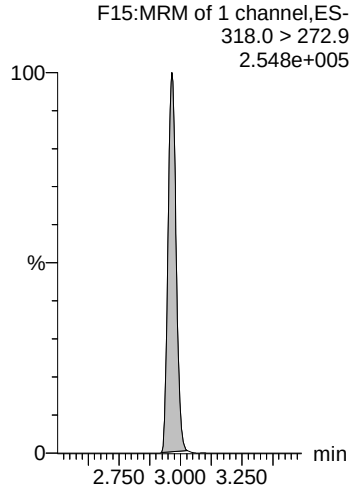
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-34.qld

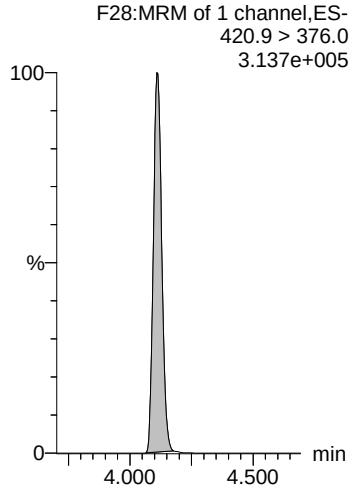
Last Altered: Monday, July 15, 2019 09:20:25 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:34:34 Pacific Daylight Time

Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

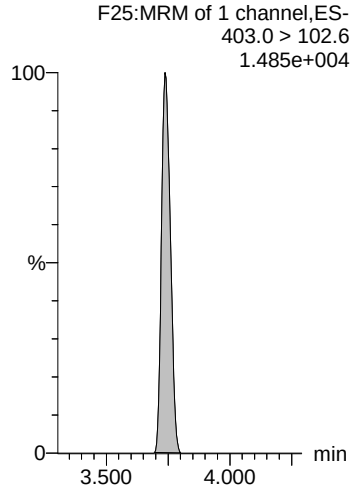
13C5-PFHxA



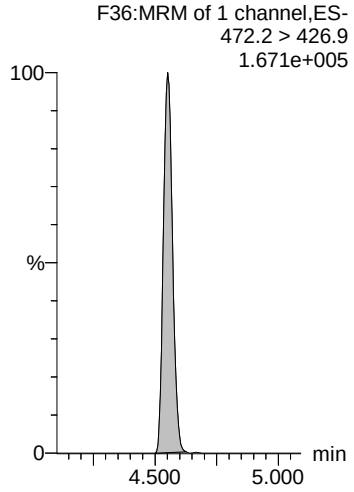
13C8-PFOA



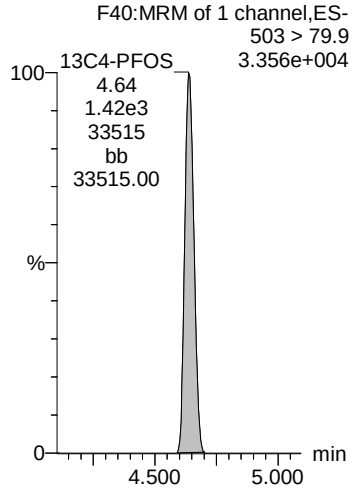
18O2-PFHxS



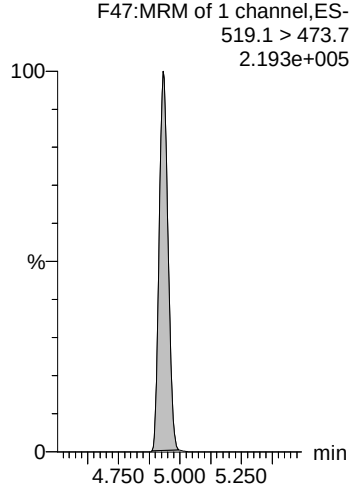
13C9-PFNA



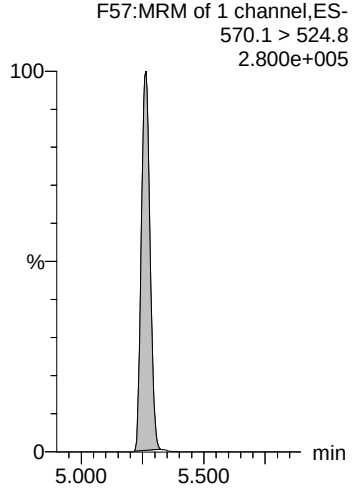
13C4-PFOS



13C6-PFDA



13C7-PFUdA



FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, 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 > 79.7	1.16e3	6.16e2	0.125		2.46	2.46	23.4	81.6899	102.1	2.690	NO
2	7	PFHxA	313.0 > 269.0	7.76e3	3.00e3	0.125		2.96	2.96	12.9	89.0469	111.3	15.652	NO
3	11	PFHpA	363.0 > 318.9	3.70e3	3.61e3	0.125		3.58	3.58	12.8	83.4201	104.3	5.402	NO
4	13	L-PFHxS	398.9 > 79.6	9.53e2	1.27e3	0.125		3.74	3.74	9.36	89.3600	111.7	1.808	NO
5	80	Total PFHxS	398.9 > 79.6	9.53e2	1.27e3	0.125		3.83		9.36	89.3600			
6	49	13C3-PFBS	302.0 > 98.8	6.16e2	5.93e2	0.125	1.035	2.46	2.46	13.0	100.2958	100.3		
7	52	13C2-PFHxA	315.0 > 270.0	3.00e3	9.46e3	0.125	0.792	2.96	2.96	3.96	39.9947	100.0		
8	53	13C4-PFHpA	367.2 > 321.8	3.61e3	9.46e3	0.125	0.391	3.58	3.58	4.78	97.6880	97.7		
9	54	13C3-PFHxS	401.8 > 79.9	1.27e3	5.93e2	0.125	2.547	3.74	3.74	26.8	84.2328	84.2		
10	54	13C3-PFHxS	401.8 > 79.9	1.27e3	5.93e2	0.125	2.547	3.74	3.74	26.8	84.2328	84.2		
11	-1													
12	16	L-PFOA	412.8 > 368.9	1.00e4	6.42e3	0.125		4.11	4.11	19.6	84.5572	105.7	3.580	NO
13	81	Total PFOA	412.8 > 368.9	1.00e4	6.42e3	0.125		4.21		19.6	84.5572			
14	21	PFNA	463.0 > 418.8	5.44e3	5.96e3	0.125		4.55	4.55	11.4	83.0935	103.9	2.965	NO
15	23	L-PFOS	498.9 > 79.9	1.10e3	1.08e3	0.125		4.64	4.64	12.8	81.7420	102.2	1.968	NO
16	82	Total PFOS	498.9 > 79.9	1.10e3	1.08e3	0.125		4.74		12.8	81.7420			
17	58	13C2-PFOA	414.9 > 369.7	6.42e3	1.42e4	0.125	0.564	4.11	4.11	5.65	80.0370	80.0		
18	58	13C2-PFOA	414.9 > 369.7	6.42e3	1.42e4	0.125	0.564	4.11	4.11	5.65	80.0370	80.0		
19	56	13C5-PFNA	468.2 > 422.9	5.96e3	8.54e3	0.125	0.983	4.56	4.55	8.72	70.9977	71.0		
20	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.39e3	0.125	1.060	4.64	4.64	9.65	72.8274	72.8		
21	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.39e3	0.125	1.060	4.64	4.64	9.65	72.8274	72.8		
22	-1													
23	26	PFDA	513 > 468.8	6.03e3	4.49e3	0.125		4.93	4.93	16.8	80.8252	101.0	4.484	NO
24	29	L-MeFOSAA	570 > 419	2.80e3	1.11e3	0.125		5.08	5.09	31.6	84.5379	105.7	2.870	NO
25	83	Total N-MeFOSAA	570. > 419	2.80e3	1.11e3	0.125		5.19		31.6	84.5379			
26	33	PFUdA	563.0 > 518.9	5.09e3	6.35e3	0.125		5.26	5.26	10.0	86.0433	107.6	6.960	NO
27	37	PFDoA	612.9 > 569.0	4.69e3	5.70e3	0.125		5.55	5.55	10.3	86.1885	107.7	7.289	NO
28	60	13C2-PFDA	515.1 > 469.9	4.49e3	1.01e4	0.125	0.662	4.94	4.93	5.55	67.0208	67.0		
29	62	d3-N-MeFOSAA	573.3 > 419	1.11e3	1.26e4	0.125	0.129	5.09	5.08	1.10	68.3306	68.3		
30	62	d3-N-MeFOSAA	573.3 > 419	1.11e3	1.26e4	0.125	0.129	5.09	5.08	1.10	68.3306	68.3		
31	63	13C2-PFUdA	565 > 519.8	6.35e3	1.26e4	0.125	0.857	5.26	5.26	6.32	58.9557	59.0		
32	65	13C2-PFDoA	614.7 > 569.7	5.70e3	1.01e4	0.125	1.229	5.55	5.55	7.04	45.8324	45.8		
33	-1													
34	31	L-EtFOSAA	584.1 > 419	1.99e3	1.10e3	0.125		5.24	5.25	22.6	91.0494	113.8	1.437	NO
35	84	Total N-EtFOSAA	584.1 > 419	1.99e3	1.10e3	0.125		5.33		22.6	91.0494			
36	39	PFTrDA	662.9 > 618.9	4.94e3	5.70e3	0.125		5.80	5.80	10.8	81.7354	102.2	13.117	NO

FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	41	PFTeDA	713.0 > 669.0	3.53e3	2.66e3	0.125		6.02	6.02	16.5	88.3182	110.4	12.150	NO
38	85	TDCA	498.3>106.9			0.125		5.45						
39	64	d5-N-EtFOSAA	589.3 > 419	1.10e3	1.26e4	0.125	0.147	5.24	5.24	1.09	59.2984	59.3		
40	64	d5-N-EtFOSAA	589.3 > 419	1.10e3	1.26e4	0.125	0.147	5.24	5.24	1.09	59.2984	59.3		
41	65	13C2-PFDoA	614.7 > 569.7	5.70e3	1.01e4	0.125	1.229	5.55	5.55	7.04	45.8324	45.8		
42	67	13C2-PFTeDA	715.1 > 669.7	2.66e3	1.26e4	0.125	0.511	6.02	6.02	2.65	41.4365	41.4		
43	59	13C8-PFOS	507.0 > 79.9	1.08e3	1.39e3	0.125	1.060	4.64	4.64	9.65	72.8274	72.8		
44	-1													
45	73	13C5-PFHxA	318.0 > 272.9	9.46e3	9.46e3	0.125	1.000	2.96	2.96	12.5	100.0000	100.0		
46	75	13C8-PFOA	420.9 > 376.0	1.42e4	1.42e4	0.125	1.000	4.11	4.11	12.5	100.0000	100.0		
47	74	18O2-PFHxS	403.0 > 102.6	5.93e2	5.93e2	0.125	1.000	3.74	3.74	12.5	100.0000	100.0		
48	76	13C9-PFNA	472.2 > 426.9	8.54e3	8.54e3	0.125	1.000	4.55	4.55	12.5	100.0000	100.0		
49	77	13C4-PFOS	503 > 79.9	1.39e3	1.39e3	0.125	1.000	4.64	4.64	12.5	100.0000	100.0		
50	78	13C6-PFDA	519.1 > 473.7	1.01e4	1.01e4	0.125	1.000	4.93	4.93	12.5	100.0000	100.0		
51	79	13C7-PFUdA	570.1 > 524.8	1.26e4	1.26e4	0.125	1.000	5.26	5.26	12.5	100.0000	100.0		

FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

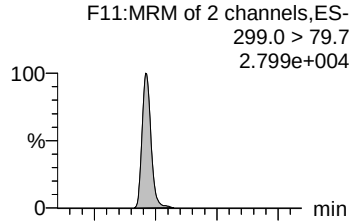
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

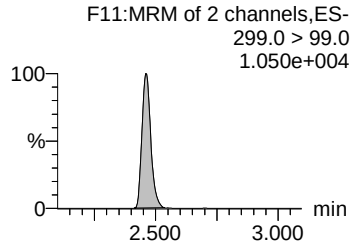
Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

Method: Z:\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: Z:\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

PFBS





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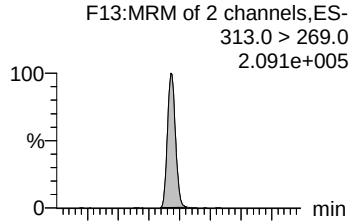

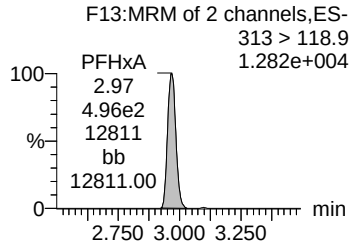

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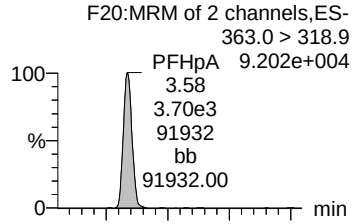
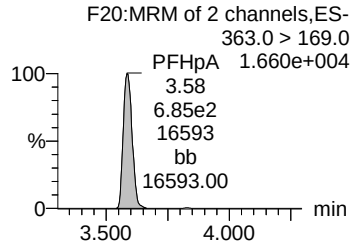
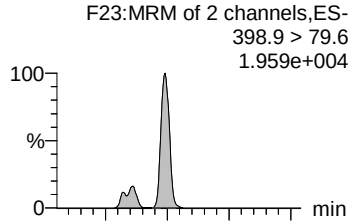
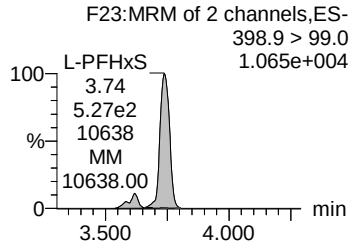


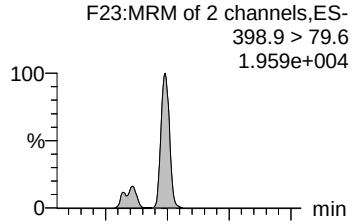


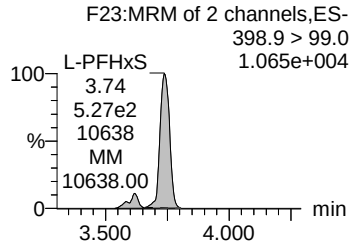
L-PFHxS



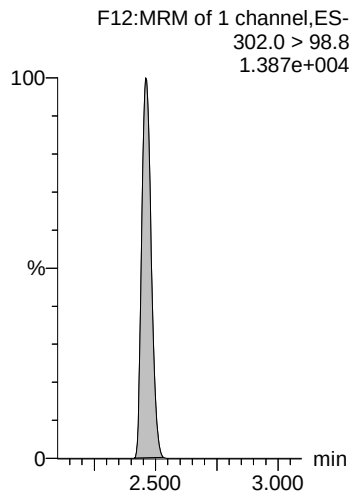


Total PFHxS

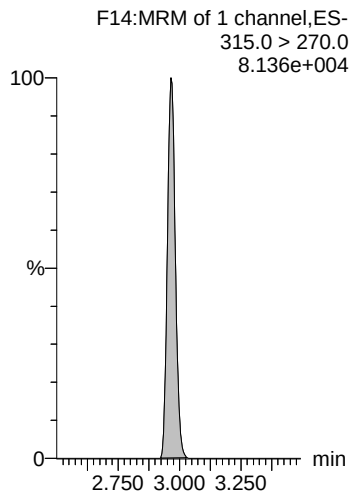




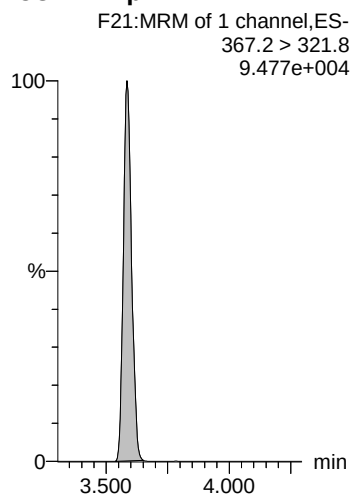
13C3-PFBS



13C2-PFHxA



13C4-PFHpA



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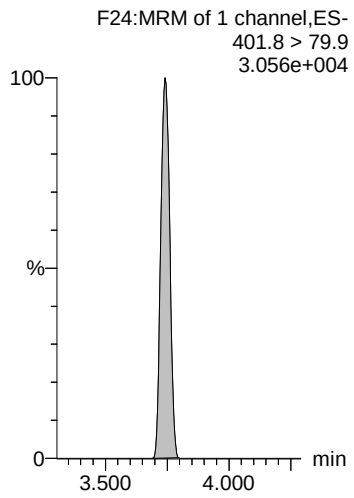

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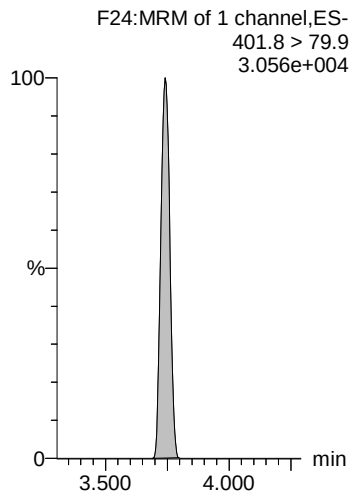


FBR 7/15/2019

Vista Analytical Laboratory L14

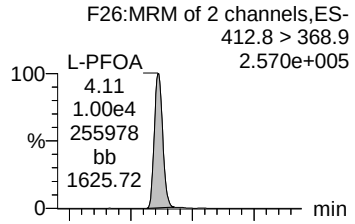
Review: AMR 7/16/2019

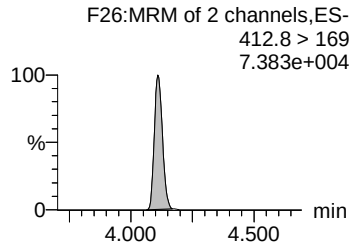
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

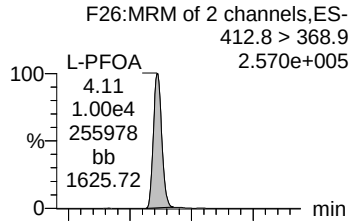
Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

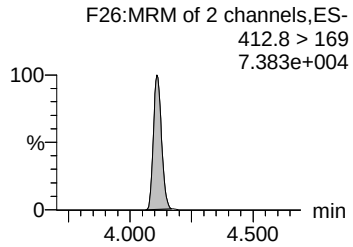
L-PFOA



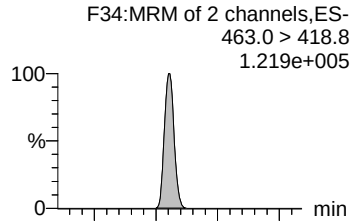


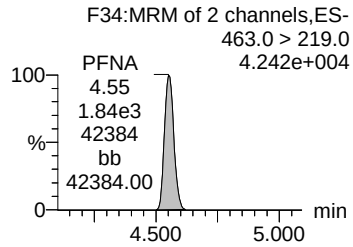
Total PFOA



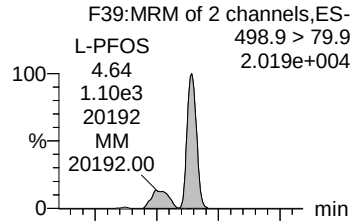


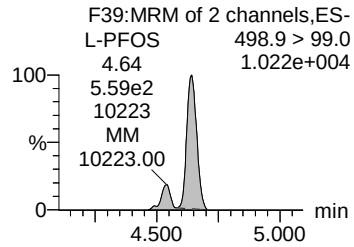
PFNA



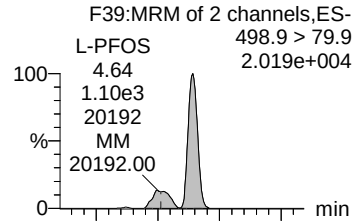


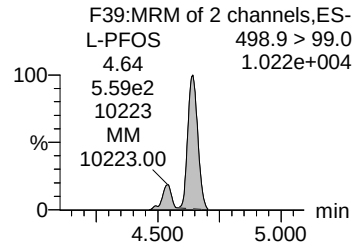
L-PFOS



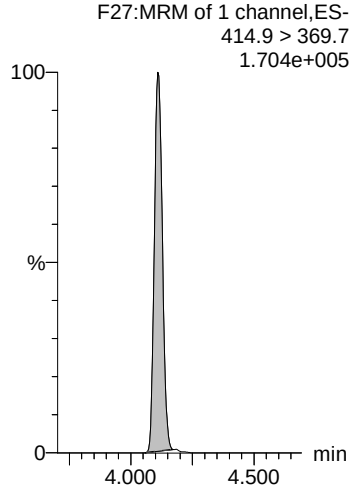


Total PFOS





13C2-PFOA



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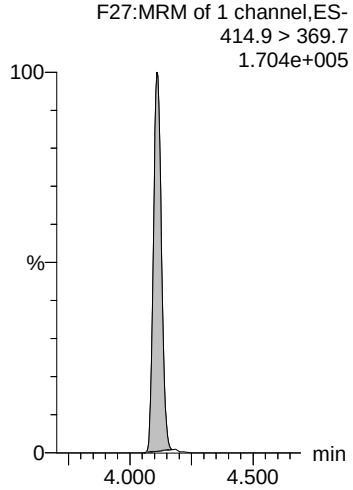

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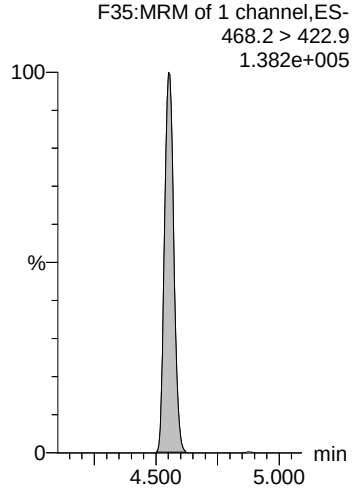

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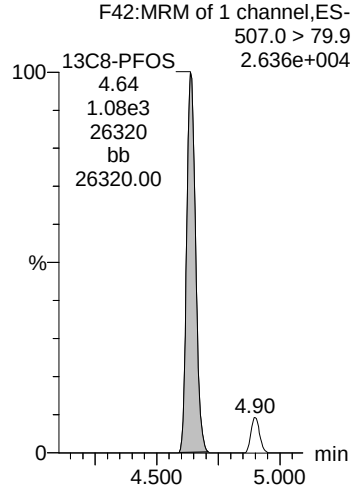

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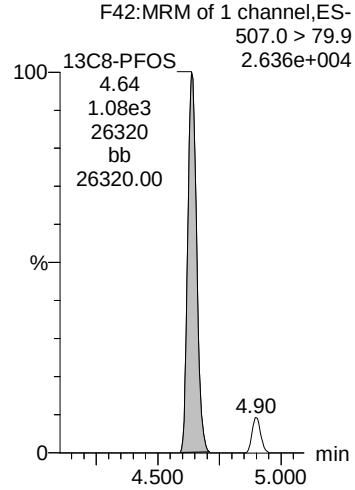


FBR 7/15/2019

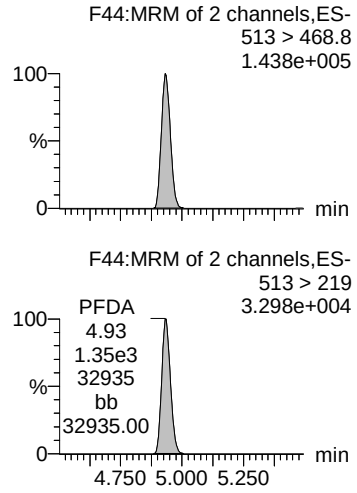
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

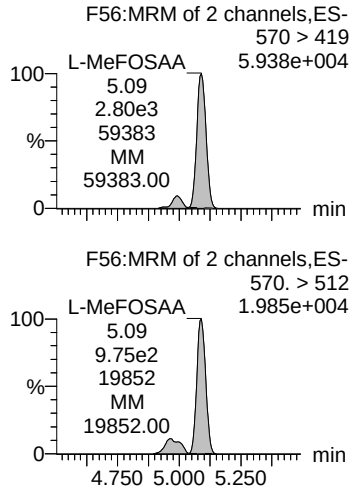
Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

PFDA



L-MeFOSAA



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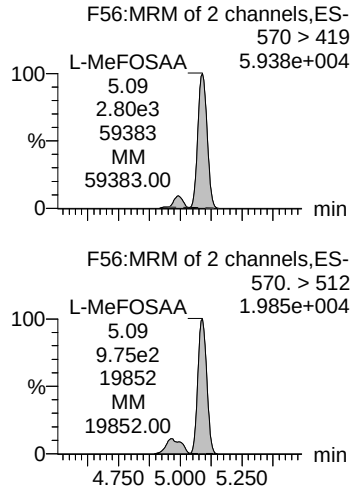

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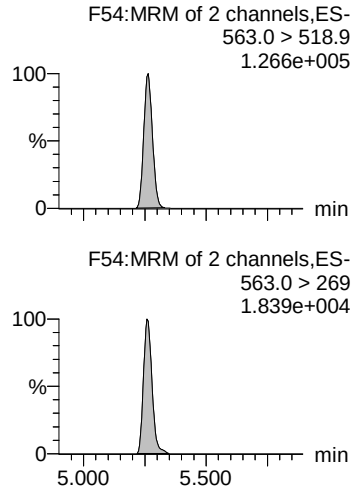
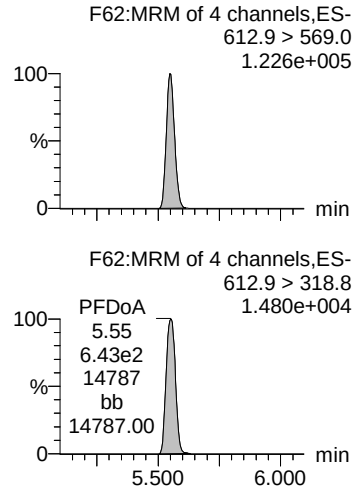


PFDoA



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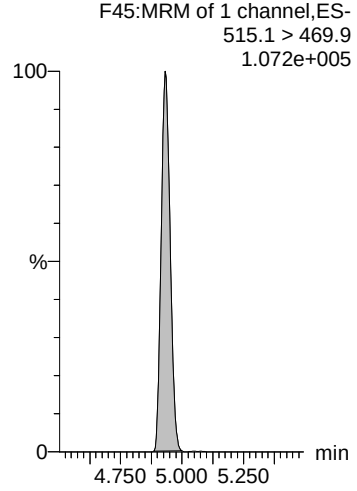
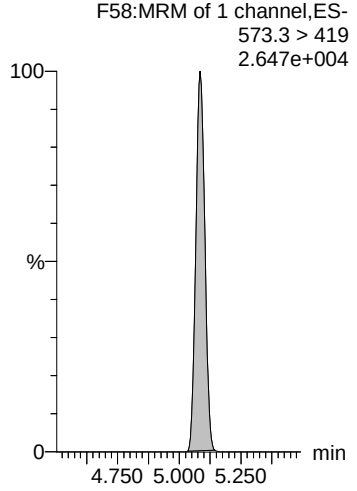


d3-N-MeFOSAA



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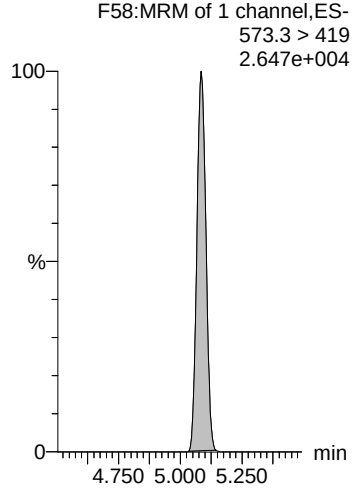
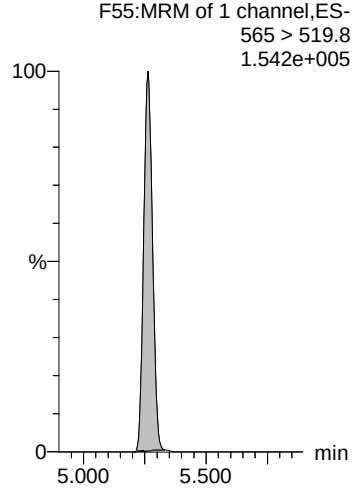
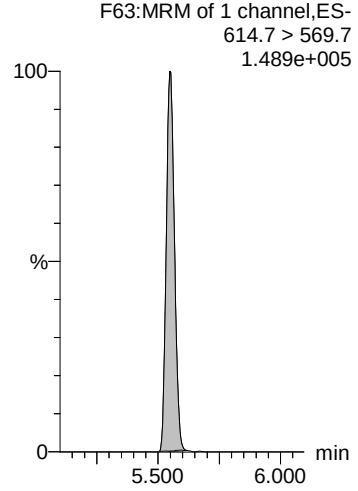


13C2-PFUdA



13C2-PFDoA



FBR 7/15/2019

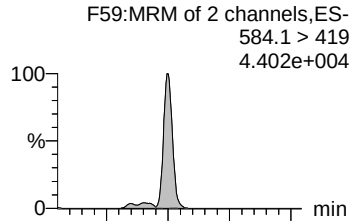
Review: AMR 7/16/2019

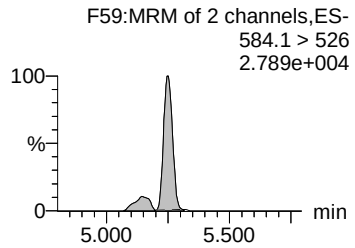
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

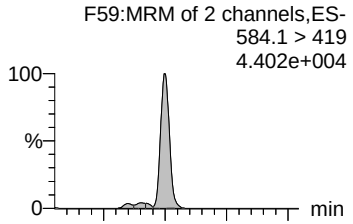
Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

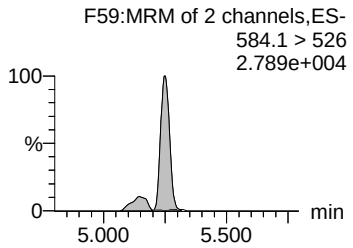
L-EtFOSAA



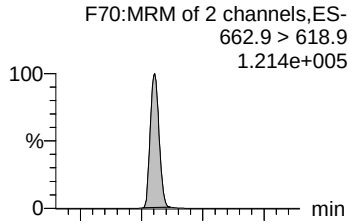


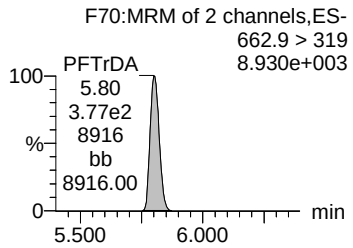
Total N-EtFOSAA



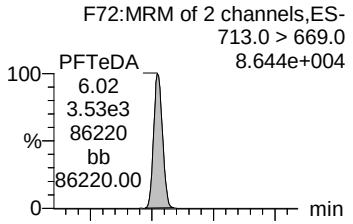


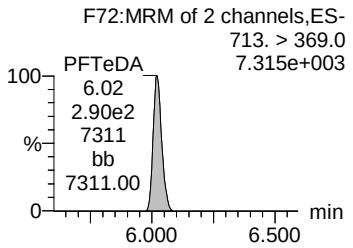
PFTrDA





PFTeDA





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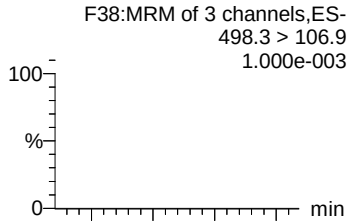

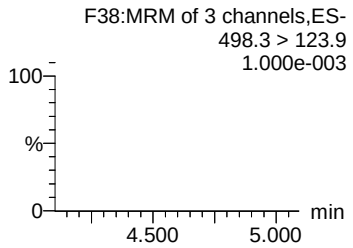

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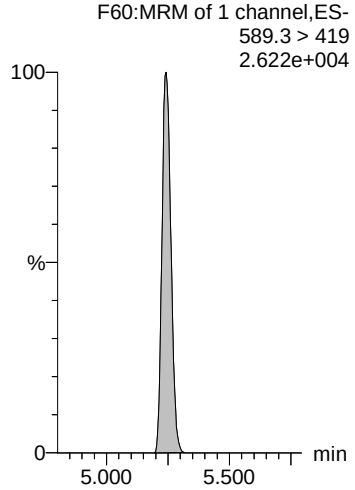

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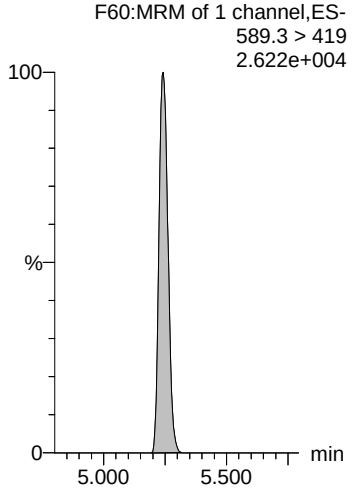
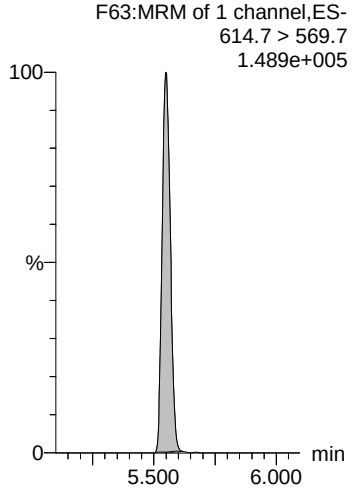
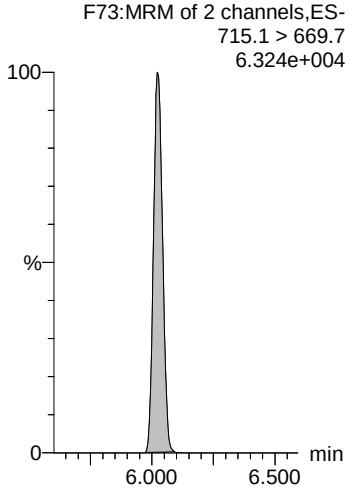


13C2-PFDoA



13C2-PFTeDA



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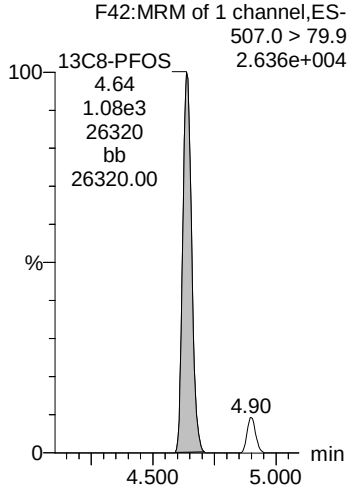


FBR 7/15/2019

Vista Analytical Laboratory L14

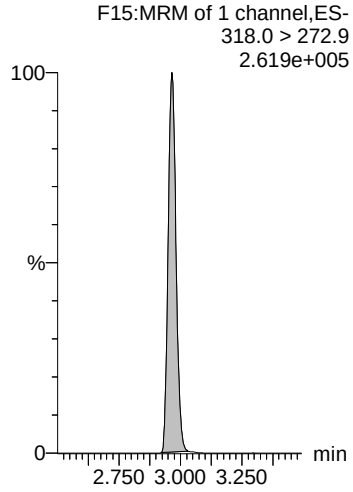
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-35.qld

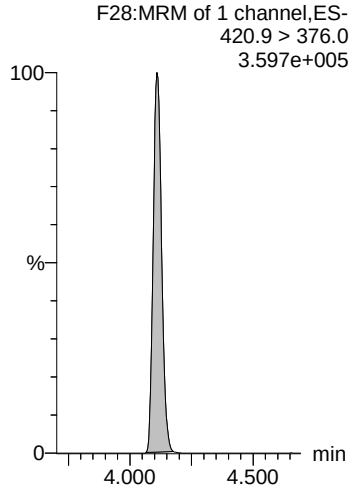
Last Altered: Monday, July 15, 2019 09:40:54 Pacific Daylight Time
Printed: Monday, July 15, 2019 09:43:10 Pacific Daylight Time

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

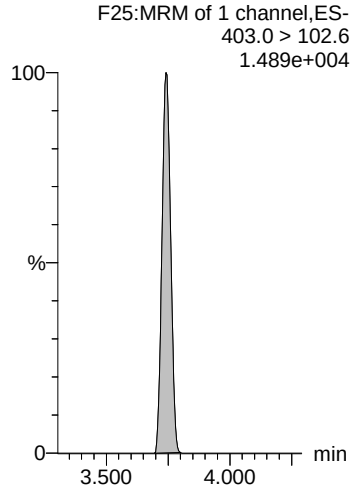
13C5-PFHxA



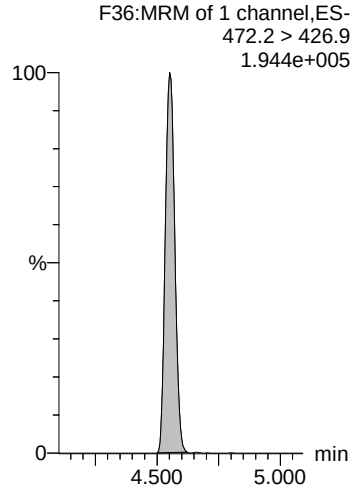
13C8-PFOA



18O2-PFHxS



13C9-PFNA



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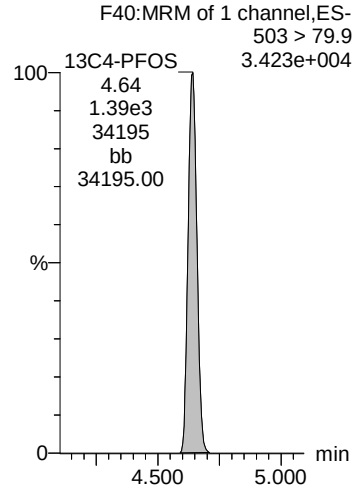
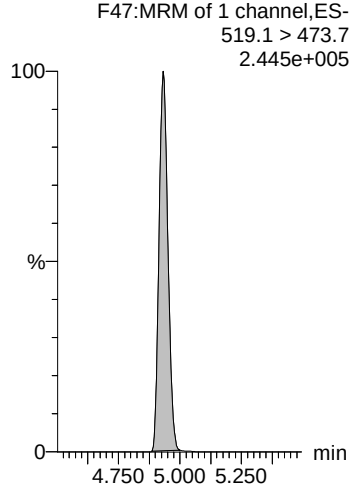
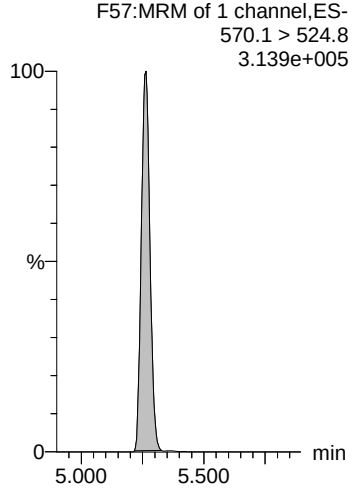


13C6-PFDA



13C7-PFUdA



FBR 7/15/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 79.7		5.42e2	0.107		2.46						
2	7	PFHxA	313.0 > 269.0		2.57e3	0.107		2.96						
3	11	PFHpA	363.0 > 318.9		3.10e3	0.107		3.59						
4	13	L-PFHxS	398.9 > 79.6		1.25e3	0.107		3.74						
5	80	Total PFHxS	398.9 > 79.6	0.00e0	1.25e3	0.107		3.83		0.000				
6	49	13C3-PFBS	302.0 > 98.8	5.42e2	5.51e2	0.107	1.035	2.46	2.46	12.3	110.8508	95.0		
7	52	13C2-PFHxA	315.0 > 270.0	2.57e3	9.02e3	0.107	0.792	2.96	2.96	3.56	42.0098	90.0		
8	53	13C4-PFHpA	367.2 > 321.8	3.10e3	9.02e3	0.107	0.391	3.58	3.59	4.30	102.6826	88.0		
9	54	13C3-PFHxS	401.8 > 79.9	1.25e3	5.51e2	0.107	2.547	3.74	3.74	28.4	104.1369	89.2		
10	54	13C3-PFHxS	401.8 > 79.9	1.25e3	5.51e2	0.107	2.547	3.74	3.74	28.4	104.1369	89.2		
11	-1													
12	16	L-PFOA	412.8 > 368.9		6.78e3	0.107		4.11						
13	81	Total PFOA	412.8 > 368.9	0.00e0	6.78e3	0.107		4.21		0.000				
14	21	PFNA	463.0 > 418.8		6.71e3	0.107		4.56						
15	23	L-PFOS	498.9 > 79.9		1.10e3	0.107		4.64						
16	82	Total PFOS	498.9 > 79.9	0.00e0	1.10e3	0.107		4.74		0.000				
17	58	13C2-PFOA	414.9 > 369.7	6.78e3	1.29e4	0.107	0.564	4.11	4.11	6.58	108.8541	93.3		
18	58	13C2-PFOA	414.9 > 369.7	6.78e3	1.29e4	0.107	0.564	4.11	4.11	6.58	108.8541	93.3		
19	56	13C5-PFNA	468.2 > 422.9	6.71e3	7.74e3	0.107	0.983	4.56	4.56	10.8	102.8721	88.1		
20	59	13C8-PFOS	507.0 > 79.9	1.10e3	1.18e3	0.107	1.060	4.64	4.64	11.6	102.5593	87.9		
21	59	13C8-PFOS	507.0 > 79.9	1.10e3	1.18e3	0.107	1.060	4.64	4.64	11.6	102.5593	87.9		
22	-1													
23	26	PFDA	513 > 468.8		4.87e3	0.107		4.93						
24	29	L-MeFOSAA	570 > 419		9.56e2	0.107		5.08						
25	83	Total N-MeFOSAA	570. > 419	0.00e0	9.56e2	0.107		5.19		0.000				
26	33	PFUdA	563.0 > 518.9	6.79e0	8.12e3	0.107		5.26	5.25	0.0105			17.976	YES
27	37	PFDoA	612.9 > 569.0		8.84e3	0.107		5.55						
28	60	13C2-PFDA	515.1 > 469.9	4.87e3	9.58e3	0.107	0.662	4.94	4.93	6.36	89.6766	76.8		
29	62	d3-N-MeFOSAA	573.3 > 419	9.56e2	1.12e4	0.107	0.129	5.09	5.08	1.07	77.5684	66.5		
30	62	d3-N-MeFOSAA	573.3 > 419	9.56e2	1.12e4	0.107	0.129	5.09	5.08	1.07	77.5684	66.5		
31	63	13C2-PFUdA	565 > 519.8	8.12e3	1.12e4	0.107	0.857	5.26	5.26	9.10	99.1573	85.0		
32	65	13C2-PFDoA	614.7 > 569.7	8.84e3	9.58e3	0.107	1.229	5.55	5.55	11.5	87.6907	75.1		
33	-1													
34	31	L-EtFOSAA	584.1 > 419		1.20e3	0.107		5.24						
35	84	Total N-EtFOSAA	584.1 > 419	0.00e0	1.20e3	0.107		5.33		0.000				
36	39	PFTrDA	662.9 > 618.9		8.84e3	0.107		5.80						

FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	41	PFTeDA	713.0 > 669.0		4.78e3	0.107		6.02						
38	85	TDCA	498.3>106.9			0.107		5.45						
39	64	d5-N-EtFOSAA	589.3 > 419	1.20e3	1.12e4	0.107	0.147	5.24	5.24	1.34	85.0214	72.8		
40	64	d5-N-EtFOSAA	589.3 > 419	1.20e3	1.12e4	0.107	0.147	5.24	5.24	1.34	85.0214	72.8		
41	65	13C2-PFDoA	614.7 > 569.7	8.84e3	9.58e3	0.107	1.229	5.55	5.55	11.5	87.6907	75.1		
42	67	13C2-PFTeDA	715.1 > 669.7	4.78e3	1.12e4	0.107	0.511	6.02	6.02	5.36	97.8949	83.9		
43	59	13C8-PFOS	507.0 > 79.9	1.10e3	1.18e3	0.107	1.060	4.64	4.64	11.6	102.5593	87.9		
44	-1													
45	73	13C5-PFHxA	318.0 > 272.9	9.02e3	9.02e3	0.107	1.000	2.96	2.96	12.5	116.7243	100.0		
46	75	13C8-PFOA	420.9 > 376.0	1.29e4	1.29e4	0.107	1.000	4.11	4.11	12.5	116.7243	100.0		
47	74	18O2-PFHxS	403.0 > 102.6	5.51e2	5.51e2	0.107	1.000	3.74	3.74	12.5	116.7243	100.0		
48	76	13C9-PFNA	472.2 > 426.9	7.74e3	7.74e3	0.107	1.000	4.55	4.56	12.5	116.7243	100.0		
49	77	13C4-PFOS	503 > 79.9	1.18e3	1.18e3	0.107	1.000	4.64	4.64	12.5	116.7243	100.0		
50	78	13C6-PFDA	519.1 > 473.7	9.58e3	9.58e3	0.107	1.000	4.93	4.93	12.5	116.7243	100.0		
51	79	13C7-PFUdA	570.1 > 524.8	1.12e4	1.12e4	0.107	1.000	5.26	5.26	12.5	116.7243	100.0		

FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

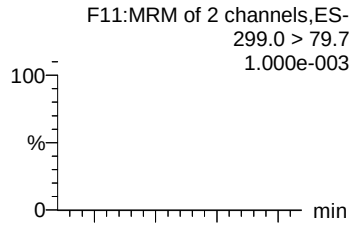
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

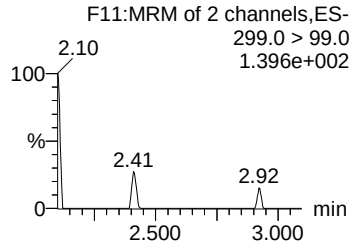
Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Method: Z:\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: Z:\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

PFBS





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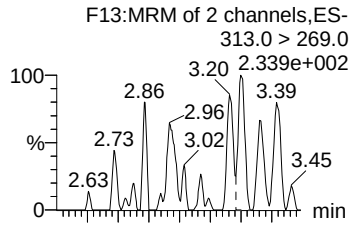

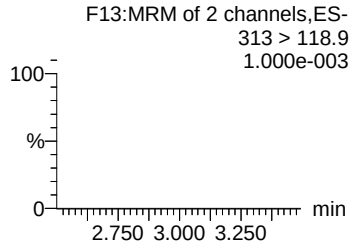

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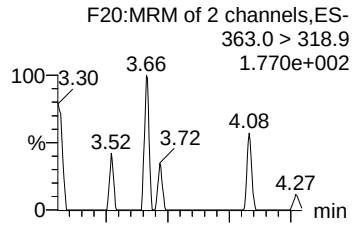
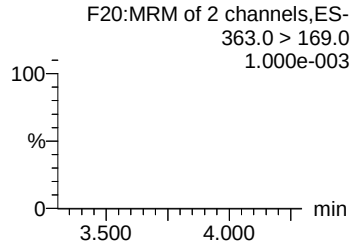
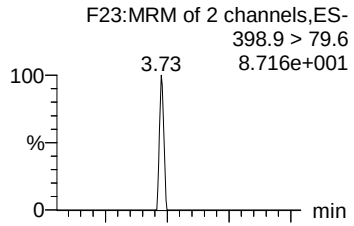
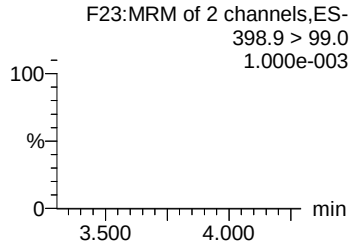


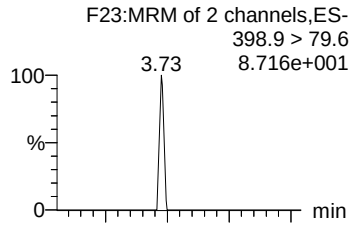


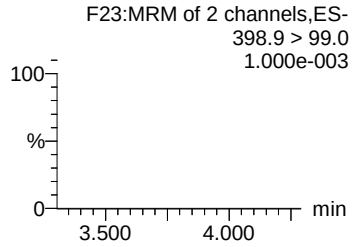
L-PFHxS



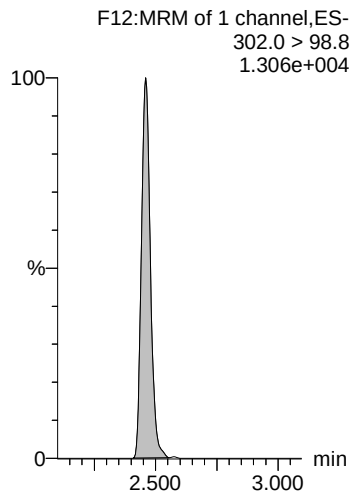


Total PFHxS





13C3-PFBS



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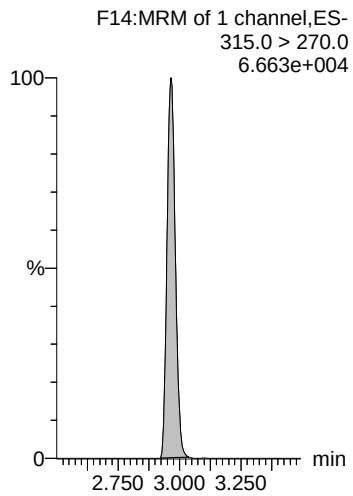

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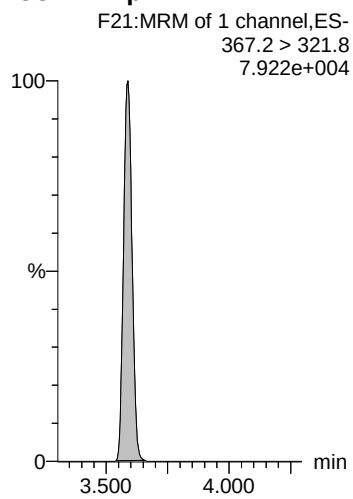

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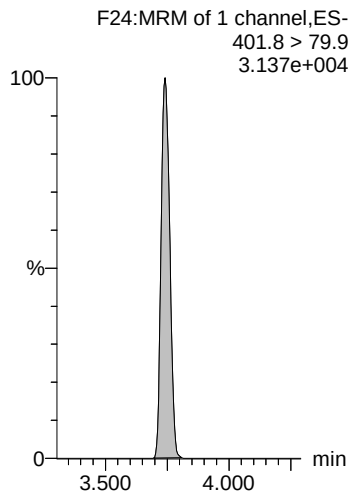

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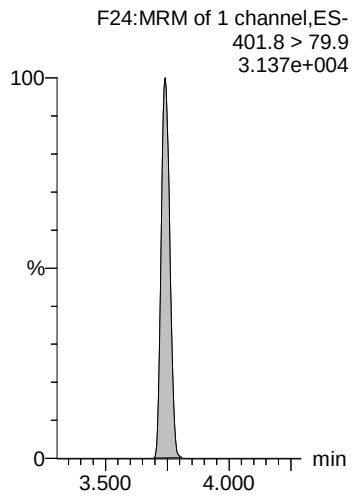


FBR 7/16/2019

Vista Analytical Laboratory L14

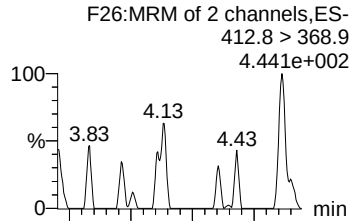
Review: AMR 7/16/2019

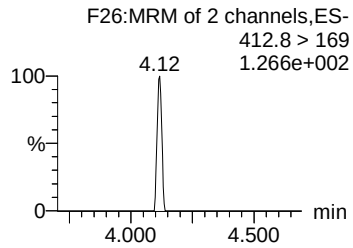
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

L-PFOA





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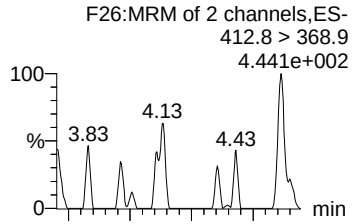

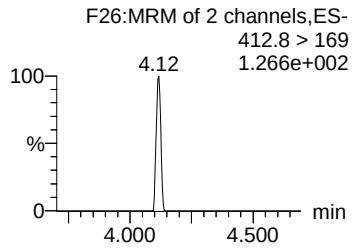

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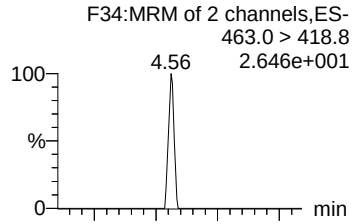
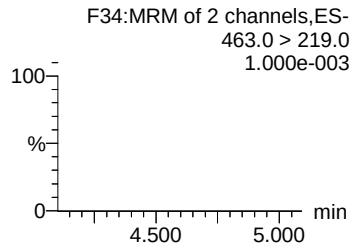
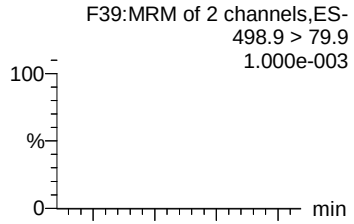
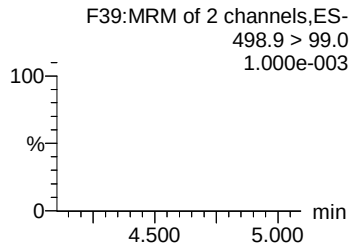


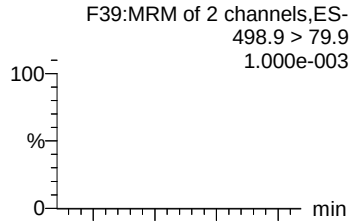


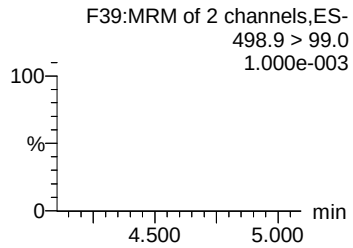
L-PFOS





Total PFOS





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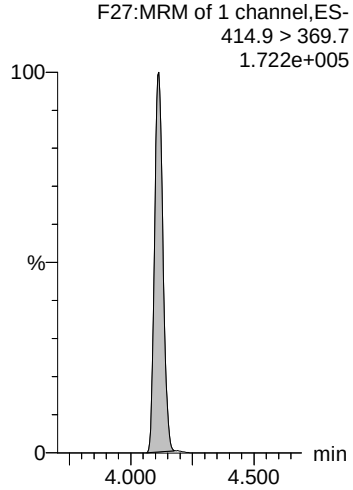

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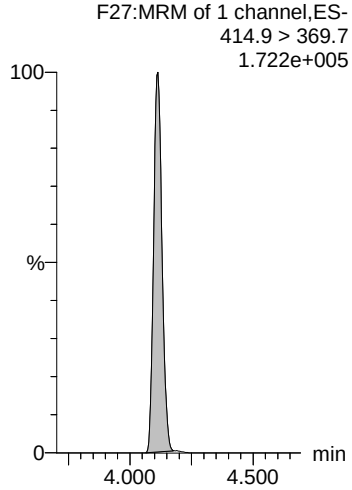
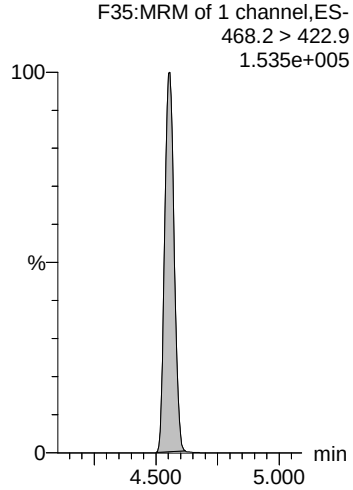
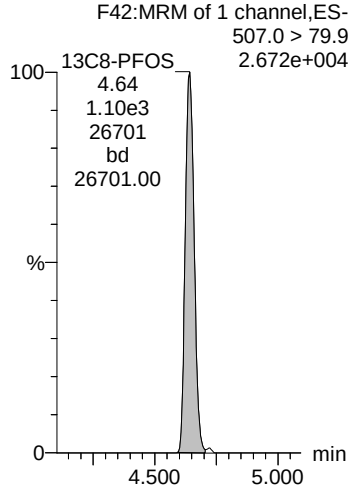


13C5-PFNA



13C8-PFOS



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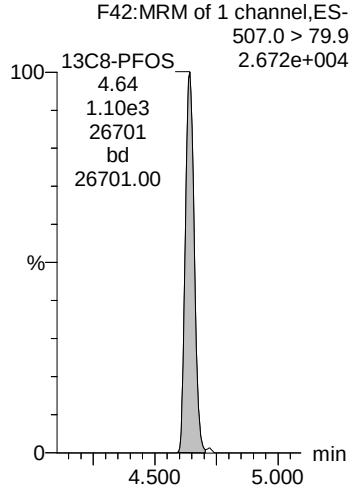


FBR 7/16/2019

Vista Analytical Laboratory L14

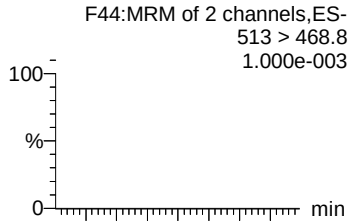
Review: AMR 7/16/2019

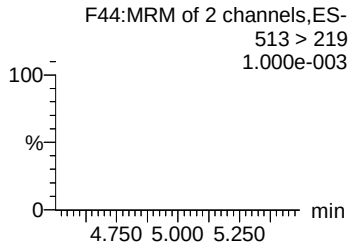
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

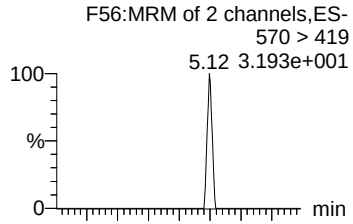
Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

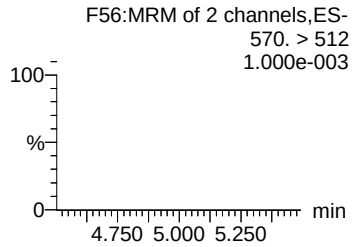
PFDA





L-MeFOSAA





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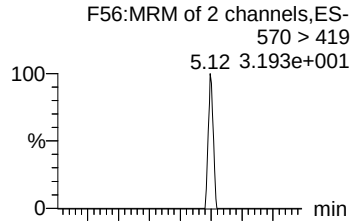

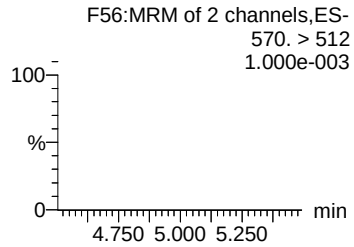

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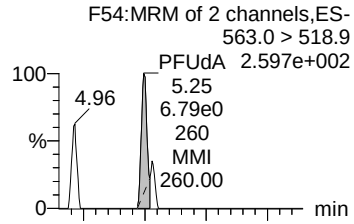
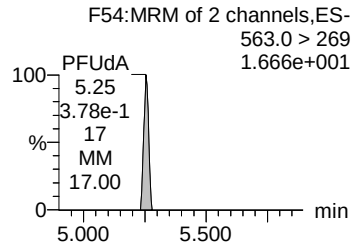
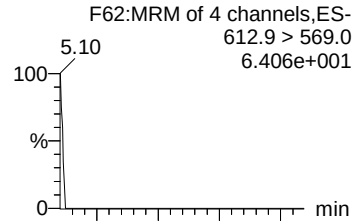
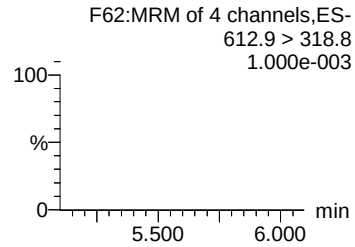




PFDoA





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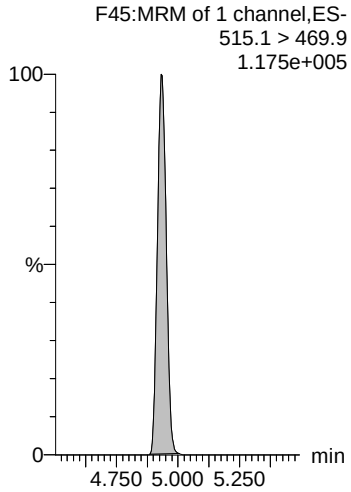
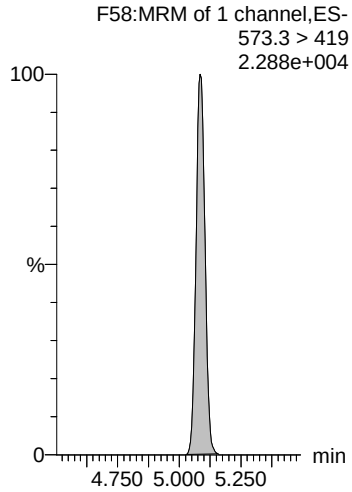


d3-N-MeFOSAA



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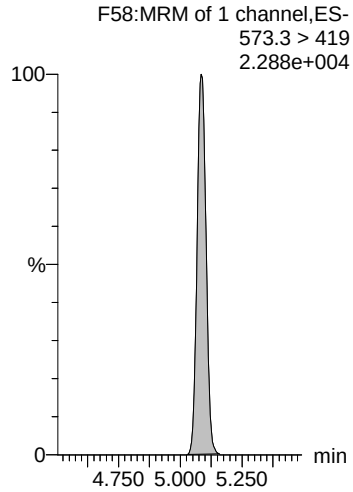

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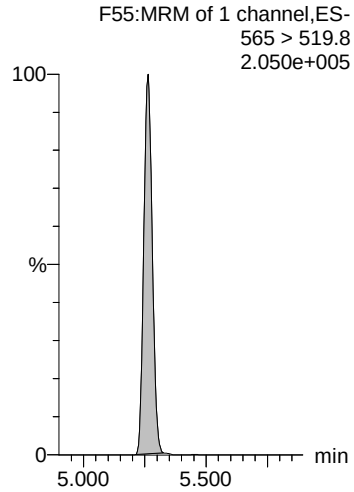

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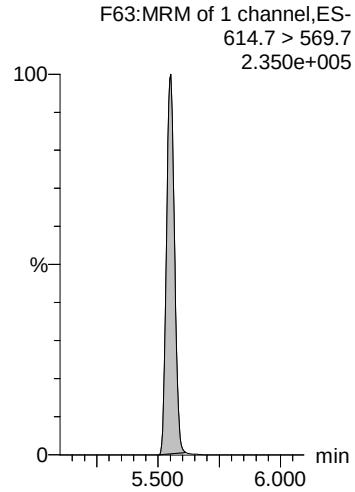


FBR 7/16/2019

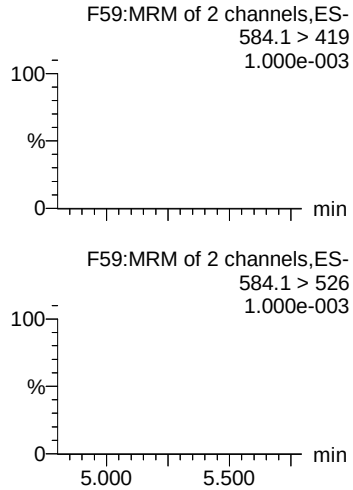
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

L-EtFOSAA



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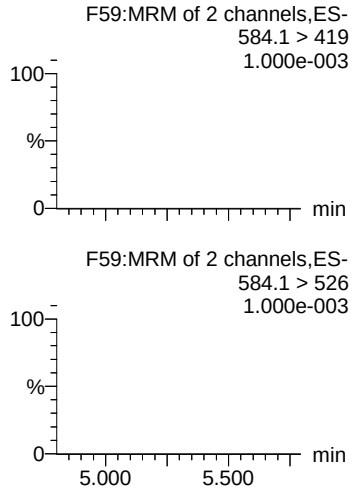

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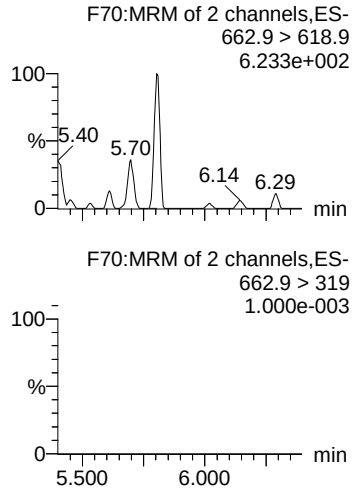

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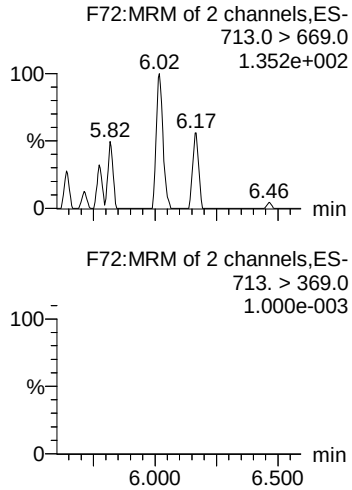

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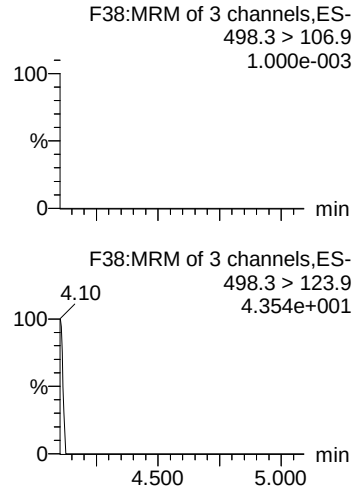

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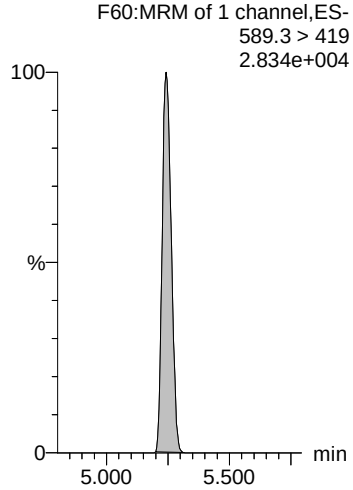

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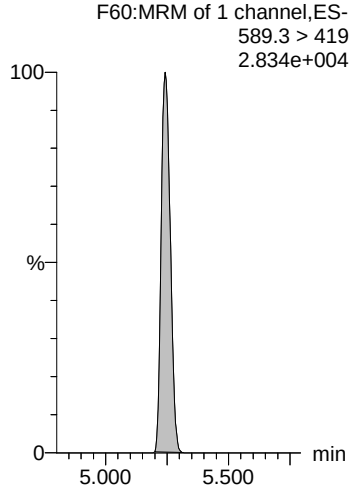

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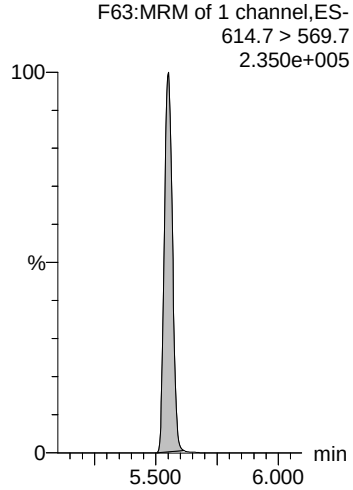

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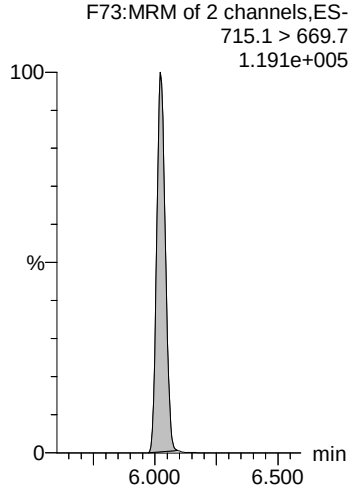

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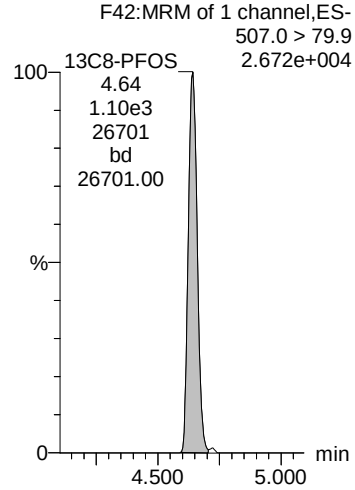


FBR 7/16/2019

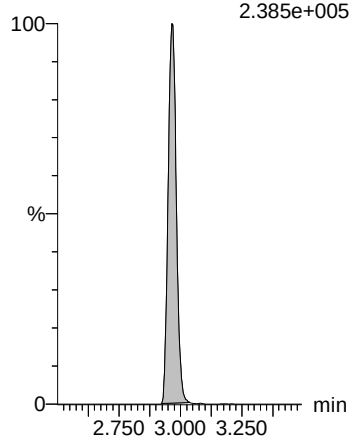
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-37.qld

Last Altered: Tuesday, July 16, 2019 10:40:29 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:42:17 Pacific Daylight Time

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

13C5-PFHxA



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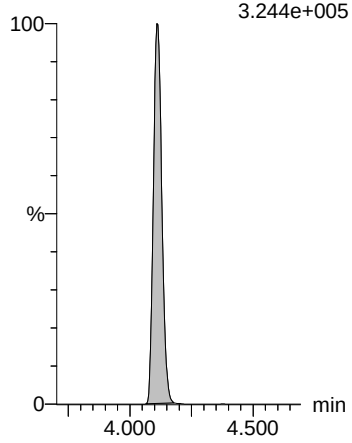
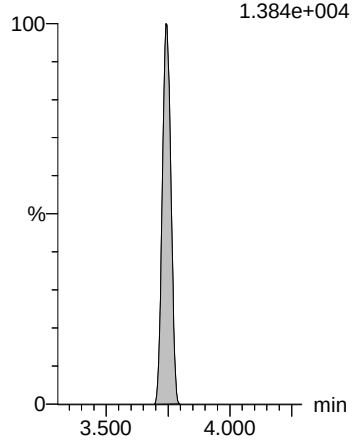
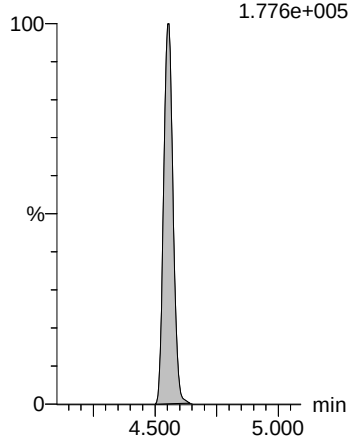


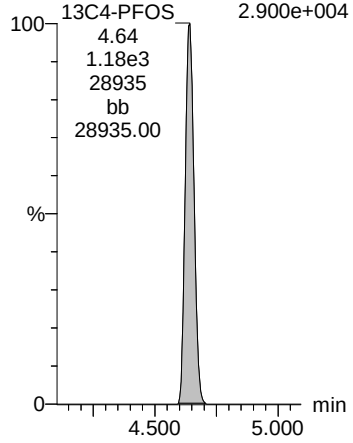
18O2-PFHxS



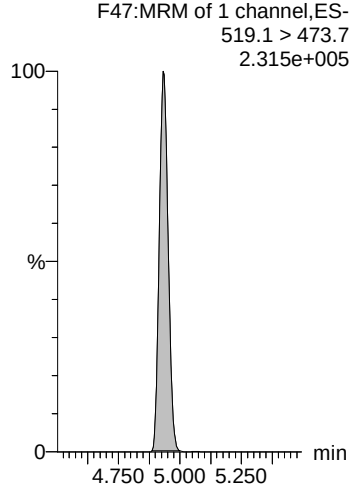
13C9-PFNA



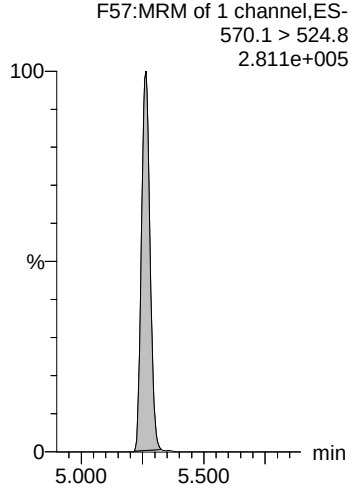
13C4-PFOS



13C6-PFDA



13C7-PFUdA



FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	5	PFBS	299.0 > 79.7	2.64e2	5.29e2	0.121		2.46	2.46	6.25	23.2630		3.047	NO
2	7	PFHxA	313.0 > 269.0	5.97e3	2.64e3	0.121		2.96	2.96	11.3	80.7009		13.190	NO
3	11	PFHpA	363.0 > 318.9	7.02e2	3.14e3	0.121		3.58	3.58	2.79	19.1085		5.869	NO
4	13	L-PFHxS	398.9 > 79.6	2.54e3	1.18e3	0.121		3.74	3.74	26.8	258.5302		2.003	NO
5	80	Total PFHxS	398.9 > 79.6	2.54e3	1.18e3	0.121		3.83		26.8	258.5302			
6	49	13C3-PFBS	302.0 > 98.8	5.29e2	5.39e2	0.121	1.035	2.46	2.46	12.3	98.3372	94.8		
7	52	13C2-PFHxA	315.0 > 270.0	2.64e3	8.33e3	0.121	0.792	2.96	2.96	3.97	41.5542	100.1		
8	53	13C4-PFHpA	367.2 > 321.8	3.14e3	8.33e3	0.121	0.391	3.58	3.58	4.72	100.1192	96.5		
9	54	13C3-PFHxS	401.8 > 79.9	1.18e3	5.39e2	0.121	2.547	3.74	3.74	27.4	89.4236	86.2		
10	54	13C3-PFHxS	401.8 > 79.9	1.18e3	5.39e2	0.121	2.547	3.74	3.74	27.4	89.4236	86.2		
11	-1													
12	16	L-PFOA	412.8 > 368.9	9.13e3	6.59e3	0.121		4.11	4.11	17.3	77.6162		3.116	NO
13	81	Total PFOA	412.8 > 368.9	9.13e3	6.59e3	0.121		4.21		17.3	77.6162			
14	21	PFNA	463.0 > 418.8	5.16e3	6.84e3	0.121		4.55	4.55	9.43	71.1770		3.212	NO
15	23	L-PFOS	498.9 > 79.9	2.55e3	1.25e3	0.121		4.64	4.64	25.5	168.0306		2.054	NO
16	82	Total PFOS	498.9 > 79.9	2.55e3	1.25e3	0.121		4.74		25.5	168.0306			
17	58	13C2-PFOA	414.9 > 369.7	6.59e3	1.15e4	0.121	0.564	4.11	4.11	7.17	105.4071	101.6		
18	58	13C2-PFOA	414.9 > 369.7	6.59e3	1.15e4	0.121	0.564	4.11	4.11	7.17	105.4071	101.6		
19	56	13C5-PFNA	468.2 > 422.9	6.84e3	7.51e3	0.121	0.983	4.56	4.55	11.4	96.1907	92.7		
20	59	13C8-PFOS	507.0 > 79.9	1.25e3	1.14e3	0.121	1.060	4.64	4.64	13.6	106.6099	102.8		
21	59	13C8-PFOS	507.0 > 79.9	1.25e3	1.14e3	0.121	1.060	4.64	4.64	13.6	106.6099	102.8		
22	-1													
23	26	PFDA	513 > 468.8	2.44e2	4.90e3	0.121		4.93	4.93	0.622	3.6605		4.248	NO
24	29	L-MeFOSAA	570 > 419		7.67e2	0.121		5.08						
25	83	Total N-MeFOSAA	570. > 419	0.00e0	7.67e2	0.121		5.19		0.000				
26	33	PFUdA	563.0 > 518.9	3.12e2	6.93e3	0.121		5.26	5.26	0.563	4.9029		7.210	NO
27	37	PFDoA	612.9 > 569.0		6.93e3	0.121		5.55						
28	60	13C2-PFDA	515.1 > 469.9	4.90e3	8.56e3	0.121	0.662	4.94	4.93	7.15	89.5546	86.3		
29	62	d3-N-MeFOSAA	573.3 > 419	7.67e2	1.01e4	0.121	0.129	5.09	5.08	0.953	61.3099	59.1		
30	62	d3-N-MeFOSAA	573.3 > 419	7.67e2	1.01e4	0.121	0.129	5.09	5.08	0.953	61.3099	59.1		
31	63	13C2-PFUdA	565 > 519.8	6.93e3	1.01e4	0.121	0.857	5.26	5.26	8.61	83.3720	80.4		
32	65	13C2-PFDoA	614.7 > 569.7	6.93e3	8.56e3	0.121	1.229	5.55	5.55	10.1	68.3153	65.9		
33	-1													
34	31	L-EtFOSAA	584.1 > 419		1.20e3	0.121		5.24						
35	84	Total N-EtFOSAA	584.1 > 419	0.00e0	1.20e3	0.121		5.33		0.000				
36	39	PFTrDA	662.9 > 618.9		6.93e3	0.121		5.80						

FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	41	PFTeDA	713.0 > 669.0		3.89e3	0.121		6.02						
38	85	TDCA	498.3>106.9			0.121		5.45						
39	64	d5-N-EtFOSAA	589.3 > 419	1.20e3	1.01e4	0.121	0.147	5.24	5.24	1.49	83.6151	80.6		
40	64	d5-N-EtFOSAA	589.3 > 419	1.20e3	1.01e4	0.121	0.147	5.24	5.24	1.49	83.6151	80.6		
41	65	13C2-PFDoA	614.7 > 569.7	6.93e3	8.56e3	0.121	1.229	5.55	5.55	10.1	68.3153	65.9		
42	67	13C2-PFTeDA	715.1 > 669.7	3.89e3	1.01e4	0.121	0.511	6.02	6.02	4.83	78.3374	75.5		
43	59	13C8-PFOS	507.0 > 79.9	1.25e3	1.14e3	0.121	1.060	4.64	4.64	13.6	106.6099	102.8		
44	-1													
45	73	13C5-PFHxA	318.0 > 272.9	8.33e3	8.33e3	0.121	1.000	2.96	2.96	12.5	103.7344	100.0		
46	75	13C8-PFOA	420.9 > 376.0	1.15e4	1.15e4	0.121	1.000	4.11	4.11	12.5	103.7344	100.0		
47	74	18O2-PFHxS	403.0 > 102.6	5.39e2	5.39e2	0.121	1.000	3.74	3.74	12.5	103.7344	100.0		
48	76	13C9-PFNA	472.2 > 426.9	7.51e3	7.51e3	0.121	1.000	4.55	4.55	12.5	103.7344	100.0		
49	77	13C4-PFOS	503 > 79.9	1.14e3	1.14e3	0.121	1.000	4.64	4.64	12.5	103.7344	100.0		
50	78	13C6-PFDA	519.1 > 473.7	8.56e3	8.56e3	0.121	1.000	4.93	4.93	12.5	103.7344	100.0		
51	79	13C7-PFUdA	570.1 > 524.8	1.01e4	1.01e4	0.121	1.000	5.26	5.26	12.5	103.7344	100.0		

FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

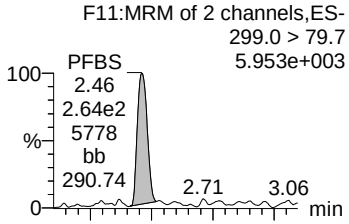
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

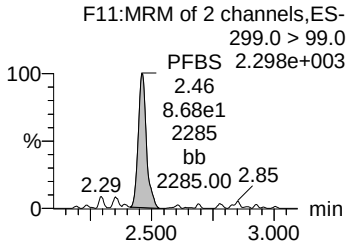
Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

Method: Z:\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: Z:\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

PFBS





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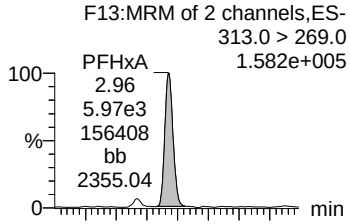

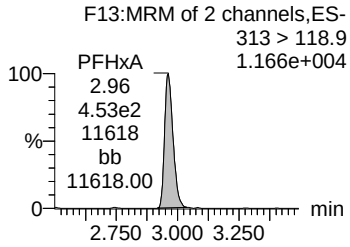

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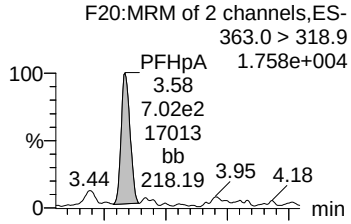

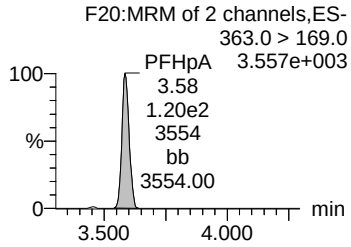

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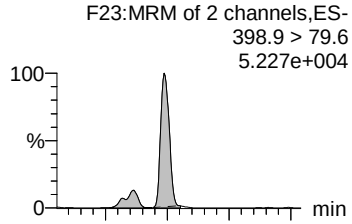

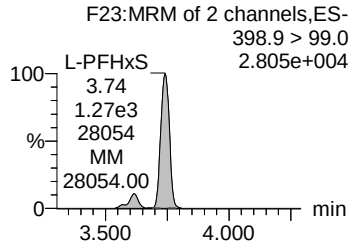

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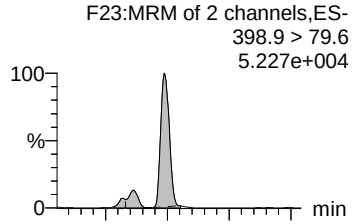
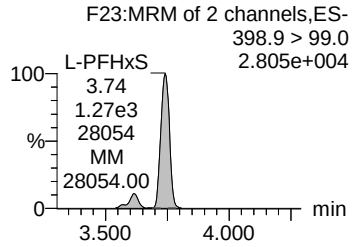
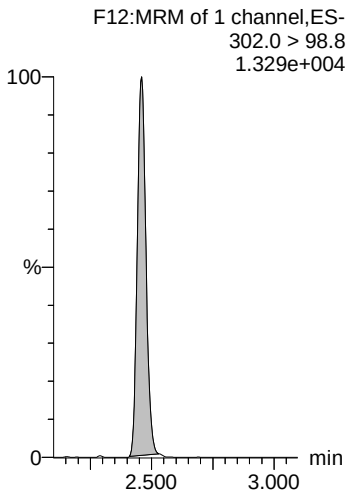




13C3-PFBS



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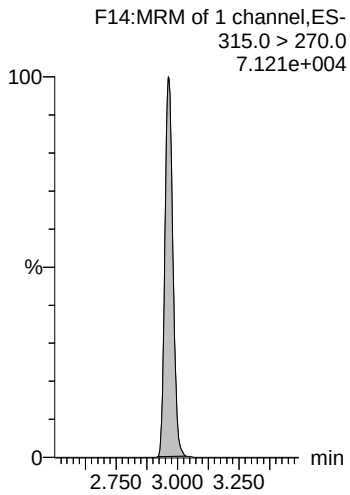

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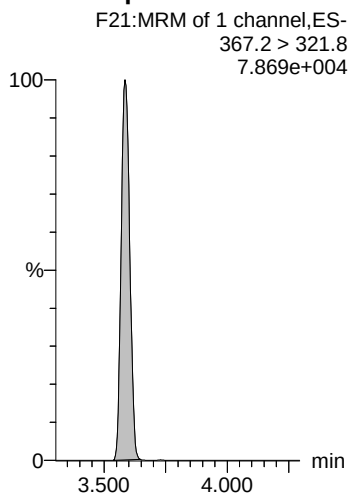

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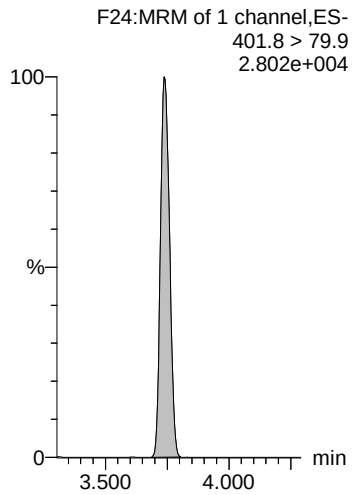

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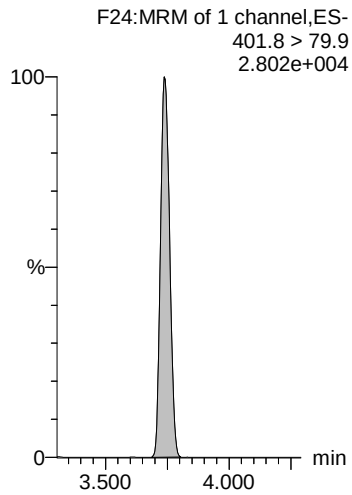

FBR 7/16/2019

Vista Analytical Laboratory L14

Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
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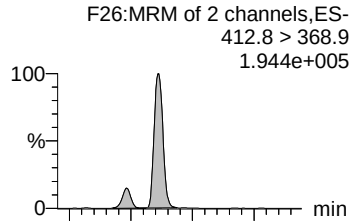
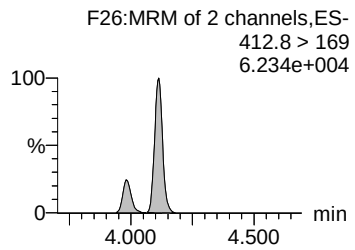
Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

L-PFOA





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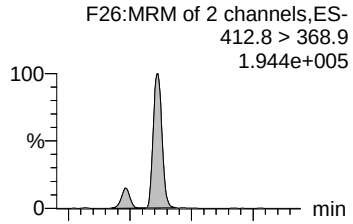

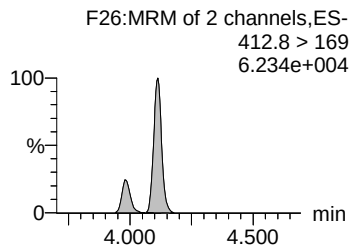

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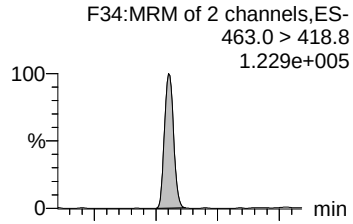
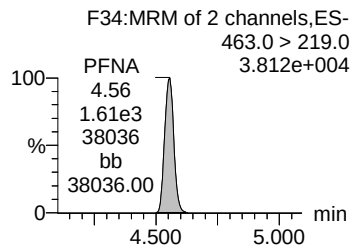
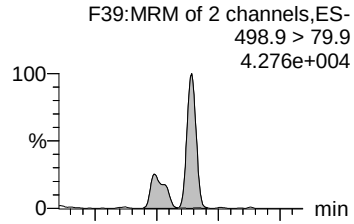
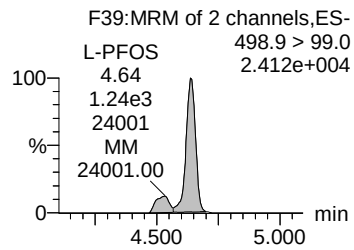




L-PFOS





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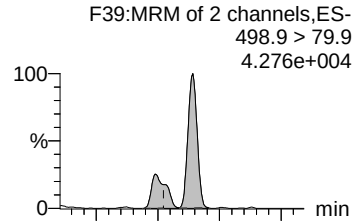

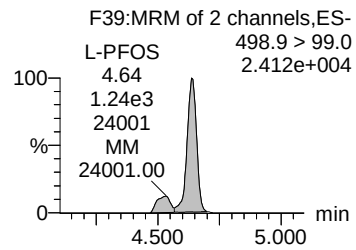

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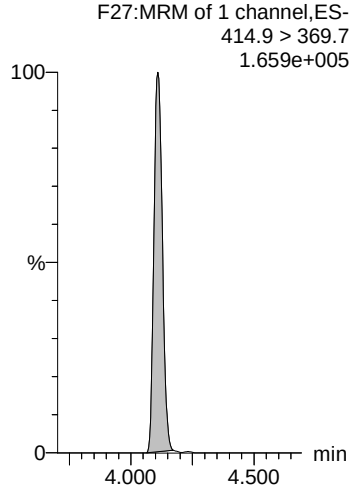
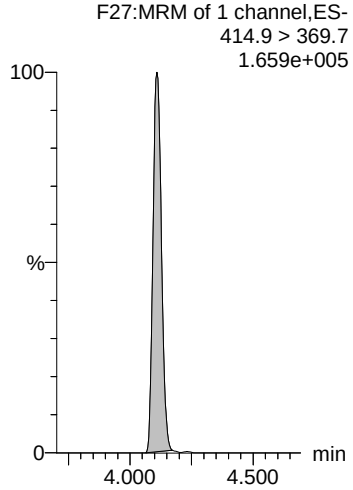
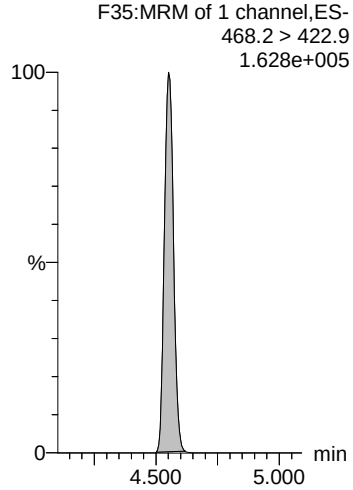


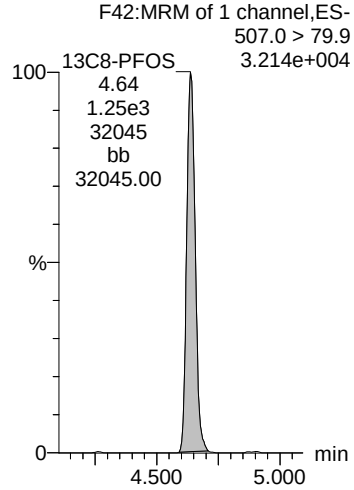
13C2-PFOA



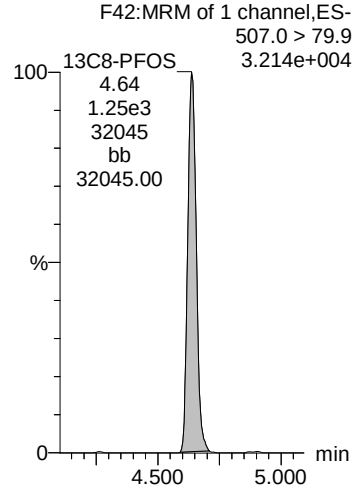
13C5-PFNA



13C8-PFOS



13C8-PFOS



FBR 7/16/2019

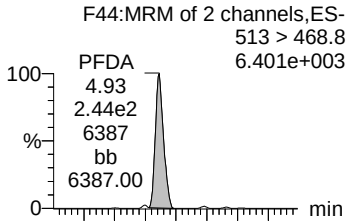
Review: AMR 7/16/2019

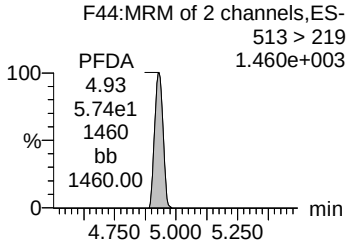
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

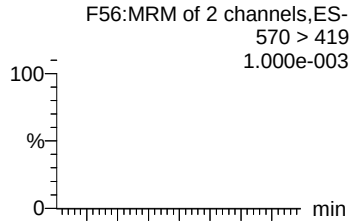
Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

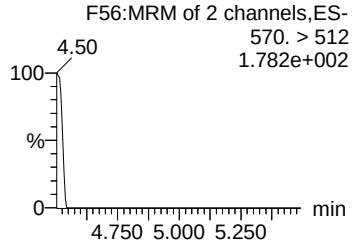
PFDA



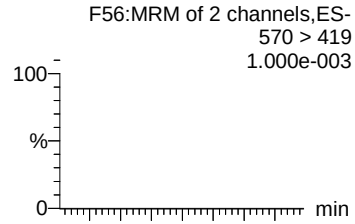


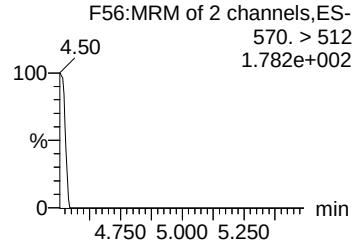
L-MeFOSAA



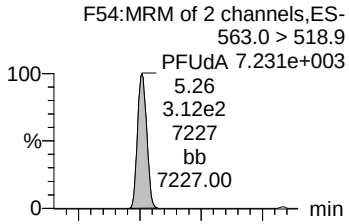


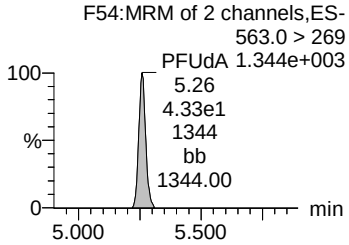
Total N-MeFOSAA



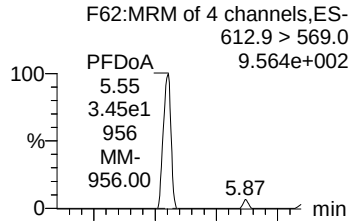


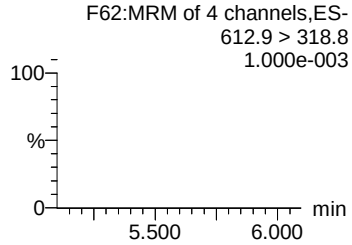
PFUdA



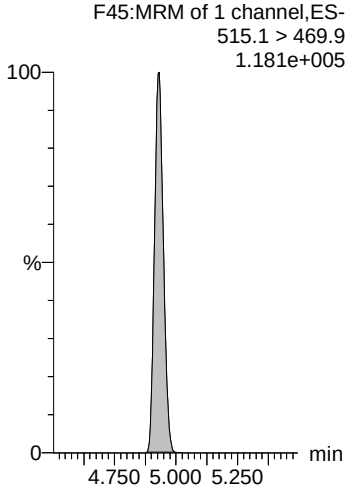


PFDoA

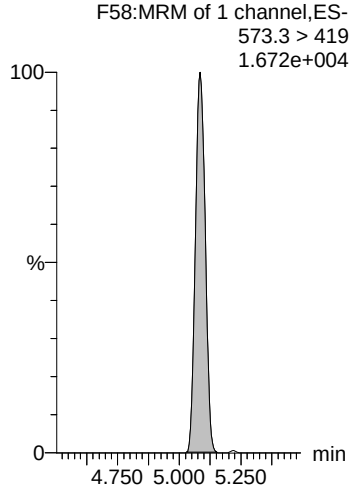




13C2-PFDA



d3-N-MeFOSAA



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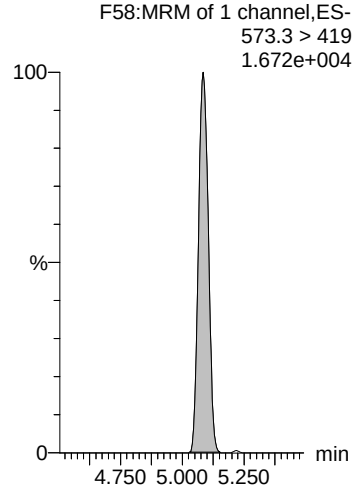
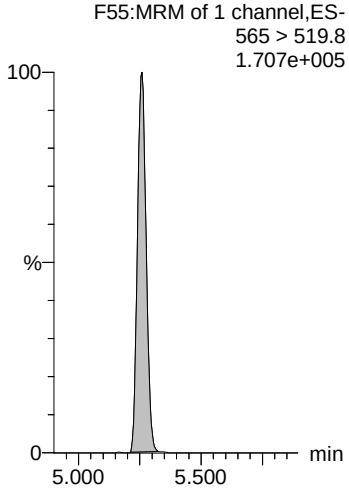
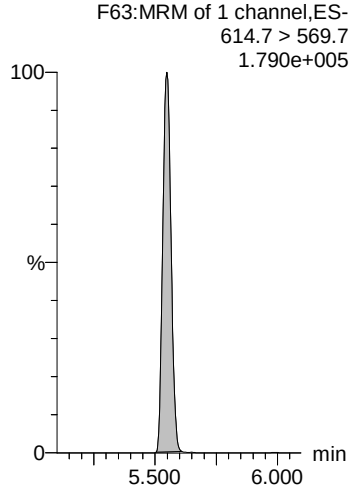


13C2-PFUdA



13C2-PFDoA



FBR 7/16/2019

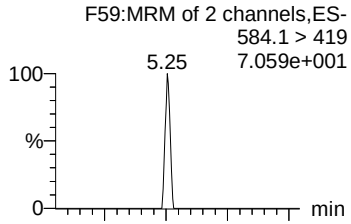
Review: AMR 7/16/2019

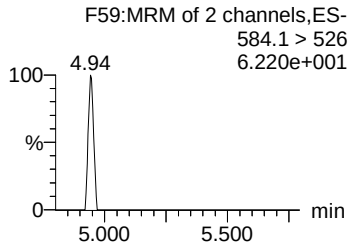
Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

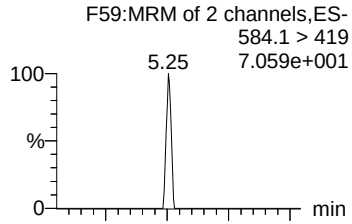
Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

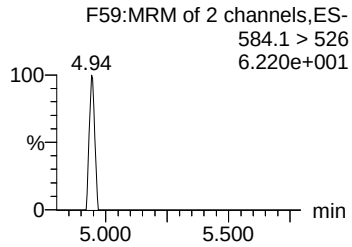
L-EtFOSAA



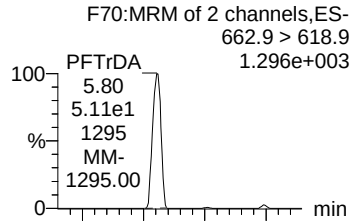


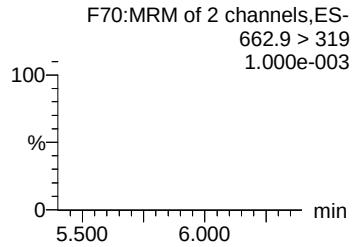
Total N-EtFOSAA



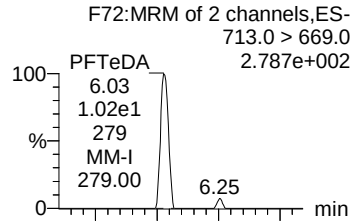


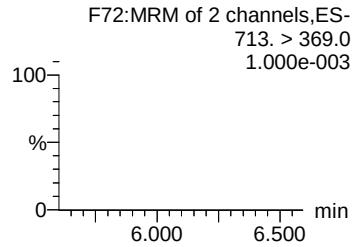
PFTrDA



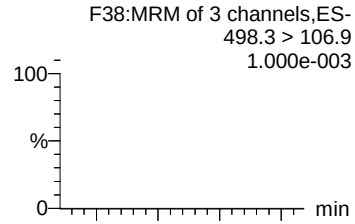


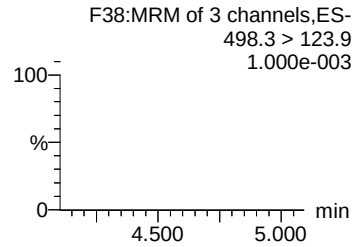
PFTeDA



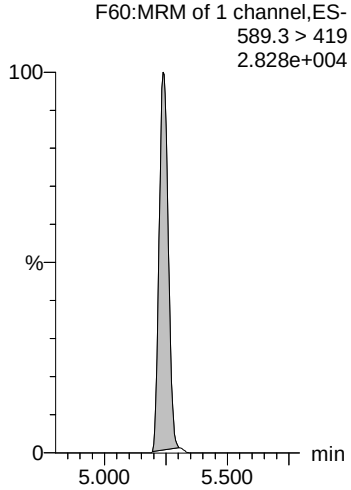


TDCA

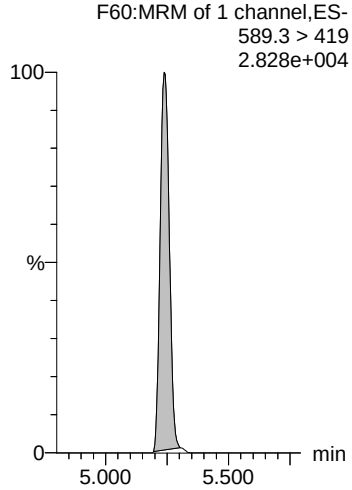




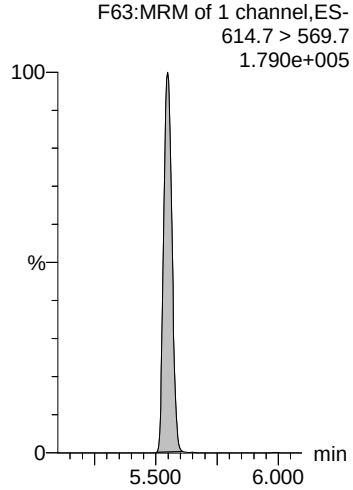
d5-N-EtFOSAA



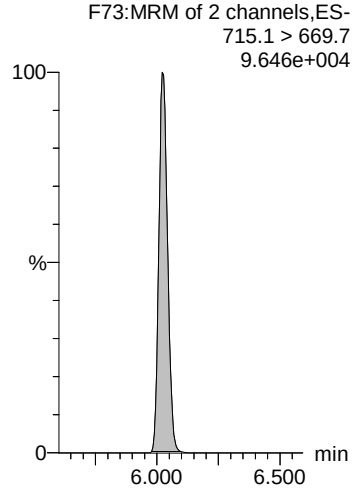
d5-N-EtFOSAA



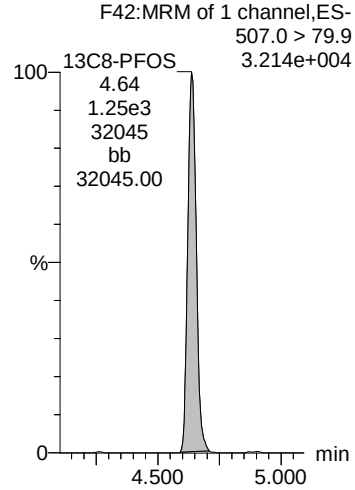
13C2-PFDoA



13C2-PFTeDA



13C8-PFOS



FBR 7/16/2019

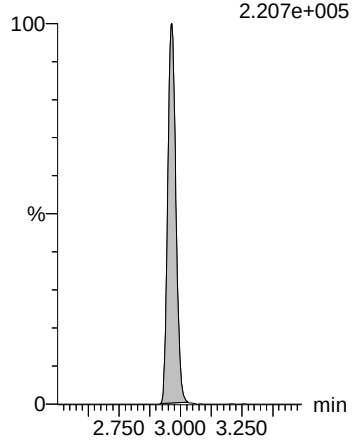
Review: AMR 7/16/2019

Dataset: Z:\PFAS.PRO\Results\190711M3\190711M3-38.qld

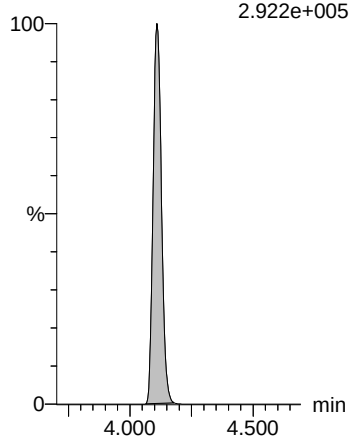
Last Altered: Tuesday, July 16, 2019 10:46:55 Pacific Daylight Time
Printed: Tuesday, July 16, 2019 10:49:20 Pacific Daylight Time

Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

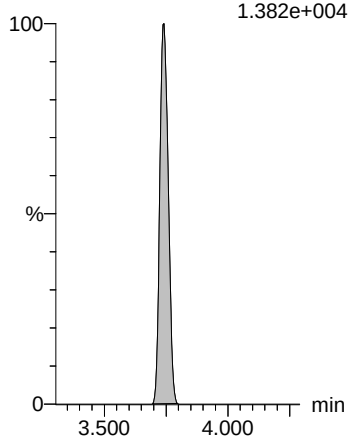
13C5-PFHxA



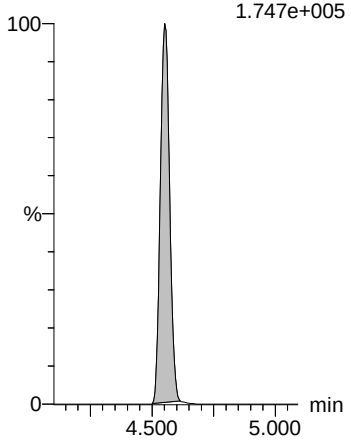
13C8-PFOA



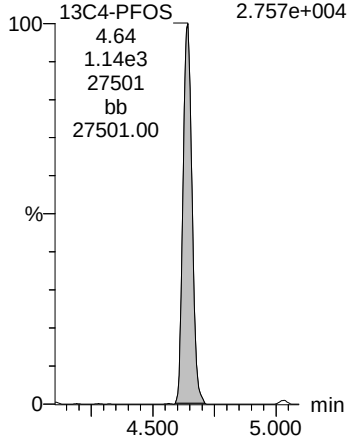
18O2-PFHxS



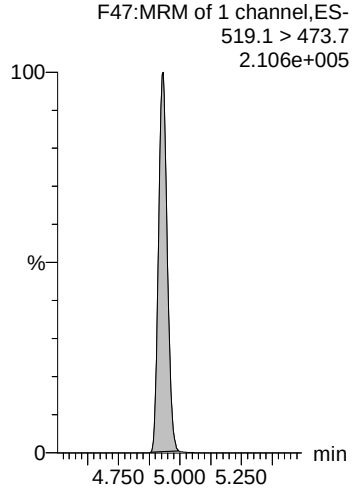
13C9-PFNA



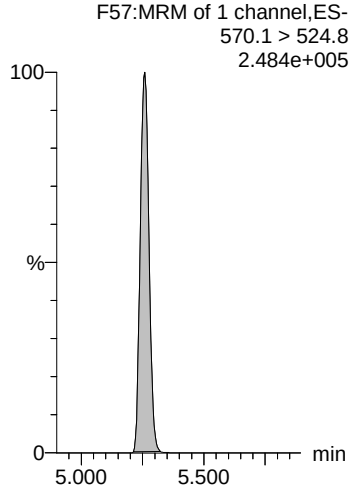
13C4-PFOS



13C6-PFDA



13C7-PFUdA



FBR 7/16/2019

INJECTION INTERNAL STANDARD (IIS) AREAS,

INSTRUMENT BLANKS (IB)

AND

CONTINUTING CALIBRATION VERIFICATIONS CCV)

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Friday, July 12, 2019 15:56:55 Pacific Daylight Time
Printed: Friday, July 12, 2019 15:56:58 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_RS-07-11-19.mdb 11 Jul 2019 15:12:17
Calibration: 12 Jul 2019 15:56:55

Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

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1	1	13C4-PFBA	ST190711M3-3 PFC CS0 19G1103	3.19e3	100.0	NO
2	2	13C5-PFHxA	ST190711M3-3 PFC CS0 19G1103	1.12e4	100.0	NO
3	3	18O2-PFHxS	ST190711M3-3 PFC CS0 19G1103	5.41e2	100.0	NO
4	4	13C8-PFOA	ST190711M3-3 PFC CS0 19G1103	1.48e4	100.0	NO
5	5	13C9-PFNA	ST190711M3-3 PFC CS0 19G1103	8.34e3	100.0	NO
6	6	13C4-PFOS	ST190711M3-3 PFC CS0 19G1103	1.44e3	100.0	NO
7	7	13C6-PFDA	ST190711M3-3 PFC CS0 19G1103	1.12e4	100.0	NO
8	8	13C7-PFUdA	ST190711M3-3 PFC CS0 19G1103	1.41e4	100.0	NO

Name: 190711M3_5, Date: 11-Jul-2019, Time: 22:09:33, ID: ST190711M3-4 PFC CS1 19G1104, Description: PFC CS1 19G1104

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-4 PFC CS1 19G1104	3.72e3	116.5	NO
2	2	13C5-PFHxA	ST190711M3-4 PFC CS1 19G1104	1.18e4	105.6	NO
3	3	18O2-PFHxS	ST190711M3-4 PFC CS1 19G1104	5.97e2	110.5	NO
4	4	13C8-PFOA	ST190711M3-4 PFC CS1 19G1104	1.55e4	105.0	NO
5	5	13C9-PFNA	ST190711M3-4 PFC CS1 19G1104	9.65e3	115.7	NO
6	6	13C4-PFOS	ST190711M3-4 PFC CS1 19G1104	1.57e3	108.5	NO
7	7	13C6-PFDA	ST190711M3-4 PFC CS1 19G1104	1.19e4	106.4	NO
8	8	13C7-PFUdA	ST190711M3-4 PFC CS1 19G1104	1.40e4	99.3	NO

Name: 190711M3_6, Date: 11-Jul-2019, Time: 22:20:12, ID: ST190711M3-5 PFC CS2 19G1105, Description: PFC CS2 19G1105

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-5 PFC CS2 19G1105	3.27e3	102.3	NO
2	2	13C5-PFHxA	ST190711M3-5 PFC CS2 19G1105	1.10e4	98.7	NO
3	3	18O2-PFHxS	ST190711M3-5 PFC CS2 19G1105	5.35e2	99.0	NO
4	4	13C8-PFOA	ST190711M3-5 PFC CS2 19G1105	1.41e4	95.7	NO
5	5	13C9-PFNA	ST190711M3-5 PFC CS2 19G1105	9.01e3	108.1	NO
6	6	13C4-PFOS	ST190711M3-5 PFC CS2 19G1105	1.41e3	98.0	NO
7	7	13C6-PFDA	ST190711M3-5 PFC CS2 19G1105	1.06e4	94.1	NO
8	8	13C7-PFUdA	ST190711M3-5 PFC CS2 19G1105	1.33e4	94.1	NO

Name: 190711M3_7, Date: 11-Jul-2019, Time: 22:30:45, ID: ST190711M3-6 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	ID	Area	%Rec	Area Out
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2	2	13C5-PFHxA	ST190711M3-6 PFC CS3 19G1106	1.06e4	94.7	NO
3	3	18O2-PFHxS	ST190711M3-6 PFC CS3 19G1106	5.77e2	106.8	NO
4	4	13C8-PFOA	ST190711M3-6 PFC CS3 19G1106	1.45e4	98.4	NO
5	5	13C9-PFNA	ST190711M3-6 PFC CS3 19G1106	8.64e3	103.6	NO
6	6	13C4-PFOS	ST190711M3-6 PFC CS3 19G1106	1.39e3	96.6	NO
7	7	13C6-PFDA	ST190711M3-6 PFC CS3 19G1106	1.04e4	92.7	NO
8	8	13C7-PFUdA	ST190711M3-6 PFC CS3 19G1106	1.27e4	90.2	NO

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Name: 190711M3_8, Date: 11-Jul-2019, Time: 22:41:23, ID: ST190711M3-7 PFC CS4 19G1107, Description: PFC CS4 19G1107

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-7 PFC CS4 19G1107	3.37e3	105.4	NO
2	2	13C5-PFHxA	ST190711M3-7 PFC CS4 19G1107	1.06e4	94.9	NO
3	3	18O2-PFHxS	ST190711M3-7 PFC CS4 19G1107	6.09e2	112.6	NO
4	4	13C8-PFOA	ST190711M3-7 PFC CS4 19G1107	1.37e4	92.8	NO
5	5	13C9-PFNA	ST190711M3-7 PFC CS4 19G1107	8.12e3	97.3	NO
6	6	13C4-PFOS	ST190711M3-7 PFC CS4 19G1107	1.47e3	101.9	NO
7	7	13C6-PFDA	ST190711M3-7 PFC CS4 19G1107	1.06e4	94.2	NO
8	8	13C7-PFUdA	ST190711M3-7 PFC CS4 19G1107	1.22e4	86.7	NO

Name: 190711M3_9, Date: 11-Jul-2019, Time: 22:51:57, ID: ST190711M3-8 PFC CS5 19G1108, Description: PFC CS5 19G1108

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-8 PFC CS5 19G1108	3.27e3	102.4	NO
2	2	13C5-PFHxA	ST190711M3-8 PFC CS5 19G1108	1.02e4	91.4	NO
3	3	18O2-PFHxS	ST190711M3-8 PFC CS5 19G1108	6.28e2	116.1	NO
4	4	13C8-PFOA	ST190711M3-8 PFC CS5 19G1108	1.26e4	85.4	NO
5	5	13C9-PFNA	ST190711M3-8 PFC CS5 19G1108	8.05e3	96.5	NO
6	6	13C4-PFOS	ST190711M3-8 PFC CS5 19G1108	1.25e3	86.6	NO
7	7	13C6-PFDA	ST190711M3-8 PFC CS5 19G1108	9.53e3	84.9	NO
8	8	13C7-PFUdA	ST190711M3-8 PFC CS5 19G1108	1.16e4	82.0	NO

Name: 190711M3_10, Date: 11-Jul-2019, Time: 23:02:37, ID: ST190711M3-9 PFC CS6 19G1109, Description: PFC CS6 19G1109

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-9 PFC CS6 19G1109	3.39e3	106.0	NO
2	2	13C5-PFHxA	ST190711M3-9 PFC CS6 19G1109	8.90e3	79.5	NO
3	3	18O2-PFHxS	ST190711M3-9 PFC CS6 19G1109	4.58e2	84.7	NO
4	4	13C8-PFOA	ST190711M3-9 PFC CS6 19G1109	1.06e4	71.6	NO
5	5	13C9-PFNA	ST190711M3-9 PFC CS6 19G1109	7.48e3	89.6	NO
6	6	13C4-PFOS	ST190711M3-9 PFC CS6 19G1109	1.16e3	80.2	NO
7	7	13C6-PFDA	ST190711M3-9 PFC CS6 19G1109	8.83e3	78.6	NO
8	8	13C7-PFUdA	ST190711M3-9 PFC CS6 19G1109	1.02e4	72.1	NO

Name: 190711M3_11, Date: 11-Jul-2019, Time: 23:13:13, ID: ST190711M3-10 PFC CS7 19G1110, Description: PFC CS7 19G1110

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-10 PFC CS7 19G1110	3.35e3	104.7	NO
2	2	13C5-PFHxA	ST190711M3-10 PFC CS7 19G1110	8.41e3	75.2	NO
3	3	18O2-PFHxS	ST190711M3-10 PFC CS7 19G1110	4.42e2	81.8	NO
4	4	13C8-PFOA	ST190711M3-10 PFC CS7 19G1110	9.42e3	63.8	NO
5	5	13C9-PFNA	ST190711M3-10 PFC CS7 19G1110	6.52e3	78.2	NO
6	6	13C4-PFOS	ST190711M3-10 PFC CS7 19G1110	1.09e3	75.3	NO
7	7	13C6-PFDA	ST190711M3-10 PFC CS7 19G1110	7.69e3	68.5	NO
8	8	13C7-PFUdA	ST190711M3-10 PFC CS7 19G1110	8.80e3	62.5	NO

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Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IB	3.39e3	106.2	NO
2	2	13C5-PFHxA	IB	1.12e4	99.9	NO
3	3	18O2-PFHxS	IB	6.46e2	119.4	NO
4	4	13C8-PFOA	IB	1.54e4	104.2	NO
5	5	13C9-PFNA	IB	9.15e3	109.7	NO
6	6	13C4-PFOS	IB	1.44e3	100.1	NO
7	7	13C6-PFDA	IB	1.13e4	100.7	NO
8	8	13C7-PFUdA	IB	1.39e4	98.5	NO

Name: 190711M3_13, Date: 11-Jul-2019, Time: 23:34:17, ID: ST190711M3-1 PFC ICV 19G1111, Description: PFC ICV 19G1111

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-1 PFC ICV 19G1111	3.42e3	107.0	NO
2	2	13C5-PFHxA	ST190711M3-1 PFC ICV 19G1111	1.07e4	95.5	NO
3	3	18O2-PFHxS	ST190711M3-1 PFC ICV 19G1111	6.15e2	113.8	NO
4	4	13C8-PFOA	ST190711M3-1 PFC ICV 19G1111	1.48e4	100.0	NO
5	5	13C9-PFNA	ST190711M3-1 PFC ICV 19G1111	9.07e3	108.7	NO
6	6	13C4-PFOS	ST190711M3-1 PFC ICV 19G1111	1.42e3	98.4	NO
7	7	13C6-PFDA	ST190711M3-1 PFC ICV 19G1111	1.12e4	100.0	NO
8	8	13C7-PFUdA	ST190711M3-1 PFC ICV 19G1111	1.30e4	92.5	NO

Name: 190711M3_14, Date: 11-Jul-2019, Time: 23:44:56, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_15, Date: 11-Jul-2019, Time: 23:55:34, ID: B9G0061-BS1 OPR 0.250, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0061-BS1 OPR 0.250	8.04e3	125.9	NO
2	2	13C5-PFHxA	B9G0061-BS1 OPR 0.250	1.45e4	64.9	NO
3	3	18O2-PFHxS	B9G0061-BS1 OPR 0.250	8.85e2	81.8	NO
4	4	13C8-PFOA	B9G0061-BS1 OPR 0.250	2.01e4	67.9	NO
5	5	13C9-PFNA	B9G0061-BS1 OPR 0.250	1.24e4	74.6	NO
6	6	13C4-PFOS	B9G0061-BS1 OPR 0.250	2.04e3	70.7	NO
7	7	13C6-PFDA	B9G0061-BS1 OPR 0.250	1.55e4	69.1	NO
8	8	13C7-PFUdA	B9G0061-BS1 OPR 0.250	1.87e4	66.4	NO

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Name: 190711M3_16, Date: 12-Jul-2019, Time: 00:06:07, ID: B9F0279-BS1 OPR 1, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9F0279-BS1 OPR 1	3.79e3	118.6	NO
2	2	13C5-PFHxA	B9F0279-BS1 OPR 1	7.08e3	63.3	NO
3	3	18O2-PFHxS	B9F0279-BS1 OPR 1	5.30e2	98.0	NO
4	4	13C8-PFOA	B9F0279-BS1 OPR 1	1.06e4	71.8	NO
5	5	13C9-PFNA	B9F0279-BS1 OPR 1	6.92e3	83.0	NO
6	6	13C4-PFOS	B9F0279-BS1 OPR 1	1.26e3	87.1	NO
7	7	13C6-PFDA	B9F0279-BS1 OPR 1	8.72e3	77.7	NO
8	8	13C7-PFUdA	B9F0279-BS1 OPR 1	1.04e4	73.9	NO

Name: 190711M3_17, Date: 12-Jul-2019, Time: 00:16:45, ID: B9F0279-BLK1 Method Blank 1, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9F0279-BLK1 Method Blank 1	3.68e3	115.1	NO
2	2	13C5-PFHxA	B9F0279-BLK1 Method Blank 1	7.23e3	64.6	NO
3	3	18O2-PFHxS	B9F0279-BLK1 Method Blank 1	4.49e2	83.1	NO
4	4	13C8-PFOA	B9F0279-BLK1 Method Blank 1	1.01e4	68.5	NO
5	5	13C9-PFNA	B9F0279-BLK1 Method Blank 1	6.97e3	83.6	NO
6	6	13C4-PFOS	B9F0279-BLK1 Method Blank 1	1.15e3	79.9	NO
7	7	13C6-PFDA	B9F0279-BLK1 Method Blank 1	8.48e3	75.5	NO
8	8	13C7-PFUdA	B9F0279-BLK1 Method Blank 1	1.08e4	76.8	NO

Name: 190711M3_18, Date: 12-Jul-2019, Time: 00:27:18, ID: 1901784-02RE1 FRB-1 0.24972, Description: FRB-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901784-02RE1 FRB-1 0.24972	2.89e3	90.6	NO
2	2	13C5-PFHxA	1901784-02RE1 FRB-1 0.24972	5.14e3	45.9	YES
3	3	18O2-PFHxS	1901784-02RE1 FRB-1 0.24972	4.13e2	76.3	NO
4	4	13C8-PFOA	1901784-02RE1 FRB-1 0.24972	7.27e3	49.2	YES
5	5	13C9-PFNA	1901784-02RE1 FRB-1 0.24972	4.31e3	51.6	NO
6	6	13C4-PFOS	1901784-02RE1 FRB-1 0.24972	1.08e3	74.5	NO
7	7	13C6-PFDA	1901784-02RE1 FRB-1 0.24972	5.65e3	50.3	NO
8	8	13C7-PFUdA	1901784-02RE1 FRB-1 0.24972	7.29e3	51.8	NO

Name: 190711M3_19, Date: 12-Jul-2019, Time: 00:37:57, ID: 1901683-03 Hagatna 1 3.93, Description: Hagatna 1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901683-03 Hagatna 1 3.93	4.57e3	143.0	NO
2	2	13C5-PFHxA	1901683-03 Hagatna 1 3.93	8.50e3	75.9	NO
3	3	18O2-PFHxS	1901683-03 Hagatna 1 3.93	5.36e2	99.2	NO
4	4	13C8-PFOA	1901683-03 Hagatna 1 3.93	1.26e4	85.0	NO
5	5	13C9-PFNA	1901683-03 Hagatna 1 3.93	7.36e3	88.2	NO
6	6	13C4-PFOS	1901683-03 Hagatna 1 3.93	1.33e3	92.4	NO
7	7	13C6-PFDA	1901683-03 Hagatna 1 3.93	8.45e3	75.2	NO
8	8	13C7-PFUdA	1901683-03 Hagatna 1 3.93	6.75e3	47.9	YES

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Name: 190711M3_20, Date: 12-Jul-2019, Time: 00:48:35, ID: 1901910-01 SW1906280950KME 0.24336, Description: SW1906280950KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901910-01 SW1906280950KME 0.243...	4.22e3	132.1	NO
2	2	13C5-PFHxA	1901910-01 SW1906280950KME 0.243...	7.72e3	69.0	NO
3	3	18O2-PFHxS	1901910-01 SW1906280950KME 0.243...	5.67e2	104.9	NO
4	4	13C8-PFOA	1901910-01 SW1906280950KME 0.243...	1.01e4	68.6	NO
5	5	13C9-PFNA	1901910-01 SW1906280950KME 0.243...	6.65e3	79.7	NO
6	6	13C4-PFOS	1901910-01 SW1906280950KME 0.243...	1.19e3	82.6	NO
7	7	13C6-PFDA	1901910-01 SW1906280950KME 0.243...	7.93e3	70.6	NO
8	8	13C7-PFUdA	1901910-01 SW1906280950KME 0.243...	9.29e3	66.0	NO

Name: 190711M3_21, Date: 12-Jul-2019, Time: 00:59:09, ID: 1901910-02 SW1906281025KME 0.24464, Description: SW1906281025KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901910-02 SW1906281025KME 0.244...	3.60e3	112.9	NO
2	2	13C5-PFHxA	1901910-02 SW1906281025KME 0.244...	6.46e3	57.8	NO
3	3	18O2-PFHxS	1901910-02 SW1906281025KME 0.244...	5.17e2	95.5	NO
4	4	13C8-PFOA	1901910-02 SW1906281025KME 0.244...	9.61e3	65.1	NO
5	5	13C9-PFNA	1901910-02 SW1906281025KME 0.244...	5.97e3	71.6	NO
6	6	13C4-PFOS	1901910-02 SW1906281025KME 0.244...	1.12e3	77.4	NO
7	7	13C6-PFDA	1901910-02 SW1906281025KME 0.244...	7.48e3	66.6	NO
8	8	13C7-PFUdA	1901910-02 SW1906281025KME 0.244...	8.58e3	60.9	NO

Name: 190711M3_22, Date: 12-Jul-2019, Time: 01:09:47, ID: 1901910-03 SW1906281035KME 0.24318, Description: SW1906281035KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901910-03 SW1906281035KME 0.243...	4.10e3	128.3	NO
2	2	13C5-PFHxA	1901910-03 SW1906281035KME 0.243...	7.57e3	67.7	NO
3	3	18O2-PFHxS	1901910-03 SW1906281035KME 0.243...	5.50e2	101.6	NO
4	4	13C8-PFOA	1901910-03 SW1906281035KME 0.243...	9.89e3	67.0	NO
5	5	13C9-PFNA	1901910-03 SW1906281035KME 0.243...	6.10e3	73.2	NO
6	6	13C4-PFOS	1901910-03 SW1906281035KME 0.243...	1.13e3	78.4	NO
7	7	13C6-PFDA	1901910-03 SW1906281035KME 0.243...	7.28e3	64.8	NO
8	8	13C7-PFUdA	1901910-03 SW1906281035KME 0.243...	8.72e3	61.9	NO

Name: 190711M3_23, Date: 12-Jul-2019, Time: 01:20:19, ID: 1901911-01 WMP1907010855JSJ 0.2509, Description: WMP1907010855JSJ

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901911-01 WMP1907010855JSJ 0.2509	3.34e3	104.6	NO
2	2	13C5-PFHxA	1901911-01 WMP1907010855JSJ 0.2509	5.99e3	53.6	NO
3	3	18O2-PFHxS	1901911-01 WMP1907010855JSJ 0.2509	4.69e2	86.7	NO
4	4	13C8-PFOA	1901911-01 WMP1907010855JSJ 0.2509	6.73e3	45.6	YES
5	5	13C9-PFNA	1901911-01 WMP1907010855JSJ 0.2509	4.99e3	59.9	NO
6	6	13C4-PFOS	1901911-01 WMP1907010855JSJ 0.2509	1.09e3	75.2	NO
7	7	13C6-PFDA	1901911-01 WMP1907010855JSJ 0.2509	6.48e3	57.7	NO
8	8	13C7-PFUdA	1901911-01 WMP1907010855JSJ 0.2509	7.52e3	53.4	NO

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Name: 190711M3_24, Date: 12-Jul-2019, Time: 01:30:58, ID: B9G0095-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0095-BS1 OPR 0.25	9.59e3	150.1	YES
2	2	13C5-PFHxA	B9G0095-BS1 OPR 0.25	1.69e4	75.5	NO
3	3	18O2-PFHxS	B9G0095-BS1 OPR 0.25	9.93e2	91.8	NO
4	4	13C8-PFOA	B9G0095-BS1 OPR 0.25	2.46e4	83.3	NO
5	5	13C9-PFNA	B9G0095-BS1 OPR 0.25	1.57e4	94.3	NO
6	6	13C4-PFOS	B9G0095-BS1 OPR 0.25	2.59e3	89.9	NO
7	7	13C6-PFDA	B9G0095-BS1 OPR 0.25	1.80e4	80.3	NO
8	8	13C7-PFUdA	B9G0095-BS1 OPR 0.25	2.28e4	81.0	NO

Name: 190711M3_25, Date: 12-Jul-2019, Time: 01:41:36, ID: B9G0095-BSD1 LCSD 0.25, Description: LCSD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0095-BSD1 LCSD 0.25	1.05e4	164.9	YES
2	2	13C5-PFHxA	B9G0095-BSD1 LCSD 0.25	1.87e4	83.6	NO
3	3	18O2-PFHxS	B9G0095-BSD1 LCSD 0.25	1.02e3	94.5	NO
4	4	13C8-PFOA	B9G0095-BSD1 LCSD 0.25	2.53e4	85.7	NO
5	5	13C9-PFNA	B9G0095-BSD1 LCSD 0.25	1.53e4	91.6	NO
6	6	13C4-PFOS	B9G0095-BSD1 LCSD 0.25	2.59e3	89.7	NO
7	7	13C6-PFDA	B9G0095-BSD1 LCSD 0.25	1.87e4	83.4	NO
8	8	13C7-PFUdA	B9G0095-BSD1 LCSD 0.25	2.30e4	81.6	NO

Name: 190711M3_26, Date: 12-Jul-2019, Time: 01:52:09, ID: B9G0095-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0095-BLK1 Method Blank 0.25	9.93e3	155.4	YES
2	2	13C5-PFHxA	B9G0095-BLK1 Method Blank 0.25	1.79e4	79.8	NO
3	3	18O2-PFHxS	B9G0095-BLK1 Method Blank 0.25	1.04e3	96.6	NO
4	4	13C8-PFOA	B9G0095-BLK1 Method Blank 0.25	2.53e4	85.5	NO
5	5	13C9-PFNA	B9G0095-BLK1 Method Blank 0.25	1.55e4	92.9	NO
6	6	13C4-PFOS	B9G0095-BLK1 Method Blank 0.25	2.55e3	88.5	NO
7	7	13C6-PFDA	B9G0095-BLK1 Method Blank 0.25	1.90e4	84.8	NO
8	8	13C7-PFUdA	B9G0095-BLK1 Method Blank 0.25	2.29e4	81.1	NO

Name: 190711M3_27, Date: 12-Jul-2019, Time: 02:02:47, ID: 1901759-01 HW-AF-01-01-420-062419 0.11818, Description: HW-AF-01-01-420-062419

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901759-01 HW-AF-01-01-420-062419 ...	8.08e3	126.5	NO
2	2	13C5-PFHxA	1901759-01 HW-AF-01-01-420-062419 ...	1.53e4	68.3	NO
3	3	18O2-PFHxS	1901759-01 HW-AF-01-01-420-062419 ...	9.46e2	87.4	NO
4	4	13C8-PFOA	1901759-01 HW-AF-01-01-420-062419 ...	2.23e4	75.6	NO
5	5	13C9-PFNA	1901759-01 HW-AF-01-01-420-062419 ...	1.27e4	76.1	NO
6	6	13C4-PFOS	1901759-01 HW-AF-01-01-420-062419 ...	2.26e3	78.4	NO
7	7	13C6-PFDA	1901759-01 HW-AF-01-01-420-062419 ...	1.60e4	71.3	NO
8	8	13C7-PFUdA	1901759-01 HW-AF-01-01-420-062419 ...	1.62e4	57.4	NO

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Name: 190711M3_28, Date: 12-Jul-2019, Time: 02:13:26, ID: 1901992-01 WIN1907081315GGA 0.24256, Description: WIN1907081315GGA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901992-01 WIN1907081315GGA 0.24...	1.05e4	165.0	YES
2	2	13C5-PFHxA	1901992-01 WIN1907081315GGA 0.24...	1.90e4	85.0	NO
3	3	18O2-PFHxS	1901992-01 WIN1907081315GGA 0.24...	1.08e3	99.7	NO
4	4	13C8-PFOA	1901992-01 WIN1907081315GGA 0.24...	2.70e4	91.6	NO
5	5	13C9-PFNA	1901992-01 WIN1907081315GGA 0.24...	1.63e4	98.0	NO
6	6	13C4-PFOS	1901992-01 WIN1907081315GGA 0.24...	2.44e3	84.4	NO
7	7	13C6-PFDA	1901992-01 WIN1907081315GGA 0.24...	2.01e4	89.5	NO
8	8	13C7-PFUdA	1901992-01 WIN1907081315GGA 0.24...	2.46e4	87.2	NO

Name: 190711M3_29, Date: 12-Jul-2019, Time: 02:23:58, ID: 1901992-02 WMP1907081305GGA 0.23352, Description: WMP1907081305GGA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901992-02 WMP1907081305GGA 0.2...	8.79e3	137.6	NO
2	2	13C5-PFHxA	1901992-02 WMP1907081305GGA 0.2...	1.60e4	71.4	NO
3	3	18O2-PFHxS	1901992-02 WMP1907081305GGA 0.2...	9.72e2	89.8	NO
4	4	13C8-PFOA	1901992-02 WMP1907081305GGA 0.2...	2.28e4	77.1	NO
5	5	13C9-PFNA	1901992-02 WMP1907081305GGA 0.2...	1.45e4	87.2	NO
6	6	13C4-PFOS	1901992-02 WMP1907081305GGA 0.2...	2.71e3	93.9	NO
7	7	13C6-PFDA	1901992-02 WMP1907081305GGA 0.2...	1.90e4	84.5	NO
8	8	13C7-PFUdA	1901992-02 WMP1907081305GGA 0.2...	2.17e4	77.0	NO

Name: 190711M3_30, Date: 12-Jul-2019, Time: 02:34:37, ID: 1901992-03 WEF1907081310GGA 0.24328, Description: WEF1907081310GGA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901992-03 WEF1907081310GGA 0.24...	8.61e3	134.8	NO
2	2	13C5-PFHxA	1901992-03 WEF1907081310GGA 0.24...	1.56e4	69.8	NO
3	3	18O2-PFHxS	1901992-03 WEF1907081310GGA 0.24...	1.02e3	94.2	NO
4	4	13C8-PFOA	1901992-03 WEF1907081310GGA 0.24...	2.29e4	77.4	NO
5	5	13C9-PFNA	1901992-03 WEF1907081310GGA 0.24...	1.40e4	83.7	NO
6	6	13C4-PFOS	1901992-03 WEF1907081310GGA 0.24...	2.34e3	80.9	NO
7	7	13C6-PFDA	1901992-03 WEF1907081310GGA 0.24...	1.67e4	74.3	NO
8	8	13C7-PFUdA	1901992-03 WEF1907081310GGA 0.24...	2.09e4	74.1	NO

Name: 190711M3_31, Date: 12-Jul-2019, Time: 02:45:10, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

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Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-11 PFC CS3 19G1106	3.26e3	102.1	NO
2	2	13C5-PFHxA	ST190711M3-11 PFC CS3 19G1106	1.07e4	95.5	NO
3	3	18O2-PFHxS	ST190711M3-11 PFC CS3 19G1106	5.26e2	97.3	NO
4	4	13C8-PFOA	ST190711M3-11 PFC CS3 19G1106	1.42e4	95.9	NO
5	5	13C9-PFNA	ST190711M3-11 PFC CS3 19G1106	8.50e3	101.9	NO
6	6	13C4-PFOS	ST190711M3-11 PFC CS3 19G1106	1.36e3	94.5	NO
7	7	13C6-PFDA	ST190711M3-11 PFC CS3 19G1106	1.08e4	96.4	NO
8	8	13C7-PFUdA	ST190711M3-11 PFC CS3 19G1106	1.28e4	90.8	NO

Name: 190711M3_33, Date: 12-Jul-2019, Time: 03:06:21, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_34, Date: 12-Jul-2019, Time: 03:16:59, ID: B9G0062-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0062-BS1 OPR 0.125	5.21e3	163.3	YES
2	2	13C5-PFHxA	B9G0062-BS1 OPR 0.125	9.48e3	84.8	NO
3	3	18O2-PFHxS	B9G0062-BS1 OPR 0.125	6.11e2	113.0	NO
4	4	13C8-PFOA	B9G0062-BS1 OPR 0.125	1.24e4	83.7	NO
5	5	13C9-PFNA	B9G0062-BS1 OPR 0.125	7.11e3	85.2	NO
6	6	13C4-PFOS	B9G0062-BS1 OPR 0.125	1.42e3	98.3	NO
7	7	13C6-PFDA	B9G0062-BS1 OPR 0.125	9.08e3	80.8	NO
8	8	13C7-PFUdA	B9G0062-BS1 OPR 0.125	1.13e4	80.3	NO

Name: 190711M3_35, Date: 12-Jul-2019, Time: 03:27:38, ID: B9G0062-BSD1 LCSD 0.125, Description: LCSD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0062-BSD1 LCSD 0.125	5.35e3	167.6	YES
2	2	13C5-PFHxA	B9G0062-BSD1 LCSD 0.125	9.46e3	84.6	NO
3	3	18O2-PFHxS	B9G0062-BSD1 LCSD 0.125	5.93e2	109.7	NO
4	4	13C8-PFOA	B9G0062-BSD1 LCSD 0.125	1.42e4	96.2	NO
5	5	13C9-PFNA	B9G0062-BSD1 LCSD 0.125	8.54e3	102.4	NO
6	6	13C4-PFOS	B9G0062-BSD1 LCSD 0.125	1.39e3	96.5	NO
7	7	13C6-PFDA	B9G0062-BSD1 LCSD 0.125	1.01e4	90.1	NO
8	8	13C7-PFUdA	B9G0062-BSD1 LCSD 0.125	1.26e4	89.2	NO

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Name: 190711M3_36, Date: 12-Jul-2019, Time: 03:38:11, ID: B9G0062-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0062-BLK1 Method Blank 0.125	5.44e3	170.5	YES
2	2	13C5-PFHxA	B9G0062-BLK1 Method Blank 0.125	9.67e3	86.5	NO
3	3	18O2-PFHxS	B9G0062-BLK1 Method Blank 0.125	5.72e2	105.8	NO
4	4	13C8-PFOA	B9G0062-BLK1 Method Blank 0.125	1.45e4	98.2	NO
5	5	13C9-PFNA	B9G0062-BLK1 Method Blank 0.125	8.35e3	100.1	NO
6	6	13C4-PFOS	B9G0062-BLK1 Method Blank 0.125	1.38e3	95.8	NO
7	7	13C6-PFDA	B9G0062-BLK1 Method Blank 0.125	1.03e4	91.4	NO
8	8	13C7-PFUdA	B9G0062-BLK1 Method Blank 0.125	1.23e4	87.6	NO

Name: 190711M3_37, Date: 12-Jul-2019, Time: 03:48:49, ID: 1901922-01 FRB-07022019 0.10709, Description: FRB-07022019

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901922-01 FRB-07022019 0.10709	4.53e3	142.0	NO
2	2	13C5-PFHxA	1901922-01 FRB-07022019 0.10709	9.02e3	80.6	NO
3	3	18O2-PFHxS	1901922-01 FRB-07022019 0.10709	5.51e2	102.0	NO
4	4	13C8-PFOA	1901922-01 FRB-07022019 0.10709	1.29e4	87.3	NO
5	5	13C9-PFNA	1901922-01 FRB-07022019 0.10709	7.74e3	92.8	NO
6	6	13C4-PFOS	1901922-01 FRB-07022019 0.10709	1.18e3	81.5	NO
7	7	13C6-PFDA	1901922-01 FRB-07022019 0.10709	9.58e3	85.3	NO
8	8	13C7-PFUdA	1901922-01 FRB-07022019 0.10709	1.12e4	79.2	NO

Name: 190711M3_38, Date: 12-Jul-2019, Time: 03:59:23, ID: 1901922-02 CAOA-B02-GW 0.1205, Description: CAOA-B02-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901922-02 CAOA-B02-GW 0.1205	4.26e3	133.3	NO
2	2	13C5-PFHxA	1901922-02 CAOA-B02-GW 0.1205	8.33e3	74.4	NO
3	3	18O2-PFHxS	1901922-02 CAOA-B02-GW 0.1205	5.39e2	99.7	NO
4	4	13C8-PFOA	1901922-02 CAOA-B02-GW 0.1205	1.15e4	77.8	NO
5	5	13C9-PFNA	1901922-02 CAOA-B02-GW 0.1205	7.51e3	90.1	NO
6	6	13C4-PFOS	1901922-02 CAOA-B02-GW 0.1205	1.14e3	79.3	NO
7	7	13C6-PFDA	1901922-02 CAOA-B02-GW 0.1205	8.56e3	76.2	NO
8	8	13C7-PFUdA	1901922-02 CAOA-B02-GW 0.1205	1.01e4	71.4	NO

Name: 190711M3_39, Date: 12-Jul-2019, Time: 04:10:01, ID: 1901920-02 SAOA-B08-GW 0.13318, Description: SAOA-B08-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-02 SAOA-B08-GW 0.13318	3.61e3	113.1	NO
2	2	13C5-PFHxA	1901920-02 SAOA-B08-GW 0.13318	6.63e3	59.2	NO
3	3	18O2-PFHxS	1901920-02 SAOA-B08-GW 0.13318	5.08e2	93.9	NO
4	4	13C8-PFOA	1901920-02 SAOA-B08-GW 0.13318	9.30e3	63.0	NO
5	5	13C9-PFNA	1901920-02 SAOA-B08-GW 0.13318	6.00e3	71.9	NO
6	6	13C4-PFOS	1901920-02 SAOA-B08-GW 0.13318	9.76e2	67.6	NO
7	7	13C6-PFDA	1901920-02 SAOA-B08-GW 0.13318	7.57e3	67.4	NO
8	8	13C7-PFUdA	1901920-02 SAOA-B08-GW 0.13318	9.39e3	66.6	NO

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Name: 190711M3_40, Date: 12-Jul-2019, Time: 04:20:34, ID: 1901920-03 EB-06272019-GW 0.11429, Description: EB-06272019-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-03 EB-06272019-GW 0.11429	4.68e3	146.5	NO
2	2	13C5-PFHxA	1901920-03 EB-06272019-GW 0.11429	8.48e3	75.8	NO
3	3	18O2-PFHxS	1901920-03 EB-06272019-GW 0.11429	5.44e2	100.6	NO
4	4	13C8-PFOA	1901920-03 EB-06272019-GW 0.11429	1.28e4	86.5	NO
5	5	13C9-PFNA	1901920-03 EB-06272019-GW 0.11429	8.42e3	100.9	NO
6	6	13C4-PFOS	1901920-03 EB-06272019-GW 0.11429	1.34e3	93.1	NO
7	7	13C6-PFDA	1901920-03 EB-06272019-GW 0.11429	9.41e3	83.8	NO
8	8	13C7-PFUdA	1901920-03 EB-06272019-GW 0.11429	1.22e4	86.7	NO

Name: 190711M3_41, Date: 12-Jul-2019, Time: 04:31:13, ID: 1901920-04 FRB-06282019 0.11576, Description: FRB-06282019

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-04 FRB-06282019 0.11576	5.21e3	163.2	YES
2	2	13C5-PFHxA	1901920-04 FRB-06282019 0.11576	9.33e3	83.4	NO
3	3	18O2-PFHxS	1901920-04 FRB-06282019 0.11576	5.69e2	105.2	NO
4	4	13C8-PFOA	1901920-04 FRB-06282019 0.11576	1.31e4	88.4	NO
5	5	13C9-PFNA	1901920-04 FRB-06282019 0.11576	7.85e3	94.1	NO
6	6	13C4-PFOS	1901920-04 FRB-06282019 0.11576	1.32e3	91.6	NO
7	7	13C6-PFDA	1901920-04 FRB-06282019 0.11576	9.53e3	84.9	NO
8	8	13C7-PFUdA	1901920-04 FRB-06282019 0.11576	1.17e4	83.3	NO

Name: 190711M3_42, Date: 12-Jul-2019, Time: 04:41:51, ID: 1901920-05 SAOA-B12-GW 0.12204, Description: SAOA-B12-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-05 SAOA-B12-GW 0.12204	3.93e3	123.1	NO
2	2	13C5-PFHxA	1901920-05 SAOA-B12-GW 0.12204	7.04e3	62.9	NO
3	3	18O2-PFHxS	1901920-05 SAOA-B12-GW 0.12204	4.90e2	90.7	NO
4	4	13C8-PFOA	1901920-05 SAOA-B12-GW 0.12204	9.84e3	66.6	NO
5	5	13C9-PFNA	1901920-05 SAOA-B12-GW 0.12204	6.43e3	77.1	NO
6	6	13C4-PFOS	1901920-05 SAOA-B12-GW 0.12204	1.32e3	91.5	NO
7	7	13C6-PFDA	1901920-05 SAOA-B12-GW 0.12204	8.26e3	73.6	NO
8	8	13C7-PFUdA	1901920-05 SAOA-B12-GW 0.12204	1.04e4	73.5	NO

Name: 190711M3_43, Date: 12-Jul-2019, Time: 04:52:24, ID: 1901920-06 SAOA-B12-GW-D 0.12639, Description: SAOA-B12-GW-D

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-06 SAOA-B12-GW-D 0.12639	3.36e3	105.1	NO
2	2	13C5-PFHxA	1901920-06 SAOA-B12-GW-D 0.12639	6.30e3	56.3	NO
3	3	18O2-PFHxS	1901920-06 SAOA-B12-GW-D 0.12639	5.40e2	99.9	NO
4	4	13C8-PFOA	1901920-06 SAOA-B12-GW-D 0.12639	9.25e3	62.6	NO
5	5	13C9-PFNA	1901920-06 SAOA-B12-GW-D 0.12639	6.01e3	72.0	NO
6	6	13C4-PFOS	1901920-06 SAOA-B12-GW-D 0.12639	1.10e3	76.5	NO
7	7	13C6-PFDA	1901920-06 SAOA-B12-GW-D 0.12639	7.55e3	67.2	NO
8	8	13C7-PFUdA	1901920-06 SAOA-B12-GW-D 0.12639	9.76e3	69.3	NO

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Name: 190711M3_44, Date: 12-Jul-2019, Time: 05:03:03, ID: 1901920-11 NAOA-B02-GW 0.122, Description: NAOA-B02-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-11 NAOA-B02-GW 0.122	4.54e3	142.3	NO
2	2	13C5-PFHxA	1901920-11 NAOA-B02-GW 0.122	8.60e3	76.8	NO
3	3	18O2-PFHxS	1901920-11 NAOA-B02-GW 0.122	5.59e2	103.3	NO
4	4	13C8-PFOA	1901920-11 NAOA-B02-GW 0.122	1.18e4	79.7	NO
5	5	13C9-PFNA	1901920-11 NAOA-B02-GW 0.122	7.50e3	89.9	NO
6	6	13C4-PFOS	1901920-11 NAOA-B02-GW 0.122	1.22e3	84.5	NO
7	7	13C6-PFDA	1901920-11 NAOA-B02-GW 0.122	9.46e3	84.2	NO
8	8	13C7-PFUdA	1901920-11 NAOA-B02-GW 0.122	1.13e4	80.2	NO

Name: 190711M3_45, Date: 12-Jul-2019, Time: 05:13:36, ID: 1901920-12 EB-07012019 0.11155, Description: EB-07012019

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-12 EB-07012019 0.11155	4.84e3	151.7	YES
2	2	13C5-PFHxA	1901920-12 EB-07012019 0.11155	9.27e3	82.8	NO
3	3	18O2-PFHxS	1901920-12 EB-07012019 0.11155	5.50e2	101.8	NO
4	4	13C8-PFOA	1901920-12 EB-07012019 0.11155	1.29e4	87.3	NO
5	5	13C9-PFNA	1901920-12 EB-07012019 0.11155	8.00e3	96.0	NO
6	6	13C4-PFOS	1901920-12 EB-07012019 0.11155	1.35e3	93.5	NO
7	7	13C6-PFDA	1901920-12 EB-07012019 0.11155	1.04e4	92.4	NO
8	8	13C7-PFUdA	1901920-12 EB-07012019 0.11155	1.26e4	89.6	NO

Name: 190711M3_46, Date: 12-Jul-2019, Time: 05:24:14, ID: 1901920-14 FRB-07012019 0.11643, Description: FRB-07012019

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-14 FRB-07012019 0.11643	4.96e3	155.3	YES
2	2	13C5-PFHxA	1901920-14 FRB-07012019 0.11643	8.93e3	79.8	NO
3	3	18O2-PFHxS	1901920-14 FRB-07012019 0.11643	4.81e2	89.0	NO
4	4	13C8-PFOA	1901920-14 FRB-07012019 0.11643	1.19e4	80.3	NO
5	5	13C9-PFNA	1901920-14 FRB-07012019 0.11643	7.27e3	87.2	NO
6	6	13C4-PFOS	1901920-14 FRB-07012019 0.11643	1.07e3	74.2	NO
7	7	13C6-PFDA	1901920-14 FRB-07012019 0.11643	8.55e3	76.2	NO
8	8	13C7-PFUdA	1901920-14 FRB-07012019 0.11643	1.05e4	74.9	NO

Name: 190711M3_47, Date: 12-Jul-2019, Time: 05:34:46, ID: 1901920-16 NAOA-B01-GW 0.1294, Description: NAOA-B01-GW

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-16 NAOA-B01-GW 0.1294	4.36e3	136.6	NO
2	2	13C5-PFHxA	1901920-16 NAOA-B01-GW 0.1294	8.41e3	75.1	NO
3	3	18O2-PFHxS	1901920-16 NAOA-B01-GW 0.1294	5.31e2	98.2	NO
4	4	13C8-PFOA	1901920-16 NAOA-B01-GW 0.1294	1.24e4	83.8	NO
5	5	13C9-PFNA	1901920-16 NAOA-B01-GW 0.1294	7.63e3	91.5	NO
6	6	13C4-PFOS	1901920-16 NAOA-B01-GW 0.1294	1.16e3	80.1	NO
7	7	13C6-PFDA	1901920-16 NAOA-B01-GW 0.1294	9.00e3	80.1	NO
8	8	13C7-PFUdA	1901920-16 NAOA-B01-GW 0.1294	1.11e4	79.1	NO

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Name: 190711M3_48, Date: 12-Jul-2019, Time: 05:45:25, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-12 PFC CS3 19G1106	3.35e3	104.8	NO
2	2	13C5-PFHxA	ST190711M3-12 PFC CS3 19G1106	1.08e4	96.3	NO
3	3	18O2-PFHxS	ST190711M3-12 PFC CS3 19G1106	5.66e2	104.6	NO
4	4	13C8-PFOA	ST190711M3-12 PFC CS3 19G1106	1.41e4	95.6	NO
5	5	13C9-PFNA	ST190711M3-12 PFC CS3 19G1106	9.26e3	111.0	NO
6	6	13C4-PFOS	ST190711M3-12 PFC CS3 19G1106	1.56e3	107.9	NO
7	7	13C6-PFDA	ST190711M3-12 PFC CS3 19G1106	1.07e4	95.5	NO
8	8	13C7-PFUdA	ST190711M3-12 PFC CS3 19G1106	1.27e4	89.9	NO

Name: 190711M3_50, Date: 12-Jul-2019, Time: 06:06:35, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_51, Date: 12-Jul-2019, Time: 06:17:14, ID: 1901920-17 NAOA-B01-GW-D 0.13768, Description: NAOA-B01-GW-D

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-17 NAOA-B01-GW-D 0.13768	3.80e3	119.0	NO
2	2	13C5-PFHxA	1901920-17 NAOA-B01-GW-D 0.13768	7.44e3	66.5	NO
3	3	18O2-PFHxS	1901920-17 NAOA-B01-GW-D 0.13768	5.73e2	105.9	NO
4	4	13C8-PFOA	1901920-17 NAOA-B01-GW-D 0.13768	1.15e4	78.1	NO
5	5	13C9-PFNA	1901920-17 NAOA-B01-GW-D 0.13768	6.81e3	81.7	NO
6	6	13C4-PFOS	1901920-17 NAOA-B01-GW-D 0.13768	1.24e3	86.3	NO
7	7	13C6-PFDA	1901920-17 NAOA-B01-GW-D 0.13768	9.18e3	81.8	NO
8	8	13C7-PFUdA	1901920-17 NAOA-B01-GW-D 0.13768	1.10e4	77.8	NO

Dataset: Untitled

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Name: 190711M3_52, Date: 12-Jul-2019, Time: 06:27:47, ID: 1901920-20 EB-07022019 0.11644, Description: EB-07022019

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901920-20 EB-07022019 0.11644	4.52e3	141.4	NO
2	2	13C5-PFHxA	1901920-20 EB-07022019 0.11644	8.13e3	72.7	NO
3	3	18O2-PFHxS	1901920-20 EB-07022019 0.11644	4.44e2	82.1	NO
4	4	13C8-PFOA	1901920-20 EB-07022019 0.11644	1.14e4	76.9	NO
5	5	13C9-PFNA	1901920-20 EB-07022019 0.11644	6.65e3	79.7	NO
6	6	13C4-PFOS	1901920-20 EB-07022019 0.11644	1.20e3	83.1	NO
7	7	13C6-PFDA	1901920-20 EB-07022019 0.11644	8.40e3	74.8	NO
8	8	13C7-PFUdA	1901920-20 EB-07022019 0.11644	1.00e4	71.2	NO

Name: 190711M3_53, Date: 12-Jul-2019, Time: 06:38:25, ID: B9G0065-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0065-BS1 OPR 0.25	4.49e3	140.6	NO
2	2	13C5-PFHxA	B9G0065-BS1 OPR 0.25	8.37e3	74.8	NO
3	3	18O2-PFHxS	B9G0065-BS1 OPR 0.25	4.46e2	82.4	NO
4	4	13C8-PFOA	B9G0065-BS1 OPR 0.25	1.11e4	75.4	NO
5	5	13C9-PFNA	B9G0065-BS1 OPR 0.25	7.27e3	87.1	NO
6	6	13C4-PFOS	B9G0065-BS1 OPR 0.25	1.18e3	81.8	NO
7	7	13C6-PFDA	B9G0065-BS1 OPR 0.25	8.59e3	76.5	NO
8	8	13C7-PFUdA	B9G0065-BS1 OPR 0.25	1.05e4	74.8	NO

Name: 190711M3_54, Date: 12-Jul-2019, Time: 06:48:58, ID: B9G0065-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B9G0065-BLK1 Method Blank 0.25	4.23e3	132.3	NO
2	2	13C5-PFHxA	B9G0065-BLK1 Method Blank 0.25	7.81e3	69.8	NO
3	3	18O2-PFHxS	B9G0065-BLK1 Method Blank 0.25	4.99e2	92.2	NO
4	4	13C8-PFOA	B9G0065-BLK1 Method Blank 0.25	1.09e4	73.8	NO
5	5	13C9-PFNA	B9G0065-BLK1 Method Blank 0.25	7.05e3	84.5	NO
6	6	13C4-PFOS	B9G0065-BLK1 Method Blank 0.25	9.85e2	68.2	NO
7	7	13C6-PFDA	B9G0065-BLK1 Method Blank 0.25	8.06e3	71.8	NO
8	8	13C7-PFUdA	B9G0065-BLK1 Method Blank 0.25	9.84e3	69.8	NO

Name: 190711M3_55, Date: 12-Jul-2019, Time: 06:59:37, ID: 1901781-01 GW1906241425SK 0.24561, Description: GW1906241425SK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-01 GW1906241425SK 0.24561	4.51e3	141.3	NO
2	2	13C5-PFHxA	1901781-01 GW1906241425SK 0.24561	8.11e3	72.4	NO
3	3	18O2-PFHxS	1901781-01 GW1906241425SK 0.24561	4.90e2	90.6	NO
4	4	13C8-PFOA	1901781-01 GW1906241425SK 0.24561	1.09e4	73.7	NO
5	5	13C9-PFNA	1901781-01 GW1906241425SK 0.24561	6.86e3	82.3	NO
6	6	13C4-PFOS	1901781-01 GW1906241425SK 0.24561	1.15e3	79.8	NO
7	7	13C6-PFDA	1901781-01 GW1906241425SK 0.24561	8.12e3	72.3	NO
8	8	13C7-PFUdA	1901781-01 GW1906241425SK 0.24561	1.00e4	71.0	NO

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Name: 190711M3_56, Date: 12-Jul-2019, Time: 07:10:15, ID: 1901781-02 GW1906241605SK 0.25501, Description: GW1906241605SK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-02 GW1906241605SK 0.25501	4.72e3	147.7	NO
2	2	13C5-PFHxA	1901781-02 GW1906241605SK 0.25501	8.56e3	76.5	NO
3	3	18O2-PFHxS	1901781-02 GW1906241605SK 0.25501	5.27e2	97.4	NO
4	4	13C8-PFOA	1901781-02 GW1906241605SK 0.25501	1.17e4	79.3	NO
5	5	13C9-PFNA	1901781-02 GW1906241605SK 0.25501	6.98e3	83.7	NO
6	6	13C4-PFOS	1901781-02 GW1906241605SK 0.25501	1.08e3	75.1	NO
7	7	13C6-PFDA	1901781-02 GW1906241605SK 0.25501	8.55e3	76.1	NO
8	8	13C7-PFUdA	1901781-02 GW1906241605SK 0.25501	9.97e3	70.8	NO

Name: 190711M3_57, Date: 12-Jul-2019, Time: 07:20:48, ID: 1901781-03 GW1906250855KME 0.24339, Description: GW1906250855KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-03 GW1906250855KME 0.24...	3.58e3	112.2	NO
2	2	13C5-PFHxA	1901781-03 GW1906250855KME 0.24...	7.02e3	62.7	NO
3	3	18O2-PFHxS	1901781-03 GW1906250855KME 0.24...	4.71e2	87.1	NO
4	4	13C8-PFOA	1901781-03 GW1906250855KME 0.24...	1.06e4	71.7	NO
5	5	13C9-PFNA	1901781-03 GW1906250855KME 0.24...	6.73e3	80.7	NO
6	6	13C4-PFOS	1901781-03 GW1906250855KME 0.24...	1.16e3	80.7	NO
7	7	13C6-PFDA	1901781-03 GW1906250855KME 0.24...	8.00e3	71.2	NO
8	8	13C7-PFUdA	1901781-03 GW1906250855KME 0.24...	9.56e3	67.9	NO

Name: 190711M3_58, Date: 12-Jul-2019, Time: 07:31:26, ID: 1901781-04 GW1906250855KME-FD 0.24341, Description: GW1906250855KME-FD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-04 GW1906250855KME-FD 0...	4.08e3	127.6	NO
2	2	13C5-PFHxA	1901781-04 GW1906250855KME-FD 0...	8.26e3	73.8	NO
3	3	18O2-PFHxS	1901781-04 GW1906250855KME-FD 0...	5.20e2	96.2	NO
4	4	13C8-PFOA	1901781-04 GW1906250855KME-FD 0...	1.21e4	81.7	NO
5	5	13C9-PFNA	1901781-04 GW1906250855KME-FD 0...	7.71e3	92.4	NO
6	6	13C4-PFOS	1901781-04 GW1906250855KME-FD 0...	1.39e3	96.1	NO
7	7	13C6-PFDA	1901781-04 GW1906250855KME-FD 0...	9.49e3	84.5	NO
8	8	13C7-PFUdA	1901781-04 GW1906250855KME-FD 0...	1.11e4	79.0	NO

Name: 190711M3_59, Date: 12-Jul-2019, Time: 07:41:59, ID: 1901781-05 GW1906250935SK 0.24535, Description: GW1906250935SK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-05 GW1906250935SK 0.24535	4.68e3	146.6	NO
2	2	13C5-PFHxA	1901781-05 GW1906250935SK 0.24535	9.59e3	85.7	NO
3	3	18O2-PFHxS	1901781-05 GW1906250935SK 0.24535	5.15e2	95.3	NO
4	4	13C8-PFOA	1901781-05 GW1906250935SK 0.24535	1.34e4	90.6	NO
5	5	13C9-PFNA	1901781-05 GW1906250935SK 0.24535	7.88e3	94.5	NO
6	6	13C4-PFOS	1901781-05 GW1906250935SK 0.24535	1.37e3	94.8	NO
7	7	13C6-PFDA	1901781-05 GW1906250935SK 0.24535	9.42e3	83.8	NO
8	8	13C7-PFUdA	1901781-05 GW1906250935SK 0.24535	1.13e4	80.4	NO

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Name: 190711M3_60, Date: 12-Jul-2019, Time: 07:52:37, ID: 1901781-06 GW1906251040KME 0.24373, Description: GW1906251040KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-06 GW1906251040KME 0.24...	5.29e3	165.7	YES
2	2	13C5-PFHxA	1901781-06 GW1906251040KME 0.24...	9.75e3	87.1	NO
3	3	18O2-PFHxS	1901781-06 GW1906251040KME 0.24...	5.39e2	99.7	NO
4	4	13C8-PFOA	1901781-06 GW1906251040KME 0.24...	1.25e4	84.8	NO
5	5	13C9-PFNA	1901781-06 GW1906251040KME 0.24...	7.95e3	95.3	NO
6	6	13C4-PFOS	1901781-06 GW1906251040KME 0.24...	1.27e3	88.1	NO
7	7	13C6-PFDA	1901781-06 GW1906251040KME 0.24...	1.03e4	91.9	NO
8	8	13C7-PFUdA	1901781-06 GW1906251040KME 0.24...	1.18e4	83.8	NO

Name: 190711M3_61, Date: 12-Jul-2019, Time: 08:03:15, ID: 1901781-07 GW1906251120SK 0.24467, Description: GW1906251120SK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-07 GW1906251120SK 0.24467	4.68e3	146.5	NO
2	2	13C5-PFHxA	1901781-07 GW1906251120SK 0.24467	8.99e3	80.4	NO
3	3	18O2-PFHxS	1901781-07 GW1906251120SK 0.24467	4.85e2	89.7	NO
4	4	13C8-PFOA	1901781-07 GW1906251120SK 0.24467	1.24e4	84.0	NO
5	5	13C9-PFNA	1901781-07 GW1906251120SK 0.24467	7.64e3	91.6	NO
6	6	13C4-PFOS	1901781-07 GW1906251120SK 0.24467	1.31e3	90.7	NO
7	7	13C6-PFDA	1901781-07 GW1906251120SK 0.24467	9.71e3	86.4	NO
8	8	13C7-PFUdA	1901781-07 GW1906251120SK 0.24467	1.03e4	73.3	NO

Name: 190711M3_62, Date: 12-Jul-2019, Time: 08:13:48, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_63, Date: 12-Jul-2019, Time: 08:24:26, ID: ST190711M3-13 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-13 PFC CS3 19G1106	3.44e3	107.7	NO
2	2	13C5-PFHxA	ST190711M3-13 PFC CS3 19G1106	1.11e4	99.5	NO
3	3	18O2-PFHxS	ST190711M3-13 PFC CS3 19G1106	6.06e2	112.0	NO
4	4	13C8-PFOA	ST190711M3-13 PFC CS3 19G1106	1.48e4	100.3	NO
5	5	13C9-PFNA	ST190711M3-13 PFC CS3 19G1106	8.90e3	106.7	NO
6	6	13C4-PFOS	ST190711M3-13 PFC CS3 19G1106	1.46e3	101.2	NO
7	7	13C6-PFDA	ST190711M3-13 PFC CS3 19G1106	1.12e4	100.1	NO
8	8	13C7-PFUdA	ST190711M3-13 PFC CS3 19G1106	1.30e4	92.3	NO

Dataset: Untitled

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Name: 190711M3_64, Date: 12-Jul-2019, Time: 08:34:58, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_65, Date: 12-Jul-2019, Time: 08:45:54, ID: 1901781-08 GMW1906251200KME 0.24756, Description: GMW1906251200KME

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-08 GMW1906251200KME 0.2...	4.71e3	147.4	NO
2	2	13C5-PFHxA	1901781-08 GMW1906251200KME 0.2...	8.25e3	73.7	NO
3	3	18O2-PFHxS	1901781-08 GMW1906251200KME 0.2...	4.72e2	87.2	NO
4	4	13C8-PFOA	1901781-08 GMW1906251200KME 0.2...	1.22e4	82.5	NO
5	5	13C9-PFNA	1901781-08 GMW1906251200KME 0.2...	7.51e3	90.1	NO
6	6	13C4-PFOS	1901781-08 GMW1906251200KME 0.2...	1.23e3	85.4	NO
7	7	13C6-PFDA	1901781-08 GMW1906251200KME 0.2...	8.52e3	75.9	NO
8	8	13C7-PFUdA	1901781-08 GMW1906251200KME 0.2...	1.05e4	74.6	NO

Name: 190711M3_66, Date: 12-Jul-2019, Time: 08:56:32, ID: 1901781-09 FB1906251135SK 0.25189, Description: FB1906251135SK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1901781-09 FB1906251135SK 0.25189	4.58e3	143.4	NO
2	2	13C5-PFHxA	1901781-09 FB1906251135SK 0.25189	8.25e3	73.8	NO
3	3	18O2-PFHxS	1901781-09 FB1906251135SK 0.25189	5.36e2	99.1	NO
4	4	13C8-PFOA	1901781-09 FB1906251135SK 0.25189	1.21e4	82.2	NO
5	5	13C9-PFNA	1901781-09 FB1906251135SK 0.25189	7.53e3	90.2	NO
6	6	13C4-PFOS	1901781-09 FB1906251135SK 0.25189	1.20e3	83.0	NO
7	7	13C6-PFDA	1901781-09 FB1906251135SK 0.25189	9.05e3	80.6	NO
8	8	13C7-PFUdA	1901781-09 FB1906251135SK 0.25189	1.10e4	78.3	NO

Name: 190711M3_67, Date: 12-Jul-2019, Time: 09:07:05, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Dataset: Untitled

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Name: 190711M3_68, Date: 12-Jul-2019, Time: 09:17:43, ID: ST190711M3-14 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST190711M3-14 PFC CS3 19G1106	3.37e3	105.7	NO
2	2	13C5-PFHxA	ST190711M3-14 PFC CS3 19G1106	1.03e4	92.4	NO
3	3	18O2-PFHxS	ST190711M3-14 PFC CS3 19G1106	5.56e2	102.8	NO
4	4	13C8-PFOA	ST190711M3-14 PFC CS3 19G1106	1.45e4	98.1	NO
5	5	13C9-PFNA	ST190711M3-14 PFC CS3 19G1106	8.67e3	104.0	NO
6	6	13C4-PFOS	ST190711M3-14 PFC CS3 19G1106	1.43e3	98.9	NO
7	7	13C6-PFDA	ST190711M3-14 PFC CS3 19G1106	1.06e4	94.6	NO
8	8	13C7-PFUdA	ST190711M3-14 PFC CS3 19G1106	1.25e4	88.8	NO

Name: 190711M3_69, Date: 12-Jul-2019, Time: 09:28:22, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	18O2-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 190711M3_70, Date: 12-Jul-2019, Time: 09:38:55, ID: IB tester, Description: MeOH

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IB tester	2.63e3	82.3	NO
2	2	13C5-PFHxA	IB tester	8.52e3	76.1	NO
3	3	18O2-PFHxS	IB tester	5.54e2	102.5	NO
4	4	13C8-PFOA	IB tester	1.35e4	91.5	NO
5	5	13C9-PFNA	IB tester	8.80e3	105.5	NO
6	6	13C4-PFOS	IB tester	1.37e3	94.8	NO
7	7	13C6-PFDA	IB tester	1.01e4	89.6	NO
8	8	13C7-PFUdA	IB tester	1.22e4	86.8	NO

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

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Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8		2169.162	1.00					NO		
2	2	PFPrS	248.9 > 79.9		658.630	1.00					NO		
3	3	3:3 FTCA	240.9 > 176.9		4335.059	1.00					NO		
4	4	PFPeA	263.1 > 218.9		4335.059	1.00					NO		
5	5	PFBS	299.0 > 79.7		658.630	1.00					NO		
6	6	4:2 FTS	327.0 > 306.9		1393.920	1.00					NO		
7	47	13C3-PFBA	216.1 > 171.8	2169.162	3391.515	1.00	1.18	7.995	12.3	98.4	NO		
8	49	13C3-PFBS	302.0 > 98.8	658.630	645.575	1.00	2.46	12.753	12.3	98.6	NO		
9	48	13C3-PFPeA	266.0 > 221.8	4335.059	11174.867	1.00	2.17	4.849	11.9	95.2	NO		
10	48	13C3-PFPeA	266.0 > 221.8	4335.059	11174.867	1.00	2.17	4.849	11.9	95.2	NO		
11	49	13C3-PFBS	302.0 > 98.8	658.630	645.575	1.00	2.46	12.753	12.3	98.6	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1393.920	645.575	1.00	2.88	26.990	12.1	96.4	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0		3474.314	1.00					NO		
15	8	PFPeS	349.1>80.1		658.630	1.00					NO		
16	9	HFPO-DA	285.1 > 168.9		1278.940	1.00					NO		
17	10	5:3 FTCA	340.9 > 236.9		4347.714	1.00					NO		
18	11	PFHpA	363.0 > 318.9		4347.714	1.00					NO		
19	12	ADONA	376.8 > 250.9		4347.714	1.00					NO		
20	52	13C2-PFHxA	315.0 > 270.0	3474.314	11174.867	1.00	2.96	3.886	4.9	98.1	NO		
21	49	13C3-PFBS	302.0 > 98.8	658.630	645.575	1.00	2.46	12.753	12.3	98.6	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1278.940	11174.867	1.00	3.18	1.431	4.7	93.4	NO		
23	53	13C4-PFHpA	367.2 > 321.8	4347.714	11174.867	1.00	3.58	4.863	12.4	99.5	NO		
24	53	13C4-PFHpA	367.2 > 321.8	4347.714	11174.867	1.00	3.58	4.863	12.4	99.5	NO		
25	53	13C4-PFHpA	367.2 > 321.8	4347.714	11174.867	1.00	3.58	4.863	12.4	99.5	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6		1497.795	1.00					NO		
28	15	6:2 FTS	427.0 > 406.9		1169.839	1.00					NO		
29	16	L-PFOA	412.8 > 368.9	50.243	8479.957	1.00	4.11	0.074	0.0		NO	10.472	YES
30	18	PFecHS	460.8 > 381.0		8479.957	1.00					NO		
31	19	PFHpS	449.0 > 80.0		1397.016	1.00					NO		
32	20	7:3 FTCA	440.9 > 336.9		9163.891	1.00					NO		
33	54	13C3-PFHxS	401.8 > 79.9	1497.795	645.575	1.00	3.74	29.001	11.4	91.1	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	1169.839	1444.856	1.00	4.05	10.121	13.7	110.0	NO		
35	58	13C2-PFOA	414.9 > 369.7	8479.957	15397.797	1.00	4.11	6.884	12.2	97.6	NO		
36	58	13C2-PFOA	414.9 > 369.7	8479.957	15397.797	1.00	4.11	6.884	12.2	97.6	NO		

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
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Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	59	13C8-PFOS	507.0 > 79.9	1397.016	1444.856	1.00	4.64	12.086	11.4	91.2	NO		
38	56	13C5-PFNA	468.2 > 422.9	9163.891	9162.572	1.00	4.55	12.502	12.7	101.8	NO		
39	-1												
40	21	PFNA	463.0 > 418.8		9163.891	1.00					NO		
41	22	PFOSA	497.9 > 77.9		1767.577	1.00					NO		
42	23	L-PFOS	498.9 > 79.9		1397.016	1.00					NO		
43	25	9Cl-PF30NS	530.7 > 350.8		1397.016	1.00					NO		
44	26	PFDA	513 > 468.8		7527.925	1.00					NO		
45	27	8:2 FTS	527.0 > 506.9		1117.957	1.00					NO		
46	56	13C5-PFNA	468.2 > 422.9	9163.891	9162.572	1.00	4.55	12.502	12.7	101.8	NO		
47	57	13C8-PFOSA	506.1 > 77.7	1767.577	13872.562	1.00	4.62	1.593	12.2	97.8	NO		
48	59	13C8-PFOS	507.0 > 79.9	1397.016	1444.856	1.00	4.64	12.086	11.4	91.2	NO		
49	59	13C8-PFOS	507.0 > 79.9	1397.016	1444.856	1.00	4.64	12.086	11.4	91.2	NO		
50	60	13C2-PFDA	515.1 > 469.9	7527.925	11306.739	1.00	4.93	8.322	12.6	100.5	NO		
51	61	13C2-8:2 FTS	529 > 79.9	1117.957	1444.856	1.00	4.90	9.672	13.9	111.3	NO		
52	-1												
53	28	PFNS	549.1 > 80.1		1397.016	1.00					NO		
54	29	L-MeFOSAA	570 > 419		1463.168	1.00					NO		
55	31	L-EtFOSAA	584.1 > 419		1896.617	1.00					NO		
56	33	PFUdA	563.0 > 518.9	27.150	11955.964	1.00	5.26	0.028	0.0		NO	20.292	YES
57	34	PFDS	598.8 > 79.9		1117.957	1.00					NO		
58	35	11Cl-PF30UdS	632.6 > 452.7		13471.563	1.00					NO		
59	59	13C8-PFOS	507.0 > 79.9	1397.016	1444.856	1.00	4.64	12.086	11.4	91.2	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1463.168	13872.562	1.00	5.08	1.318	10.2	81.7	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1896.617	13872.562	1.00	5.24	1.709	11.6	92.7	NO		
62	63	13C2-PFUdA	565 > 519.8	11955.964	13872.562	1.00	5.26	10.773	12.6	100.6	NO		
63	61	13C2-8:2 FTS	529 > 79.9	1117.957	1444.856	1.00	4.90	9.672	13.9	111.3	NO		
64	65	13C2-PFDoA	614.7 > 569.7	13471.563	11306.739	1.00	5.55	14.893	12.1	96.9	NO		
65	-1												
66	36	10:2 FTS	627.0 > 606.9		1117.957	1.00					NO		
67	37	PFDoA	612.9 > 569.0		13471.563	1.00					NO		
68	38	N-MeFOSA	512.1 > 168.9		3768.635	1.00					NO		
69	39	PFTrDA	662.9 > 618.9		13471.563	1.00					NO		
70	40	PFDoS	698.8 > 79.9		6802.284	1.00					NO		
71	41	PFTeDA	713.0 > 669.0		6802.284	1.00					NO		
72	65	13C2-PFDoA	614.7 > 569.7	13471.563	11306.739	1.00	5.55	14.893	12.1	96.9	NO		

Vista Analytical Laboratory

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Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	65	13C2-PFDoA	614.7 > 569.7	13471.563	11306.739	1.00	5.55	14.893	12.1	96.9	NO		
74	66	d3-N-MeFOSA	515.2 > 168.9	3768.635	13872.562	1.00	5.70	3.396	153.2	102.2	NO		
75	65	13C2-PFDoA	614.7 > 569.7	13471.563	11306.739	1.00	5.55	14.893	12.1	96.9	NO		
76	67	13C2-PFTeDA	715.1 > 669.7	6802.284	13872.562	1.00	6.02	6.129	12.0	95.9	NO		
77	67	13C2-PFTeDA	715.1 > 669.7	6802.284	13872.562	1.00	6.02	6.129	12.0	95.9	NO		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9		5493.738	1.00					NO		
80	43	PFHxDA	813.1 > 768.6		3849.397	1.00					NO		
81	44	PFODA	913.1 > 868.8	22.256	3849.397	1.00	6.63	0.029	0.0		NO		
82	45	N-MeFOSE	616.1 > 58.9		5038.851	1.00					NO		
83	46	N-EtFOSE	630.1 > 58.9		4912.971	1.00					NO		
84	72	13C4-PFBA	217.0 > 172.0	3391.515	3391.515	1.00	1.18	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9	5493.738	13872.562	1.00	6.13	4.950	158.8	105.9	NO		
86	69	13C2-PFHxDA	815 > 769.7	3849.397	13872.562	1.00	6.38	3.469	4.7	94.4	NO		
87	69	13C2-PFHxDA	815 > 769.7	3849.397	13872.562	1.00	6.38	3.469	4.7	94.4	NO		
88	70	d7-N-MeFOSE	623.1 > 58.9	5038.851	13872.562	1.00	6.29	4.540	162.4	108.3	NO		
89	71	d9-N-EtFOSE	639.2 > 58.8	4912.971	13872.562	1.00	6.44	4.427	160.9	107.3	NO		
90	73	13C5-PFHxA	318.0 > 272.9	11174.867	11174.867	1.00	2.96	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	15397.797	15397.797	1.00	4.11	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	645.575	645.575	1.00	3.74	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	9162.572	9162.572	1.00	4.55	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1444.856	1444.856	1.00	4.64	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	11306.739	11306.739	1.00	4.93	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	13872.562	13872.562	1.00	5.26	12.500	12.5	100.0	NO		

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

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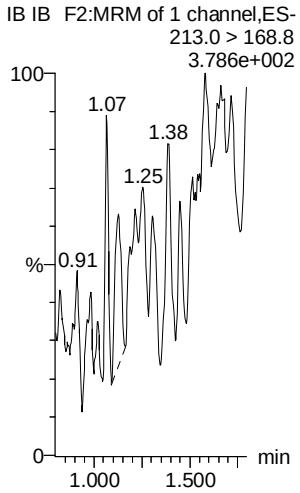
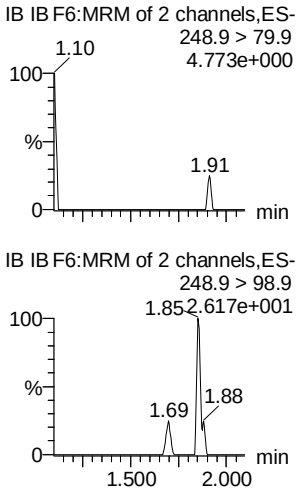
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

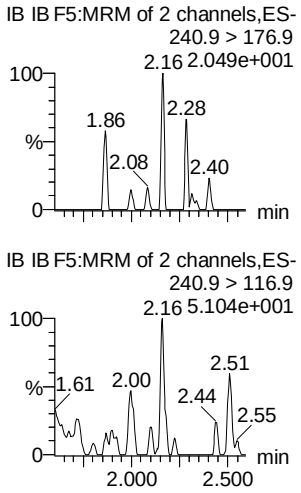
PFBA



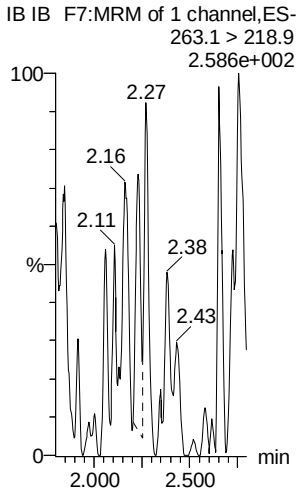
PFPrS



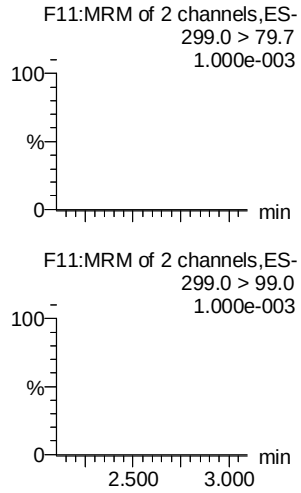
3:3 FTCA



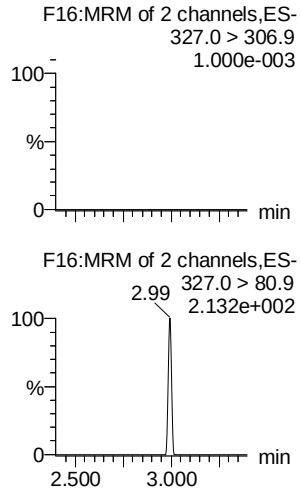
PFPeA



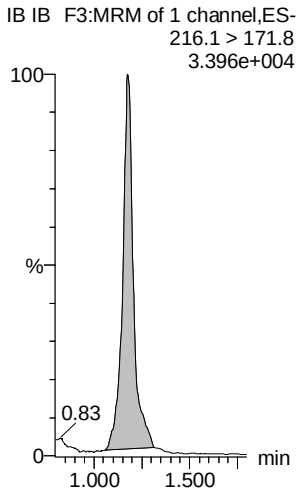
PFBS



4:2 FTS



13C3-PFBA



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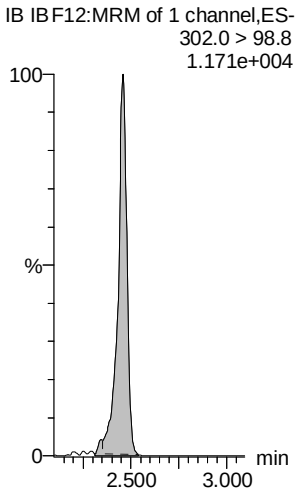

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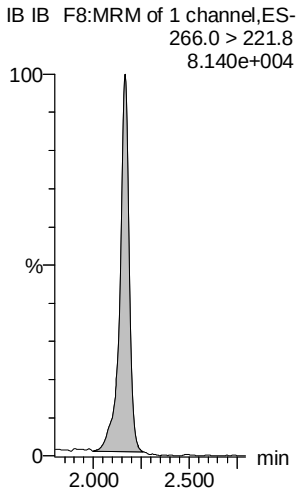

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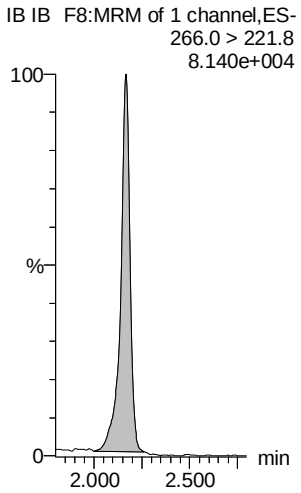

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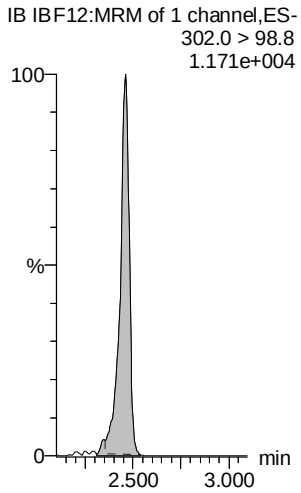
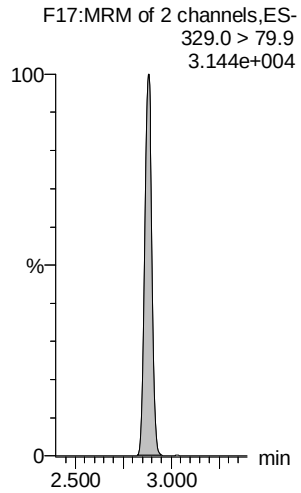


13C2-4:2 FTS



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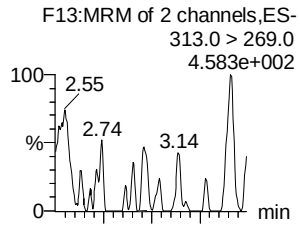
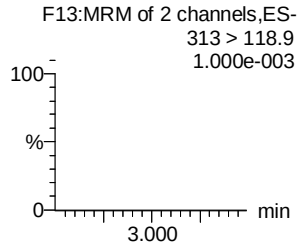
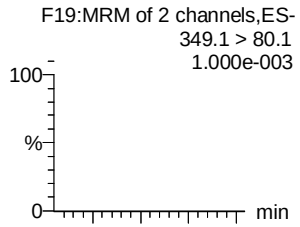
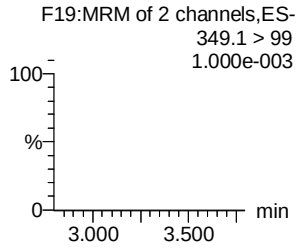
PFHxA



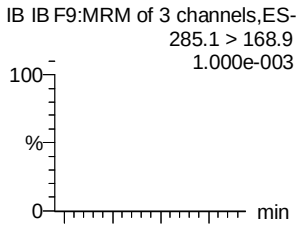


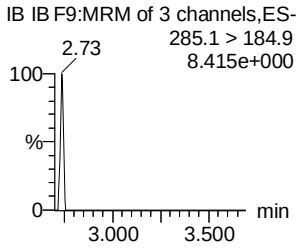
PFPeS



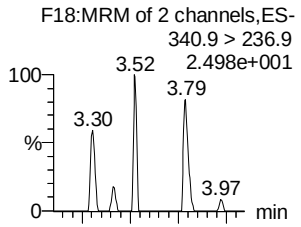


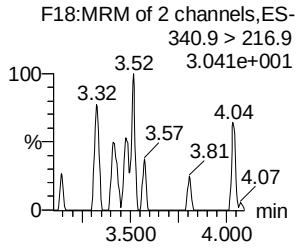
HFPO-DA



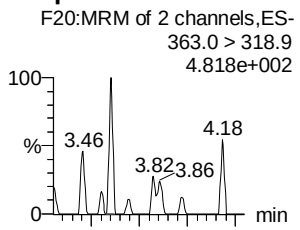


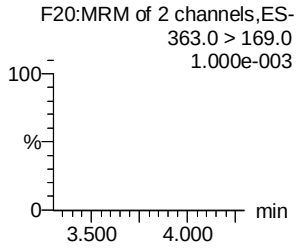
5:3 FTCA



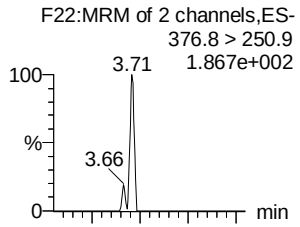


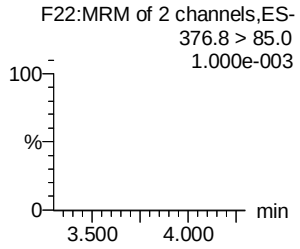
PFHpA



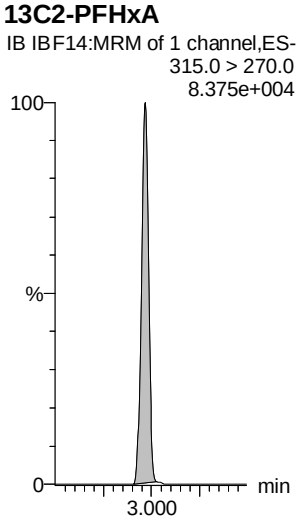


ADONA

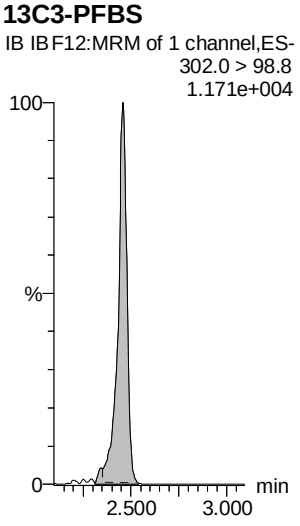




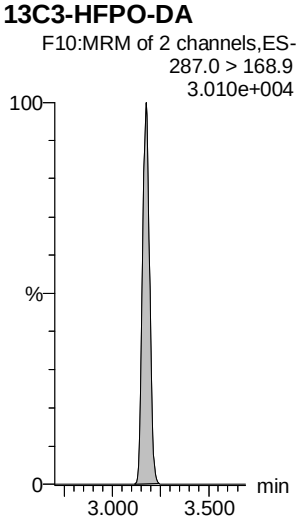
13C2-PFHxA



13C3-PFBS



13C3-HFPO-DA



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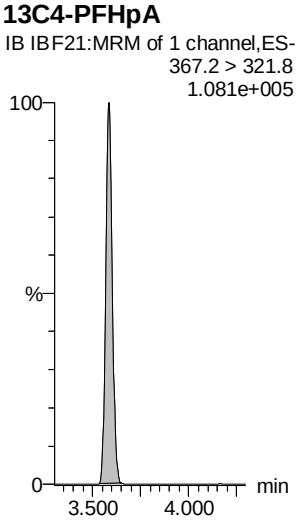

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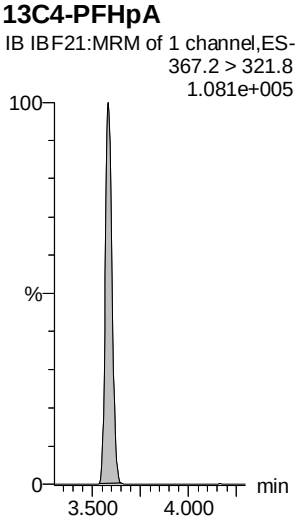

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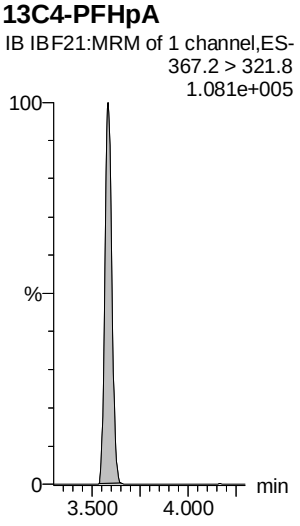


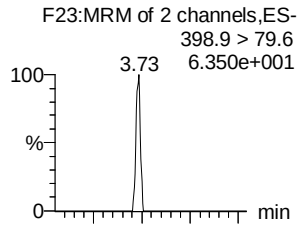
Vista Analytical Laboratory

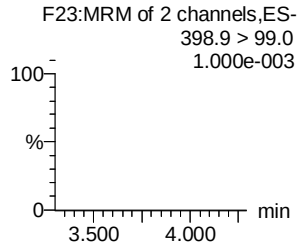
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

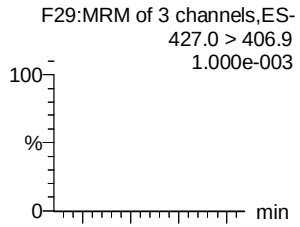
Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

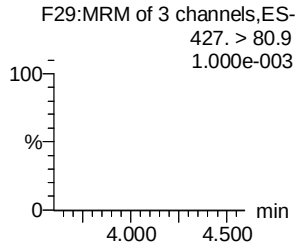
L-PFHxS





6:2 FTS





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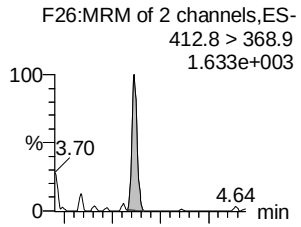

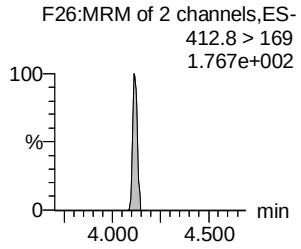

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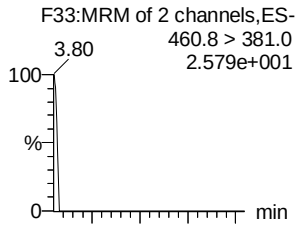

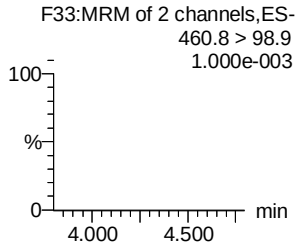

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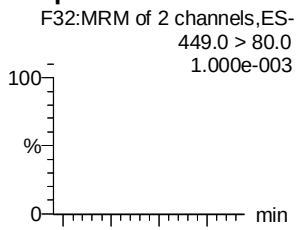
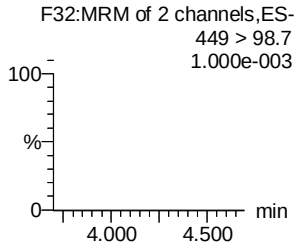
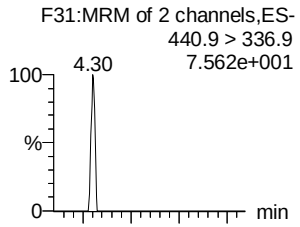
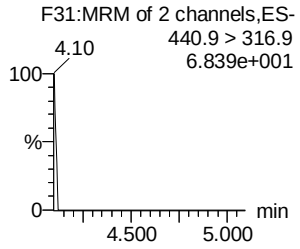


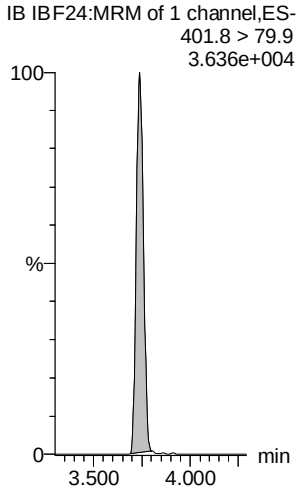


7:3 FTCA

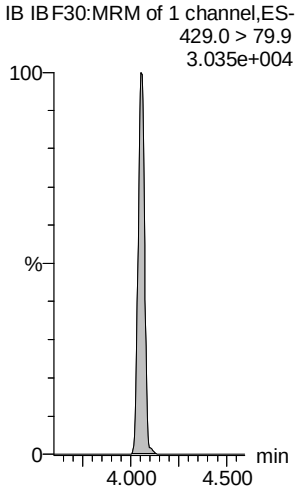




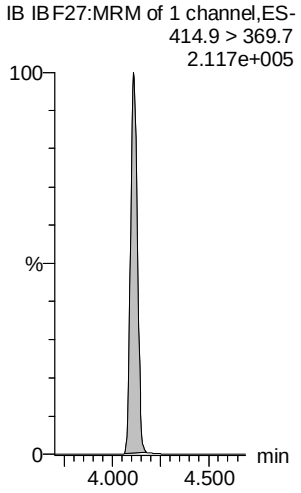
13C3-PFHxS



13C2-6:2 FTS



13C2-PFOA



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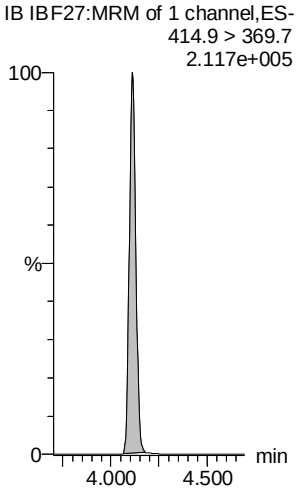
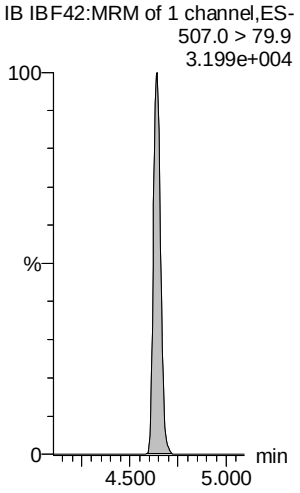
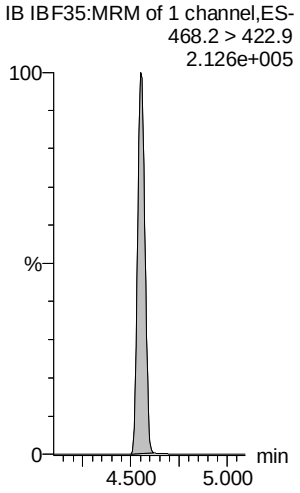


13C8-PFOS



13C5-PFNA

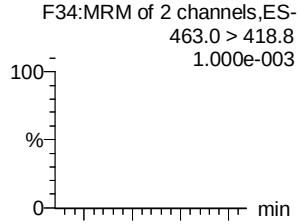


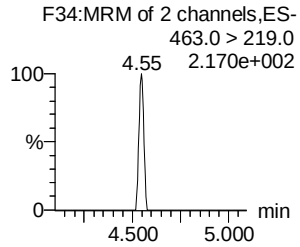
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

PFNA





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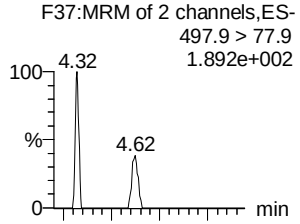
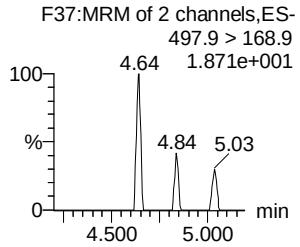
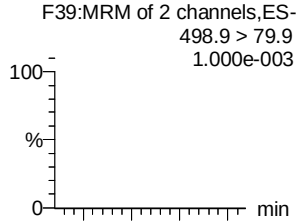
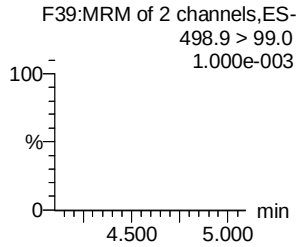


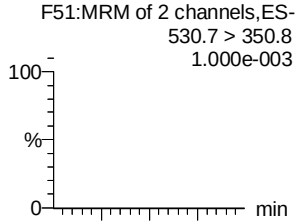


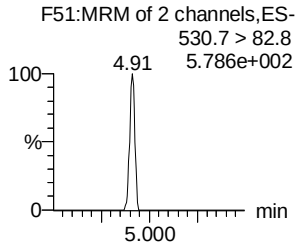
L-PFOS



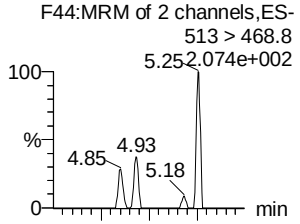


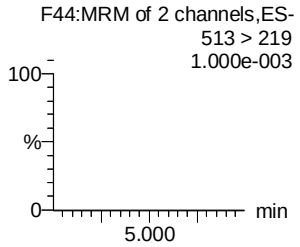
9Cl-PF30NS





PFDA





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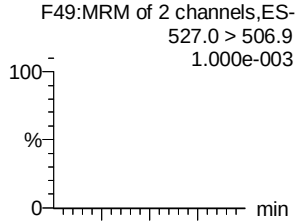
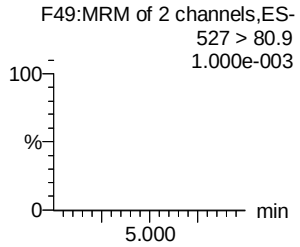
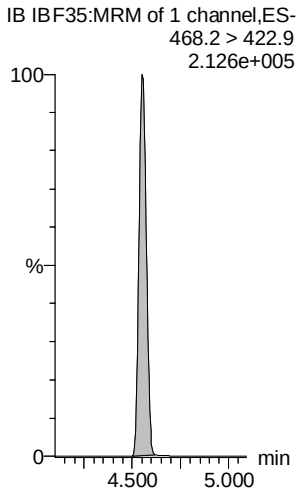
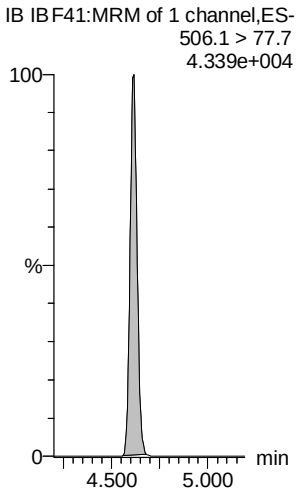




13C5-PFNA



13C8-PFOSA



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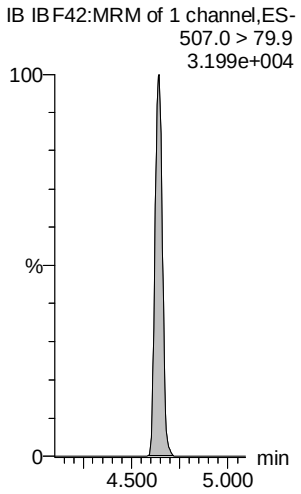

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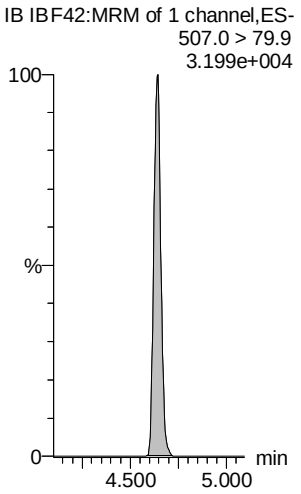

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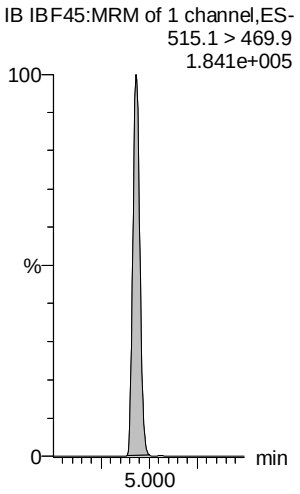

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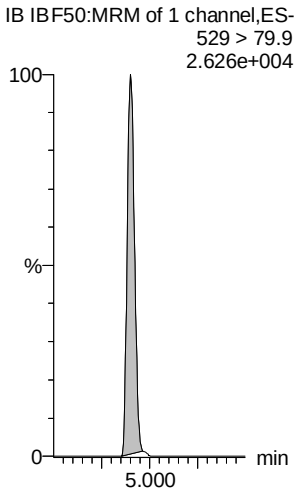
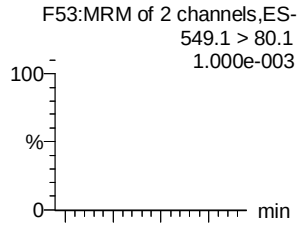


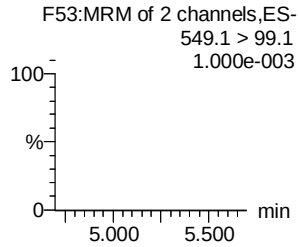
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

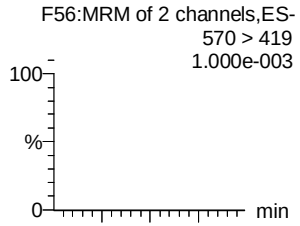
Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

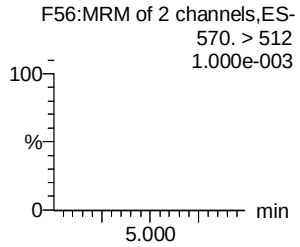
PFNS





L-MeFOSAA





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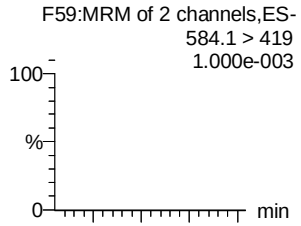
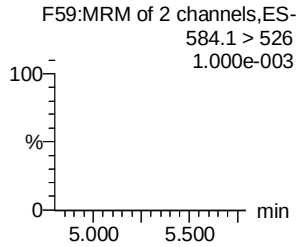
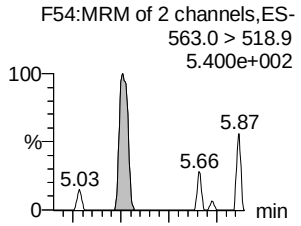
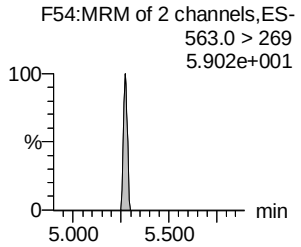


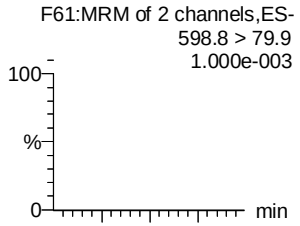


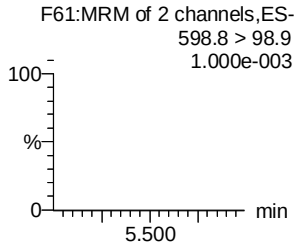
PFUdA





PFDS





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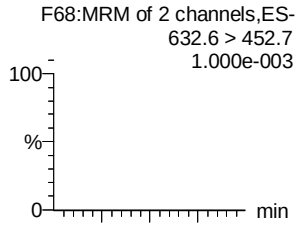
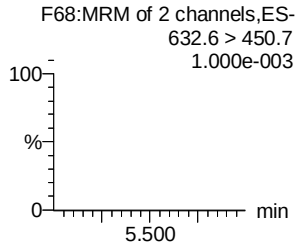
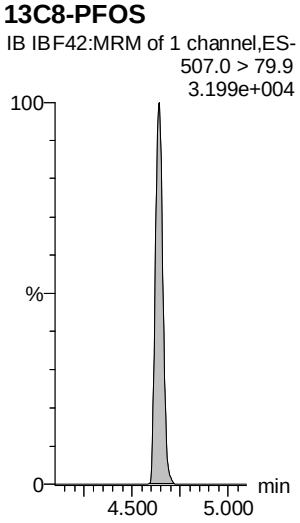
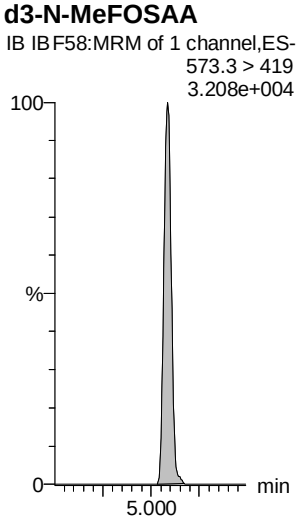




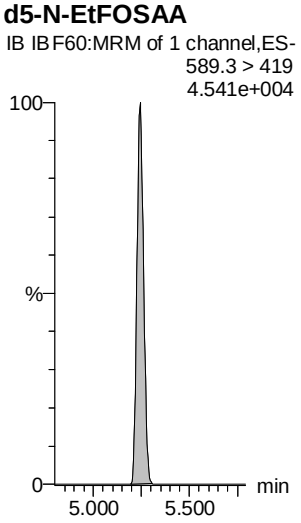
13C8-PFOS



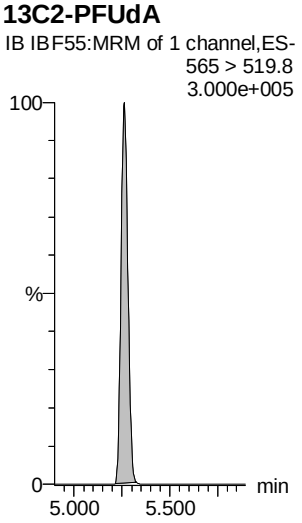
d3-N-MeFOSAA



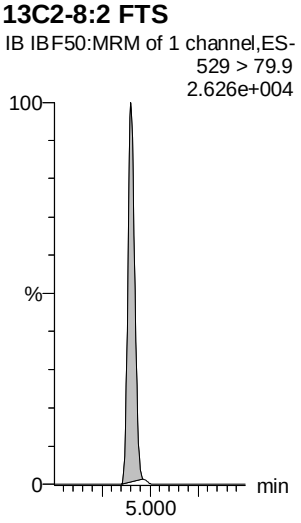
d5-N-EtFOSAA



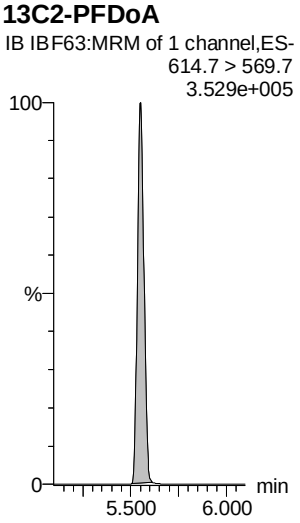
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA

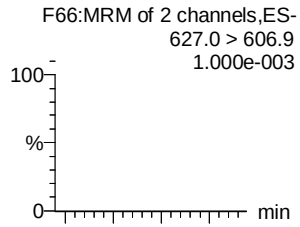


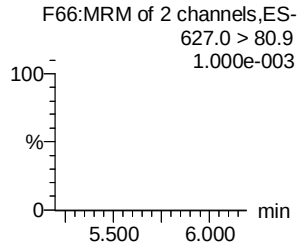
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

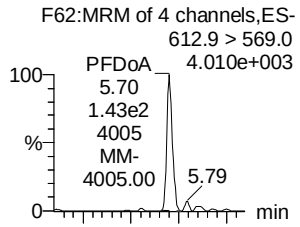
Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

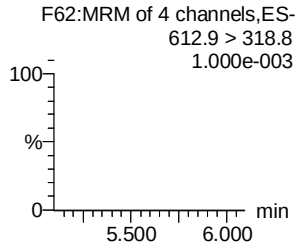
10:2 FTS



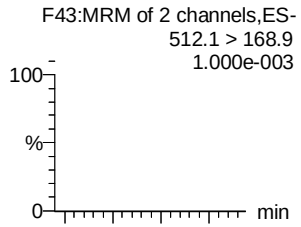


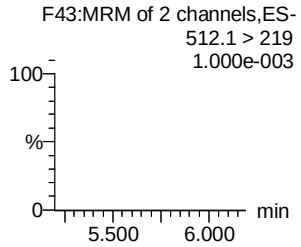
PFDoA



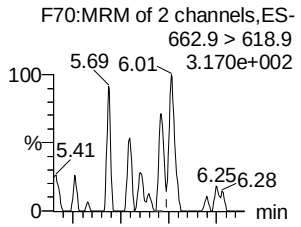


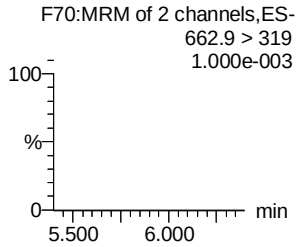
N-MeFOSA



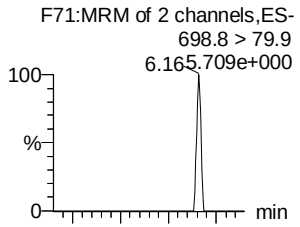


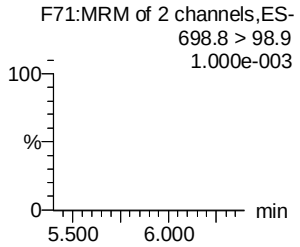
PFTrDA



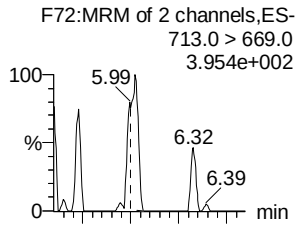


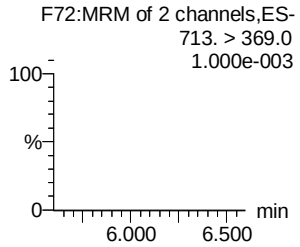
PFDoS



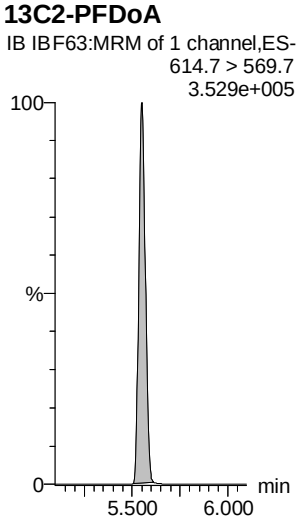


PFTeDA

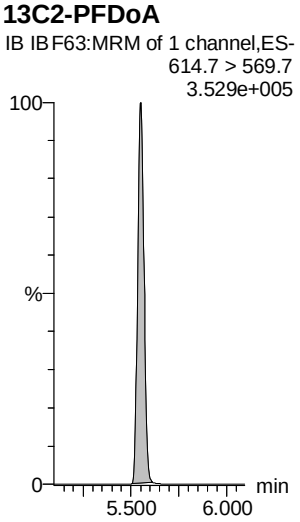




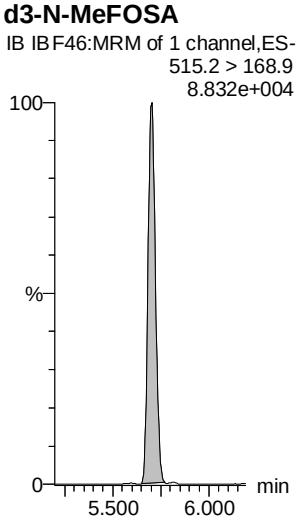
13C2-PFDoA



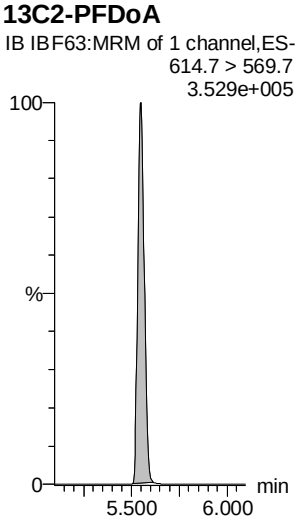
13C2-PFDoA



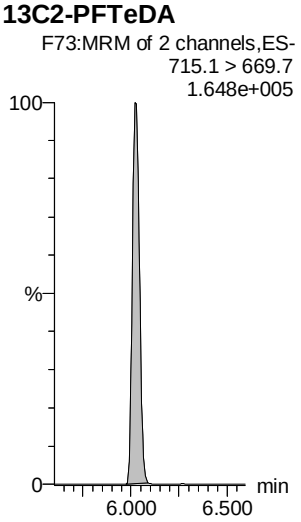
d3-N-MeFOSA



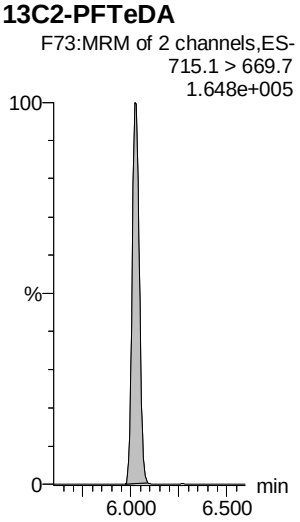
13C2-PFDoA



13C2-PFTeDA



13C2-PFTeDA

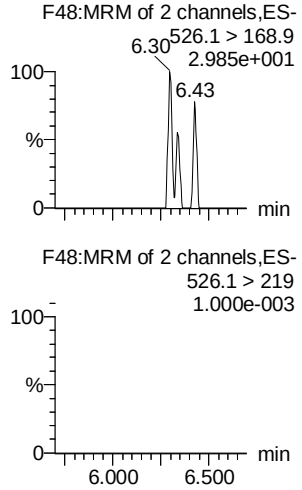


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

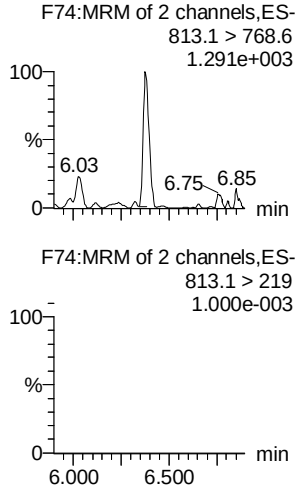
Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

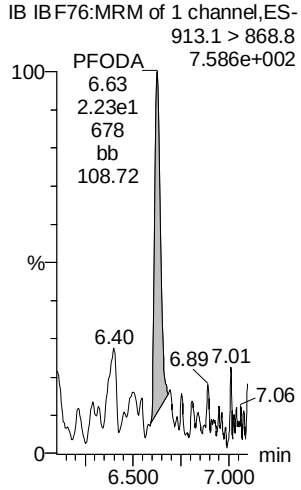
N-EtFOSA



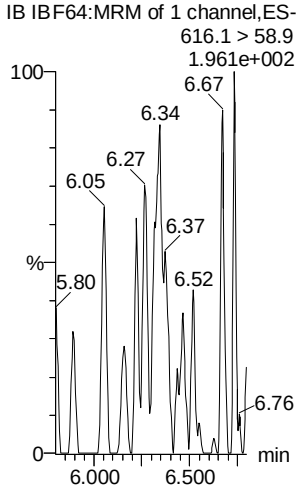
PFHxDA



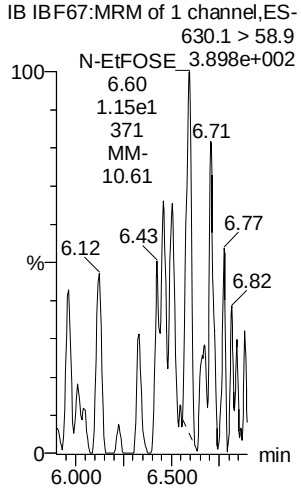
PFODA



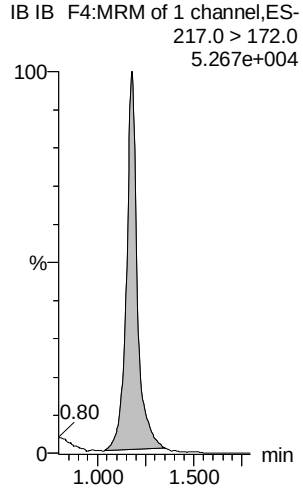
N-MeFOSE



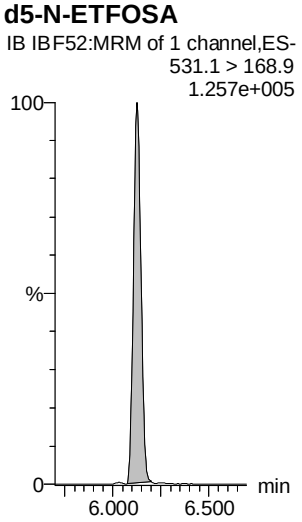
N-EtFOSE



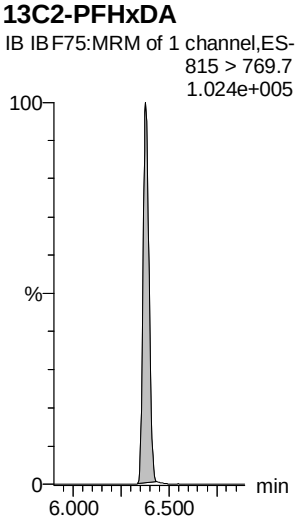
13C4-PFBA



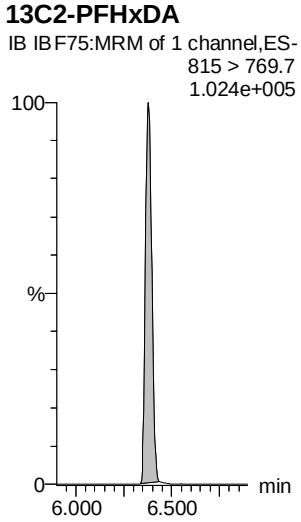
d5-N-ETFOSA



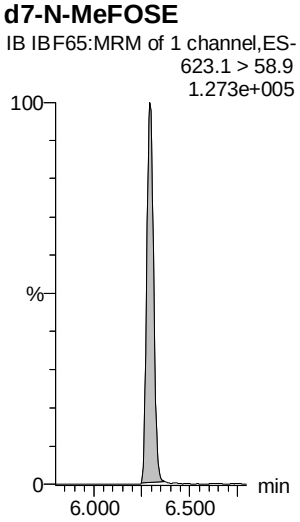
13C2-PFHxDA



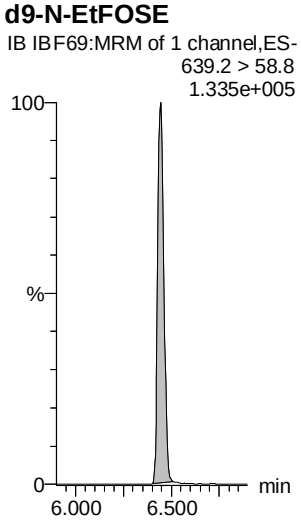
13C2-PFHxDA



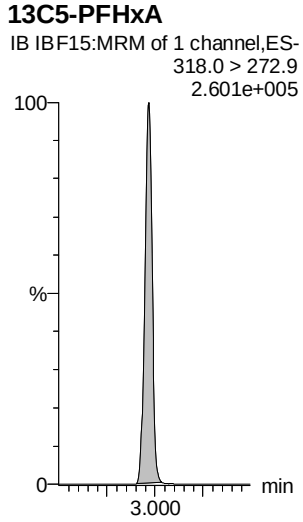
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

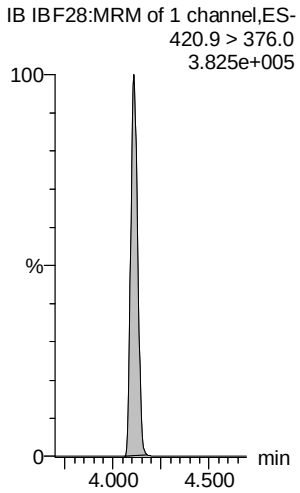


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-IB.qld

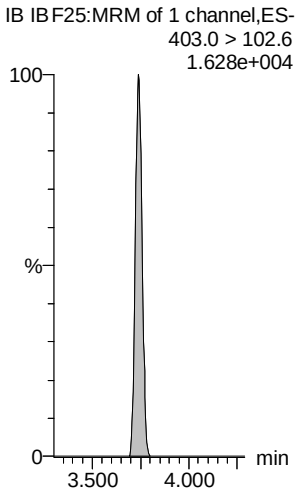
Last Altered: Friday, July 12, 2019 09:29:49 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:30:42 Pacific Daylight Time

Name: 190711M3_12, Date: 11-Jul-2019, Time: 23:23:47, ID: IB, Description: IB

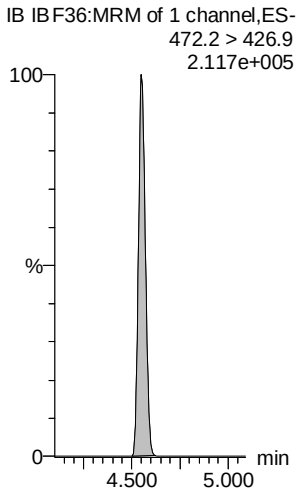
13C8-PFOA



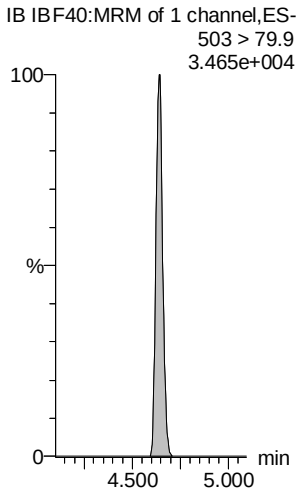
18O2-PFHxS



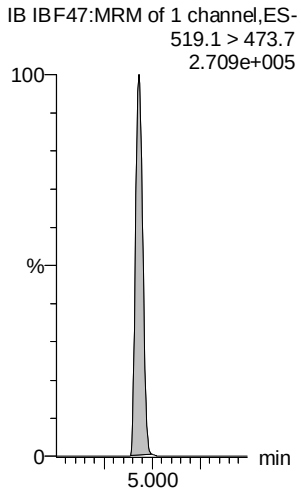
13C9-PFNA



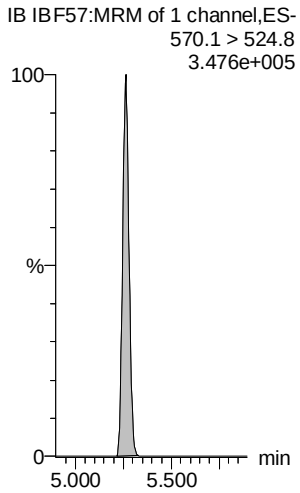
13C4-PFOS



13C6-PFDA



13C7-PFUdA



LC Calibration Standards Review Checklist Q4

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manual Integrations	N/A
Calibration ID:	ST190711M3-3	L M H	☑	☐ Ⓐ	☒	☑	☑	☑	☐
Calibration ID:	-11	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	-12	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	-13	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	-14	L M H	☑	☑	☑	☑	☑	☑	☑
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐ N/A Calc 7/12/19	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐

Full Mass Cal. Date: 07/03/19

Run Log Present: ☑

# of Samples per Sequence Checked: ☑

Instrument Blank Saved ☑

All Branches in Acquisition Window ☑

IIS Area Saved ☑

Reviewed By: [illegible] 7/12/19
Initials/Date

Comments:

Ⓐ IICI-PF30uds < 70%.

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:42:47 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	Name	Pred.RT	RT	Pred. Ratio	Ion Ratio	Ratio out?
1	PFBA	1.17	1.17			
2	PFPrS	1.53	1.53	2.303	2.303	NO
3	3:3 FTCA	2.03	2.01	1.893	1.893	NO
4	PFPeA	2.16	2.16			
5	PFBS	2.46	2.46	3.066	3.066	NO
6	4:2 FTS	2.88	2.88	1.967	1.967	NO
7	PFHxA	2.96	2.96	16.349	16.349	NO
8	PFPeS	3.17	3.17	1.554	1.554	NO
9	HFPO-DA	3.17	3.17	1.994	1.994	NO
10	5:3 FTCA	3.51	3.52	1.387	1.387	NO
11	PFHpA	3.58	3.58	5.744	5.744	NO
12	ADONA	3.70	3.70	3.227	3.227	NO
13	L-PFHxS	3.74	3.74	2.181	2.181	NO
14	6:2 FTS	4.05	4.05	2.109	2.109	NO
15	L-PFOA	4.11	4.11	3.450	3.450	NO
16	PFecHS	4.13	4.13	0.939	0.939	NO
17	PFHpS	4.23	4.23	2.242	2.242	NO
18	7:3 FTCA	4.55	4.54	2.024	2.024	NO
19	PFNA	4.56	4.56	2.747	2.747	NO
20	PFOSA	4.62	4.61	32.469	32.469	NO
21	L-PFOS	4.64	4.64	2.240	2.240	NO
22	9Cl-PF30NS	4.86	4.86	16.635	16.635	NO
23	PFDA	4.94	4.94	4.576	4.576	NO
24	8:2 FTS	4.90	4.90	1.464	1.464	NO
25	PFNS	5.00	5.00	1.585	1.585	NO
26	L-MeFOSAA	5.09	5.09	2.581	2.581	NO

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:42:59 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	Name	Pred.RT	RT	Pred. Ratio	Ion Ratio	Ratio out?
1	L-EtFOSAA	5.24	5.25	1.399	1.399	NO
2	PFUdA	5.26	5.26	6.355	6.355	NO
3	PFDS	5.31	5.31	1.783	1.783	NO
4	11Cl-PF30UdS	5.48	5.48	6.844	6.844	NO
5	10:2 FTS	5.53	5.53	1.528	1.528	NO
6	PFDoA	5.55	5.55	7.294	7.294	NO
7	N-MeFOSA	5.67	5.67	1.663	1.663	NO
8	PFTrDA	5.80	5.80	15.848	15.848	NO
9	PFDoS	5.83	5.83	1.916	1.916	NO
10	PFTeDA	6.02	6.03	13.714	13.714	NO
11	N-EtFOSA	6.11	6.11	1.778	1.778	NO
12	PFHxDA	6.38	6.38	15.561	15.561	NO
13	PFODA	6.63	6.63			
14	N-MeFOSE	6.30	6.30			
15	N-EtFOSE	6.46	6.46			

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Ⓐ 11Cl-PF3Ouds < 70%.

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Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	199.965	2067.945	1.00	1.18	1.209	0.9	89.4	NO		
2	2	PFPrS	248.9 > 79.9	43.861	526.839	1.00	1.54	1.041	1.0	98.2	NO	2.469	NO
3	3	3:3 FTCA	240.9 > 176.9	9.493	3889.368	1.00	2.01	0.031	0.9	85.7	NO	2.098	NO
4	4	PFPeA	263.1 > 218.9	285.547	3889.368	1.00	2.16	0.918	1.0	101.1	NO		
5	5	PFBS	299.0 > 79.7	90.047	526.839	1.00	2.46	2.136	1.0	103.3	NO	3.071	NO
6	6	4:2 FTS	327.0 > 306.9	268.281	1442.733	1.00	2.87	2.324	1.0	96.3	NO	2.291	NO
7	47	13C3-PFBA	216.1 > 171.8	2067.945	3193.654	1.00	1.18	8.094	12.5	99.6	NO		
8	49	13C3-PFBS	302.0 > 98.8	526.839	540.822	1.00	2.46	12.177	11.8	94.1	NO		
9	48	13C3-PFPeA	266.0 > 221.8	3889.368	11189.764	1.00	2.17	4.345	10.7	85.3	NO		
10	48	13C3-PFPeA	266.0 > 221.8	3889.368	11189.764	1.00	2.17	4.345	10.7	85.3	NO		
11	49	13C3-PFBS	302.0 > 98.8	526.839	540.822	1.00	2.46	12.177	11.8	94.1	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1442.733	540.822	1.00	2.88	33.346	14.9	119.2	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0	734.832	3614.287	1.00	2.96	1.017	0.9	87.4	NO	15.410	NO
15	8	PFPeS	349.1>80.1	109.890	526.839	1.00	3.17	2.607	1.2	121.7	NO	1.251	NO
16	9	HFPO-DA	285.1 > 168.9	160.302	1420.385	1.00	3.18	0.564	1.0	103.7	NO	2.004	NO
17	10	5:3 FTCA	340.9 > 236.9	81.809	4256.605	1.00	3.51	0.240	1.0	103.7	NO	1.538	NO
18	11	PFHpA	363.0 > 318.9	455.800	4256.605	1.00	3.58	1.339	1.1	112.3	NO	9.096	YES
19	12	ADONA	376.8 > 250.9	1355.290	4256.605	1.00	3.70	3.980	0.9	92.2	NO	3.876	NO
20	52	13C2-PFHxA	315.0 > 270.0	3614.287	11189.764	1.00	2.96	4.037	5.1	101.9	NO		
21	49	13C3-PFBS	302.0 > 98.8	526.839	540.822	1.00	2.46	12.177	11.8	94.1	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1420.385	11189.764	1.00	3.18	1.587	5.2	103.5	NO		
23	53	13C4-PFHpA	367.2 > 321.8	4256.605	11189.764	1.00	3.58	4.755	12.2	97.3	NO		
24	53	13C4-PFHpA	367.2 > 321.8	4256.605	11189.764	1.00	3.58	4.755	12.2	97.3	NO		
25	53	13C4-PFHpA	367.2 > 321.8	4256.605	11189.764	1.00	3.58	4.755	12.2	97.3	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6	83.561	1432.166	1.00	3.74	0.729	1.0	95.8	NO	1.753	NO
28	15	6:2 FTS	427.0 > 406.9	232.232	1055.665	1.00	4.06	2.750	1.0	100.7	NO	2.498	NO
29	16	L-PFOA	412.8 > 368.9	1231.637	8696.132	1.00	4.11	1.770	0.9	93.7	NO	3.332	NO
30	18	PFecHS	460.8 > 381.0	175.103	8696.132	1.00	4.12	0.252	1.0	97.8	NO	1.016	NO
31	19	PFHpS	449.0 > 80.0	102.843	1537.147	1.00	4.23	0.836	1.0	99.0	NO	8.032	YES
32	20	7:3 FTCA	440.9 > 336.9	70.857	8563.523	1.00	4.54	0.103	0.9	89.3	NO	3.345	YES
33	54	13C3-PFHxS	401.8 > 79.9	1432.166	540.822	1.00	3.74	33.102	13.0	104.0	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	1055.665	1443.314	1.00	4.05	9.143	12.4	99.4	NO		
35	58	13C2-PFOA	414.9 > 369.7	8696.132	14770.249	1.00	4.11	7.360	13.0	104.3	NO		
36	58	13C2-PFOA	414.9 > 369.7	8696.132	14770.249	1.00	4.11	7.360	13.0	104.3	NO		

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Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	59	13C8-PFOS	507.0 > 79.9	1537.147	1443.314	1.00	4.64	13.313	12.6	100.5	NO		
38	56	13C5-PFNA	468.2 > 422.9	8563.523	8340.979	1.00	4.55	12.834	13.1	104.5	NO		
39	-1												
40	21	PFNA	463.0 > 418.8	736.998	8563.523	1.00	4.55	1.076	1.0	95.4	NO	3.789	NO
41	22	PFOSA	497.9 > 77.9	129.996	1871.672	1.00	4.61	0.868	0.7	70.4	NO	39.803	NO
42	23	L-PFOS	498.9 > 79.9	148.648	1537.147	1.00	4.64	1.209	1.1	109.0	NO	2.829	NO
43	25	9Cl-PF30NS	530.7 > 350.8	349.698	1537.147	1.00	4.86	2.844	1.0	97.3	NO	88.554	YES
44	26	PFDA	513 > 468.8	857.462	7221.111	1.00	4.93	1.484	1.0	95.6	NO	4.508	NO
45	27	8:2 FTS	527.0 > 506.9	244.740	1038.107	1.00	4.90	2.947	1.3	129.7	NO	1.759	NO
46	56	13C5-PFNA	468.2 > 422.9	8563.523	8340.979	1.00	4.55	12.834	13.1	104.5	NO		
47	57	13C8-PFOSA	506.1 > 77.7	1871.672	14087.684	1.00	4.61	1.661	12.7	102.0	NO		
48	59	13C8-PFOS	507.0 > 79.9	1537.147	1443.314	1.00	4.64	13.313	12.6	100.5	NO		
49	59	13C8-PFOS	507.0 > 79.9	1537.147	1443.314	1.00	4.64	13.313	12.6	100.5	NO		
50	60	13C2-PFDA	515.1 > 469.9	7221.111	11232.013	1.00	4.93	8.036	12.1	97.1	NO		
51	61	13C2-8:2 FTS	529 > 79.9	1038.107	1443.314	1.00	4.90	8.991	12.9	103.4	NO		
52	-1												
53	28	PFNS	549.1 > 80.1	92.409	1537.147	1.00	5.00	0.751	0.9	93.7	NO	1.202	NO
54	29	L-MeFOSAA	570 > 419	377.045	1554.592	1.00	5.09	3.032	1.0	103.1	NO	2.525	NO
55	31	L-EtFOSAA	584.1 > 419	225.752	1758.010	1.00	5.25	1.605	0.9	92.8	NO	1.253	NO
56	33	PFUdA	563.0 > 518.9	833.829	11481.199	1.00	5.26	0.908	1.0	96.2	NO	7.443	NO
57	34	PFDS	598.8 > 79.9	110.114	1038.107	1.00	5.31	1.326	0.8	83.1	NO	2.878	YES
58	35	11Cl-PF30UdS	632.6 > 452.7	48.250	13223.400	1.00	5.49	0.046	0.7	69.6	YES		
59	59	13C8-PFOS	507.0 > 79.9	1537.147	1443.314	1.00	4.64	13.313	12.6	100.5	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1554.592	14087.684	1.00	5.08	1.379	10.7	85.5	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1758.010	14087.684	1.00	5.24	1.560	10.6	84.7	NO		
62	63	13C2-PFUdA	565 > 519.8	11481.199	14087.684	1.00	5.26	10.187	11.9	95.1	NO		
63	61	13C2-8:2 FTS	529 > 79.9	1038.107	1443.314	1.00	4.90	8.991	12.9	103.4	NO		
64	65	13C2-PFDoA	614.7 > 569.7	13223.400	11232.013	1.00	5.55	14.716	12.0	95.8	NO		
65	-1												
66	36	10:2 FTS	627.0 > 606.9	192.572	1038.107	1.00	5.54	2.319	0.9	88.8	NO	1.464	NO
67	37	PFDoA	612.9 > 569.0	921.527	13223.400	1.00	5.55	0.871	0.9	93.8	NO	8.227	NO
68	38	N-MeFOSA	512.1 > 168.9	106.245	3520.567	1.00	5.67	4.527	3.9	78.0	NO	1.699	NO
69	39	PFTrDA	662.9 > 618.9	1226.758	13223.400	1.00	5.80	1.160	1.1	112.7	NO	20.390	NO
70	40	PFDoS	698.8 > 79.9	135.882	6850.699	1.00	5.83	0.248	1.1	109.8	NO	2.545	NO
71	41	PFTeDA	713.0 > 669.0	831.811	6850.699	1.00	6.03	1.518	1.0	99.6	NO	24.591	YES
72	65	13C2-PFDoA	614.7 > 569.7	13223.400	11232.013	1.00	5.55	14.716	12.0	95.8	NO		

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Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	65	13C2-PFDoA	614.7 > 569.7	13223.400	11232.013	1.00	5.55	14.716	12.0	95.8	NO		
74	66	d3-N-MeFOSA	515.2 > 168.9	3520.567	14087.684	1.00	5.70	3.124	141.0	94.0	NO		
75	65	13C2-PFDoA	614.7 > 569.7	13223.400	11232.013	1.00	5.55	14.716	12.0	95.8	NO		
76	67	13C2-PFTeDA	715.1 > 669.7	6850.699	14087.684	1.00	6.02	6.079	11.9	95.1	NO		
77	67	13C2-PFTeDA	715.1 > 669.7	6850.699	14087.684	1.00	6.02	6.079	11.9	95.1	NO		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9	152.796	5573.488	1.00	6.10	4.112	4.9	98.1	NO	2.334	NO
80	43	PFHxDA	813.1 > 768.6	582.168	3787.741	1.00	6.38	0.768	0.9	94.5	NO	17.306	NO
81	44	PFODA	913.1 > 868.8	611.984	3787.741	1.00	6.63	0.808	1.0	96.0	NO		
82	45	N-MeFOSE	616.1 > 58.9	181.463	4916.013	1.00	6.30	5.537	4.8	96.1	NO		
83	46	N-EtFOSE	630.1 > 58.9	211.362	4743.509	1.00	6.45	6.684	4.9	98.4	NO		
84	72	13C4-PFBA	217.0 > 172.0	3193.654	3193.654	1.00	1.18	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9	5573.488	14087.684	1.00	6.13	4.945	158.7	105.8	NO		
86	69	13C2-PFHxDA	815 > 769.7	3787.741	14087.684	1.00	6.38	3.361	4.6	91.5	NO		
87	69	13C2-PFHxDA	815 > 769.7	3787.741	14087.684	1.00	6.38	3.361	4.6	91.5	NO		
88	70	d7-N-MeFOSE	623.1 > 58.9	4916.013	14087.684	1.00	6.29	4.362	156.0	104.0	NO		
89	71	d9-N-EtFOSE	639.2 > 58.8	4743.509	14087.684	1.00	6.44	4.209	153.0	102.0	NO		
90	73	13C5-PFHxA	318.0 > 272.9	11189.764	11189.764	1.00	2.96	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	14770.249	14770.249	1.00	4.11	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	540.822	540.822	1.00	3.74	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	8340.979	8340.979	1.00	4.55	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1443.314	1443.314	1.00	4.64	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	11232.013	11232.013	1.00	4.93	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	14087.684	14087.684	1.00	5.26	12.500	12.5	100.0	NO		

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Dataset: Untitled

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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	190711M3_1	IPA	11-Jul-19	21:27:14
2	2	190711M3_2	ST190711M3-1 PFC CS-2 19G1101	11-Jul-19	21:37:49
3	3	190711M3_3	ST190711M3-2 PFC CS-1 19G1102	11-Jul-19	21:48:22
4	4	190711M3_4	ST190711M3-3 PFC CS0 19G1103	11-Jul-19	21:59:01
5	5	190711M3_5	ST190711M3-4 PFC CS1 19G1104	11-Jul-19	22:09:33
6	6	190711M3_6	ST190711M3-5 PFC CS2 19G1105	11-Jul-19	22:20:12
7	7	190711M3_7	ST190711M3-6 PFC CS3 19G1106	11-Jul-19	22:30:45
8	8	190711M3_8	ST190711M3-7 PFC CS4 19G1107	11-Jul-19	22:41:23
9	9	190711M3_9	ST190711M3-8 PFC CS5 19G1108	11-Jul-19	22:51:57
10	10	190711M3_10	ST190711M3-9 PFC CS6 19G1109	11-Jul-19	23:02:37
11	11	190711M3_11	ST190711M3-10 PFC CS7 19G1110	11-Jul-19	23:13:13
12	12	190711M3_12	IB	11-Jul-19	23:23:47
13	13	190711M3_13	ST190711M3-1 PFC ICV 19G1111	11-Jul-19	23:34:17
14	14	190711M3_14	IPA	11-Jul-19	23:44:56
15	15	190711M3_15	B9G0061-BS1 OPR 0.125	11-Jul-19	23:55:34
16	16	190711M3_16	B9F0279-BS1 OPR 1	12-Jul-19	00:06:07
17	17	190711M3_17	B9F0279-BLK1 Method Blank 1	12-Jul-19	00:16:45
18	18	190711M3_18	1901784-02RE1 FRB-1 0.24972	12-Jul-19	00:27:18
19	19	190711M3_19	1901683-03 Hagatna 1 3.93	12-Jul-19	00:37:57
20	20	190711M3_20	1901910-01 SW1906280950KME 0.24336	12-Jul-19	00:48:35
21	21	190711M3_21	1901910-02 SW1906281025KME 0.24464	12-Jul-19	00:59:09
22	22	190711M3_22	1901910-03 SW1906281035KME 0.24318	12-Jul-19	01:09:47
23	23	190711M3_23	1901911-01 WMP1907010855JSJ 0.2509	12-Jul-19	01:20:19
24	24	190711M3_24	B9G0095-BS1 OPR 0.25	12-Jul-19	01:30:58
25	25	190711M3_25	B9G0095-BSD1 LCSD 0.25	12-Jul-19	01:41:36
26	26	190711M3_26	B9G0095-BLK1 Method Blank 0.25	12-Jul-19	01:52:09
27	27	190711M3_27	1901759-01 HW-AF-01-01-420-062419 0.11818	12-Jul-19	02:02:47
28	28	190711M3_28	1901992-01 WIN1907081315GGA 0.24256	12-Jul-19	02:13:26
29	29	190711M3_29	1901992-02 WMP1907081305GGA 0.23352	12-Jul-19	02:23:58
30	30	190711M3_30	1901992-03 WEF1907081310GGA 0.24328	12-Jul-19	02:34:37
31	31	190711M3_31	IPA	12-Jul-19	02:45:10
32	32	190711M3_32	ST190711M3-11 PFC CS3 19G1106	12-Jul-19	02:55:49

* KCV not used
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Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
33	33	190711M3_33	IPA	12-Jul-19	03:06:21
34	34	190711M3_34	B9G0062-BS1 OPR 0.125	12-Jul-19	03:16:59
35	35	190711M3_35	B9G0062-BSD1 LCSD 0.125	12-Jul-19	03:27:38
36	36	190711M3_36	B9G0062-BLK1 Method Blank 0.125	12-Jul-19	03:38:11
37	37	190711M3_37	1901922-01 FRB-07022019 0.10709	12-Jul-19	03:48:49
38	38	190711M3_38	1901922-02 CAOA-B02-GW 0.1205	12-Jul-19	03:59:23
39	39	190711M3_39	1901920-02 SAOA-B08-GW 0.13318	12-Jul-19	04:10:01
40	40	190711M3_40	1901920-03 EB-06272019-GW 0.11429	12-Jul-19	04:20:34
41	41	190711M3_41	1901920-04 FRB-06282019 0.11576	12-Jul-19	04:31:13
42	42	190711M3_42	1901920-05 SAOA-B12-GW 0.12204	12-Jul-19	04:41:51
43	43	190711M3_43	1901920-06 SAOA-B12-GW-D 0.12639	12-Jul-19	04:52:24
44	44	190711M3_44	1901920-11 NAOA-B02-GW 0.122	12-Jul-19	05:03:03
45	45	190711M3_45	1901920-12 EB-07012019 0.11155	12-Jul-19	05:13:36
46	46	190711M3_46	1901920-14 FRB-07012019 0.11643	12-Jul-19	05:24:14
47	47	190711M3_47	1901920-16 NAOA-B01-GW 0.1294	12-Jul-19	05:34:46
48	48	190711M3_48	IPA	12-Jul-19	05:45:25
49	49	190711M3_49	ST190711M3-12 PFC CS3 19G1106	12-Jul-19	05:56:03
50	50	190711M3_50	IPA	12-Jul-19	06:06:35
51	51	190711M3_51	1901920-17 NAOA-B01-GW-D 0.13768	12-Jul-19	06:17:14
52	52	190711M3_52	1901920-20 EB-07022019 0.11644	12-Jul-19	06:27:47
53	53	190711M3_53	B9G0065-BS1 OPR 0.25	12-Jul-19	06:38:25
54	54	190711M3_54	B9G0065-BLK1 Method Blank 0.25	12-Jul-19	06:48:58
55	55	190711M3_55	1901781-01 GW1906241425SK 0.24561	12-Jul-19	06:59:37
56	56	190711M3_56	1901781-02 GW1906241605SK 0.25501	12-Jul-19	07:10:15
57	57	190711M3_57	1901781-03 GW1906250855KME 0.24339	12-Jul-19	07:20:48
58	58	190711M3_58	1901781-04 GW1906250855KME-FD 0.24341	12-Jul-19	07:31:26
59	59	190711M3_59	1901781-05 GW1906250935SK 0.24535	12-Jul-19	07:41:59
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61	61	190711M3_61	1901781-07 GW1906251120SK 0.24467	12-Jul-19	08:03:15
62	62	190711M3_62	IPA	12-Jul-19	08:13:48
63	63	190711M3_63	ST190711M3-13 PFC CS3 19G1106	12-Jul-19	08:24:26
64	64	190711M3_64	IPA	12-Jul-19	08:34:58
65	65	190711M3_65	1901781-08 GMW1906251200KME 0.24756	12-Jul-19	08:45:54
66	66	190711M3_66	1901781-09 FB1906251135SK 0.25189	12-Jul-19	08:56:32
67	67	190711M3_67	IPA	12-Jul-19	09:07:05
68	68	190711M3_68	ST190711M3-14 PFC CS3 19G1106	12-Jul-19	09:17:43

Dataset: Untitled

Last Altered: Friday, July 12, 2019 09:54:29 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:54:35 Pacific Daylight Time

Compound name: PFBA

	# Name	ID	Acq.Date	Acq.Time
69	69 190711M3_69	IPA	12-Jul-19	09:28:22
70	70 190711M3_70	IB tester	12-Jul-19	09:38:55

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

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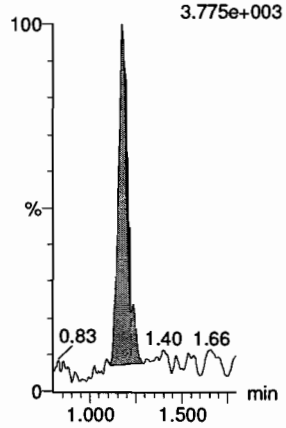

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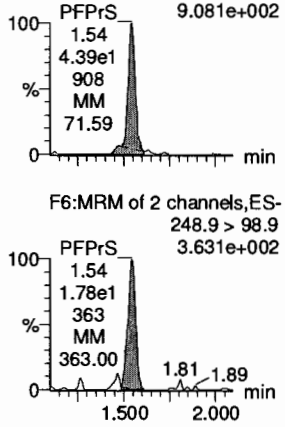
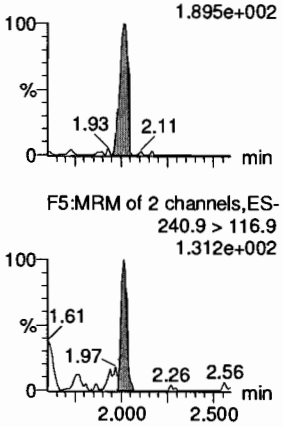


3:3 FTCA



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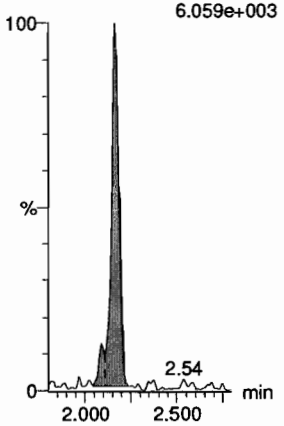

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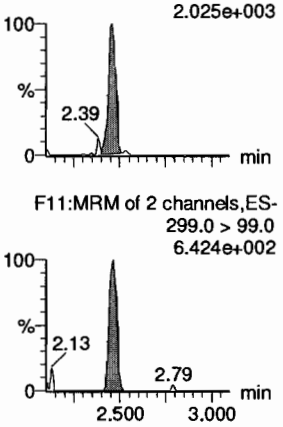
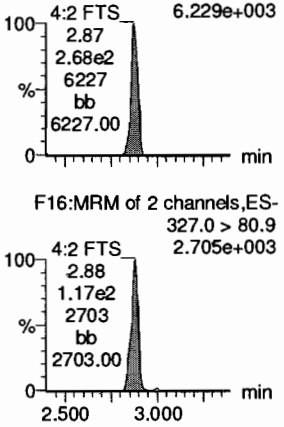
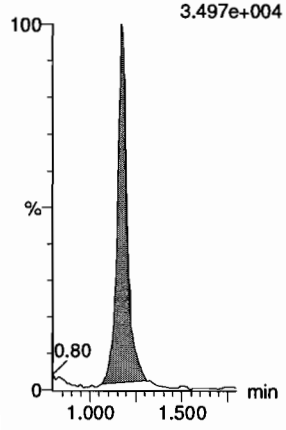


4:2 FTS



13C3-PFBA



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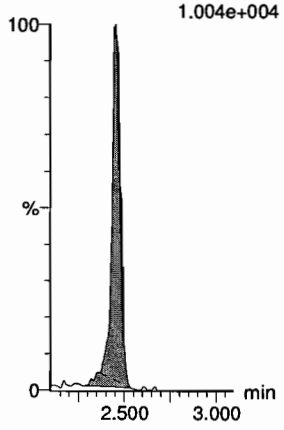

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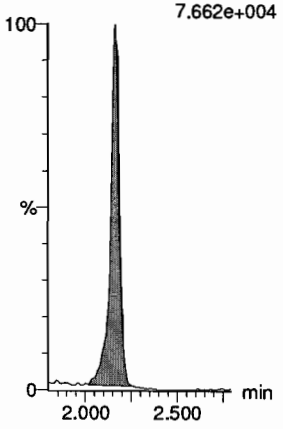

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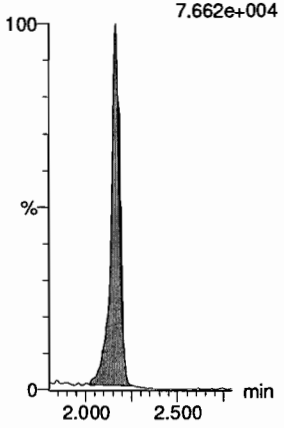

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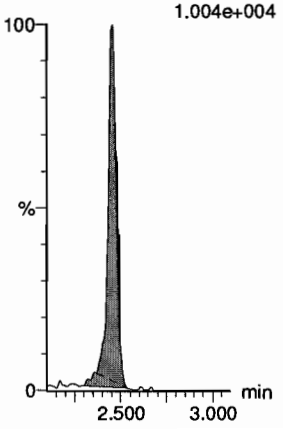
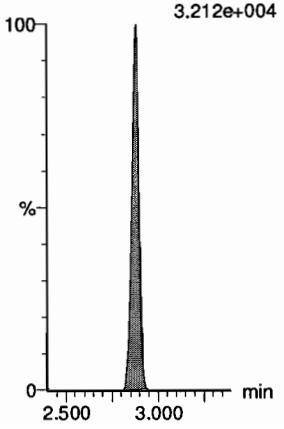


13C2-4:2 FTS



Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

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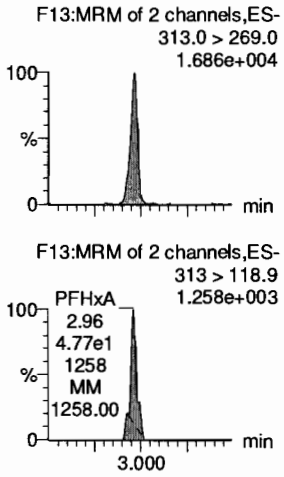

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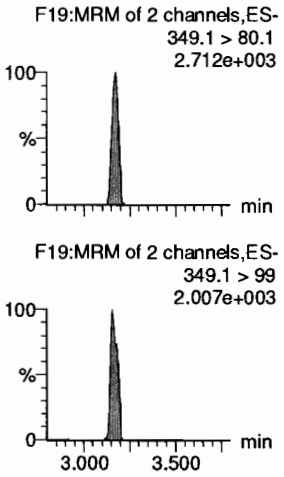

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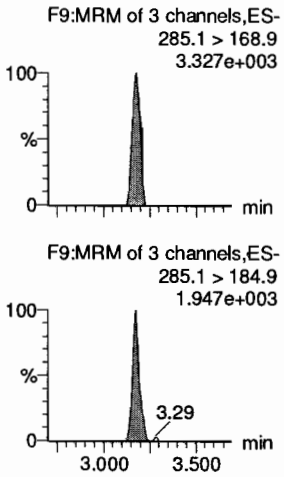
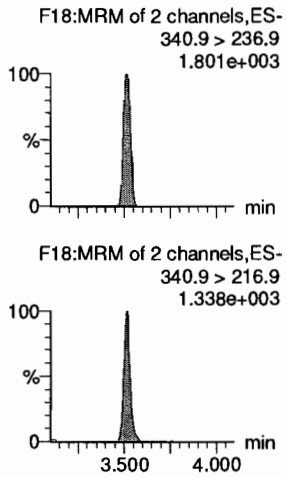


5:3 FTCA



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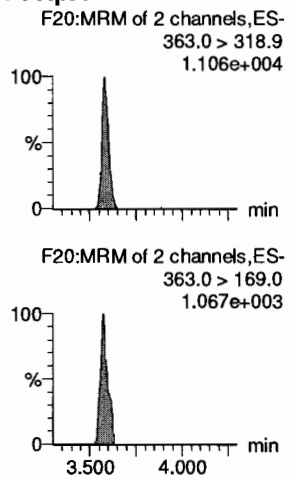

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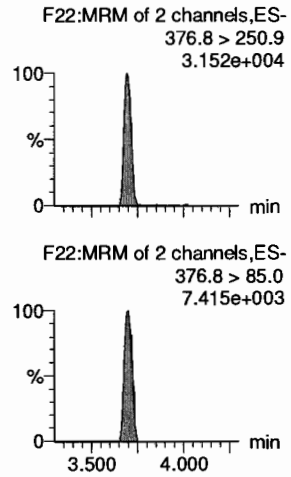
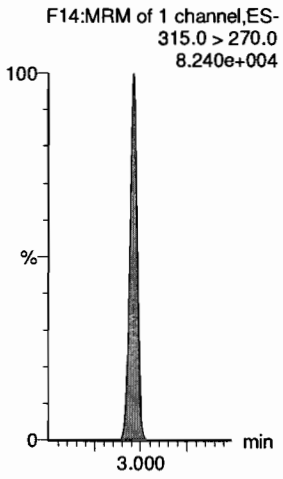


13C2-PFHxA



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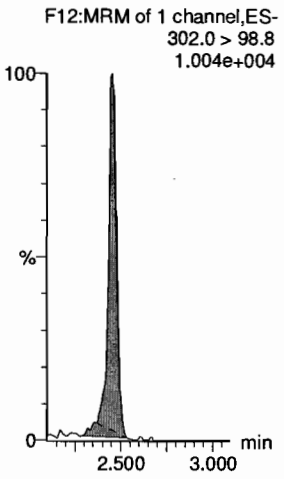

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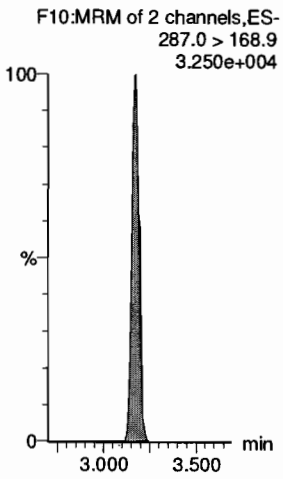

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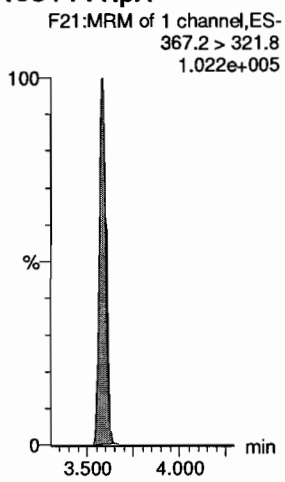

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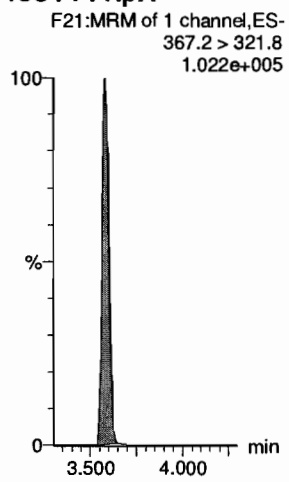

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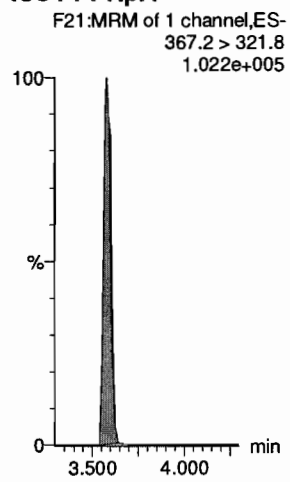

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

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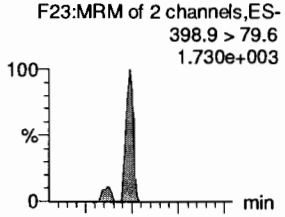
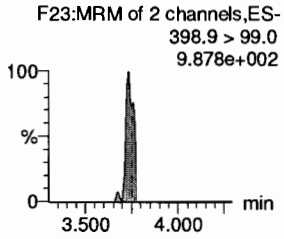
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

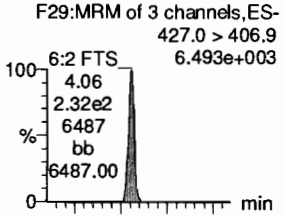
Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

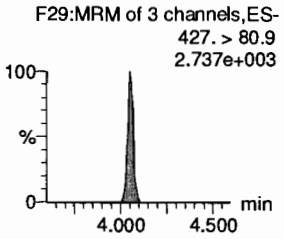
L-PFHxS



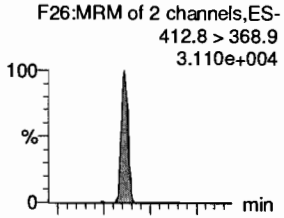


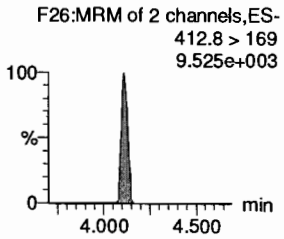
6:2 FTS



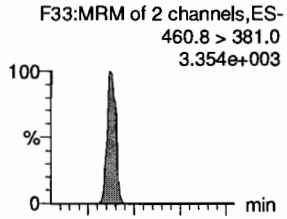


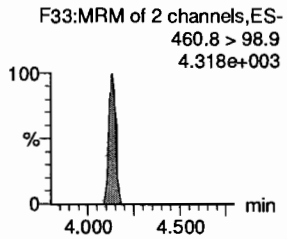
L-PFOA





PFEChS





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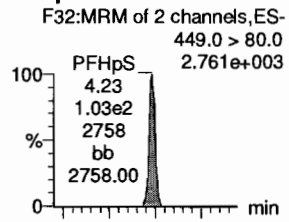
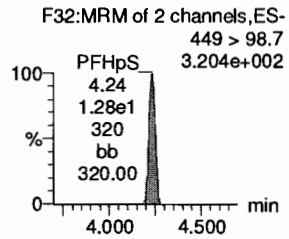
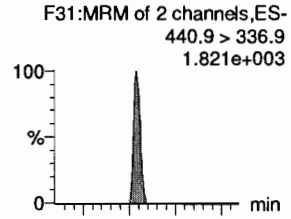
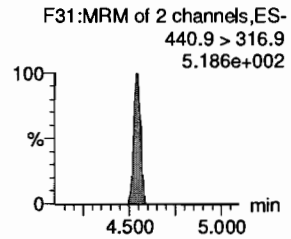




7:3 FTCA





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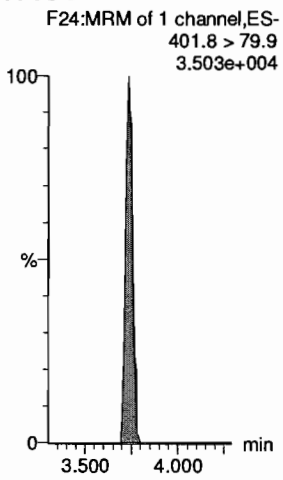
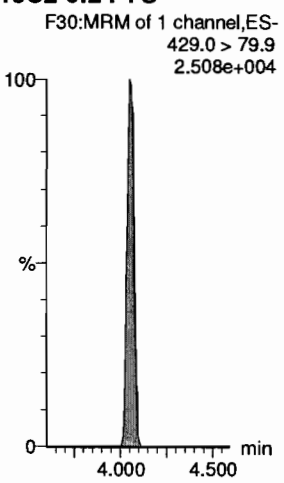


13C2-6:2 FTS



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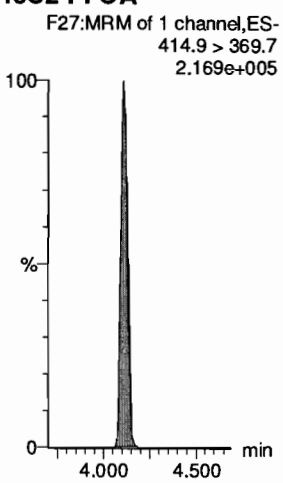
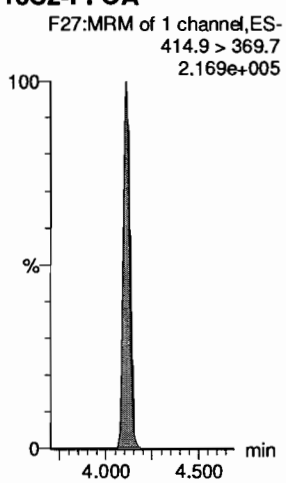
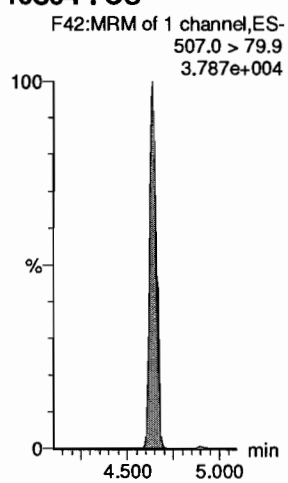


13C2-PFOA



13C8-PFOS



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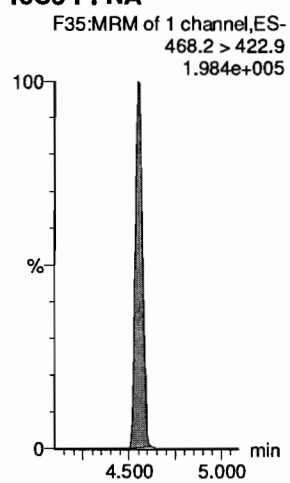
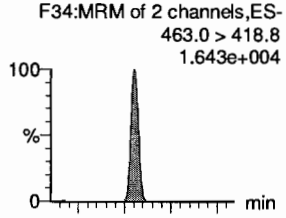


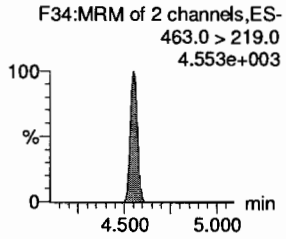
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

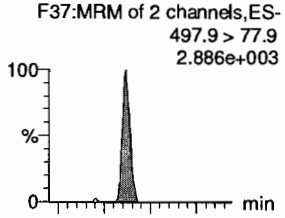
Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

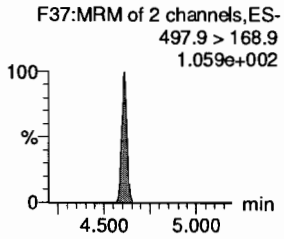
PFNA



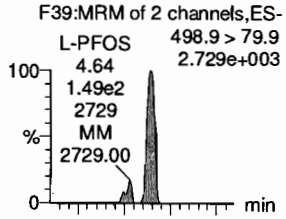


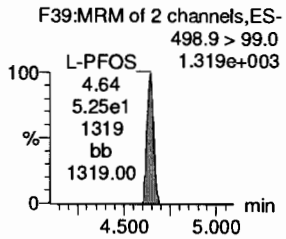
PFOSA



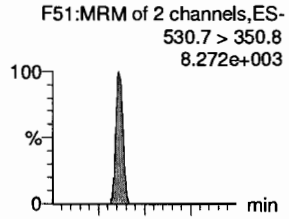


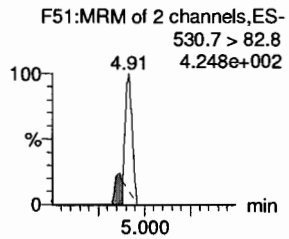
L-PFOS



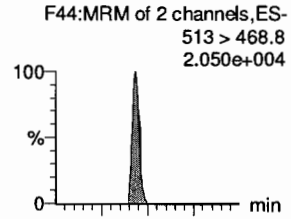


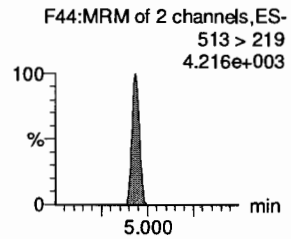
9Cl-PF30NS



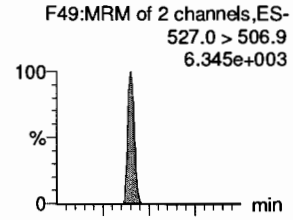


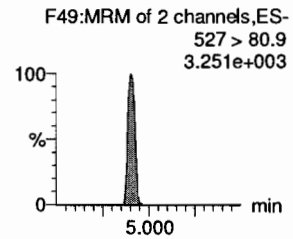
PFDA



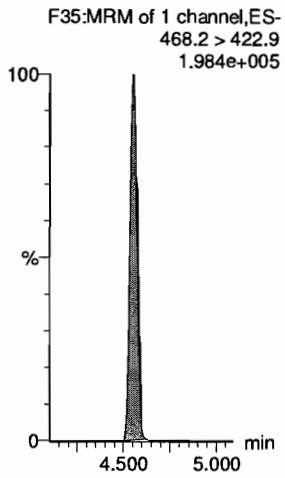


8:2 FTS

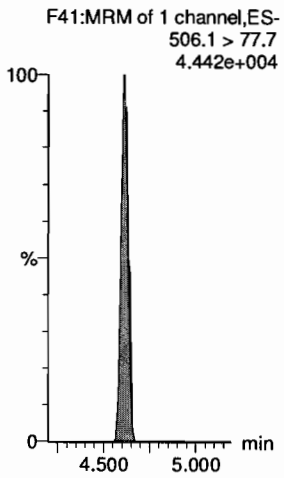




13C5-PFNA



13C8-PFOSA



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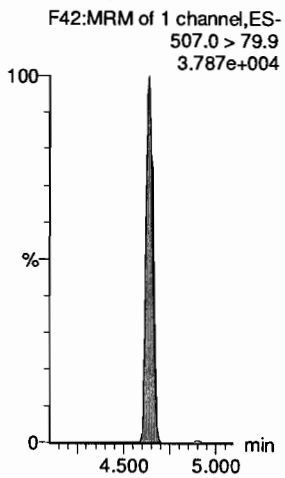
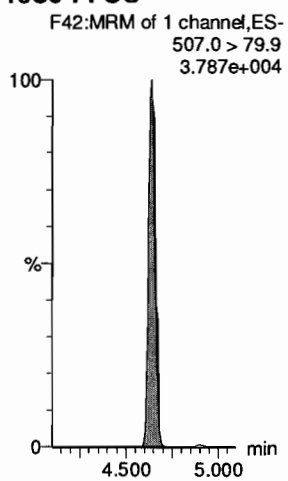
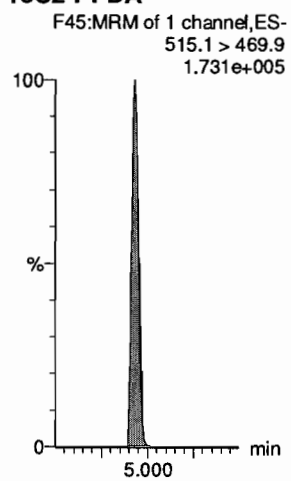


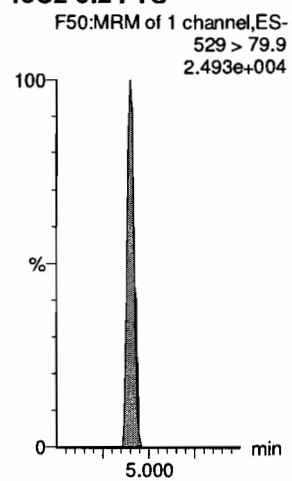
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

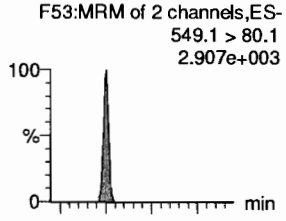


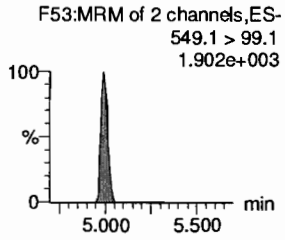
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

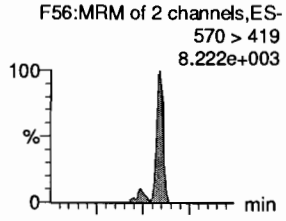
Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

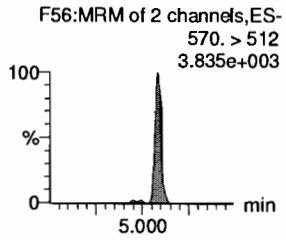
PFNS



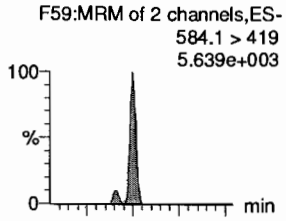


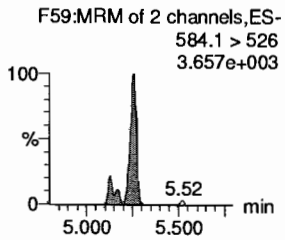
L-MeFOSAA



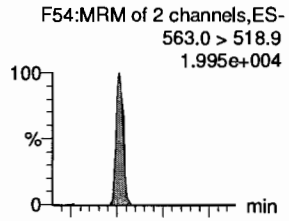


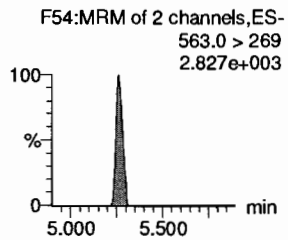
L-EtFOSAA



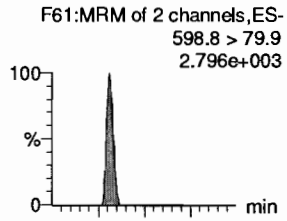


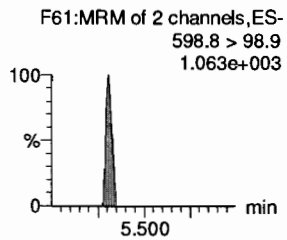
PFUdA



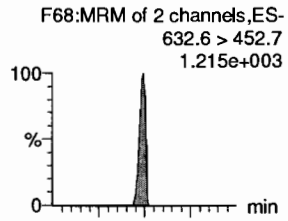


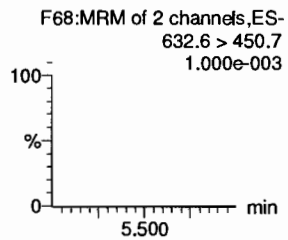
PFDS



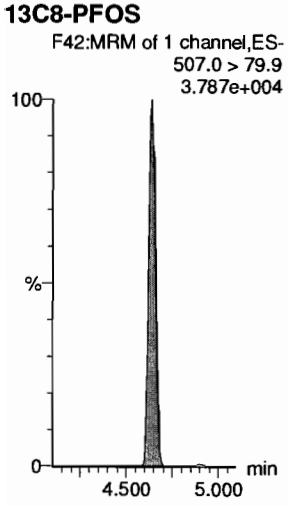


11Cl-PF30UdS

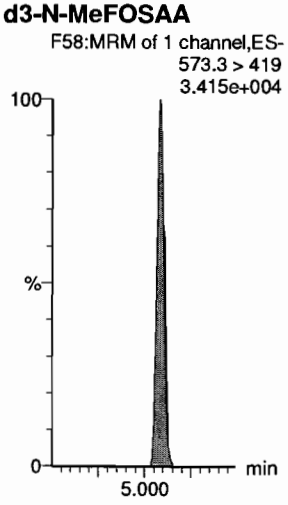




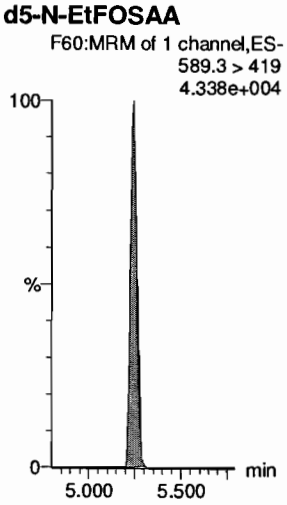
13C8-PFOS



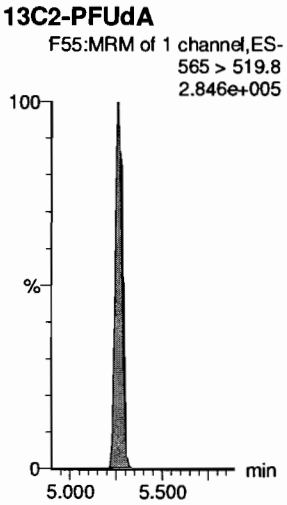
d3-N-MeFOSAA



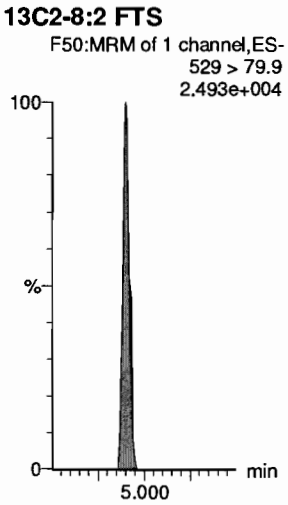
d5-N-EtFOSAA



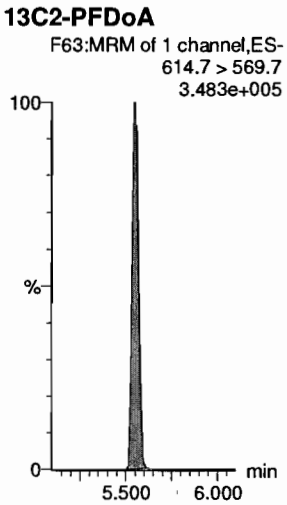
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA



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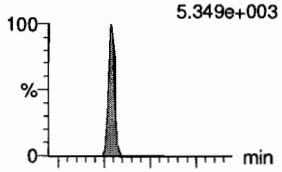
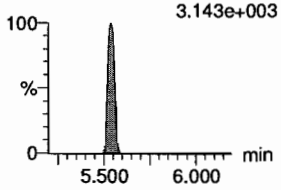
Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

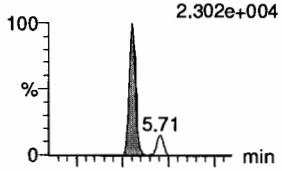
10:2 FTS
F66:MRM of 2 channels,ES-
627.0 > 606.9
5.349e+003



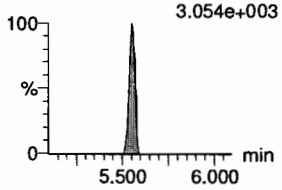
F66:MRM of 2 channels,ES-
627.0 > 80.9
3.143e+003



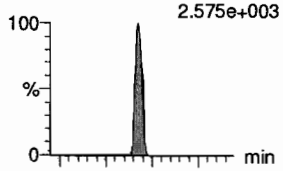
PFDoA
F62:MRM of 4 channels,ES-
612.9 > 569.0
2.302e+004



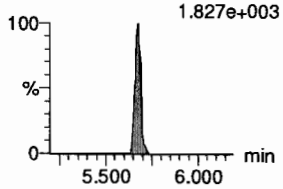
F62:MRM of 4 channels,ES-
612.9 > 318.8
3.054e+003



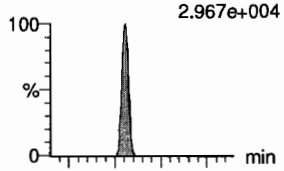
N-MeFOSA
F43:MRM of 2 channels,ES-
512.1 > 168.9
2.575e+003



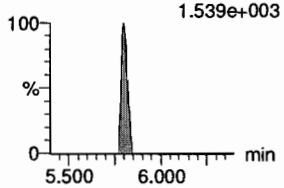
F43:MRM of 2 channels,ES-
512.1 > 219
1.827e+003



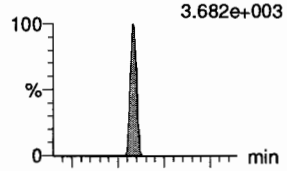
PFTrDA
F70:MRM of 2 channels,ES-
662.9 > 618.9
2.967e+004



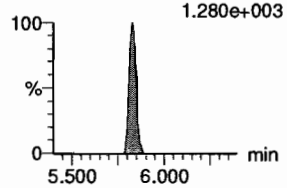
F70:MRM of 2 channels,ES-
662.9 > 319
1.539e+003



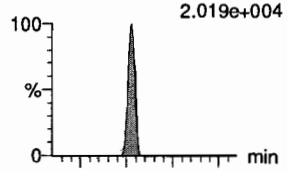
PFDoS
F71:MRM of 2 channels,ES-
698.8 > 79.9
3.682e+003



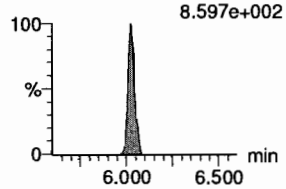
F71:MRM of 2 channels,ES-
698.8 > 98.9
1.280e+003



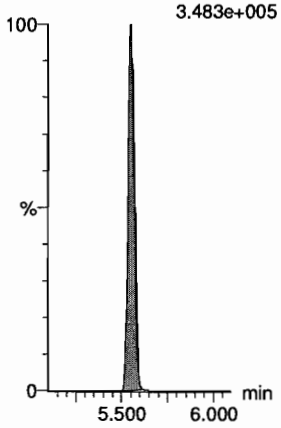
PFTeDA
F72:MRM of 2 channels,ES-
713.0 > 669.0
2.019e+004



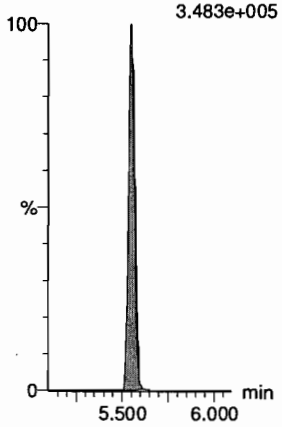
F72:MRM of 2 channels,ES-
713. > 369.0
8.597e+002



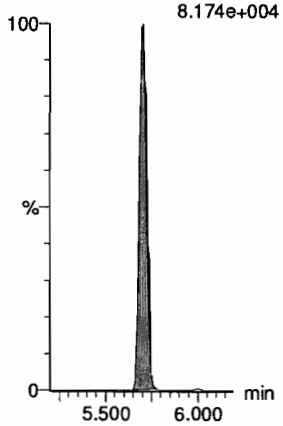
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.483e+005



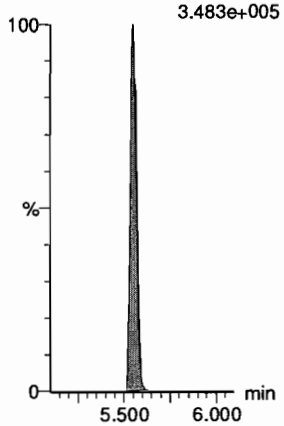
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.483e+005



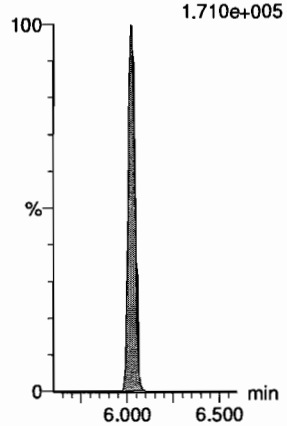
d3-N-MeFOSA
F46:MRM of 1 channel,ES-
515.2 > 168.9
8.174e+004



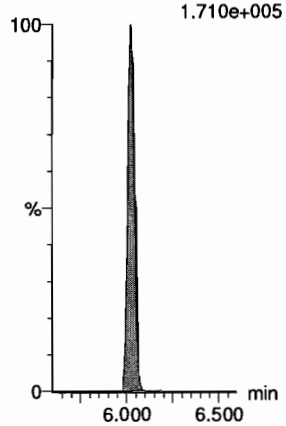
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.483e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.710e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.710e+005



Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
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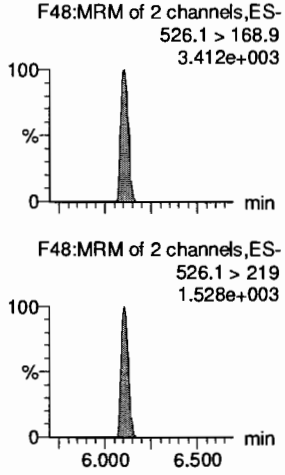
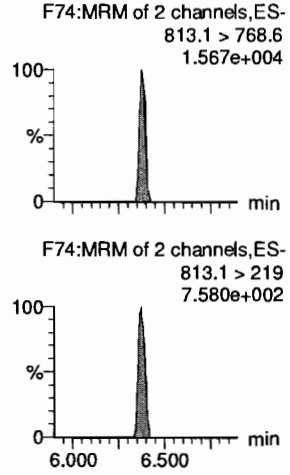
Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

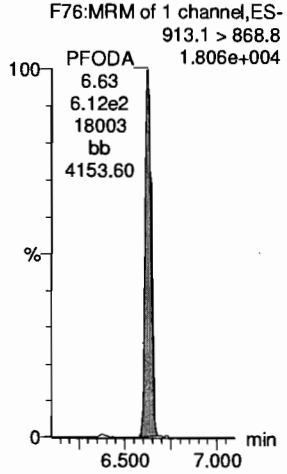
N-EtFOSA



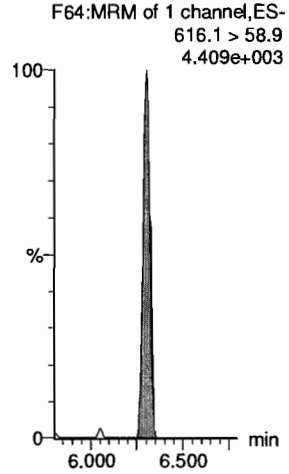
PFHxDA



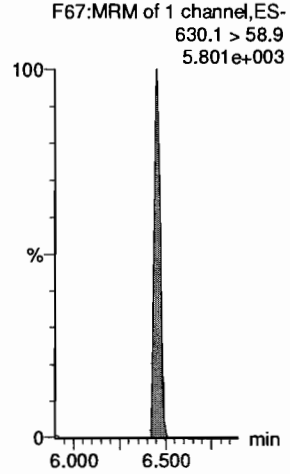
PFODA



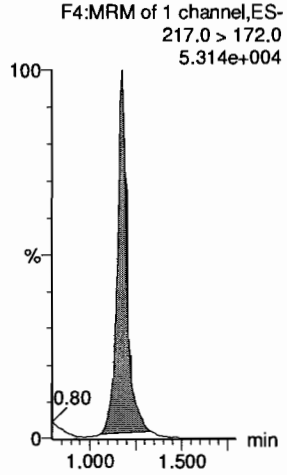
N-MeFOSE



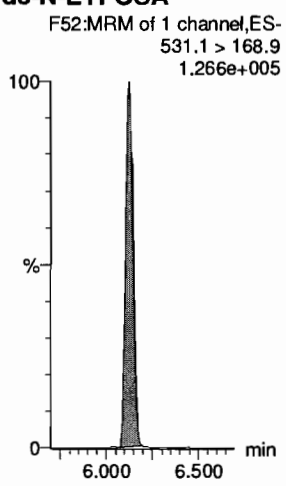
N-EtFOSE



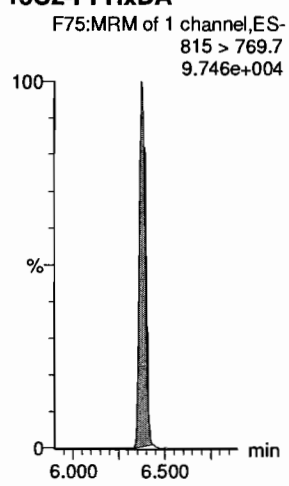
13C4-PFBA



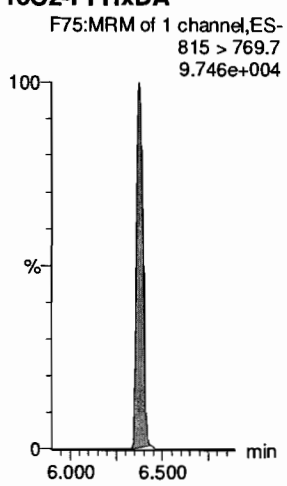
d5-N-ETFOSA



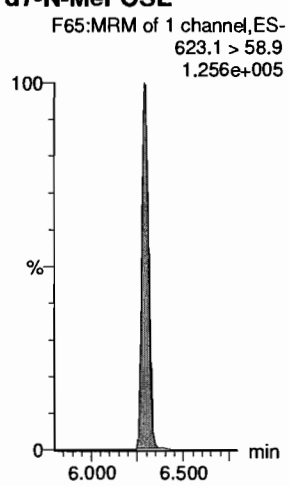
13C2-PFHxDA



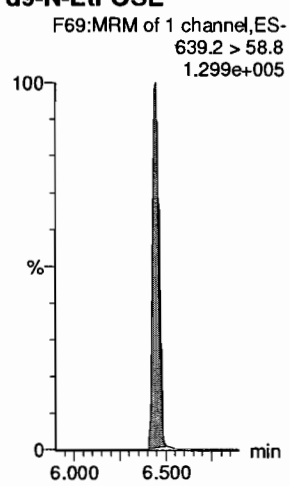
13C2-PFHxDA



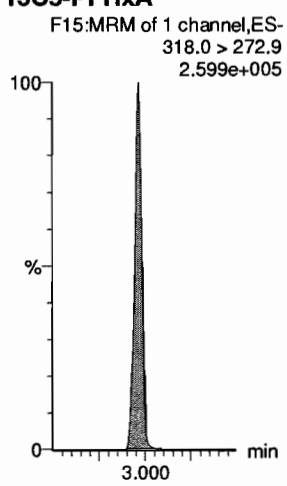
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

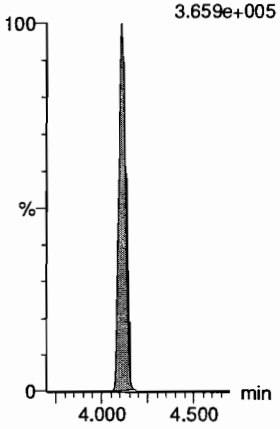


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-4.qld

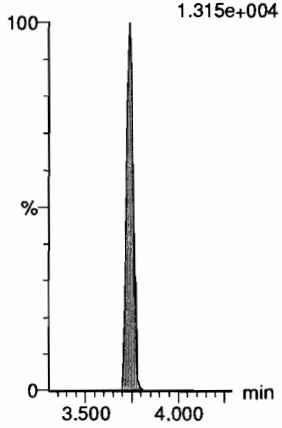
Last Altered: Friday, July 12, 2019 08:53:31 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:54:22 Pacific Daylight Time

Name: 190711M3_4, Date: 11-Jul-2019, Time: 21:59:01, ID: ST190711M3-3 PFC CS0 19G1103, Description: PFC CS0 19G1103

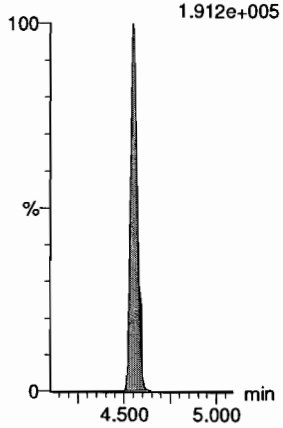
13C8-PFOA



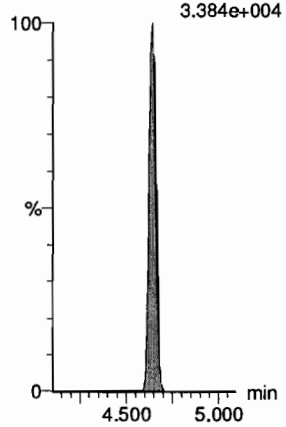
18O2-PFHxS



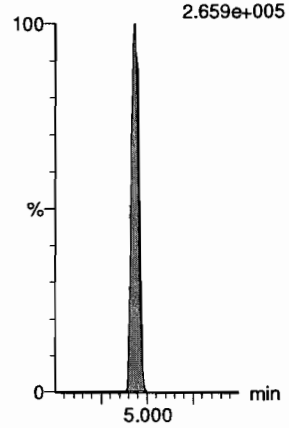
13C9-PFNA



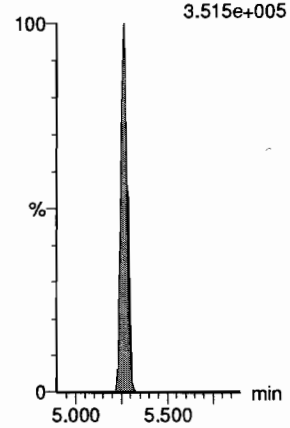
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

JA2 7/12/19

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	2296.135	2230.605	1.00	1.17	12.867	9.1	90.6	NO		
2	2	PFPrS	248.9 > 79.9	497.080	589.033	1.00	1.53	10.549	10.0	100.2	NO	2.303	NO
3	3	3:3 FTCA	240.9 > 176.9	143.146	4136.219	1.00	2.01	0.433	10.5	104.5	NO	1.893	NO
4	4	PFPeA	263.1 > 218.9	3152.229	4136.219	1.00	2.16	9.526	10.0	100.0	NO		
5	5	PFBS	299.0 > 79.7	1134.603	589.033	1.00	2.46	24.078	10.5	104.8	NO	3.066	NO
6	6	4:2 FTS	327.0 > 306.9	2597.562	1300.071	1.00	2.88	24.975	10.2	102.2	NO	1.967	NO
7	47	13C3-PFBA	216.1 > 171.8	2230.605	3260.294	1.00	1.17	8.552	13.2	105.3	NO		
8	49	13C3-PFBS	302.0 > 98.8	589.033	525.983	1.00	2.46	13.998	13.5	108.2	NO		
9	48	13C3-PFPeA	266.0 > 221.8	4136.219	10681.250	1.00	2.16	4.841	11.9	95.0	NO		
10	48	13C3-PFPeA	266.0 > 221.8	4136.219	10681.250	1.00	2.16	4.841	11.9	95.0	NO		
11	49	13C3-PFBS	302.0 > 98.8	589.033	525.983	1.00	2.46	13.998	13.5	108.2	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1300.071	525.983	1.00	2.88	30.896	13.8	110.4	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0	7978.475	3219.933	1.00	2.96	12.389	10.7	106.6	NO	16.349	NO
15	8	PFPeS	349.1>80.1	1090.994	589.033	1.00	3.17	23.152	10.9	108.6	NO	1.554	NO
16	9	HFPO-DA	285.1 > 168.9	1507.225	1353.469	1.00	3.17	5.568	10.0	100.5	NO	1.994	NO
17	10	5:3 FTCA	340.9 > 236.9	749.062	4042.534	1.00	3.52	2.316	9.1	91.0	NO	1.387	NO
18	11	PFHpA	363.0 > 318.9	4135.116	4042.534	1.00	3.58	12.786	10.4	104.2	NO	5.744	NO
19	12	ADONA	376.8 > 250.9	13610.604	4042.534	1.00	3.70	42.086	9.7	97.1	NO	3.227	NO
20	52	13C2-PFHxA	315.0 > 270.0	3219.933	10681.250	1.00	2.96	3.768	4.8	95.1	NO		
21	49	13C3-PFBS	302.0 > 98.8	589.033	525.983	1.00	2.46	13.998	13.5	108.2	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1353.469	10681.250	1.00	3.17	1.584	5.2	103.4	NO		
23	53	13C4-PFHpA	367.2 > 321.8	4042.534	10681.250	1.00	3.58	4.731	12.1	96.8	NO		
24	53	13C4-PFHpA	367.2 > 321.8	4042.534	10681.250	1.00	3.58	4.731	12.1	96.8	NO		
25	53	13C4-PFHpA	367.2 > 321.8	4042.534	10681.250	1.00	3.58	4.731	12.1	96.8	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6	1010.501	1419.481	1.00	3.74	8.899	10.6	106.3	NO	2.181	NO
28	15	6:2 FTS	427.0 > 406.9	2401.790	1069.224	1.00	4.05	28.079	9.6	96.2	NO	2.109	NO
29	16	L-PFOA	412.8 > 368.9	12496.430	8165.792	1.00	4.11	19.129	10.3	103.3	NO	3.450	NO
30	18	PFecHS	460.8 > 381.0	1824.164	8165.792	1.00	4.13	2.792	10.0	99.9	NO	0.939	NO
31	19	PFHpS	449.0 > 80.0	1158.833	1401.038	1.00	4.23	10.339	11.8	118.1	NO	2.242	NO
32	20	7:3 FTCA	440.9 > 336.9	830.156	8515.538	1.00	4.54	1.219	9.1	91.1	NO	2.024	NO
33	54	13C3-PFHxS	401.8 > 79.9	1419.481	525.983	1.00	3.74	33.734	13.2	106.0	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	1069.224	1363.537	1.00	4.05	9.802	13.3	106.5	NO		
35	58	13C2-PFOA	414.9 > 369.7	8165.792	14158.793	1.00	4.11	7.209	12.8	102.2	NO		
36	58	13C2-PFOA	414.9 > 369.7	8165.792	14158.793	1.00	4.11	7.209	12.8	102.2	NO		

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Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
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Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	59	13C8-PFOS	507.0 > 79.9	1401.038	1363.537	1.00	4.64	12.844	12.1	96.9	NO		
38	56	13C5-PFNA	468.2 > 422.9	8515.538	8496.886	1.00	4.56	12.527	12.7	102.0	NO		
39	-1												
40	21	PFNA	463.0 > 418.8	7460.492	8515.538	1.00	4.56	10.951	10.0	99.6	NO	2.747	NO
41	22	PFOSA	497.9 > 77.9	1774.579	1525.120	1.00	4.61	14.545	11.4	113.9	NO	32.469	NO
42	23	L-PFOS	498.9 > 79.9	1435.584	1401.038	1.00	4.64	12.808	10.2	102.3	NO	2.240	NO
43	25	9Cl-PF30NS	530.7 > 350.8	3806.272	1401.038	1.00	4.86	33.959	10.8	107.7	NO	16.635	NO
44	26	PFDA	513 > 468.8	9042.676	6971.401	1.00	4.94	16.214	9.8	97.6	NO	4.576	NO
45	27	8:2 FTS	527.0 > 506.9	1910.527	1114.549	1.00	4.90	21.427	9.5	95.2	NO	1.464	NO
46	56	13C5-PFNA	468.2 > 422.9	8515.538	8496.886	1.00	4.56	12.527	12.7	102.0	NO		
47	57	13C8-PFOSA	506.1 > 77.7	1525.120	12786.682	1.00	4.62	1.491	11.4	91.6	NO		
48	59	13C8-PFOS	507.0 > 79.9	1401.038	1363.537	1.00	4.64	12.844	12.1	96.9	NO		
49	59	13C8-PFOS	507.0 > 79.9	1401.038	1363.537	1.00	4.64	12.844	12.1	96.9	NO		
50	60	13C2-PFDA	515.1 > 469.9	6971.401	10829.662	1.00	4.94	8.047	12.2	97.2	NO		
51	61	13C2-8:2 FTS	529 > 79.9	1114.549	1363.537	1.00	4.90	10.217	14.7	117.5	NO		
52	-1												
53	28	PFNS	549.1 > 80.1	1040.144	1401.038	1.00	5.00	9.280	10.6	105.9	NO	1.585	NO
54	29	L-MeFOSAA	570 > 419	4125.132	1514.425	1.00	5.09	34.049	11.4	113.8	NO	2.581	NO
55	31	L-EtFOSAA	584.1 > 419	2821.183	1689.962	1.00	5.25	20.867	10.5	105.3	NO	1.399	NO
56	33	PFUdA	563.0 > 518.9	8140.202	11510.665	1.00	5.26	8.840	9.5	94.9	NO	6.355	NO
57	34	PFDS	598.8 > 79.9	1510.760	1114.549	1.00	5.31	16.944	8.4	84.0	NO	1.783	NO
58	35	11Cl-PF30UdS	632.6 > 452.7	714.987	12278.030	1.00	5.48	0.728	11.3	113.1	NO	6.844	NO
59	59	13C8-PFOS	507.0 > 79.9	1401.038	1363.537	1.00	4.64	12.844	12.1	96.9	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1514.425	12786.682	1.00	5.09	1.480	11.5	91.8	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1689.962	12786.682	1.00	5.24	1.652	11.2	89.7	NO		
62	63	13C2-PFUdA	565 > 519.8	11510.665	12786.682	1.00	5.26	11.253	13.1	105.0	NO		
63	61	13C2-8:2 FTS	529 > 79.9	1114.549	1363.537	1.00	4.90	10.217	14.7	117.5	NO		
64	65	13C2-PFDoA	614.7 > 569.7	12278.030	10829.662	1.00	5.55	14.172	11.5	92.2	NO		
65	-1												
66	36	10:2 FTS	627.0 > 606.9	1953.175	1114.549	1.00	5.53	21.905	8.2	82.5	NO	1.528	NO
67	37	PFDoA	612.9 > 569.0	9923.921	12278.030	1.00	5.55	10.103	10.6	105.9	NO	7.294	NO
68	38	N-MeFOSA	512.1 > 168.9	1404.152	3637.441	1.00	5.67	57.904	45.3	90.6	NO	1.663	NO
69	39	PFTrDA	662.9 > 618.9	10736.150	12278.030	1.00	5.80	10.930	10.3	103.1	NO	15.848	NO
70	40	PFDoS	698.8 > 79.9	1215.990	6391.971	1.00	5.83	2.378	9.8	98.5	NO	1.916	NO
71	41	PFTeDA	713.0 > 669.0	8078.837	6391.971	1.00	6.03	15.799	10.5	105.4	NO	13.714	NO
72	65	13C2-PFDoA	614.7 > 569.7	12278.030	10829.662	1.00	5.55	14.172	11.5	92.2	NO		

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

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Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	65	13C2-PFDoA	614.7 > 569.7	12278.030	10829.662	1.00	5.55	14.172	11.5	92.2	NO		
74	66	d3-N-MeFOSA	515.2 > 168.9	3637.441	12786.682	1.00	5.70	3.556	160.5	107.0	NO		
75	65	13C2-PFDoA	614.7 > 569.7	12278.030	10829.662	1.00	5.55	14.172	11.5	92.2	NO		
76	67	13C2-PFTeDA	715.1 > 669.7	6391.971	12786.682	1.00	6.02	6.249	12.2	97.8	NO		
77	67	13C2-PFTeDA	715.1 > 669.7	6391.971	12786.682	1.00	6.02	6.249	12.2	97.8	NO		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9	1512.230	5379.544	1.00	6.11	42.166	46.0	91.9	NO	1.778	NO
80	43	PFHxDA	813.1 > 768.6	5454.731	3667.506	1.00	6.38	7.437	9.8	98.2	NO	15.561	NO
81	44	PFODA	913.1 > 868.8	6219.668	3667.506	1.00	6.63	8.479	10.1	101.4	NO		
82	45	N-MeFOSE	616.1 > 58.9	1740.919	4729.849	1.00	6.30	55.211	49.2	98.4	NO		
83	46	N-EtFOSE	630.1 > 58.9	2237.700	4507.340	1.00	6.46	74.469	52.9	105.9	NO		
84	72	13C4-PFBA	217.0 > 172.0	3260.294	3260.294	1.00	1.17	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9	5379.544	12786.682	1.00	6.13	5.259	168.7	112.5	NO		
86	69	13C2-PFHxDA	815 > 769.7	3667.506	12786.682	1.00	6.38	3.585	4.9	97.6	NO		
87	69	13C2-PFHxDA	815 > 769.7	3667.506	12786.682	1.00	6.38	3.585	4.9	97.6	NO		
88	70	d7-N-MeFOSE	623.1 > 58.9	4729.849	12786.682	1.00	6.29	4.624	165.4	110.3	NO		
89	71	d9-N-EtFOSE	639.2 > 58.8	4507.340	12786.682	1.00	6.44	4.406	160.2	106.8	NO		
90	73	13C5-PFHxA	318.0 > 272.9	10681.250	10681.250	1.00	2.96	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	14158.793	14158.793	1.00	4.11	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	525.983	525.983	1.00	3.74	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	8496.886	8496.886	1.00	4.55	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1363.537	1363.537	1.00	4.64	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	10829.662	10829.662	1.00	4.93	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	12786.682	12786.682	1.00	5.26	12.500	12.5	100.0	NO		

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Dataset: Untitled

Last Altered: Friday, July 12, 2019 09:54:29 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:54:35 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	190711M3_1	IPA	11-Jul-19	21:27:14
2	2	190711M3_2	ST190711M3-1 PFC CS-2 19G1101	11-Jul-19	21:37:49
3	3	190711M3_3	ST190711M3-2 PFC CS-1 19G1102	11-Jul-19	21:48:22
4	4	190711M3_4	ST190711M3-3 PFC CS0 19G1103	11-Jul-19	21:59:01
5	5	190711M3_5	ST190711M3-4 PFC CS1 19G1104	11-Jul-19	22:09:33
6	6	190711M3_6	ST190711M3-5 PFC CS2 19G1105	11-Jul-19	22:20:12
7	7	190711M3_7	ST190711M3-6 PFC CS3 19G1106	11-Jul-19	22:30:45
8	8	190711M3_8	ST190711M3-7 PFC CS4 19G1107	11-Jul-19	22:41:23
9	9	190711M3_9	ST190711M3-8 PFC CS5 19G1108	11-Jul-19	22:51:57
10	10	190711M3_10	ST190711M3-9 PFC CS6 19G1109	11-Jul-19	23:02:37
11	11	190711M3_11	ST190711M3-10 PFC CS7 19G1110	11-Jul-19	23:13:13
12	12	190711M3_12	IB	11-Jul-19	23:23:47
13	13	190711M3_13	ST190711M3-1 PFC ICV 19G1111	11-Jul-19	23:34:17
14	14	190711M3_14	IPA	11-Jul-19	23:44:56
15	15	190711M3_15	B9G0061-BS1 OPR 0.125	11-Jul-19	23:55:34
16	16	190711M3_16	B9F0279-BS1 OPR 1	12-Jul-19	00:06:07
17	17	190711M3_17	B9F0279-BLK1 Method Blank 1	12-Jul-19	00:16:45
18	18	190711M3_18	1901784-02RE1 FRB-1 0.24972	12-Jul-19	00:27:18
19	19	190711M3_19	1901683-03 Hagatna 1 3.93	12-Jul-19	00:37:57
20	20	190711M3_20	1901910-01 SW1906280950KME 0.24336	12-Jul-19	00:48:35
21	21	190711M3_21	1901910-02 SW1906281025KME 0.24464	12-Jul-19	00:59:09
22	22	190711M3_22	1901910-03 SW1906281035KME 0.24318	12-Jul-19	01:09:47
23	23	190711M3_23	1901911-01 WMP1907010855JSJ 0.2509	12-Jul-19	01:20:19
24	24	190711M3_24	B9G0095-BS1 OPR 0.25	12-Jul-19	01:30:58
25	25	190711M3_25	B9G0095-BSD1 LCSD 0.25	12-Jul-19	01:41:36
26	26	190711M3_26	B9G0095-BLK1 Method Blank 0.25	12-Jul-19	01:52:09
27	27	190711M3_27	1901759-01 HW-AF-01-01-420-062419 0.11818	12-Jul-19	02:02:47
28	28	190711M3_28	1901992-01 WIN1907081315GGA 0.24256	12-Jul-19	02:13:26
29	29	190711M3_29	1901992-02 WMP1907081305GGA 0.23352	12-Jul-19	02:23:58
30	30	190711M3_30	1901992-03 WEF1907081310GGA 0.24328	12-Jul-19	02:34:37
31	31	190711M3_31	IPA	12-Jul-19	02:45:10
32	32	190711M3_32	ST190711M3-11 PFC CS3 19G1106	12-Jul-19	02:55:49

* CCV not used
BA 7/12/19

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Dataset: Untitled

Last Altered: Friday, July 12, 2019 09:54:29 Pacific Daylight Time
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Compound name: PFBA

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33	33	190711M3_33	IPA	12-Jul-19	03:06:21
34	34	190711M3_34	B9G0062-BS1 OPR 0.125	12-Jul-19	03:16:59
35	35	190711M3_35	B9G0062-BSD1 LCSD 0.125	12-Jul-19	03:27:38
36	36	190711M3_36	B9G0062-BLK1 Method Blank 0.125	12-Jul-19	03:38:11
37	37	190711M3_37	1901922-01 FRB-07022019 0.10709	12-Jul-19	03:48:49
38	38	190711M3_38	1901922-02 CAOA-B02-GW 0.1205	12-Jul-19	03:59:23
39	39	190711M3_39	1901920-02 SAOA-B08-GW 0.13318	12-Jul-19	04:10:01
40	40	190711M3_40	1901920-03 EB-06272019-GW 0.11429	12-Jul-19	04:20:34
41	41	190711M3_41	1901920-04 FRB-06282019 0.11576	12-Jul-19	04:31:13
42	42	190711M3_42	1901920-05 SAOA-B12-GW 0.12204	12-Jul-19	04:41:51
43	43	190711M3_43	1901920-06 SAOA-B12-GW-D 0.12639	12-Jul-19	04:52:24
44	44	190711M3_44	1901920-11 NAOA-B02-GW 0.122	12-Jul-19	05:03:03
45	45	190711M3_45	1901920-12 EB-07012019 0.11155	12-Jul-19	05:13:36
46	46	190711M3_46	1901920-14 FRB-07012019 0.11643	12-Jul-19	05:24:14
47	47	190711M3_47	1901920-16 NAOA-B01-GW 0.1294	12-Jul-19	05:34:46
48	48	190711M3_48	IPA	12-Jul-19	05:45:25
49	49	190711M3_49	ST190711M3-12 PFC CS3 19G1106	12-Jul-19	05:56:03
50	50	190711M3_50	IPA	12-Jul-19	06:06:35
51	51	190711M3_51	1901920-17 NAOA-B01-GW-D 0.13768	12-Jul-19	06:17:14
52	52	190711M3_52	1901920-20 EB-07022019 0.11644	12-Jul-19	06:27:47
53	53	190711M3_53	B9G0065-BS1 OPR 0.25	12-Jul-19	06:38:25
54	54	190711M3_54	B9G0065-BLK1 Method Blank 0.25	12-Jul-19	06:48:58
55	55	190711M3_55	1901781-01 GW1906241425SK 0.24561	12-Jul-19	06:59:37
56	56	190711M3_56	1901781-02 GW1906241605SK 0.25501	12-Jul-19	07:10:15
57	57	190711M3_57	1901781-03 GW1906250855KME 0.24339	12-Jul-19	07:20:48
58	58	190711M3_58	1901781-04 GW1906250855KME-FD 0.24341	12-Jul-19	07:31:26
59	59	190711M3_59	1901781-05 GW1906250935SK 0.24535	12-Jul-19	07:41:59
60	60	190711M3_60	1901781-06 GW1906251040KME 0.24373	12-Jul-19	07:52:37
61	61	190711M3_61	1901781-07 GW1906251120SK 0.24467	12-Jul-19	08:03:15
62	62	190711M3_62	IPA	12-Jul-19	08:13:48
63	63	190711M3_63	ST190711M3-13 PFC CS3 19G1106	12-Jul-19	08:24:26
64	64	190711M3_64	IPA	12-Jul-19	08:34:58
65	65	190711M3_65	1901781-08 GMW1906251200KME 0.24756	12-Jul-19	08:45:54
66	66	190711M3_66	1901781-09 FB1906251135SK 0.25189	12-Jul-19	08:56:32
67	67	190711M3_67	IPA	12-Jul-19	09:07:05
68	68	190711M3_68	ST190711M3-14 PFC CS3 19G1106	12-Jul-19	09:17:43

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Last Altered: Friday, July 12, 2019 09:54:29 Pacific Daylight Time
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Compound name: PFBA

	# Name	ID	Acq.Date	Acq.Time
69	69 190711M3_69	IPA	12-Jul-19	09:28:22
70	70 190711M3_70	IB tester	12-Jul-19	09:38:55

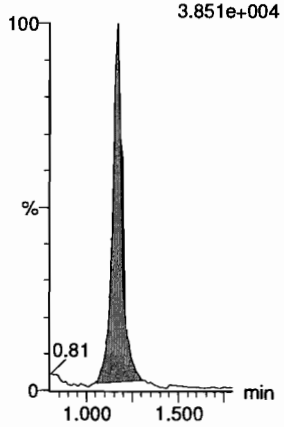
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

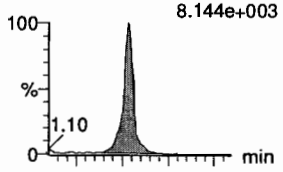
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

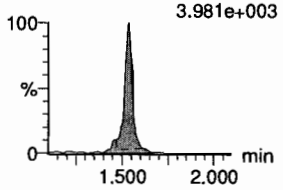
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
3.851e+004



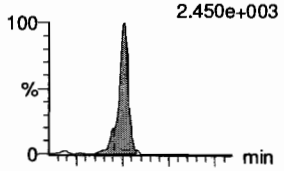
PFPrS
F6:MRM of 2 channels,ES-
248.9 > 79.9
8.144e+003



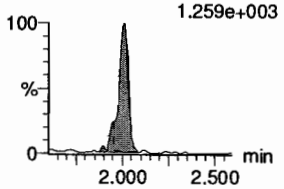
F6:MRM of 2 channels,ES-
248.9 > 98.9
3.981e+003



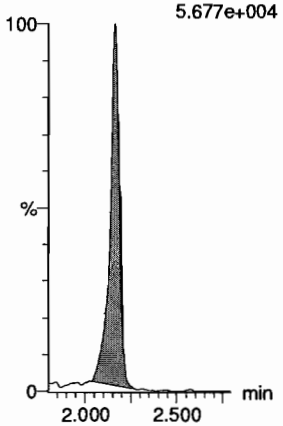
3:3 FTCA
F5:MRM of 2 channels,ES-
240.9 > 176.9
2.450e+003



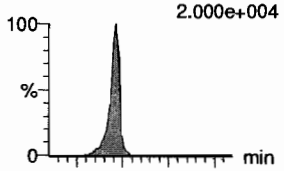
F5:MRM of 2 channels,ES-
240.9 > 116.9
1.259e+003



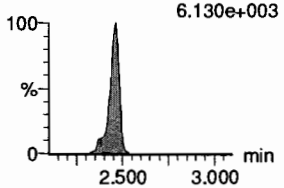
PFPeA
F7:MRM of 1 channel,ES-
263.1 > 218.9
5.677e+004



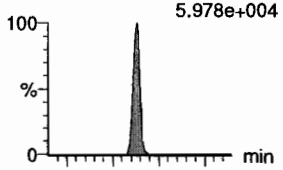
PFBS
F11:MRM of 2 channels,ES-
299.0 > 79.7
2.000e+004



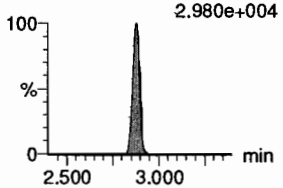
F11:MRM of 2 channels,ES-
299.0 > 99.0
6.130e+003



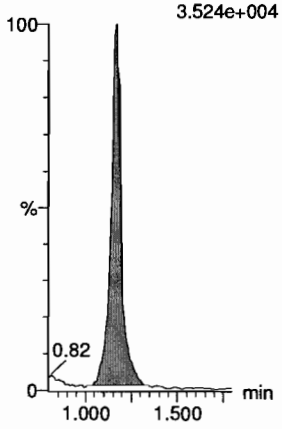
4:2 FTS
F16:MRM of 2 channels,ES-
327.0 > 306.9
5.978e+004



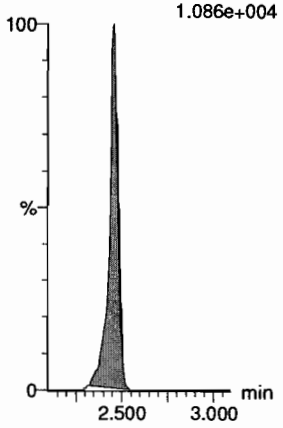
F16:MRM of 2 channels,ES-
327.0 > 80.9
2.980e+004



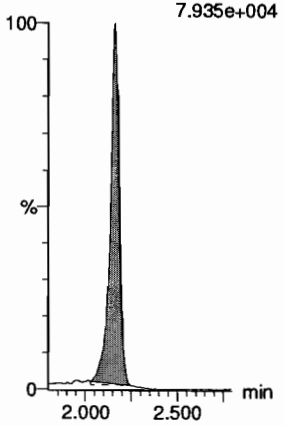
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
3.524e+004



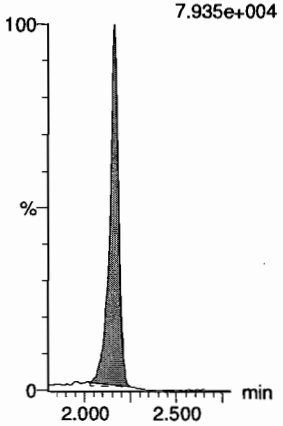
13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
1.086e+004



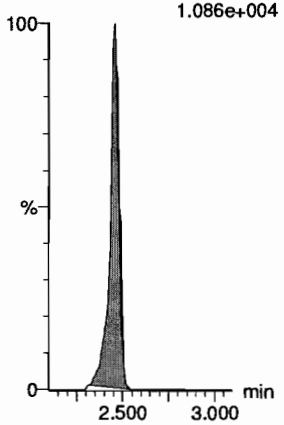
13C3-PFPeA
F8:MRM of 1 channel,ES-
266.0 > 221.8
7.935e+004



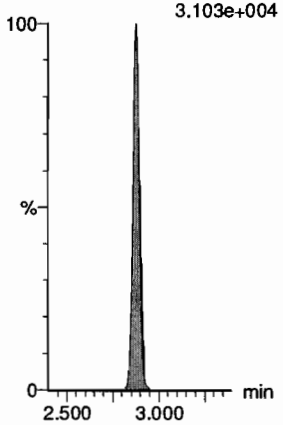
13C3-PFPeA
F8:MRM of 1 channel,ES-
266.0 > 221.8
7.935e+004



13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
1.086e+004



13C2-4:2 FTS
F17:MRM of 2 channels,ES-
329.0 > 79.9
3.103e+004

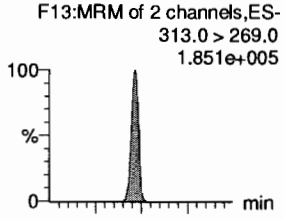


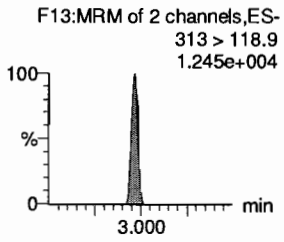
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

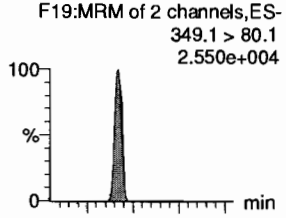
Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

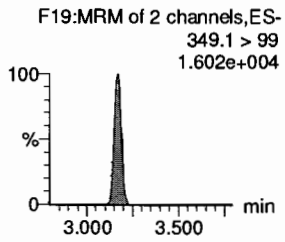
PFHxA



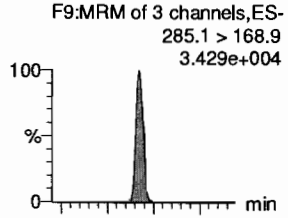


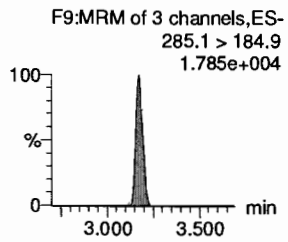
PFPeS



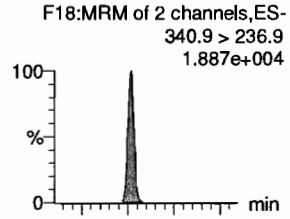


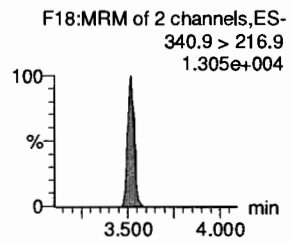
HFPO-DA



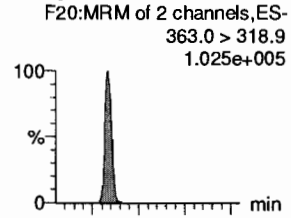


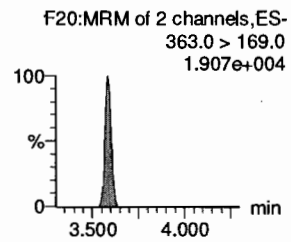
5:3 FTCA



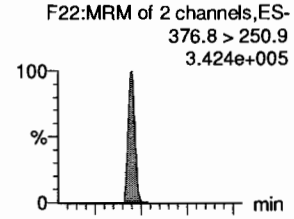


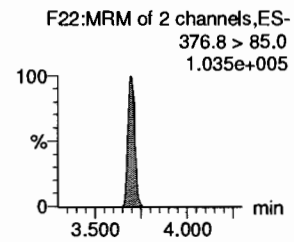
PFHpA



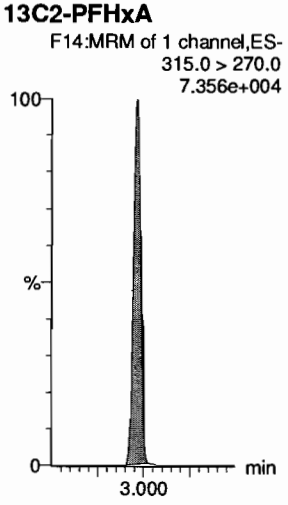


ADONA

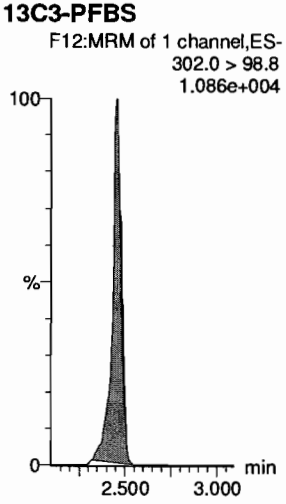




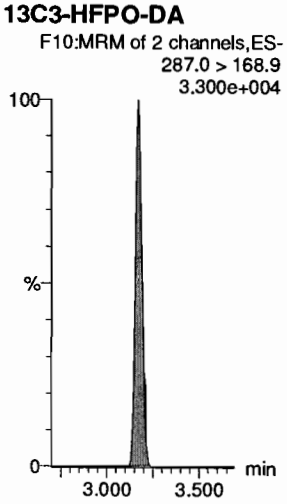
13C2-PFHxA



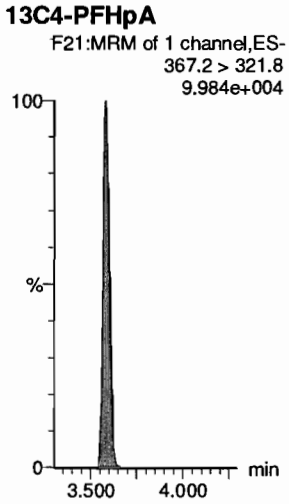
13C3-PFBS



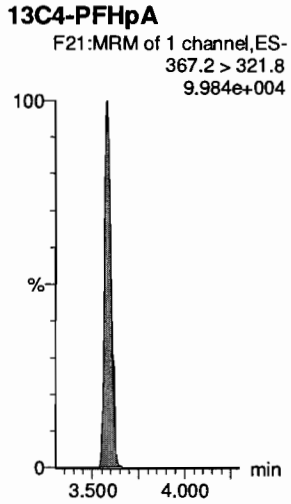
13C3-HFPO-DA



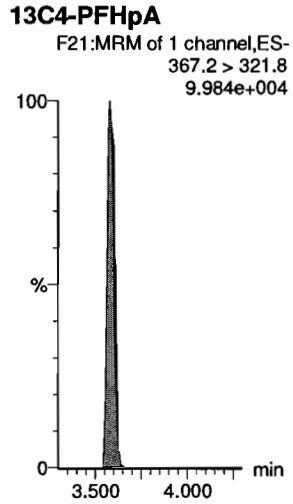
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA

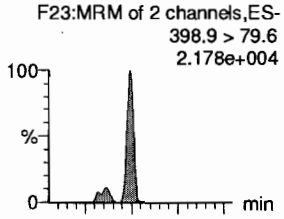


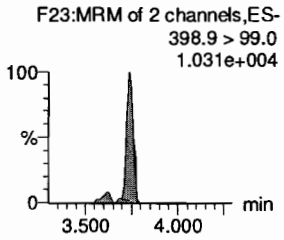
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

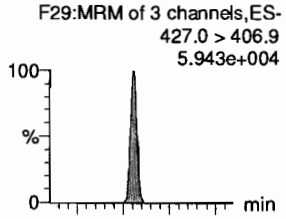
Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

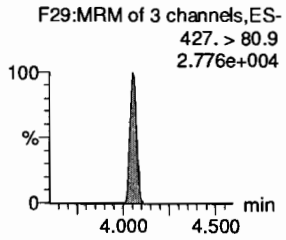
L-PFHxS



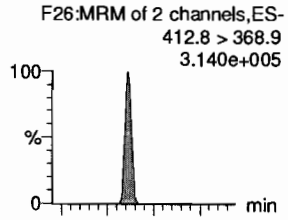


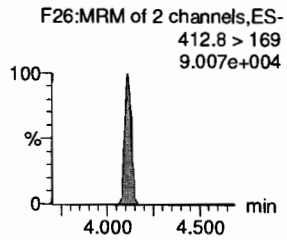
6:2 FTS



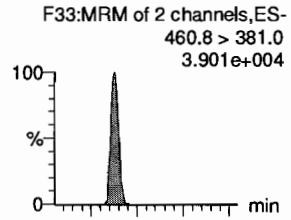


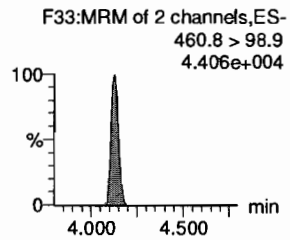
L-PFOA



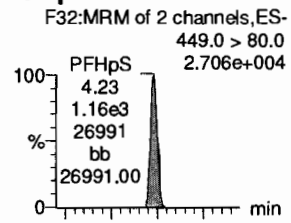


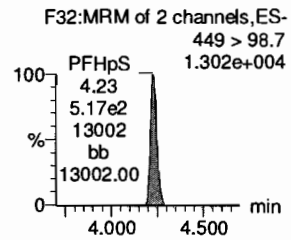
PFEChS



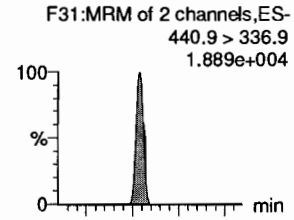


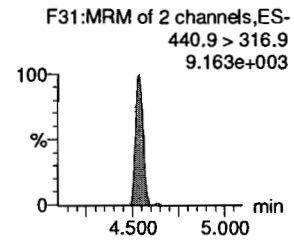
PFHpS



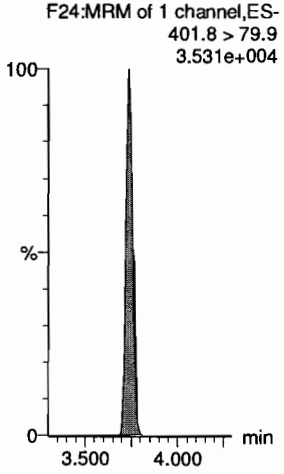


7:3 FTCA

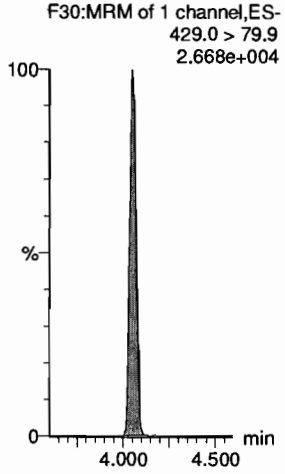




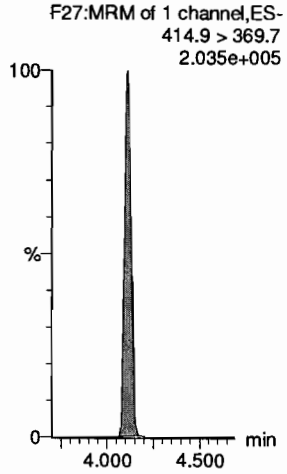
13C3-PFHxS



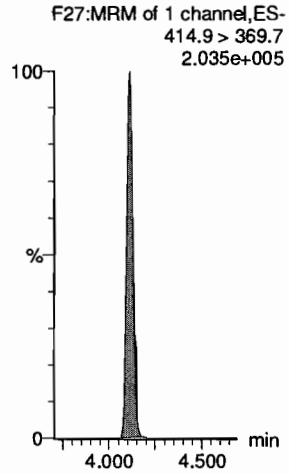
13C2-6:2 FTS



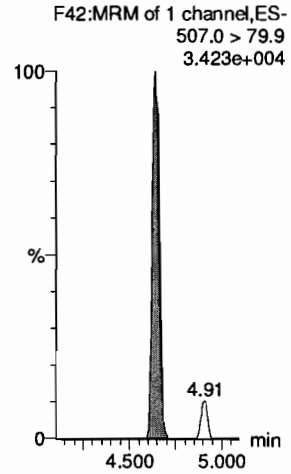
13C2-PFOA



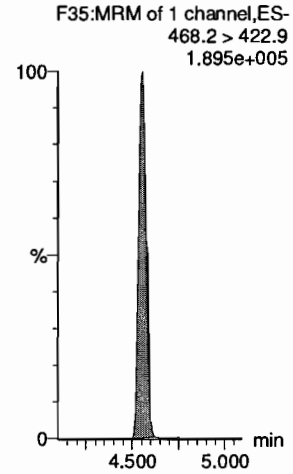
13C2-PFOA



13C8-PFOS



13C5-PFNA

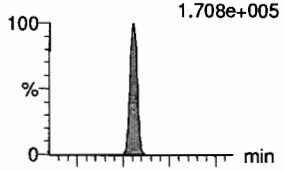


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

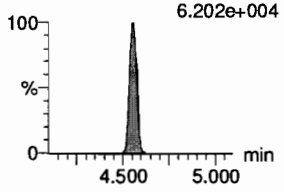
Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

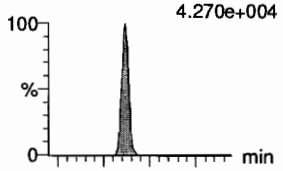
PFNA
F34:MRM of 2 channels,ES-
463.0 > 418.8
1.708e+005



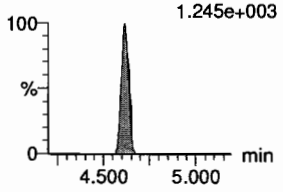
F34:MRM of 2 channels,ES-
463.0 > 219.0
6.202e+004



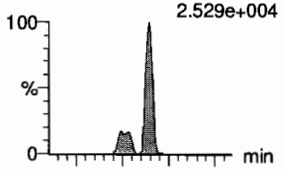
PFOSA
F37:MRM of 2 channels,ES-
497.9 > 77.9
4.270e+004



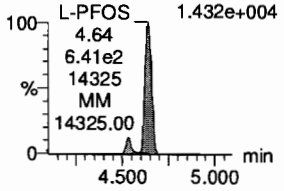
F37:MRM of 2 channels,ES-
497.9 > 168.9
1.245e+003



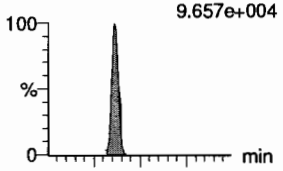
L-PFOS
F39:MRM of 2 channels,ES-
498.9 > 79.9
2.529e+004



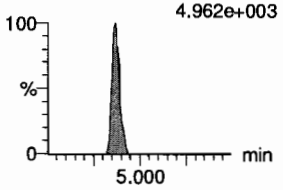
F39:MRM of 2 channels,ES-
498.9 > 99.0
1.432e+004



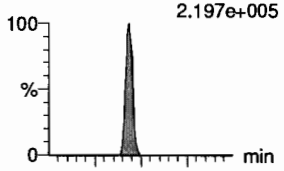
9Cl-PF30NS
F51:MRM of 2 channels,ES-
530.7 > 350.8
9.657e+004



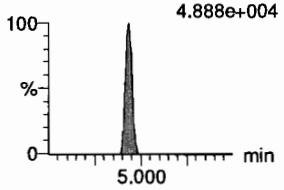
F51:MRM of 2 channels,ES-
530.7 > 82.8
4.962e+003



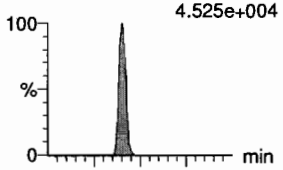
PFDA
F44:MRM of 2 channels,ES-
513 > 468.8
2.197e+005



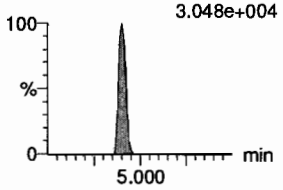
F44:MRM of 2 channels,ES-
513 > 219
4.888e+004



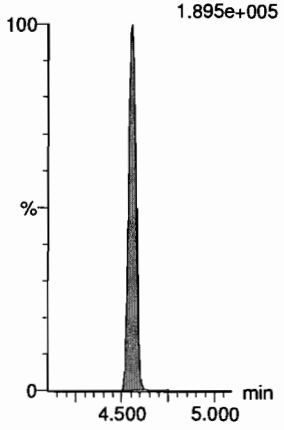
8:2 FTS
F49:MRM of 2 channels,ES-
527.0 > 506.9
4.525e+004



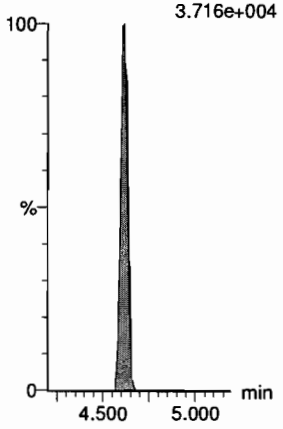
F49:MRM of 2 channels,ES-
527 > 80.9
3.048e+004



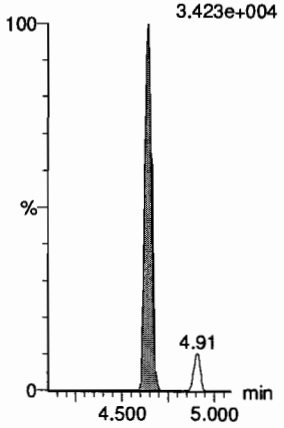
13C5-PFNA
F35:MRM of 1 channel,ES-
468.2 > 422.9
1.895e+005



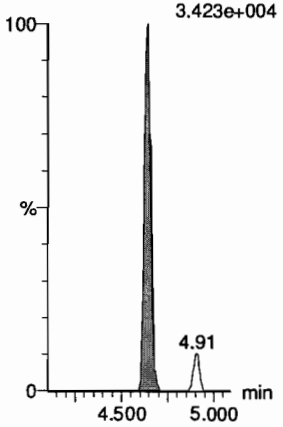
13C8-PFOSA
F41:MRM of 1 channel,ES-
506.1 > 77.7
3.716e+004



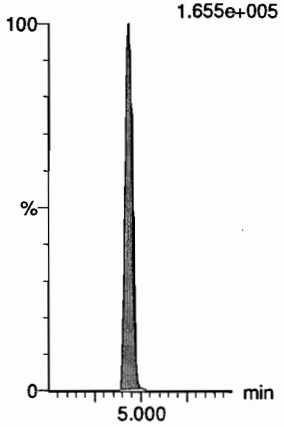
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.423e+004



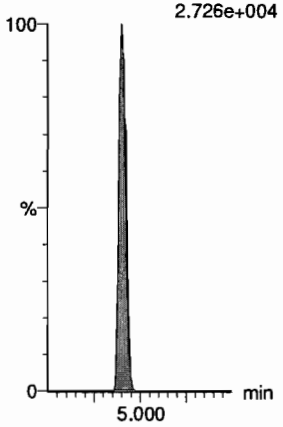
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.423e+004



13C2-PFDA
F45:MRM of 1 channel,ES-
515.1 > 469.9
1.655e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.726e+004

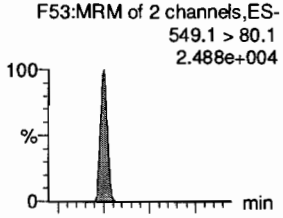


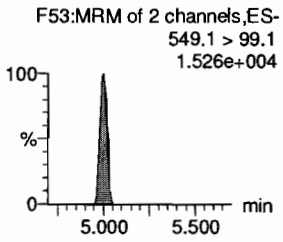
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

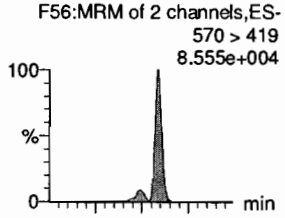
Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

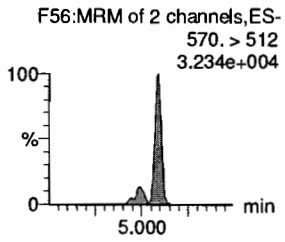
PFNS



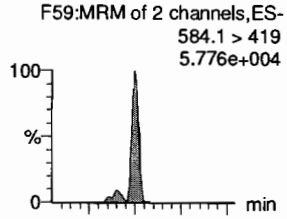


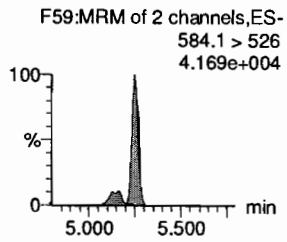
L-MeFOSAA



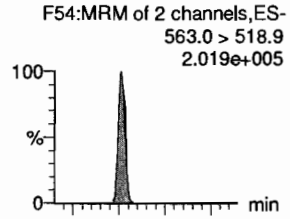


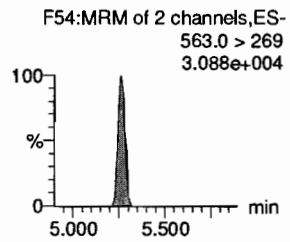
L-EtFOSAA



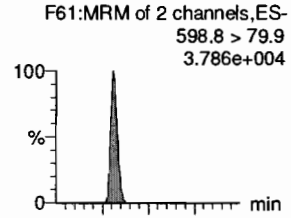


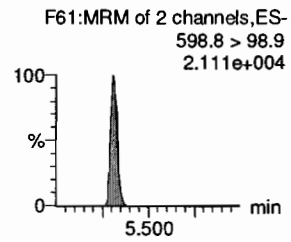
PFUdA



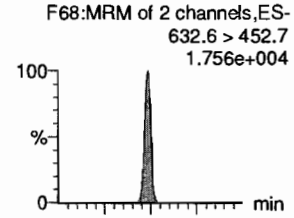


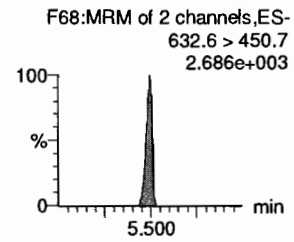
PFDS



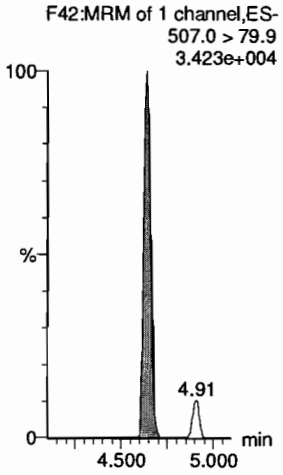


11Cl-PF30UdS

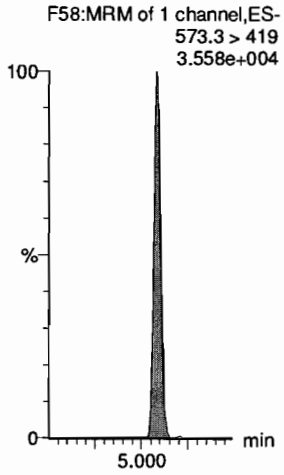




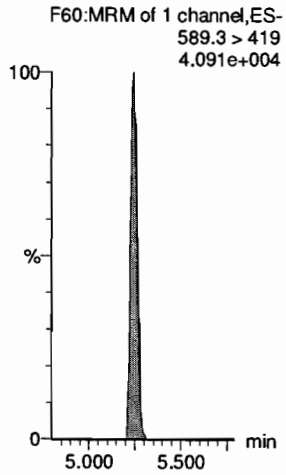
13C8-PFOS



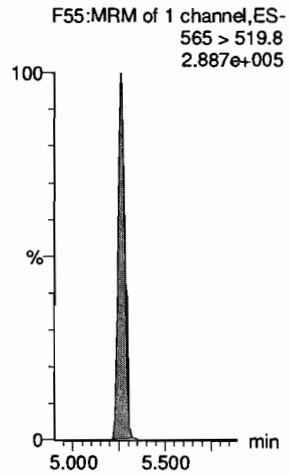
d3-N-MeFOSAA



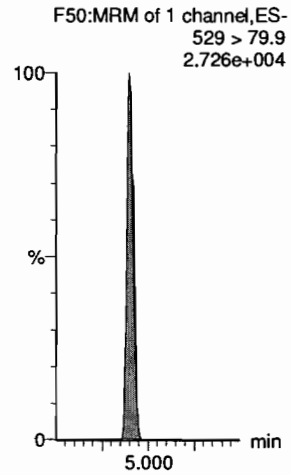
d5-N-EtFOSAA



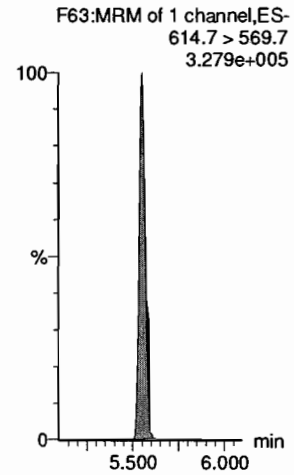
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA

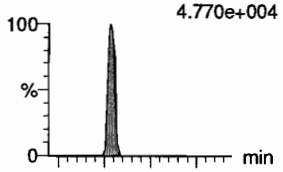


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

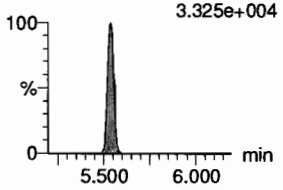
Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

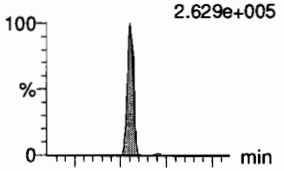
10:2 FTS
F66:MRM of 2 channels,ES-
627.0 > 606.9
4.770e+004



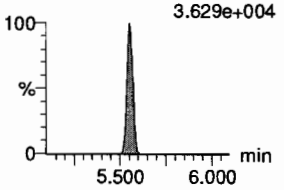
F66:MRM of 2 channels,ES-
627.0 > 80.9
3.325e+004



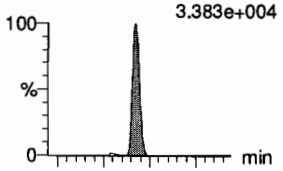
PFDoA
F62:MRM of 4 channels,ES-
612.9 > 569.0
2.629e+005



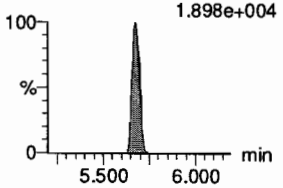
F62:MRM of 4 channels,ES-
612.9 > 318.8
3.629e+004



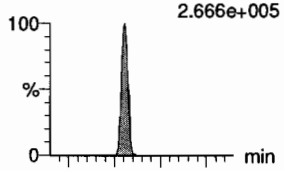
N-MeFOSA
F43:MRM of 2 channels,ES-
512.1 > 168.9
3.383e+004



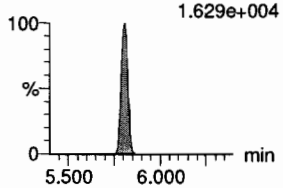
F43:MRM of 2 channels,ES-
512.1 > 219
1.898e+004



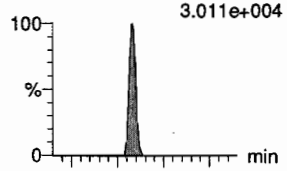
PFTrDA
F70:MRM of 2 channels,ES-
662.9 > 618.9
2.666e+005



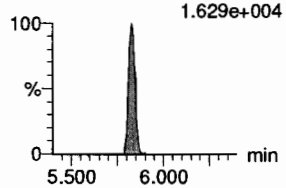
F70:MRM of 2 channels,ES-
662.9 > 319
1.629e+004



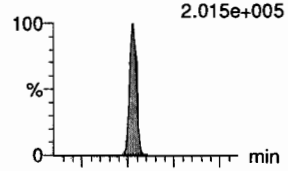
PFDoS
F71:MRM of 2 channels,ES-
698.8 > 79.9
3.011e+004



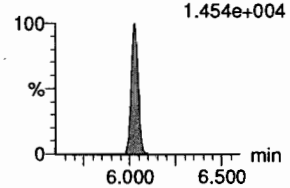
F71:MRM of 2 channels,ES-
698.8 > 98.9
1.629e+004



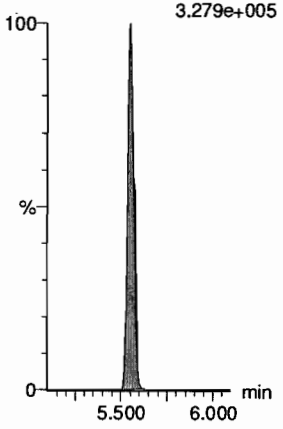
PFTeDA
F72:MRM of 2 channels,ES-
713.0 > 669.0
2.015e+005



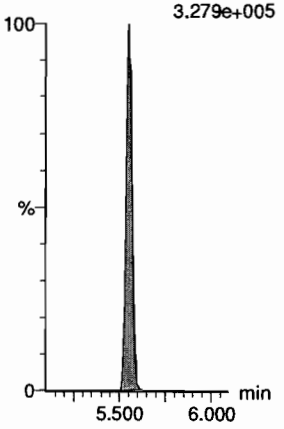
F72:MRM of 2 channels,ES-
713. > 369.0
1.454e+004



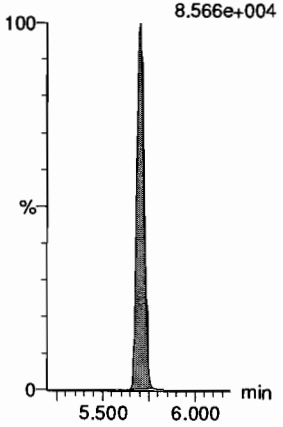
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.279e+005



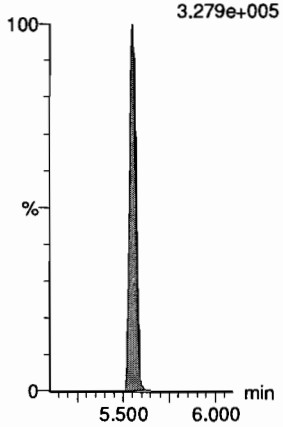
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.279e+005



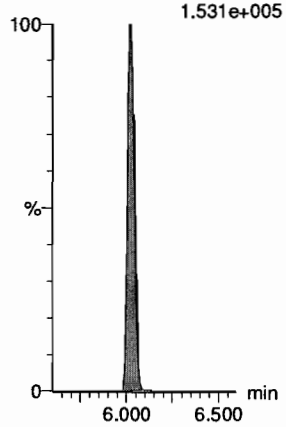
d3-N-MeFOSA
F46:MRM of 1 channel,ES-
515.2 > 168.9
8.566e+004



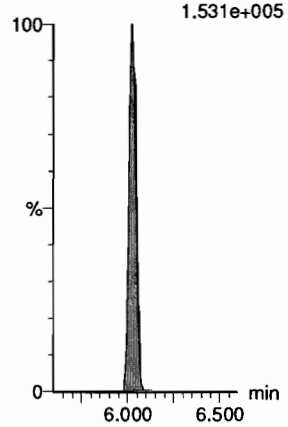
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.279e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.531e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.531e+005

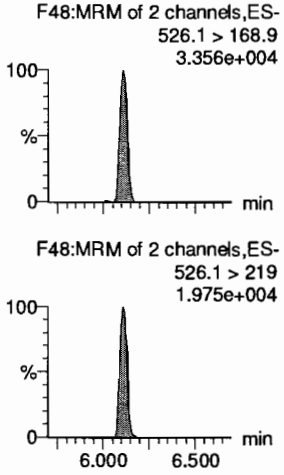


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

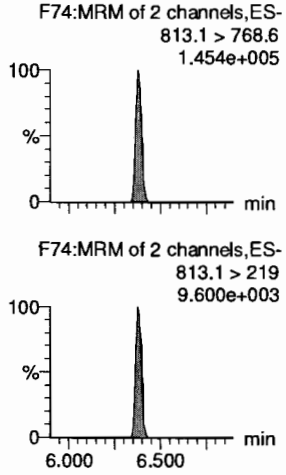
Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

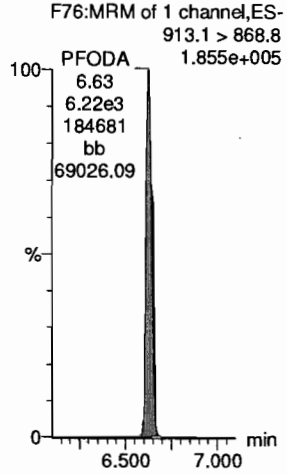
N-EtFOSA



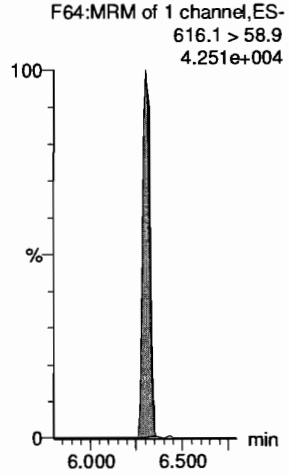
PFHxDA



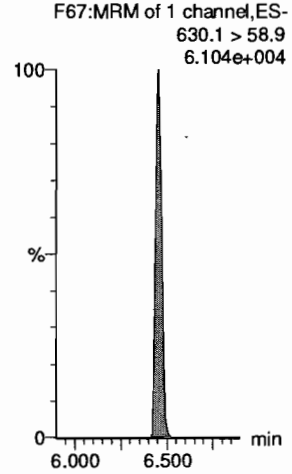
PFODA



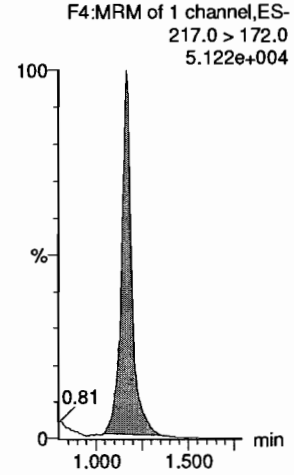
N-MeFOSE



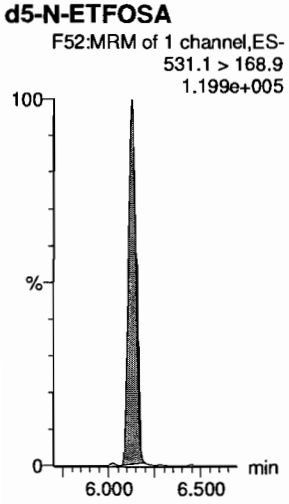
N-EtFOSE



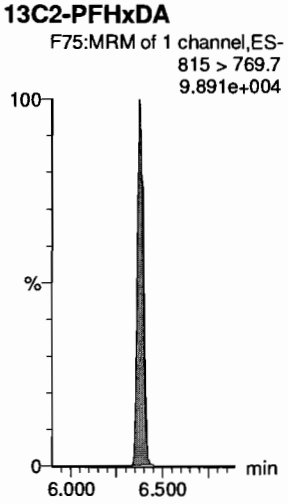
13C4-PFBA



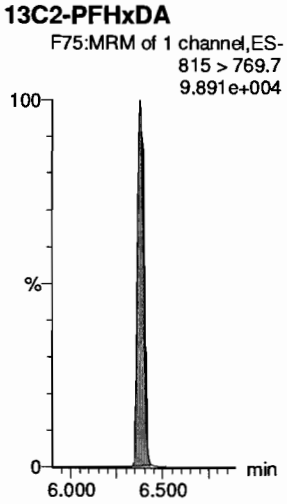
d5-N-ETFOSA



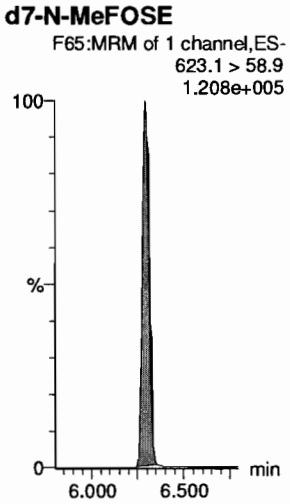
13C2-PFHxDA



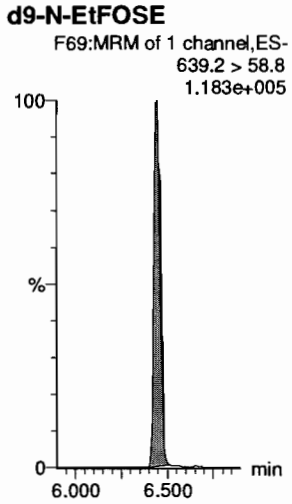
13C2-PFHxDA



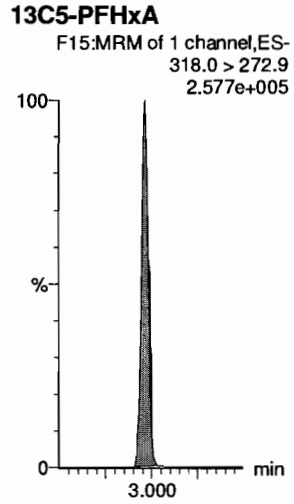
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

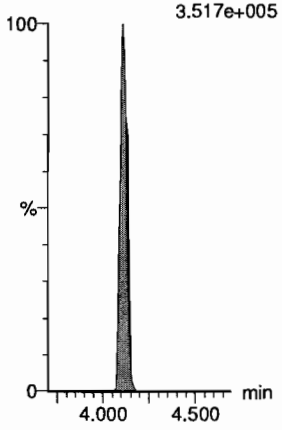


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-32.qld

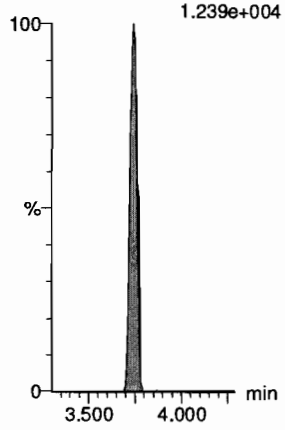
Last Altered: Friday, July 12, 2019 08:40:57 Pacific Daylight Time
Printed: Friday, July 12, 2019 08:41:15 Pacific Daylight Time

Name: 190711M3_32, Date: 12-Jul-2019, Time: 02:55:49, ID: ST190711M3-11 PFC CS3 19G1106, Description: PFC CS3 19G1106

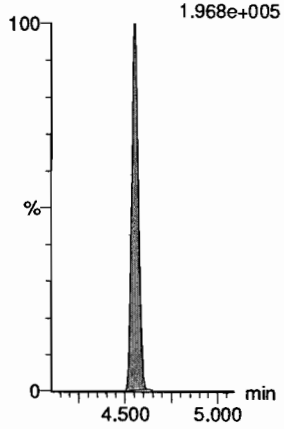
13C8-PFOA



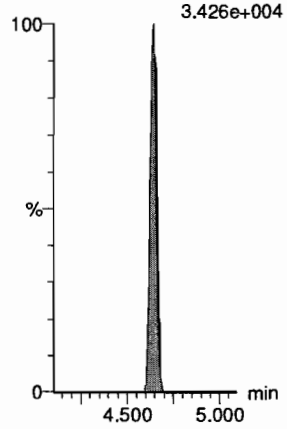
18O2-PFHxS



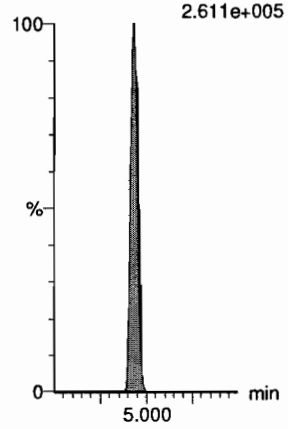
13C9-PFNA



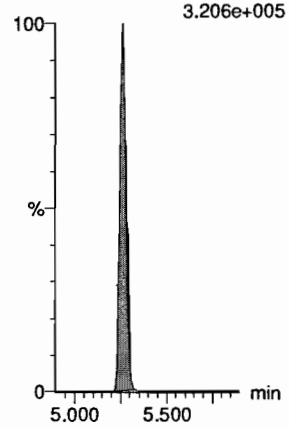
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

JAn 7/12/19

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	2446.746	2265.594	1.00	1.17	13.499	9.5	95.0	NO		
2	2	PFPrS	248.9 > 79.9	518.894	543.285	1.00	1.54	11.939	11.3	113.3	NO	2.435	NO
3	3	3:3 FTCA	240.9 > 176.9	124.347	4075.844	1.00	2.01	0.381	9.2	92.3	NO	1.759	NO
4	4	PFPeA	263.1 > 218.9	3063.286	4075.844	1.00	2.17	9.395	9.9	98.6	NO		
5	5	PFBS	299.0 > 79.7	939.682	543.285	1.00	2.46	21.620	9.4	94.2	NO	2.595	NO
6	6	4:2 FTS	327.0 > 306.9	2588.176	1275.560	1.00	2.88	25.363	10.4	103.8	NO	1.803	NO
7	47	13C3-PFBA	216.1 > 171.8	2265.594	3345.600	1.00	1.17	8.465	13.0	104.2	NO		
8	49	13C3-PFBS	302.0 > 98.8	543.285	565.812	1.00	2.46	12.002	11.6	92.8	NO		
9	48	13C3-PFPeA	266.0 > 221.8	4075.844	10771.561	1.00	2.16	4.730	11.6	92.8	NO		
10	48	13C3-PFPeA	266.0 > 221.8	4075.844	10771.561	1.00	2.16	4.730	11.6	92.8	NO		
11	49	13C3-PFBS	302.0 > 98.8	543.285	565.812	1.00	2.46	12.002	11.6	92.8	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1275.560	565.812	1.00	2.88	28.180	12.6	100.7	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0	8022.152	3432.788	1.00	2.96	11.685	10.1	100.6	NO	15.399	NO
15	8	PFPeS	349.1>80.1	1133.898	543.285	1.00	3.17	26.089	12.2	122.3	NO	1.563	NO
16	9	HFPO-DA	285.1 > 168.9	1647.476	1394.833	1.00	3.18	5.906	10.6	106.5	NO	2.128	NO
17	10	5:3 FTCA	340.9 > 236.9	772.794	3744.053	1.00	3.52	2.580	10.1	100.9	NO	1.438	NO
18	11	PFHpA	363.0 > 318.9	4142.208	3744.053	1.00	3.58	13.829	11.3	112.6	NO	4.820	NO
19	12	ADONA	376.8 > 250.9	13787.599	3744.053	1.00	3.70	46.032	10.6	106.2	NO	3.292	NO
20	52	13C2-PFHxA	315.0 > 270.0	3432.788	10771.561	1.00	2.96	3.984	5.0	100.5	NO		
21	49	13C3-PFBS	302.0 > 98.8	543.285	565.812	1.00	2.46	12.002	11.6	92.8	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1394.833	10771.561	1.00	3.18	1.619	5.3	105.6	NO		
23	53	13C4-PFHpA	367.2 > 321.8	3744.053	10771.561	1.00	3.58	4.345	11.1	88.9	NO		
24	53	13C4-PFHpA	367.2 > 321.8	3744.053	10771.561	1.00	3.58	4.345	11.1	88.9	NO		
25	53	13C4-PFHpA	367.2 > 321.8	3744.053	10771.561	1.00	3.58	4.345	11.1	88.9	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6	943.427	1510.318	1.00	3.74	7.808	9.3	93.5	NO	1.741	NO
28	15	6:2 FTS	427.0 > 406.9	2181.035	1014.572	1.00	4.06	26.871	9.2	92.1	NO	1.944	NO
29	16	L-PFOA	412.8 > 368.9	12096.011	8232.679	1.00	4.11	18.366	9.9	99.2	NO	3.502	NO
30	18	PFecHS	460.8 > 381.0	1974.864	8232.679	1.00	4.13	2.999	10.7	107.1	NO	1.014	NO
31	19	PFHpS	449.0 > 80.0	1079.335	1486.616	1.00	4.23	9.075	10.4	103.9	NO	2.197	NO
32	20	7:3 FTCA	440.9 > 336.9	907.626	8770.270	1.00	4.54	1.294	9.7	96.6	NO	2.189	NO
33	54	13C3-PFHxS	401.8 > 79.9	1510.318	565.812	1.00	3.74	33.366	13.1	104.8	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	1014.572	1557.096	1.00	4.05	8.145	11.1	88.5	NO		
35	58	13C2-PFOA	414.9 > 369.7	8232.679	14119.083	1.00	4.11	7.289	12.9	103.3	NO		
36	58	13C2-PFOA	414.9 > 369.7	8232.679	14119.083	1.00	4.11	7.289	12.9	103.3	NO		

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Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
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Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	59	13C8-PFOS	507.0 > 79.9	1486.616	1557.096	1.00	4.64	11.934	11.3	90.1	NO		
38	56	13C5-PFNA	468.2 > 422.9	8770.270	9261.484	1.00	4.56	11.837	12.0	96.4	NO		
39	-1												
40	21	PFNA	463.0 > 418.8	7938.128	8770.270	1.00	4.56	11.314	10.3	102.9	NO	2.958	NO
41	22	PFOSA	497.9 > 77.9	1927.743	1773.858	1.00	4.61	13.584	10.6	106.4	NO	41.911	NO
42	23	L-PFOS	498.9 > 79.9	1421.334	1486.616	1.00	4.64	11.951	9.6	95.5	NO	1.953	NO
43	25	9Cl-PF30NS	530.7 > 350.8	3664.460	1486.616	1.00	4.86	30.812	9.8	97.9	NO	19.264	NO
44	26	PFDA	513 > 468.8	8640.904	6855.043	1.00	4.94	15.756	9.5	94.8	NO	4.318	NO
45	27	8:2 FTS	527.0 > 506.9	1971.226	908.958	1.00	4.90	27.108	12.1	120.5	NO	1.286	NO
46	56	13C5-PFNA	468.2 > 422.9	8770.270	9261.484	1.00	4.56	11.837	12.0	96.4	NO		
47	57	13C8-PFOSA	506.1 > 77.7	1773.858	12658.801	1.00	4.62	1.752	13.4	107.6	NO		
48	59	13C8-PFOS	507.0 > 79.9	1486.616	1557.096	1.00	4.64	11.934	11.3	90.1	NO		
49	59	13C8-PFOS	507.0 > 79.9	1486.616	1557.096	1.00	4.64	11.934	11.3	90.1	NO		
50	60	13C2-PFDA	515.1 > 469.9	6855.043	10721.471	1.00	4.93	7.992	12.1	96.6	NO		
51	61	13C2-8:2 FTS	529 > 79.9	908.958	1557.096	1.00	4.90	7.297	10.5	83.9	NO		
52	-1												
53	28	PFNS	549.1 > 80.1	1054.656	1486.616	1.00	5.00	8.868	10.1	101.3	NO	1.377	NO
54	29	L-MeFOSAA	570 > 419	3830.508	1608.781	1.00	5.09	29.763	10.0	99.7	NO	2.391	NO
55	31	L-EtFOSAA	584.1 > 419	2789.294	1811.891	1.00	5.25	19.243	9.7	97.2	NO	1.338	NO
56	33	PFUdA	563.0 > 518.9	8324.721	11795.893	1.00	5.26	8.822	9.5	94.7	NO	6.595	NO
57	34	PFDS	598.8 > 79.9	1362.648	908.958	1.00	5.31	18.739	9.3	92.7	NO	1.611	NO
58	35	11Cl-PF30UdS	632.6 > 452.7	736.174	12751.516	1.00	5.48	0.722	11.2	112.2	NO	4.793	NO
59	59	13C8-PFOS	507.0 > 79.9	1486.616	1557.096	1.00	4.64	11.934	11.3	90.1	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1608.781	12658.801	1.00	5.08	1.589	12.3	98.5	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1811.891	12658.801	1.00	5.24	1.789	12.1	97.1	NO		
62	63	13C2-PFUdA	565 > 519.8	11795.893	12658.801	1.00	5.26	11.648	13.6	108.7	NO		
63	61	13C2-8:2 FTS	529 > 79.9	908.958	1557.096	1.00	4.90	7.297	10.5	83.9	NO		
64	65	13C2-PFDoA	614.7 > 569.7	12751.516	10721.471	1.00	5.55	14.867	12.1	96.8	NO		
65	-1												
66	36	10:2 FTS	627.0 > 606.9	2006.673	908.958	1.00	5.53	27.596	10.4	104.2	NO	1.493	NO
67	37	PFDoA	612.9 > 569.0	9891.139	12751.516	1.00	5.55	9.696	10.2	101.6	NO	7.806	NO
68	38	N-MeFOSA	512.1 > 168.9	1569.446	3659.659	1.00	5.68	64.328	50.3	100.7	NO	1.942	NO
69	39	PFTrDA	662.9 > 618.9	10966.639	12751.516	1.00	5.80	10.750	10.1	101.4	NO	14.955	NO
70	40	PFDoS	698.8 > 79.9	1229.069	6431.932	1.00	5.83	2.389	9.9	98.9	NO	1.873	NO
71	41	PFTeDA	713.0 > 669.0	8174.072	6431.932	1.00	6.03	15.886	10.6	106.0	NO	13.583	NO
72	65	13C2-PFDoA	614.7 > 569.7	12751.516	10721.471	1.00	5.55	14.867	12.1	96.8	NO		

Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

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Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	65	13C2-PFDoA	614.7 > 569.7	12751.516	10721.471	1.00	5.55	14.867	12.1	96.8	NO		
74	66	d3-N-MeFOSA	515.2 > 168.9	3659.659	12658.801	1.00	5.70	3.614	163.1	108.7	NO		
75	65	13C2-PFDoA	614.7 > 569.7	12751.516	10721.471	1.00	5.55	14.867	12.1	96.8	NO		
76	67	13C2-PFTeDA	715.1 > 669.7	6431.932	12658.801	1.00	6.03	6.351	12.4	99.4	NO		
77	67	13C2-PFTeDA	715.1 > 669.7	6431.932	12658.801	1.00	6.03	6.351	12.4	99.4	NO		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9	1581.472	5463.459	1.00	6.11	43.420	47.3	94.6	NO	1.847	NO
80	43	PFHxDA	813.1 > 768.6	5606.415	3681.921	1.00	6.38	7.613	10.1	100.6	NO	18.767	NO
81	44	PFODA	913.1 > 868.8	6195.762	3681.921	1.00	6.63	8.414	10.1	100.7	NO		
82	45	N-MeFOSE	616.1 > 58.9	1616.713	4972.039	1.00	6.30	48.774	43.5	86.9	NO		
83	46	N-EtFOSE	630.1 > 58.9	2038.453	4474.348	1.00	6.45	68.338	48.6	97.2	NO		
84	72	13C4-PFBA	217.0 > 172.0	3345.600	3345.600	1.00	1.17	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9	5463.459	12658.801	1.00	6.13	5.395	173.1	115.4	NO		
86	69	13C2-PFHxDA	815 > 769.7	3681.921	12658.801	1.00	6.38	3.636	4.9	99.0	NO		
87	69	13C2-PFHxDA	815 > 769.7	3681.921	12658.801	1.00	6.38	3.636	4.9	99.0	NO		
88	70	d7-N-MeFOSE	623.1 > 58.9	4972.039	12658.801	1.00	6.29	4.910	175.6	117.1	NO		
89	71	d9-N-EtFOSE	639.2 > 58.8	4474.348	12658.801	1.00	6.44	4.418	160.6	107.1	NO		
90	73	13C5-PFHxA	318.0 > 272.9	10771.561	10771.561	1.00	2.96	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	14119.083	14119.083	1.00	4.11	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	565.812	565.812	1.00	3.74	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	9261.484	9261.484	1.00	4.56	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1557.096	1557.096	1.00	4.64	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	10721.471	10721.471	1.00	4.93	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	12658.801	12658.801	1.00	5.26	12.500	12.5	100.0	NO		

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Dataset: Untitled

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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	190711M3_1	IPA	11-Jul-19	21:27:14
2	2	190711M3_2	ST190711M3-1 PFC CS-2 19G1101	11-Jul-19	21:37:49
3	3	190711M3_3	ST190711M3-2 PFC CS-1 19G1102	11-Jul-19	21:48:22
4	4	190711M3_4	ST190711M3-3 PFC CS0 19G1103	11-Jul-19	21:59:01
5	5	190711M3_5	ST190711M3-4 PFC CS1 19G1104	11-Jul-19	22:09:33
6	6	190711M3_6	ST190711M3-5 PFC CS2 19G1105	11-Jul-19	22:20:12
7	7	190711M3_7	ST190711M3-6 PFC CS3 19G1106	11-Jul-19	22:30:45
8	8	190711M3_8	ST190711M3-7 PFC CS4 19G1107	11-Jul-19	22:41:23
9	9	190711M3_9	ST190711M3-8 PFC CS5 19G1108	11-Jul-19	22:51:57
10	10	190711M3_10	ST190711M3-9 PFC CS6 19G1109	11-Jul-19	23:02:37
11	11	190711M3_11	ST190711M3-10 PFC CS7 19G1110	11-Jul-19	23:13:13
12	12	190711M3_12	IB	11-Jul-19	23:23:47
13	13	190711M3_13	ST190711M3-1 PFC ICV 19G1111	11-Jul-19	23:34:17
14	14	190711M3_14	IPA	11-Jul-19	23:44:56
15	15	190711M3_15	B9G0061-BS1 OPR 0.125	11-Jul-19	23:55:34
16	16	190711M3_16	B9F0279-BS1 OPR 1	12-Jul-19	00:06:07
17	17	190711M3_17	B9F0279-BLK1 Method Blank 1	12-Jul-19	00:16:45
18	18	190711M3_18	1901784-02RE1 FRB-1 0.24972	12-Jul-19	00:27:18
19	19	190711M3_19	1901683-03 Hagatna 1 3.93	12-Jul-19	00:37:57
20	20	190711M3_20	1901910-01 SW1906280950KME 0.24336	12-Jul-19	00:48:35
21	21	190711M3_21	1901910-02 SW1906281025KME 0.24464	12-Jul-19	00:59:09
22	22	190711M3_22	1901910-03 SW1906281035KME 0.24318	12-Jul-19	01:09:47
23	23	190711M3_23	1901911-01 WMP1907010855JSJ 0.2509	12-Jul-19	01:20:19
24	24	190711M3_24	B9G0095-BS1 OPR 0.25	12-Jul-19	01:30:58
25	25	190711M3_25	B9G0095-BSD1 LCSD 0.25	12-Jul-19	01:41:36
26	26	190711M3_26	B9G0095-BLK1 Method Blank 0.25	12-Jul-19	01:52:09
27	27	190711M3_27	1901759-01 HW-AF-01-01-420-062419 0.11818	12-Jul-19	02:02:47
28	28	190711M3_28	1901992-01 WIN1907081315GGA 0.24256	12-Jul-19	02:13:26
29	29	190711M3_29	1901992-02 WMP1907081305GGA 0.23352	12-Jul-19	02:23:58
30	30	190711M3_30	1901992-03 WEF1907081310GGA 0.24328	12-Jul-19	02:34:37
31	31	190711M3_31	IPA	12-Jul-19	02:45:10
32	32	190711M3_32	ST190711M3-11 PFC CS3 19G1106	12-Jul-19	02:55:49

* CCV not used
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Compound name: PFBA

	# Name	ID	Acq.Date	Acq.Time
33	33 190711M3_33	IPA	12-Jul-19	03:06:21
34	34 190711M3_34	B9G0062-BS1 OPR 0.125	12-Jul-19	03:16:59
35	35 190711M3_35	B9G0062-BSD1 LCSD 0.125	12-Jul-19	03:27:38
36	36 190711M3_36	B9G0062-BLK1 Method Blank 0.125	12-Jul-19	03:38:11
37	37 190711M3_37	1901922-01 FRB-07022019 0.10709	12-Jul-19	03:48:49
38	38 190711M3_38	1901922-02 CAOA-B02-GW 0.1205	12-Jul-19	03:59:23
39	39 190711M3_39	1901920-02 SAOA-B08-GW 0.13318	12-Jul-19	04:10:01
40	40 190711M3_40	1901920-03 EB-06272019-GW 0.11429	12-Jul-19	04:20:34
41	41 190711M3_41	1901920-04 FRB-06282019 0.11576	12-Jul-19	04:31:13
42	42 190711M3_42	1901920-05 SAOA-B12-GW 0.12204	12-Jul-19	04:41:51
43	43 190711M3_43	1901920-06 SAOA-B12-GW-D 0.12639	12-Jul-19	04:52:24
44	44 190711M3_44	1901920-11 NAOA-B02-GW 0.122	12-Jul-19	05:03:03
45	45 190711M3_45	1901920-12 EB-07012019 0.11155	12-Jul-19	05:13:36
46	46 190711M3_46	1901920-14 FRB-07012019 0.11643	12-Jul-19	05:24:14
47	47 190711M3_47	1901920-16 NAOA-B01-GW 0.1294	12-Jul-19	05:34:46
48	48 190711M3_48	IPA	12-Jul-19	05:45:25
49	49 190711M3_49	ST190711M3-12 PFC CS3 19G1106	12-Jul-19	05:56:03
50	50 190711M3_50	IPA	12-Jul-19	06:06:35
51	51 190711M3_51	1901920-17 NAOA-B01-GW-D 0.13768	12-Jul-19	06:17:14
52	52 190711M3_52	1901920-20 EB-07022019 0.11644	12-Jul-19	06:27:47
53	53 190711M3_53	B9G0065-BS1 OPR 0.25	12-Jul-19	06:38:25
54	54 190711M3_54	B9G0065-BLK1 Method Blank 0.25	12-Jul-19	06:48:58
55	55 190711M3_55	1901781-01 GW1906241425SK 0.24561	12-Jul-19	06:59:37
56	56 190711M3_56	1901781-02 GW1906241605SK 0.25501	12-Jul-19	07:10:15
57	57 190711M3_57	1901781-03 GW1906250855KME 0.24339	12-Jul-19	07:20:48
58	58 190711M3_58	1901781-04 GW1906250855KME-FD 0.24341	12-Jul-19	07:31:26
59	59 190711M3_59	1901781-05 GW1906250935SK 0.24535	12-Jul-19	07:41:59
60	60 190711M3_60	1901781-06 GW1906251040KME 0.24373	12-Jul-19	07:52:37
61	61 190711M3_61	1901781-07 GW1906251120SK 0.24467	12-Jul-19	08:03:15
62	62 190711M3_62	IPA	12-Jul-19	08:13:48
63	63 190711M3_63	ST190711M3-13 PFC CS3 19G1106	12-Jul-19	08:24:26
64	64 190711M3_64	IPA	12-Jul-19	08:34:58
65	65 190711M3_65	1901781-08 GMW1906251200KME 0.24756	12-Jul-19	08:45:54
66	66 190711M3_66	1901781-09 FB1906251135SK 0.25189	12-Jul-19	08:56:32
67	67 190711M3_67	IPA	12-Jul-19	09:07:05
68	68 190711M3_68	ST190711M3-14 PFC CS3 19G1106	12-Jul-19	09:17:43

Dataset: Untitled

Last Altered: Friday, July 12, 2019 09:54:29 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:54:35 Pacific Daylight Time

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
69	69	190711M3_69	IPA	12-Jul-19	09:28:22
70	70	190711M3_70	IB tester	12-Jul-19	09:38:55

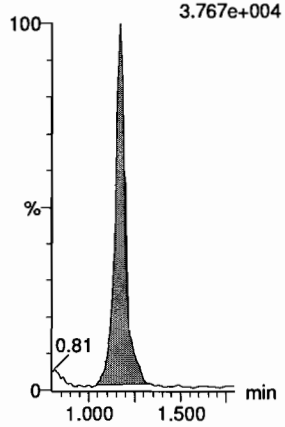
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

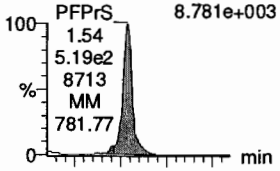
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071119.mdb 12 Jul 2019 08:40:55
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

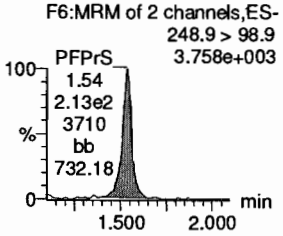
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
3.767e+004



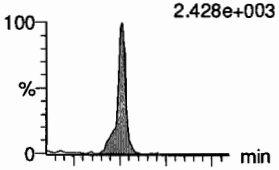
PFPrS
F6:MRM of 2 channels,ES-
248.9 > 79.9
8.781e+003



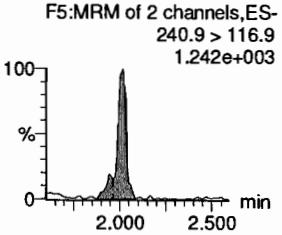
F6:MRM of 2 channels,ES-
248.9 > 98.9
3.758e+003



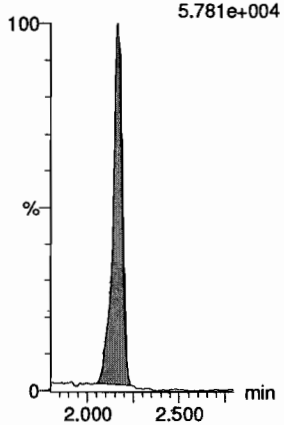
3:3 FTCA
F5:MRM of 2 channels,ES-
240.9 > 176.9
2.428e+003



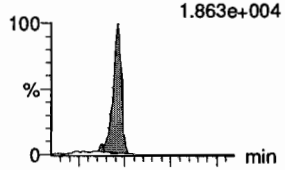
F5:MRM of 2 channels,ES-
240.9 > 116.9
1.242e+003



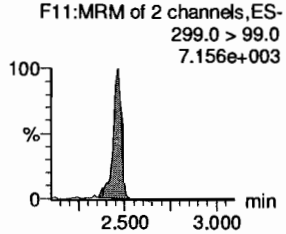
PFPeA
F7:MRM of 1 channel,ES-
263.1 > 218.9
5.781e+004



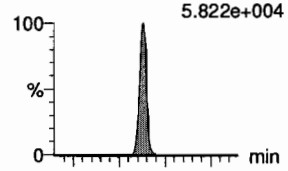
PFBS
F11:MRM of 2 channels,ES-
299.0 > 79.7
1.863e+004



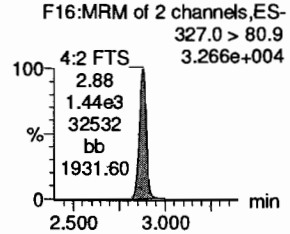
F11:MRM of 2 channels,ES-
299.0 > 99.0
7.156e+003



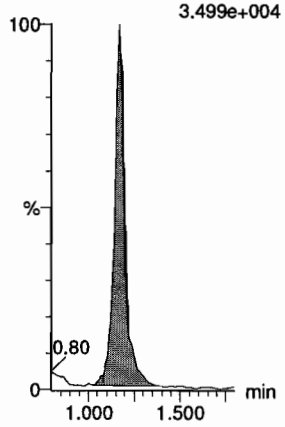
4:2 FTS
F16:MRM of 2 channels,ES-
327.0 > 306.9
5.822e+004



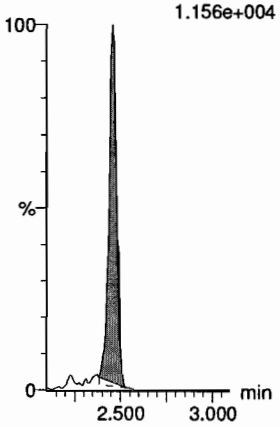
F16:MRM of 2 channels,ES-
327.0 > 80.9
3.266e+004



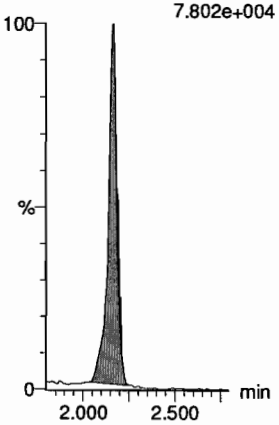
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
3.499e+004



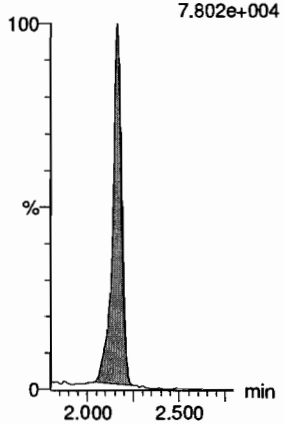
13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
1.156e+004



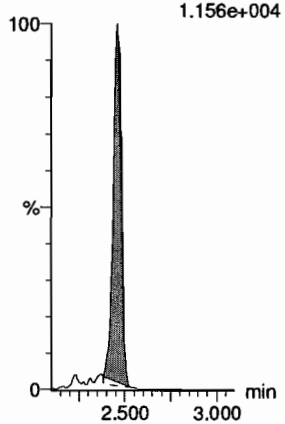
13C3-PFPeA
F8:MRM of 1 channel,ES-
266.0 > 221.8
7.802e+004



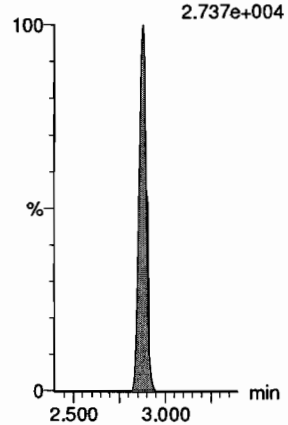
13C3-PFPeA
F8:MRM of 1 channel,ES-
266.0 > 221.8
7.802e+004



13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
1.156e+004



13C2-4:2 FTS
F17:MRM of 2 channels,ES-
329.0 > 79.9
2.737e+004

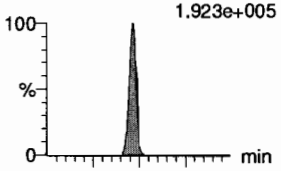


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

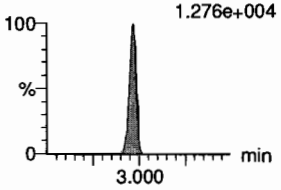
Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

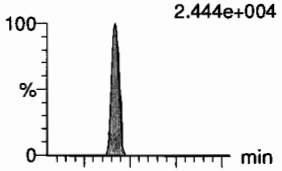
PFHxA
F13:MRM of 2 channels,ES-
313.0 > 269.0
1.923e+005



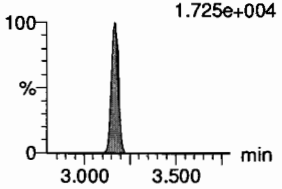
F13:MRM of 2 channels,ES-
313 > 118.9
1.276e+004



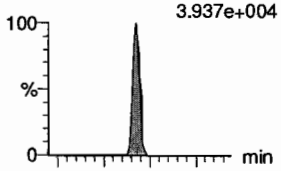
PFPeS
F19:MRM of 2 channels,ES-
349.1 > 80.1
2.444e+004



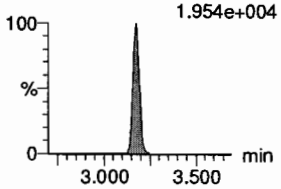
F19:MRM of 2 channels,ES-
349.1 > 99
1.725e+004



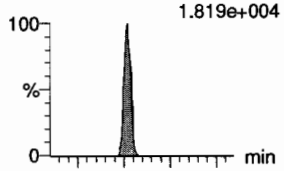
HFPO-DA
F9:MRM of 3 channels,ES-
285.1 > 168.9
3.937e+004



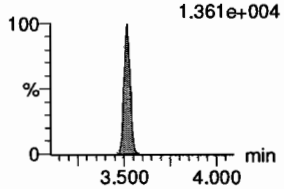
F9:MRM of 3 channels,ES-
285.1 > 184.9
1.954e+004



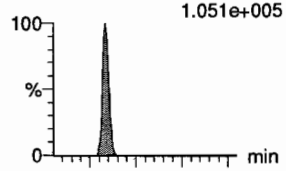
5:3 FTCA
F18:MRM of 2 channels,ES-
340.9 > 236.9
1.819e+004



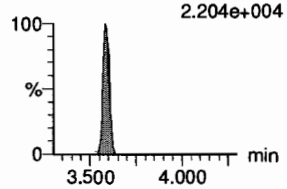
F18:MRM of 2 channels,ES-
340.9 > 216.9
1.361e+004



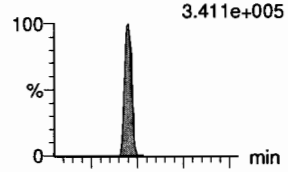
PFHpA
F20:MRM of 2 channels,ES-
363.0 > 318.9
1.051e+005



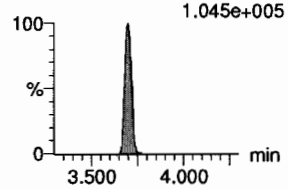
F20:MRM of 2 channels,ES-
363.0 > 169.0
2.204e+004



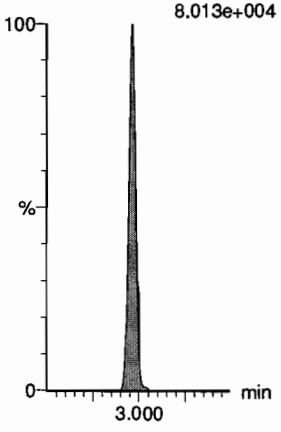
ADONA
F22:MRM of 2 channels,ES-
376.8 > 250.9
3.411e+005



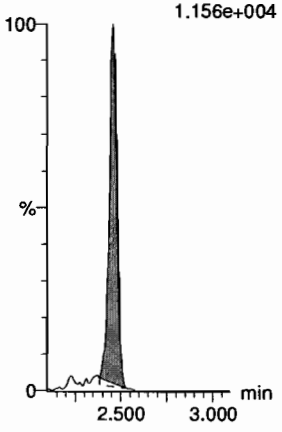
F22:MRM of 2 channels,ES-
376.8 > 85.0
1.045e+005



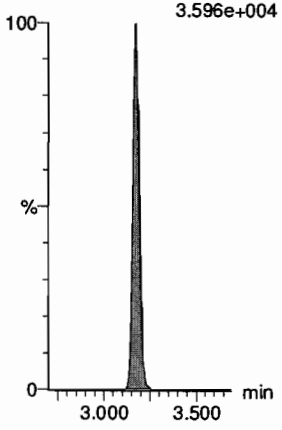
13C2-PFHxA
F14:MRM of 1 channel,ES-
315.0 > 270.0
8.013e+004



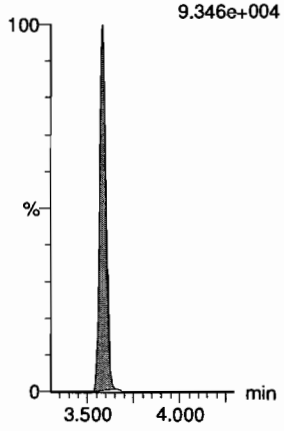
13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
1.156e+004



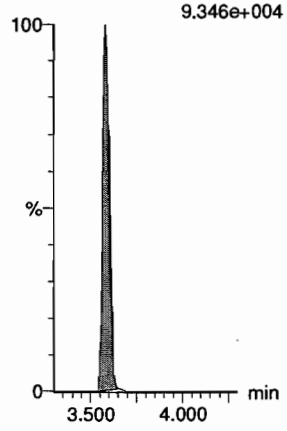
13C3-HFPO-DA
F10:MRM of 2 channels,ES-
287.0 > 168.9
3.596e+004



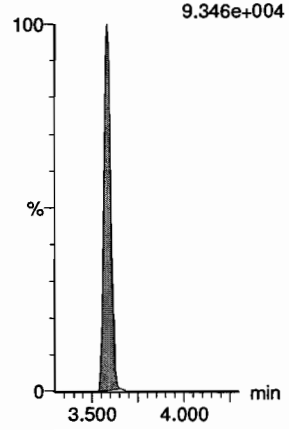
13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.346e+004



13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.346e+004



13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.346e+004

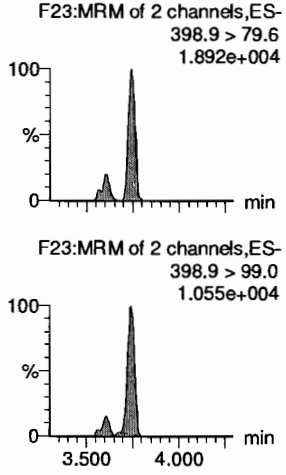


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

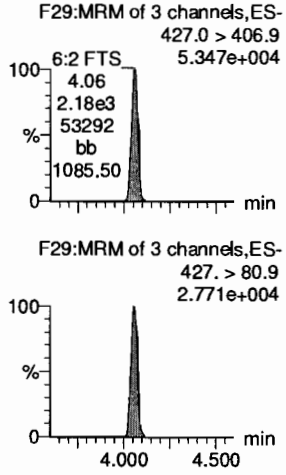
Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

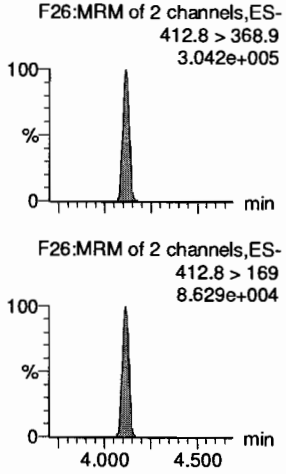
L-PFHxS



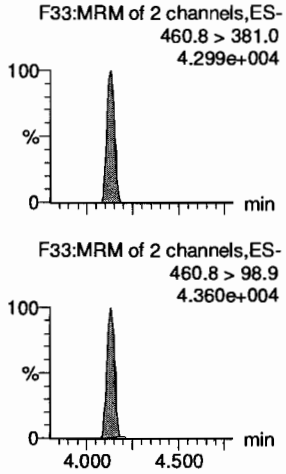
6:2 FTS



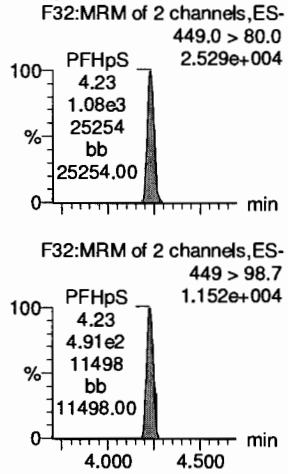
L-PFOA



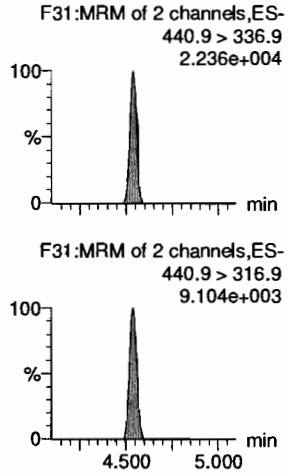
PFEChS



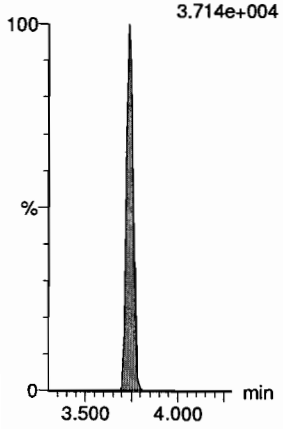
PFHpS



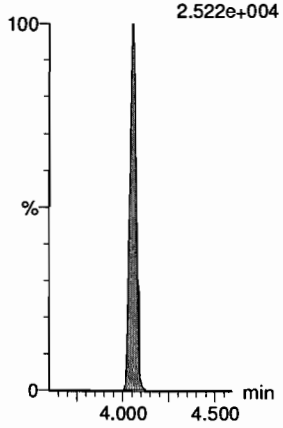
7:3 FTCA



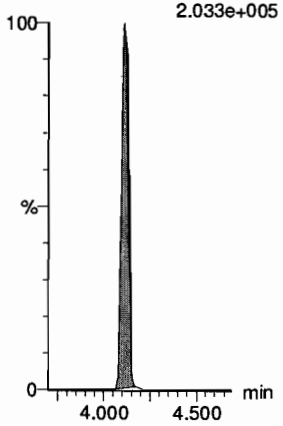
13C3-PFHxS



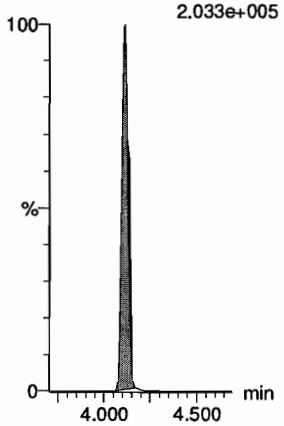
13C2-6:2 FTS



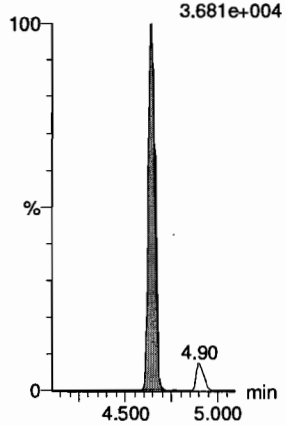
13C2-PFOA



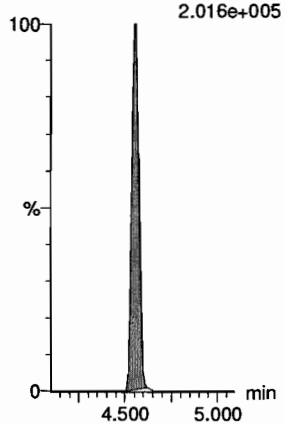
13C2-PFOA



13C8-PFOS



13C5-PFNA

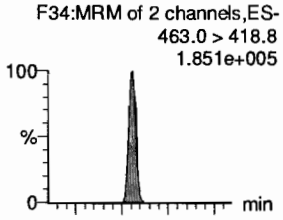


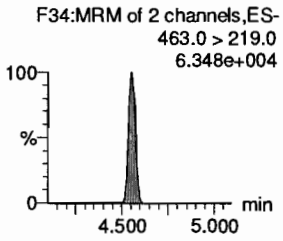
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

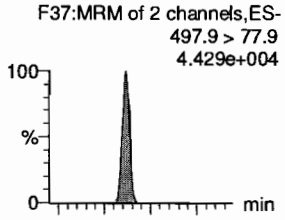
Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

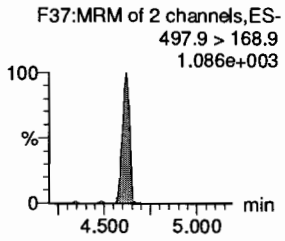
PFNA



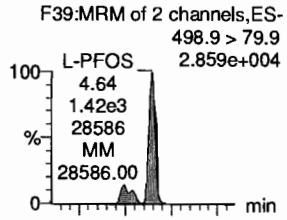


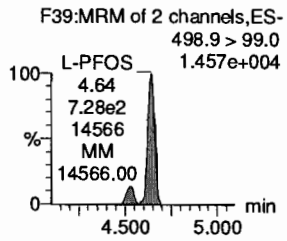
PFOSA



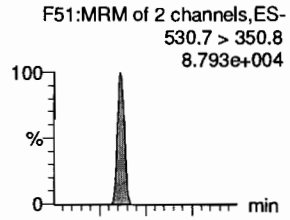


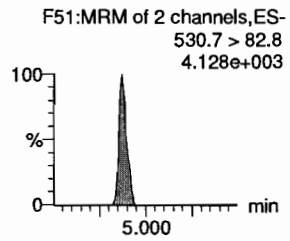
L-PFOS





9Cl-PF30NS





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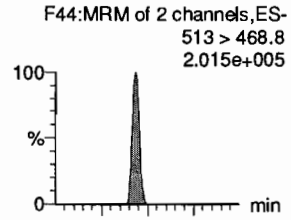
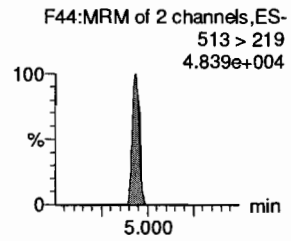
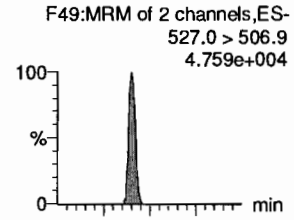
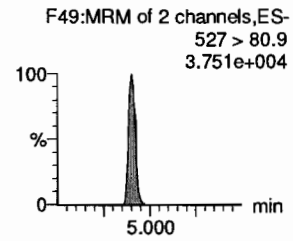


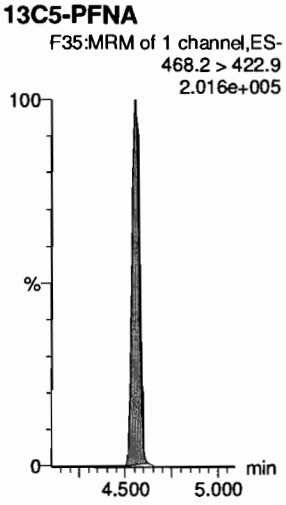


8:2 FTS

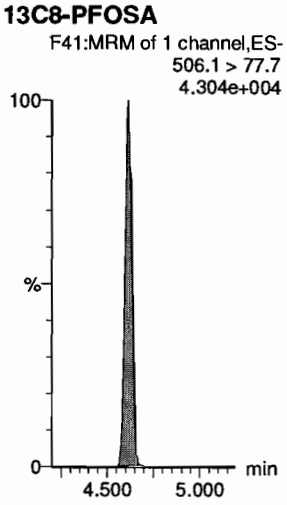




13C5-PFNA



13C8-PFOSA



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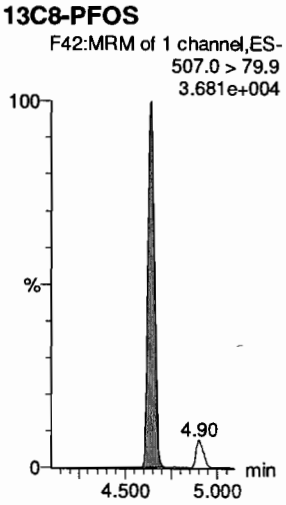

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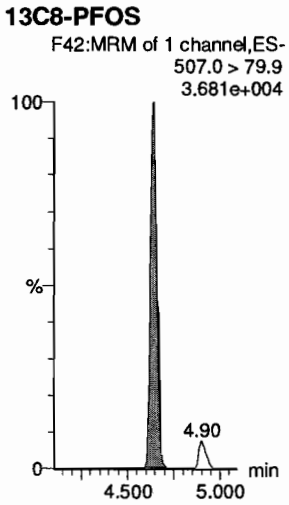
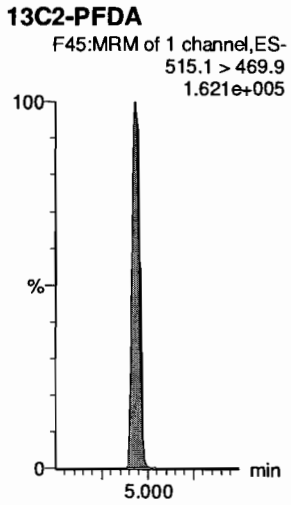
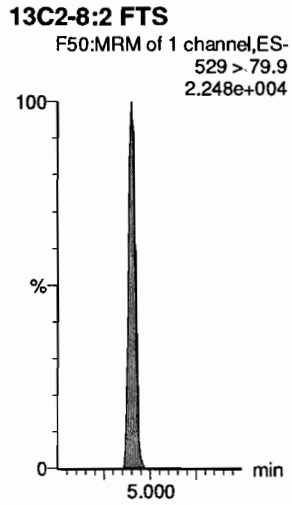


13C2-PFDA



13C2-8:2 FTS

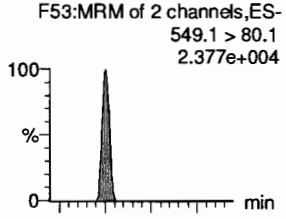


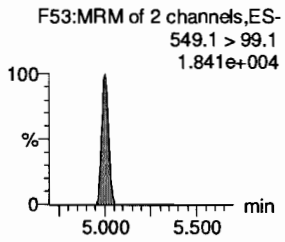
Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

PFNS





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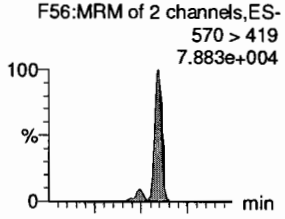

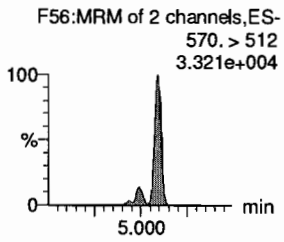

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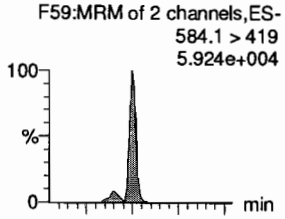

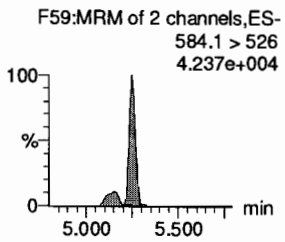

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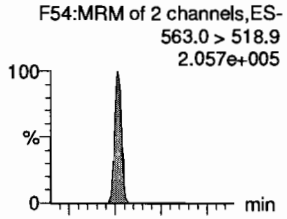
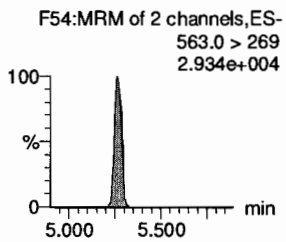
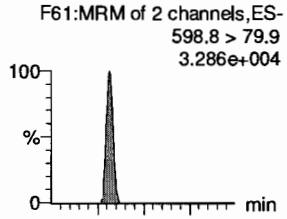
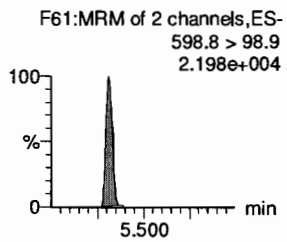




PFDS





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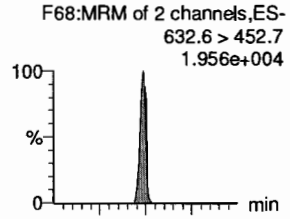
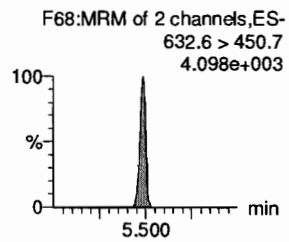
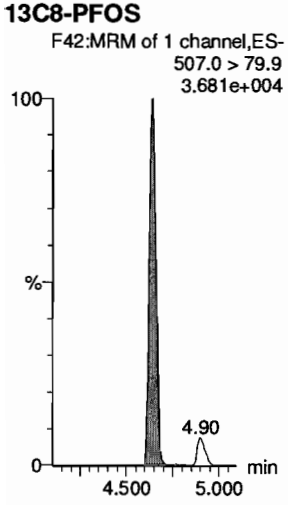
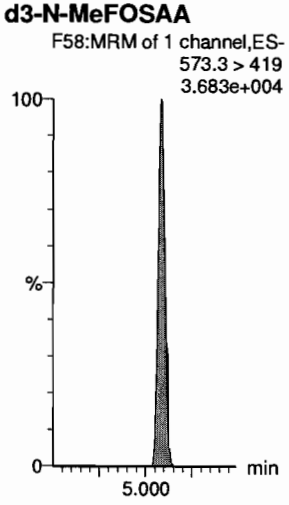




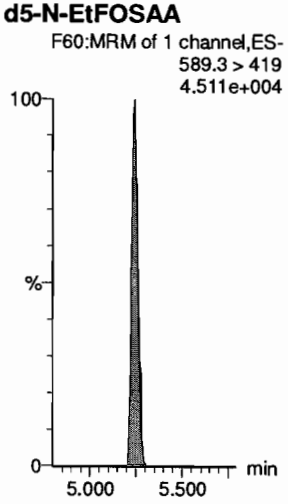
13C8-PFOS



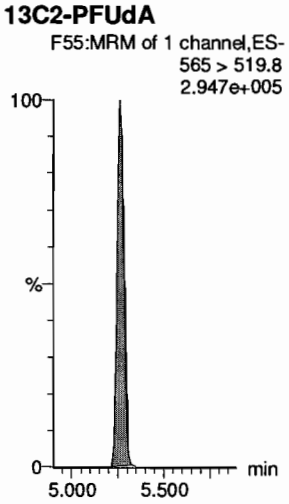
d3-N-MeFOSAA



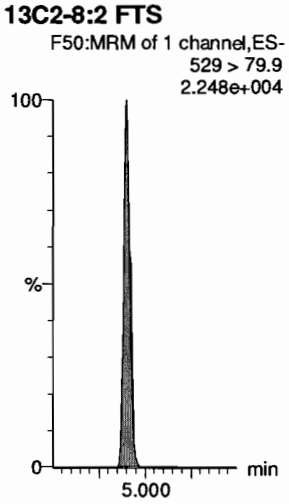
d5-N-EtFOSAA



13C2-PFUdA



13C2-8:2 FTS



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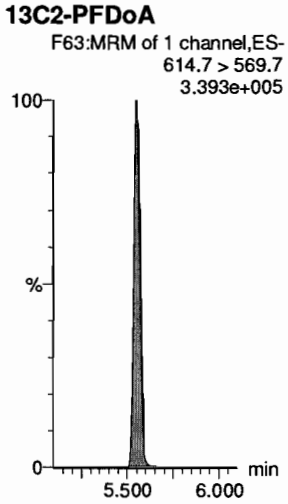

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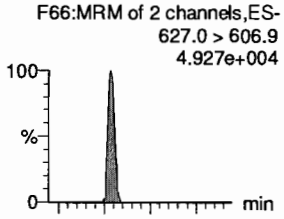
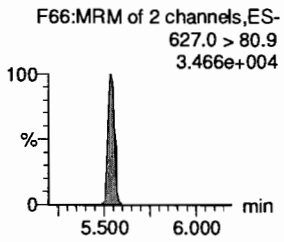
Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

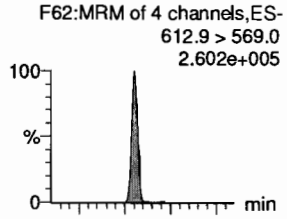
Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

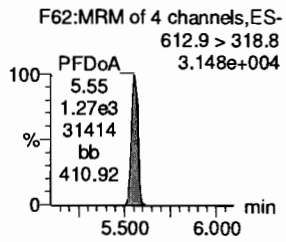
10:2 FTS



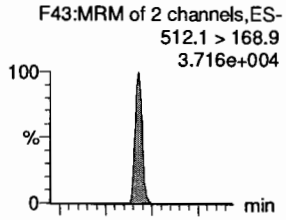


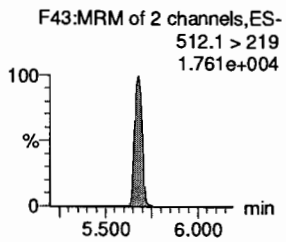
PFDoA



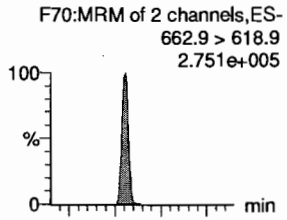


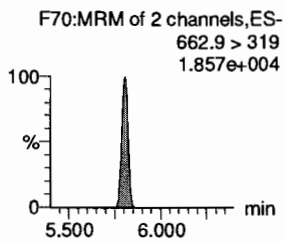
N-MeFOSA



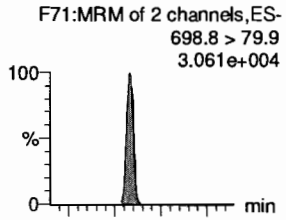


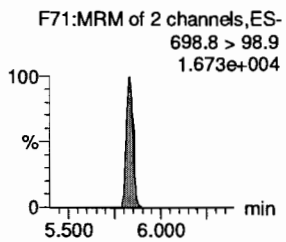
PFTrDA



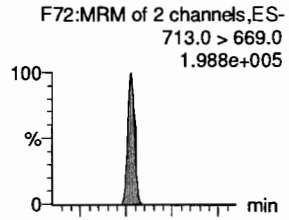


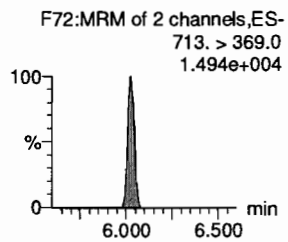
PFDoS



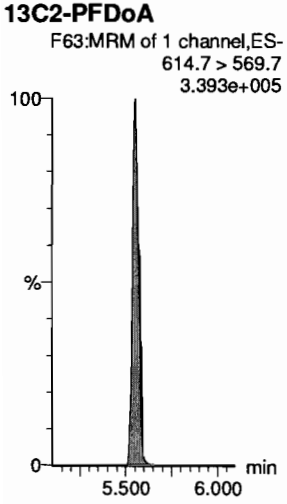


PFTeDA





13C2-PFDoA



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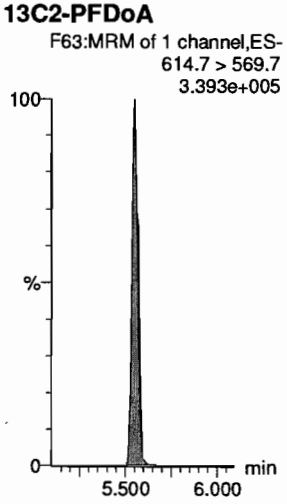
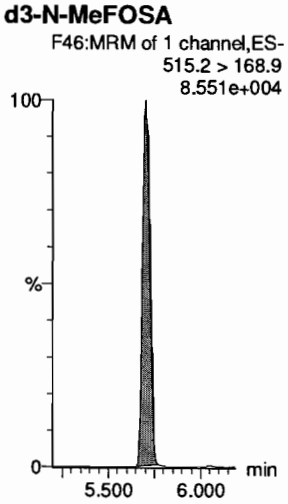
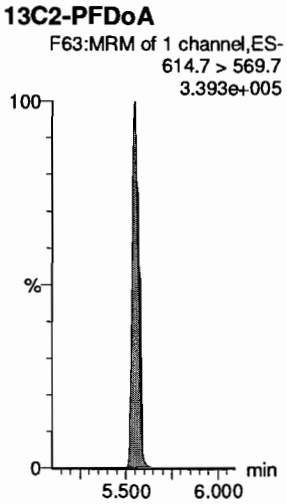


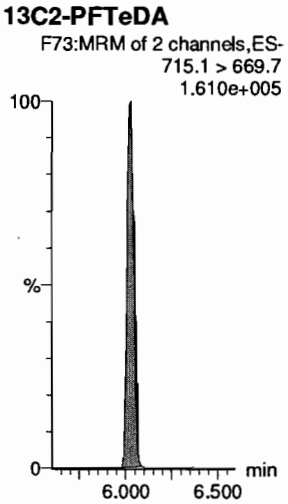
d3-N-MeFOSA



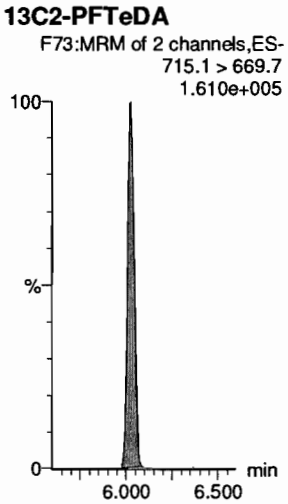
13C2-PFDoA



13C2-PFTeDA



13C2-PFTeDA

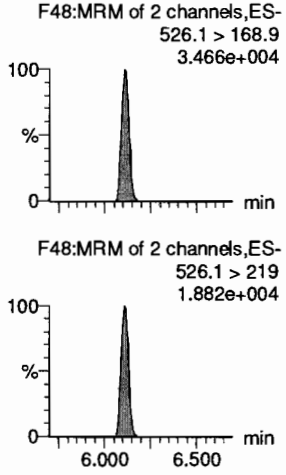


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

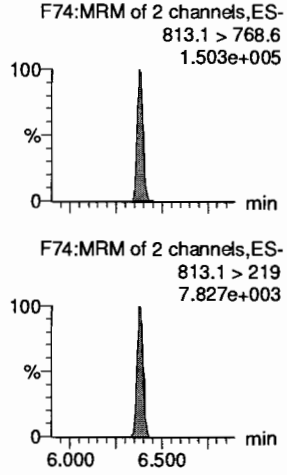
Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

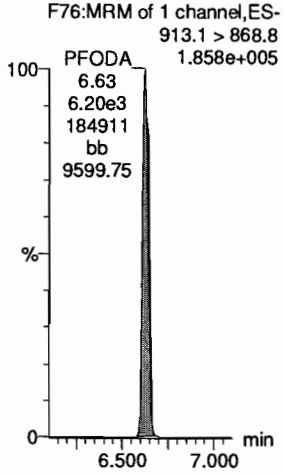
N-EtFOSA



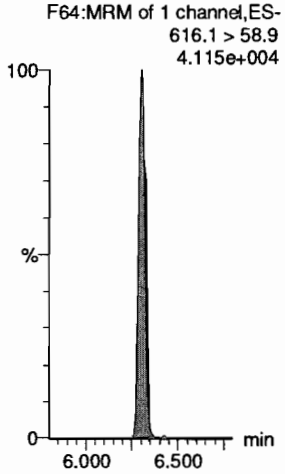
PFHxDA



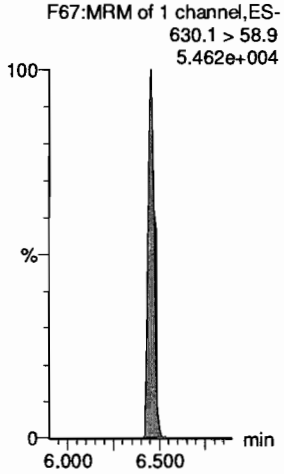
PFODA



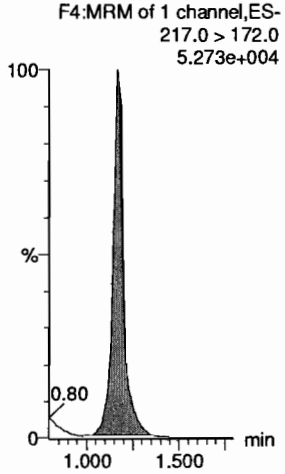
N-MeFOSE



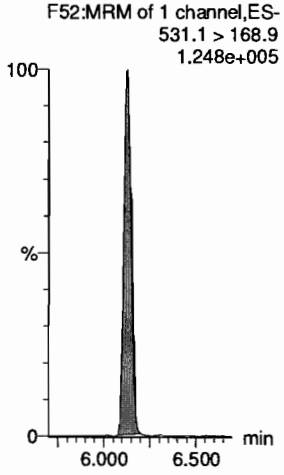
N-EtFOSE



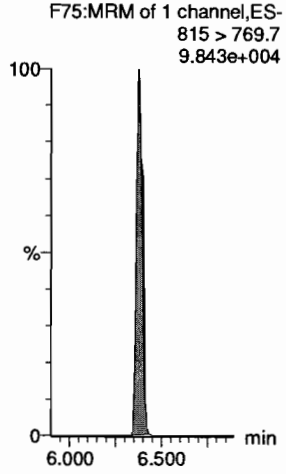
13C4-PFBA



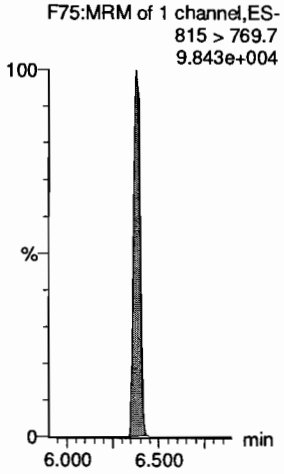
d5-N-ETFOSA



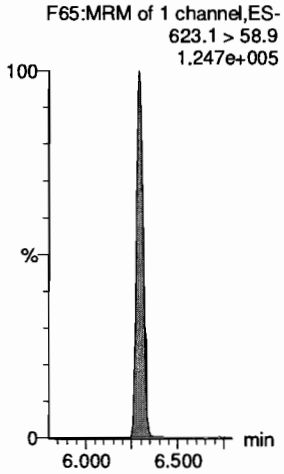
13C2-PFHxDA



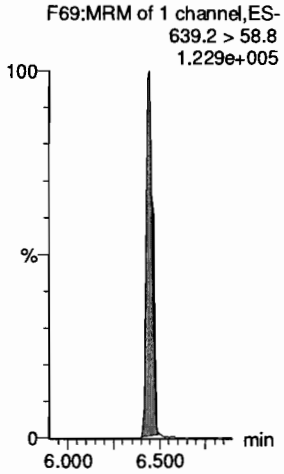
13C2-PFHxDA



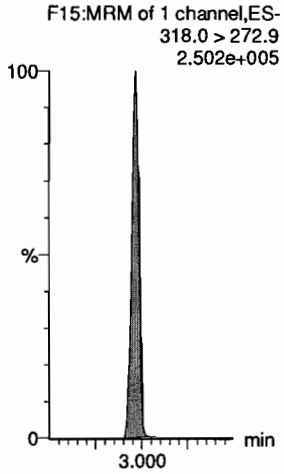
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

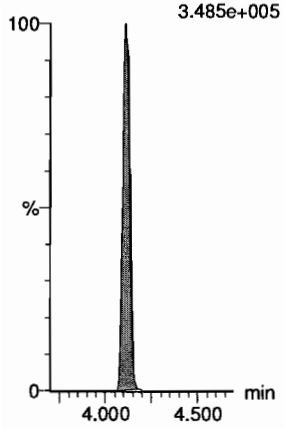


Dataset: F:\Projects\PFAS.PRO\Results\190711M3\190711M3-49.qld

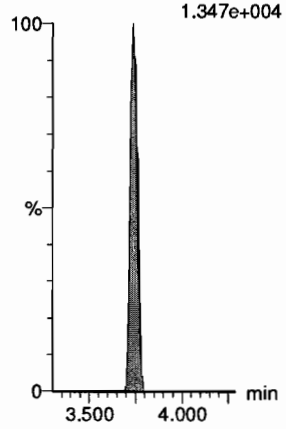
Last Altered: Friday, July 12, 2019 09:02:20 Pacific Daylight Time
Printed: Friday, July 12, 2019 09:02:40 Pacific Daylight Time

Name: 190711M3_49, Date: 12-Jul-2019, Time: 05:56:03, ID: ST190711M3-12 PFC CS3 19G1106, Description: PFC CS3 19G1106

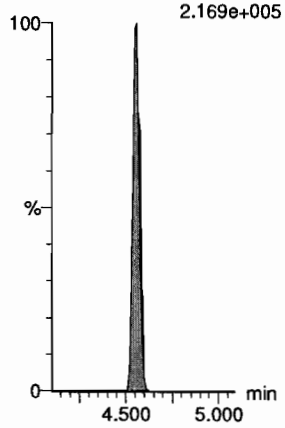
13C8-PFOA



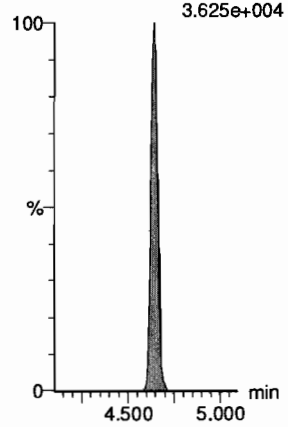
18O2-PFHxS



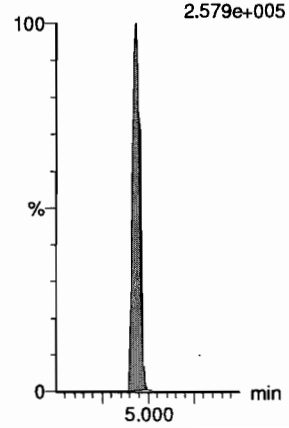
13C9-PFNA



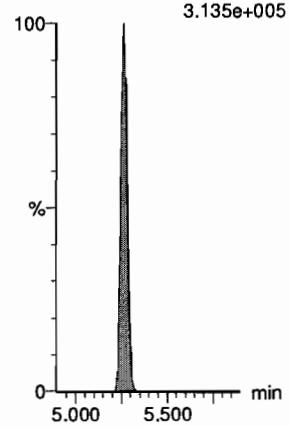
13C4-PFOS



13C6-PFDA



13C7-PFUdA



INITIAL CALIBRATION (ICAL)

INCLUDING ASSOCIATED

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

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:11:11 Pacific Daylight Time

high pt
5:3FTCA = 50
all other compounds = 100

low pt
PFHpS = 0.5
PFDS ↓

scanned
tP 07/11/19

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

7:3FTCA & 11Cl-PF3OUdS not used.
AM 7/11/19
7/11/19

Compound name: PFBA
Correlation coefficient: r = 0.999710, r^2 = 0.999420
Calibration curve: 1.42744 * x + -0.0673711
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	1.22	55.051	1930.395	0.356	0.3	18.8	NO	0.999	NO	MM
2	2 190710M2_7	Standard	0.500	1.21	97.891	2093.751	0.584	0.5	-8.7	NO	0.999	NO	MM
3	3 190710M2_8	Standard	1.000	1.21	198.526	1877.004	1.322	1.0	-2.7	NO	0.999	NO	MM
4	4 190710M2_9	Standard	2.000	1.21	444.612	1948.465	2.852	2.0	2.3	NO	0.999	NO	MM
5	5 190710M2_10	Standard	5.000	1.21	1384.449	2587.624	6.688	4.7	-5.4	NO	0.999	NO	MM
6	6 190710M2_11	Standard	10.000	1.21	2122.117	1944.651	13.641	9.6	-4.0	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	1.22	17596.623	3149.437	69.840	49.0	-2.1	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	1.21	20709.215	1784.566	145.058	101.7	1.7	NO	0.999	NO	bb

Compound name: PFPrS
Coefficient of Determination: R^2 = 0.997891
Calibration curve: 0.000772076 * x^2 + 1.04403 * x + 0.0148423
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	1.57	8.922	545.502	0.204	0.2	-27.4	NO	0.998	NO	bb
2	2 190710M2_7	Standard	0.500	1.57	25.938	500.786	0.647	0.6	21.1	NO	0.998	NO	bb
3	3 190710M2_8	Standard	1.000	1.57	43.402	517.896	1.048	1.0	-1.2	NO	0.998	NO	MM
4	4 190710M2_9	Standard	2.000	1.57	98.335	589.041	2.087	2.0	-0.9	NO	0.998	NO	MM
5	5 190710M2_10	Standard	5.000	1.57	301.372	676.534	5.568	5.3	6.0	NO	0.998	NO	bb
6	6 190710M2_11	Standard	10.000	1.57	488.523	516.663	11.819	11.2	12.1	NO	0.998	NO	bb
7	7 190710M2_12	Standard	50.000	1.57	3726.911	909.570	51.218	47.4	-5.2	NO	0.998	NO	bb
8	8 190710M2_13	Standard	100.000	1.57	4578.077	504.378	113.458	101.1	1.1	NO	0.998	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:29:54 Pacific Daylight Time

Compound name: 3:3 FTCA
Coefficient of Determination: R^2 = 0.997073
Calibration curve: -1.28403e-005 * x^2 + 0.0420476 * x + -0.00551054
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	2.06	1.490	3451.527	0.005	0.3	3.8	NO	0.997	NO	MM
2	2	190710M2_7	Standard	0.500	2.03	5.305	4278.600	0.015	0.5	-0.1	NO	0.997	NO	MM
3	3	190710M2_8	Standard	1.000	2.05	7.390	3455.927	0.027	0.8	-23.3	NO	0.997	NO	bb
4	4	190710M2_9	Standard	2.000	2.05	16.319	3752.667	0.054	1.4	-28.8	NO	0.997	NO	MM
5	5	190710M2_10	Standard	5.000	2.05	76.161	4918.636	0.194	4.7	-5.2	NO	0.997	NO	MM
6	6	190710M2_11	Standard	10.000	2.04	127.957	3981.248	0.402	9.7	-2.9	NO	0.997	NO	MM
7	7	190710M2_12	Standard	50.000	2.05	1056.409	6077.235	2.173	52.7	5.3	NO	0.997	NO	db
8	8	190710M2_13	Standard	100.000	2.04	1111.191	3455.963	4.019	98.7	-1.3	NO	0.997	NO	MM

Compound name: PFPeA
Correlation coefficient: r = 0.998647, r^2 = 0.997296
Calibration curve: 0.957887 * x + -0.0507044
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	2.19	60.373	3451.527	0.219	0.3	12.5	NO	0.997	NO	bb
2	2	190710M2_7	Standard	0.500	2.20	143.024	4278.600	0.418	0.5	-2.2	NO	0.997	NO	MM
3	3	190710M2_8	Standard	1.000	2.19	247.637	3455.927	0.896	1.0	-1.2	NO	0.997	NO	MM
4	4	190710M2_9	Standard	2.000	2.19	519.623	3752.667	1.731	1.9	-7.0	NO	0.997	NO	MM
5	5	190710M2_10	Standard	5.000	2.20	1963.789	4918.636	4.991	5.3	5.3	NO	0.997	NO	bb
6	6	190710M2_11	Standard	10.000	2.20	2908.583	3981.248	9.132	9.6	-4.1	NO	0.997	NO	bb
7	7	190710M2_12	Standard	50.000	2.20	21625.723	6077.235	44.481	46.5	-7.0	NO	0.997	NO	bb
8	8	190710M2_13	Standard	100.000	2.20	27473.760	3455.963	99.371	103.8	3.8	NO	0.997	NO	MM

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:29:54 Pacific Daylight Time

Compound name: PFBS
Correlation coefficient: r = 0.999402, r^2 = 0.998804
Calibration curve: 2.32197 * x + -0.263256
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	2.47	11.926	545.502	0.273	0.2	-7.6	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	2.49	41.057	500.786	1.025	0.6	10.9	NO	0.999	NO	MM
3	3	190710M2_8	Standard	1.000	2.49	81.716	517.896	1.972	1.0	-3.7	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	2.49	202.334	589.041	4.294	2.0	-1.9	NO	0.999	NO	MM
5	5	190710M2_10	Standard	5.000	2.49	599.924	676.534	11.085	4.9	-2.3	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	2.49	1018.812	516.663	24.649	10.7	7.3	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	2.49	8051.513	909.570	110.650	47.8	-4.5	NO	0.999	NO	MM
8	8	190710M2_13	Standard	100.000	2.49	9513.766	504.378	235.780	101.7	1.7	NO	0.999	NO	bb

Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.999259
Calibration curve: 0.000507604 * x^2 + 2.44029 * x + -0.0250945
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	2.91	44.323	1218.422	0.455	0.2	-21.4	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	2.90	116.573	1263.342	1.153	0.5	-3.4	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	2.90	268.414	1209.812	2.773	1.1	14.6	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	2.90	504.618	1216.382	5.186	2.1	6.7	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	2.90	1429.432	1338.061	13.354	5.5	9.5	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	2.91	2241.920	1216.987	23.027	9.4	-5.7	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	2.90	16650.355	1698.185	122.560	49.7	-0.6	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	2.90	19554.461	979.676	249.502	100.2	0.2	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:29:54 Pacific Daylight Time

Compound name: PFHxA
Correlation coefficient: r = 0.999958, r^2 = 0.999917
Calibration curve: 1.1618 * x + 0.000973487
Response type: Internal Std (Ref 52), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	2.98	190.647	3008.368	0.317	0.3	8.8	NO	1.000	NO	bb
2	2	190710M2_7	Standard	0.500	2.99	337.259	3012.537	0.560	0.5	-3.8	NO	1.000	NO	bb
3	3	190710M2_8	Standard	1.000	2.99	683.336	3100.750	1.102	0.9	-5.2	NO	1.000	NO	bb
4	4	190710M2_9	Standard	2.000	2.99	1378.962	2883.050	2.391	2.1	2.9	NO	1.000	NO	bb
5	5	190710M2_10	Standard	5.000	2.99	4209.333	3670.589	5.734	4.9	-1.3	NO	1.000	NO	bb
6	6	190710M2_11	Standard	10.000	2.99	6548.668	2838.096	11.537	9.9	-0.7	NO	1.000	NO	bb
7	7	190710M2_12	Standard	50.000	2.99	53855.410	4670.029	57.661	49.6	-0.7	NO	1.000	NO	bb
8	8	190710M2_13	Standard	100.000	2.99	63327.426	2711.879	116.759	100.5	0.5	NO	1.000	NO	bb

Compound name: PFPeS
Coefficient of Determination: R^2 = 0.998874
Calibration curve: 0.000269775 * x^2 + 2.12841 * x + 0.0156908
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	3.19	22.487	545.502	0.515	0.2	-6.1	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	3.19	32.419	500.786	0.809	0.4	-25.4	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	3.20	103.496	517.896	2.498	1.2	16.6	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	3.19	216.941	589.041	4.604	2.2	7.8	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	3.19	601.364	676.534	11.111	5.2	4.2	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	3.19	931.931	516.663	22.547	10.6	5.7	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	3.19	7518.340	909.570	103.323	48.2	-3.5	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	3.19	8767.941	504.378	217.296	100.8	0.8	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: HFPO-DA
Coefficient of Determination: R^2 = 0.998150
Calibration curve: 0.000712906 * x^2 + 0.547378 * x + -0.00436396
Response type: Internal Std (Ref 50), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	3.21	23.157	1155.989	0.100	0.2	-23.6	NO	0.998	NO	bb
2	2 190710M2_7	Standard	0.500	3.20	72.494	1192.405	0.304	0.6	12.6	NO	0.998	NO	bb
3	3 190710M2_8	Standard	1.000	3.20	137.769	1184.265	0.582	1.1	6.9	NO	0.998	NO	bb
4	4 190710M2_9	Standard	2.000	3.20	237.149	1280.574	0.926	1.7	-15.2	NO	0.998	NO	bb
5	5 190710M2_10	Standard	5.000	3.20	830.339	1293.869	3.209	5.8	16.5	NO	0.998	NO	bb
6	6 190710M2_11	Standard	10.000	3.20	1336.519	1137.478	5.875	10.6	5.9	NO	0.998	NO	bb
7	7 190710M2_12	Standard	50.000	3.20	9810.055	1756.626	27.923	48.0	-4.0	NO	0.998	NO	bb
8	8 190710M2_13	Standard	100.000	3.20	12361.706	990.189	62.421	100.8	0.8	NO	0.998	NO	bb

Compound name: 5:3 FTCA
Coefficient of Determination: R^2 = 0.995477
Calibration curve: 0.000863776 * x^2 + 0.248802 * x + -0.0186935
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	3.54	15.177	3685.756	0.051	0.3	12.7	NO	0.995	NO	bb
2	2 190710M2_7	Standard	0.500	3.53	27.390	3854.176	0.089	0.4	-13.7	NO	0.995	NO	bb
3	3 190710M2_8	Standard	1.000	3.54	66.792	3764.723	0.222	1.0	-3.7	NO	0.995	NO	bb
4	4 190710M2_9	Standard	2.000	3.54	98.907	3733.310	0.331	1.4	-30.0	~~YES~~ NO (A)	0.995	NO	bb
5	5 190710M2_10	Standard	5.000	3.54	405.085	4336.953	1.168	4.7	-6.2	NO	0.995	NO	bb
6	6 190710M2_11	Standard	10.000	3.54	791.510	3472.715	2.849	11.1	11.0	NO	0.995	NO	bb
7	7 190710M2_12	Standard	50.000	3.54	6523.466	5609.557	14.536	49.9	-0.3	NO	0.995	NO	bb
8	8 190710M2_13	Standard	100.000	3.54	6688.903	3411.495	24.509	77.6	-22.4	NO	0.995	NO	bbX

(A) CRITERIA IS ±30%
7/11/19

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: PFHpA
Correlation coefficient: r = 0.999078, r^2 = 0.998158
Calibration curve: 1.2318 * x + -0.044697
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	3.62	67.776	3685.756	0.230	0.2	-10.8	NO	0.998	NO	bb
2	2	190710M2_7	Standard	0.500	3.61	158.246	3854.176	0.513	0.5	-9.4	NO	0.998	NO	bb
3	3	190710M2_8	Standard	1.000	3.61	374.010	3764.723	1.242	1.0	4.4	NO	0.998	NO	bb
4	4	190710M2_9	Standard	2.000	3.61	764.547	3733.310	2.560	2.1	5.7	NO	0.998	NO	bb
5	5	190710M2_10	Standard	5.000	3.61	2275.237	4336.953	6.558	5.4	7.2	NO	0.998	NO	bb
6	6	190710M2_11	Standard	10.000	3.61	3432.809	3472.715	12.356	10.1	0.7	NO	0.998	NO	bb
7	7	190710M2_12	Standard	50.000	3.61	29128.148	5609.557	64.907	52.7	5.5	NO	0.998	NO	bb
8	8	190710M2_13	Standard	100.000	3.61	32516.168	3411.495	119.142	96.8	-3.2	NO	0.998	NO	bb

Compound name: ADONA
Correlation coefficient: r = 0.999468, r^2 = 0.998936
Calibration curve: 4.33675 * x + -0.0191729
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	3.72	364.378	3685.756	1.236	0.3	15.7	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	3.72	558.907	3854.176	1.813	0.4	-15.5	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	3.72	1242.688	3764.723	4.126	1.0	-4.4	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	3.72	2533.513	3733.310	8.483	2.0	-2.0	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	3.72	7966.099	4336.953	22.960	5.3	6.0	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	3.72	11814.175	3472.715	42.525	9.8	-1.9	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	3.72	101338.813	5609.557	225.817	52.1	4.2	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	3.72	115912.508	3411.495	424.713	97.9	-2.1	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.999253
Calibration curve: 0.000954922 * x^2 + 0.833847 * x + -0.0703303
Response type: Internal Std (Ref 54), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	3.77	15.820	1304.722	0.152	0.3	6.4	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	3.76	26.272	1441.949	0.228	0.4	-28.5	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	3.75	70.632	1290.789	0.684	0.9	-9.6	NO	0.999	NO	MM
4	4	190710M2_9	Standard	2.000	3.77	177.127	1321.664	1.675	2.1	4.4	NO	0.999	NO	MM
5	5	190710M2_10	Standard	5.000	3.77	494.610	1652.108	3.742	4.5	-9.0	NO	0.999	NO	MM
6	6	190710M2_11	Standard	10.000	3.76	868.476	1279.918	8.482	10.1	1.4	NO	0.999	NO	MM
7	7	190710M2_12	Standard	50.000	3.76	7617.017	2127.934	44.744	50.8	1.6	NO	0.999	NO	MM
8	8	190710M2_13	Standard	100.000	3.76	9131.280	1233.913	92.503	99.6	-0.4	NO	0.999	NO	MM

Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.999098
Calibration curve: -0.00219189 * x^2 + 2.96391 * x + -0.232571
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	4.08	45.440	919.066	0.618	0.3	14.8	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	4.07	74.459	992.943	0.937	0.4	-21.0	NO	0.999	NO	MM
3	3	190710M2_8	Standard	1.000	4.08	168.857	961.569	2.195	0.8	-18.0	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	4.07	394.793	971.636	5.079	1.8	-10.3	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	4.08	1310.712	1089.051	15.044	5.2	3.5	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	4.08	2127.561	927.023	28.688	9.8	-1.7	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	4.07	16187.466	1394.910	145.058	50.9	1.9	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	4.08	17673.369	809.234	272.995	99.5	-0.5	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: L-PFOA
Correlation coefficient: r = 0.999875, r^2 = 0.999749
Calibration curve: 1.84829 * x + 0.038532
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.13	341.491	7718.956	0.553	0.3	11.3	NO	1.000	NO	bb
2	2 190710M2_7	Standard	0.500	4.13	527.657	7963.359	0.828	0.4	-14.5	NO	1.000	NO	bb
3	3 190710M2_8	Standard	1.000	4.13	1188.006	7400.191	2.007	1.1	6.5	NO	1.000	NO	bb
4	4 190710M2_9	Standard	2.000	4.13	2263.133	7808.747	3.623	1.9	-3.0	NO	1.000	NO	bb
5	5 190710M2_10	Standard	5.000	4.13	7076.688	9244.864	9.568	5.2	3.1	NO	1.000	NO	bb
6	6 190710M2_11	Standard	10.000	4.13	10718.578	7521.740	17.813	9.6	-3.8	NO	1.000	NO	bb
7	7 190710M2_12	Standard	50.000	4.13	84902.875	11432.653	92.829	50.2	0.4	NO	1.000	NO	bb
8	8 190710M2_13	Standard	100.000	4.13	96793.156	6540.568	184.986	100.1	0.1	NO	1.000	NO	bb

Compound name: PFecHS
Coefficient of Determination: R^2 = 0.999465
Calibration curve: 0.000151504 * x^2 + 0.280359 * x + -0.022501
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.14	27.214	7718.956	0.044	0.2	-5.0	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	4.16	66.812	7963.359	0.105	0.5	-9.2	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	4.16	192.885	7400.191	0.326	1.2	24.2	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	4.15	322.429	7808.747	0.516	1.9	-4.0	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	4.15	952.309	9244.864	1.288	4.7	-6.8	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	4.15	1686.971	7521.740	2.803	10.0	0.3	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	4.15	13248.463	11432.653	14.485	50.4	0.8	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	4.15	15423.572	6540.568	29.477	99.8	-0.2	NO	0.999	NO	bb

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Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999024
Calibration curve: 0.00125826 * x^2 + 0.86234 * x + -0.0187748
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.26	10.447	1347.552	0.097	0.1	-46.4	YES	0.999	NO	bbX
2	2 190710M2_7	Standard	0.500	4.25	61.205	1416.736	0.540	0.6	29.5	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	4.25	88.460	1422.413	0.777	0.9	-7.8	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	4.25	160.360	1341.699	1.494	1.7	-12.5	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	4.25	492.234	1597.348	3.852	4.5	-10.8	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	4.25	915.017	1315.408	8.695	10.0	-0.4	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	4.25	7844.108	2063.788	47.510	51.3	2.6	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	4.25	8916.717	1135.065	98.196	99.5	-0.5	NO	0.999	NO	bb

Compound name: 7:3 FTCA
Coefficient of Determination: R^2 = 0.995389
Calibration curve: 5.99689e-005 * x^2 + 0.135121 * x + -0.0173495
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

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	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250			7600.508				NO	0.995	NO	
2	2 190710M2_7	Standard	0.500	4.56	46.620	7970.221	0.073	0.7	33.9	YES	0.995	NO	bb
3	3 190710M2_8	Standard	1.000	4.56	46.549	7932.063	0.073	0.7	-32.9	YES	0.995	NO	bb
4	4 190710M2_9	Standard	2.000	4.55	137.996	7851.595	0.220	1.8	-12.4	NO	0.995	NO	bb
5	5 190710M2_10	Standard	5.000	4.56	461.092	9320.955	0.618	4.7	-6.1	NO	0.995	NO	bb
6	6 190710M2_11	Standard	10.000	4.56	696.622	7587.184	1.148	8.6	-14.1	NO	0.995	NO	bb
7	7 190710M2_12	Standard	50.000	4.56	7057.876	11887.996	7.421	53.8	7.5	NO	0.995	NO	bb
8	8 190710M2_13	Standard	100.000	4.56	7559.312	6822.277	13.850	98.3	-1.7	NO	0.995	NO	bb

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Compound name: PFNA
Correlation coefficient: r = 0.999712, r^2 = 0.999423
Calibration curve: 1.09616 * x + 0.0302511
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.57	209.476	7600.508	0.345	0.3	14.7	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	4.57	370.645	7970.221	0.581	0.5	0.5	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	4.58	684.983	7932.063	1.079	1.0	-4.3	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	4.57	1332.024	7851.595	2.121	1.9	-4.7	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	4.57	4077.807	9320.955	5.469	5.0	-0.8	NO	0.999	NO	bd
6	6 190710M2_11	Standard	10.000	4.57	6336.875	7587.184	10.440	9.5	-5.0	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	4.57	50993.352	11887.996	53.619	48.9	-2.2	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	4.57	60890.855	6822.277	111.566	101.8	1.8	NO	0.999	NO	bb

Compound name: PFOSA
Correlation coefficient: r = 0.999643, r^2 = 0.999286
Calibration curve: 1.27955 * x + -0.0326972
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.63	31.020	1618.611	0.240	0.2	-14.9	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	4.64	81.781	1627.413	0.628	0.5	3.3	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	4.64	172.320	1531.073	1.407	1.1	12.5	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	4.64	316.272	1466.991	2.695	2.1	6.6	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	4.63	904.992	1856.207	6.094	4.8	-4.2	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	4.63	1429.461	1427.893	12.514	9.8	-1.9	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	4.63	11812.409	2379.869	62.043	48.5	-3.0	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	4.63	13928.197	1338.825	130.041	101.7	1.7	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: L-PFOS
Correlation coefficient: r = 0.997967, r^2 = 0.995937
Calibration curve: 1.26946 * x + -0.175183
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.67	11.018	1347.552	0.102	0.2	-12.6	NO	0.996	NO	bb
2	2 190710M2_7	Standard	0.500	4.66	46.686	1416.736	0.412	0.5	-7.5	NO	0.996	NO	MM
3	3 190710M2_8	Standard	1.000	4.66	145.239	1422.413	1.276	1.1	14.3	NO	0.996	NO	MM
4	4 190710M2_9	Standard	2.000	4.66	192.269	1341.699	1.791	1.5	-22.5	NO	0.996	NO	MM
5	5 190710M2_10	Standard	5.000	4.66	690.094	1597.348	5.400	4.4	-12.2	NO	0.996	NO	MM
6	6 190710M2_11	Standard	10.000	4.66	1089.682	1315.408	10.355	8.3	-17.1	NO	0.996	NO	MM
7	7 190710M2_12	Standard	50.000	4.66	10372.741	2063.788	62.826	49.6	-0.7	NO	0.996	NO	MM
8	8 190710M2_13	Standard	100.000	4.66	11864.368	1135.065	130.657	103.1	3.1	NO	0.996	NO	MM

Compound name: 9Cl-PF30NS
Coefficient of Determination: R^2 = 0.999653
Calibration curve: 0.0017864 * x^2 + 3.15352 * x + -0.22686
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.88	57.131	1347.552	0.530	0.2	-4.0	NO	1.000	NO	bb
2	2 190710M2_7	Standard	0.500	4.88	176.989	1416.736	1.562	0.6	13.4	NO	1.000	NO	bb
3	3 190710M2_8	Standard	1.000	4.88	273.179	1422.413	2.401	0.8	-16.7	NO	1.000	NO	bb
4	4 190710M2_9	Standard	2.000	4.88	666.084	1341.699	6.206	2.0	1.9	NO	1.000	NO	bb
5	5 190710M2_10	Standard	5.000	4.88	2112.807	1597.348	16.534	5.3	6.0	NO	1.000	NO	bb
6	6 190710M2_11	Standard	10.000	4.88	3319.091	1315.408	31.541	10.0	0.2	NO	1.000	NO	bb
7	7 190710M2_12	Standard	50.000	4.88	26494.578	2063.788	160.473	49.6	-0.9	NO	1.000	NO	bb
8	8 190710M2_13	Standard	100.000	4.88	30298.004	1135.065	333.659	100.2	0.2	NO	1.000	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
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Compound name: PFDA
Correlation coefficient: r = 0.998522, r^2 = 0.997046
Calibration curve: 1.67351 * x + -0.11586
Response type: Internal Std (Ref 60), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.95	210.010	6483.450	0.405	0.3	24.5	NO	0.997	NO	bb
2	2 190710M2_7	Standard	0.500	4.95	377.184	6513.090	0.724	0.5	0.4	NO	0.997	NO	bb
3	3 190710M2_8	Standard	1.000	4.95	701.882	6815.267	1.287	0.8	-16.2	NO	0.997	NO	bb
4	4 190710M2_9	Standard	2.000	4.95	1730.184	6311.901	3.426	2.1	5.8	NO	0.997	NO	bb
5	5 190710M2_10	Standard	5.000	4.95	4940.079	7586.322	8.140	4.9	-1.3	NO	0.997	NO	bb
6	6 190710M2_11	Standard	10.000	4.95	7248.603	6184.109	14.652	8.8	-11.8	NO	0.997	NO	bb
7	7 190710M2_12	Standard	50.000	4.95	62152.000	9816.599	79.141	47.4	-5.3	NO	0.997	NO	bb
8	8 190710M2_13	Standard	100.000	4.95	73095.445	5260.100	173.703	103.9	3.9	NO	0.997	NO	bb

Compound name: 8:2 FTS
Correlation coefficient: r = 0.997198, r^2 = 0.994405
Calibration curve: 2.24647 * x + 0.0322693
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	4.92	35.266	888.285	0.496	0.2	-17.4	NO	0.994	NO	bb
2	2 190710M2_7	Standard	0.500	4.93	78.589	921.949	1.066	0.5	-8.0	NO	0.994	NO	bb
3	3 190710M2_8	Standard	1.000	4.93	136.249	954.638	1.784	0.8	-22.0	NO	0.994	NO	bb
4	4 190710M2_9	Standard	2.000	4.92	386.257	900.043	5.364	2.4	18.7	NO	0.994	NO	bb
5	5 190710M2_10	Standard	5.000	4.92	1103.913	944.165	14.615	6.5	29.8	NO	0.994	NO	bb
6	6 190710M2_11	Standard	10.000	4.92	1688.582	901.200	23.421	10.4	4.1	NO	0.994	NO	bb
7	7 190710M2_12	Standard	50.000	4.92	11984.012	1269.481	118.001	52.5	5.0	NO	0.994	NO	bb
8	8 190710M2_13	Standard	100.000	4.92	13640.808	794.537	214.603	95.5	-4.5	NO	0.994	NO	bb

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Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:06:48 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFNS
Coefficient of Determination: R^2 = 0.998948
Calibration curve: 0.0012104 * x^2 + 0.869148 * x + -0.063694
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.01	19.637	1347.552	0.182	0.3	13.1	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	5.01	42.411	1416.736	0.374	0.5	0.7	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	5.02	66.216	1422.413	0.582	0.7	-25.8	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	5.02	145.714	1341.699	1.358	1.6	-18.4	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	5.02	557.274	1597.348	4.361	5.1	1.1	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	5.01	902.201	1315.408	8.573	9.8	-2.0	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	5.01	7868.190	2063.788	47.656	51.2	2.5	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	5.02	8931.655	1135.065	98.361	99.5	-0.5	NO	0.999	NO	bb

Compound name: L-MeFOSAA
Coefficient of Determination: R^2 = 0.998887
Calibration curve: 0.003255 * x^2 + 2.95538 * x + -0.018678
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.10	110.489	1483.081	0.931	0.3	28.5	NO	0.999	NO	MM
2	2 190710M2_7	Standard	0.500	5.10	127.066	1539.354	1.032	0.4	-28.9	NO	0.999	NO	MM
3	3 190710M2_8	Standard	1.000	5.11	397.646	1534.459	3.239	1.1	10.1	NO	0.999	NO	MM
4	4 190710M2_9	Standard	2.000	5.11	672.372	1568.547	5.358	1.8	-9.2	NO	0.999	NO	MM
5	5 190710M2_10	Standard	5.000	5.10	2246.927	1786.803	15.719	5.3	5.9	NO	0.999	NO	MM
6	6 190710M2_11	Standard	10.000	5.10	3245.832	1481.031	27.395	9.2	-8.2	NO	0.999	NO	MM
7	7 190710M2_12	Standard	50.000	5.11	29639.494	2321.898	159.565	51.1	2.2	NO	0.999	NO	MM
8	8 190710M2_13	Standard	100.000	5.10	35897.949	1374.590	326.442	99.5	-0.5	NO	0.999	NO	MM

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Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:30:27 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999414
Calibration curve: 0.000968179 * x^2 + 1.99529 * x + -0.24728
Response type: Internal Std (Ref 64), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	5.26	52.427	1930.980	0.339	0.3	17.6	NO	0.999	NO	MM
2	2	190710M2_7	Standard	0.500	5.26	66.737	1750.672	0.477	0.4	-27.5	NO	0.999	NO	MM
3	3	190710M2_8	Standard	1.000	5.27	275.709	1820.030	1.894	1.1	7.2	NO	0.999	NO	MM
4	4	190710M2_9	Standard	2.000	5.27	487.290	1715.865	3.550	1.9	-4.9	NO	0.999	NO	MM
5	5	190710M2_10	Standard	5.000	5.27	1730.527	2099.478	10.303	5.3	5.5	NO	0.999	NO	MM
6	6	190710M2_11	Standard	10.000	5.27	2630.015	1603.905	20.497	10.3	3.4	NO	0.999	NO	MM
7	7	190710M2_12	Standard	50.000	5.26	20822.275	2599.831	100.114	49.1	-1.7	NO	0.999	NO	MM
8	8	190710M2_13	Standard	100.000	5.27	24331.580	1449.809	209.783	100.4	0.4	NO	0.999	NO	MM

Compound name: PFUdA
Correlation coefficient: r = 0.999664, r^2 = 0.999328
Calibration curve: 0.930582 * x + 0.0128571
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	5.27	209.962	10308.564	0.255	0.3	3.9	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	5.27	365.858	9874.773	0.463	0.5	-3.2	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	5.28	844.203	10153.241	1.039	1.1	10.3	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	5.28	1478.163	10535.049	1.754	1.9	-6.5	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	5.27	4474.803	12195.073	4.587	4.9	-1.7	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	5.28	7063.031	9619.693	9.178	9.8	-1.5	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	5.28	56901.484	15781.931	45.069	48.4	-3.2	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	5.28	66131.688	8720.392	94.795	101.9	1.9	NO	0.999	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
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Compound name: PFDS
Correlation coefficient: r = 0.997649, r^2 = 0.995303
Calibration curve: 2.06378 * x + -0.389745
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	5.33	35.202	888.285	0.495	0.4	71.6	YES	0.995	NO	bbX
2	2	190710M2_7	Standard	0.500	5.34	48.052	921.949	0.652	0.5	0.9	NO	0.995	NO	bb
3	3	190710M2_8	Standard	1.000	5.33	136.112	954.638	1.782	1.1	5.2	NO	0.995	NO	bb
4	4	190710M2_9	Standard	2.000	5.33	210.343	900.043	2.921	1.6	-19.8	NO	0.995	NO	bb
5	5	190710M2_10	Standard	5.000	5.33	913.603	944.165	12.095	6.0	21.0	NO	0.995	NO	bb
6	6	190710M2_11	Standard	10.000	5.33	1294.616	901.200	17.957	8.9	-11.1	NO	0.995	NO	bb
7	7	190710M2_12	Standard	50.000	5.33	11140.859	1269.481	109.699	53.3	6.7	NO	0.995	NO	bb
8	8	190710M2_13	Standard	100.000	5.33	12707.069	794.537	199.913	97.1	-2.9	NO	0.995	NO	bb

Compound name: 11Cl-PF30UdS
Coefficient of Determination: R^2 = 0.990993
Calibration curve: 5.10585e-005 * x^2 + 0.0636606 * x + 0.00127315
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

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	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	5.50	15.036	11849.361	0.016	0.2	-8.4	NO	0.991	NO	bb
2	2	190710M2_7	Standard	0.500	5.50	51.761	11696.822	0.055	0.8	69.7	YES	0.991	NO	bb
3	3	190710M2_8	Standard	1.000	5.50	30.014	12098.984	0.031	0.5	-53.3	YES	0.991	NO	bb
4	4	190710M2_9	Standard	2.000	5.50	135.930	12100.947	0.140	2.2	9.1	NO	0.991	NO	bb
5	5	190710M2_10	Standard	5.000	5.49	368.903	14176.774	0.325	5.1	1.4	NO	0.991	NO	bb
6	6	190710M2_11	Standard	10.000	5.49	437.921	11395.914	0.480	7.5	-25.2	NO	0.991	NO	bb
7	7	190710M2_12	Standard	50.000	5.50	5206.060	18080.182	3.599	54.2	8.3	NO	0.991	NO	bb
8	8	190710M2_13	Standard	100.000	5.50	5656.417	10474.394	6.750	98.3	-1.7	NO	0.991	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: 10:2 FTS
Coefficient of Determination: R^2 = 0.998698
Calibration curve: -0.00397372 * x^2 + 2.69789 * x + -0.0745551
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.55	45.291	888.285	0.637	0.3	5.6	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	5.55	89.307	921.949	1.211	0.5	-4.6	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	5.55	176.181	954.638	2.307	0.9	-11.6	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	5.55	404.641	900.043	5.620	2.1	5.9	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	5.55	1131.636	944.165	14.982	5.6	12.5	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	5.55	1754.811	901.200	24.340	9.2	-8.3	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	5.55	12763.050	1269.481	125.672	50.3	0.7	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	5.55	14601.342	794.537	229.715	99.9	-0.1	NO	0.999	NO	bb

Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999847
Calibration curve: -0.000390936 * x^2 + 0.961264 * x + -0.0303905
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.57	227.053	11849.361	0.240	0.3	12.3	NO	1.000	NO	bb
2	2 190710M2_7	Standard	0.500	5.56	412.587	11696.822	0.441	0.5	-1.9	NO	1.000	NO	bb
3	3 190710M2_8	Standard	1.000	5.57	843.887	12098.984	0.872	0.9	-6.1	NO	1.000	NO	bb
4	4 190710M2_9	Standard	2.000	5.56	1814.495	12100.947	1.874	2.0	-0.8	NO	1.000	NO	bb
5	5 190710M2_10	Standard	5.000	5.56	5220.757	14176.774	4.603	4.8	-3.4	NO	1.000	NO	bb
6	6 190710M2_11	Standard	10.000	5.56	8611.083	11395.914	9.445	9.9	-1.0	NO	1.000	NO	bb
7	7 190710M2_12	Standard	50.000	5.57	68919.000	18080.182	47.648	50.6	1.3	NO	1.000	NO	bb
8	8 190710M2_13	Standard	100.000	5.56	77015.367	10474.394	91.909	99.7	-0.3	NO	1.000	NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:30:27 Pacific Daylight Time

Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999075
Calibration curve: -0.000216151 * x^2 + 1.29923 * x + -0.534727
Response type: Internal Std (Ref 66), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	1.250	5.70	21.123	3054.399	1.037	1.2	-3.2	NO	0.999	NO	bb
2	2 190710M2_7	Standard	2.500	5.71	60.346	3277.438	2.762	2.5	1.5	NO	0.999	NO	bb
3	3 190710M2_8	Standard	5.000	5.71	101.673	3115.206	4.896	4.2	-16.3	NO	0.999	NO	bb
4	4 190710M2_9	Standard	10.000	5.71	208.321	3084.938	10.129	8.2	-17.8	NO	0.999	NO	bb
5	5 190710M2_10	Standard	25.000	5.70	794.928	3716.070	32.087	25.2	0.9	NO	0.999	NO	bb
6	6 190710M2_11	Standard	50.000	5.70	1250.184	2913.632	64.362	50.4	0.7	NO	0.999	NO	bb
7	7 190710M2_12	Standard	250.000	5.70	10117.369	4802.480	316.005	254.4	1.8	NO	0.999	NO	bb
8	8 190710M2_13	Standard	500.000	5.71	11808.107	2989.823	592.415	497.6	-0.5	NO	0.999	NO	bb

Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999791
Calibration curve: -0.000400083 * x^2 + 1.06843 * x + -0.0442094
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.81	212.303	11849.361	0.224	0.3	0.4	NO	1.000	NO	bb
2	2 190710M2_7	Standard	0.500	5.81	404.091	11696.822	0.432	0.4	-10.9	NO	1.000	NO	bb
3	3 190710M2_8	Standard	1.000	5.81	1110.509	12098.984	1.147	1.1	11.6	NO	1.000	NO	bb
4	4 190710M2_9	Standard	2.000	5.81	1960.829	12100.947	2.025	1.9	-3.1	NO	1.000	NO	bb
5	5 190710M2_10	Standard	5.000	5.81	6228.645	14176.774	5.492	5.2	3.8	NO	1.000	NO	bb
6	6 190710M2_11	Standard	10.000	5.81	9489.233	11395.914	10.409	9.8	-1.8	NO	1.000	NO	bb
7	7 190710M2_12	Standard	50.000	5.82	75692.906	18080.182	52.331	50.0	-0.1	NO	1.000	NO	bb
8	8 190710M2_13	Standard	100.000	5.81	86166.516	10474.394	102.830	100.0	0.0	NO	1.000	NO	bb

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Compound name: PFDoS
Coefficient of Determination: R^2 = 0.998596
Calibration curve: -6.19262e-005 * x^2 + 0.244112 * x + -0.0199214
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	5.85	20.075	5988.523	0.042	0.3	1.3	NO	0.999	NO	bb
2	2 190710M2_7	Standard	0.500	5.83	42.984	6370.549	0.084	0.4	-14.6	NO	0.999	NO	bb
3	3 190710M2_8	Standard	1.000	5.84	130.564	6280.262	0.260	1.1	14.6	NO	0.999	NO	bb
4	4 190710M2_9	Standard	2.000	5.84	196.343	6033.232	0.407	1.7	-12.6	NO	0.999	NO	bb
5	5 190710M2_10	Standard	5.000	5.84	763.588	6836.236	1.396	5.8	16.2	NO	0.999	NO	bb
6	6 190710M2_11	Standard	10.000	5.84	1055.269	5715.887	2.308	9.6	-4.4	NO	0.999	NO	bb
7	7 190710M2_12	Standard	50.000	5.84	8982.088	9409.312	11.932	49.6	-0.8	NO	0.999	NO	bb
8	8 190710M2_13	Standard	100.000	5.84	10102.171	5300.635	23.823	100.2	0.2	NO	0.999	NO	bb

Compound name: PFTeDA
Coefficient of Determination: R^2 = 0.999560
Calibration curve: 0.000924303 * x^2 + 1.48528 * x + 0.0369753
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	0.250	6.03	187.955	5988.523	0.392	0.2	-4.3	NO	1.000	NO	bb
2	2 190710M2_7	Standard	0.500	6.04	432.303	6370.549	0.848	0.5	9.2	NO	1.000	NO	bb
3	3 190710M2_8	Standard	1.000	6.04	641.228	6280.262	1.276	0.8	-16.6	NO	1.000	NO	bb
4	4 190710M2_9	Standard	2.000	6.03	1538.406	6033.232	3.187	2.1	5.9	NO	1.000	NO	bb
5	5 190710M2_10	Standard	5.000	6.04	4416.243	6836.236	8.075	5.4	7.9	NO	1.000	NO	bb
6	6 190710M2_11	Standard	10.000	6.04	6755.284	5715.887	14.773	9.9	-1.4	NO	1.000	NO	bb
7	7 190710M2_12	Standard	50.000	6.04	57140.523	9409.312	75.910	49.6	-0.9	NO	1.000	NO	bb
8	8 190710M2_13	Standard	100.000	6.04	67063.367	5300.635	158.149	100.2	0.2	NO	1.000	NO	bb

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Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999705
Calibration curve: 4.67147e-005 * x^2 + 0.924219 * x + -0.422102
Response type: Internal Std (Ref 68), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

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	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	1.250	6.12	23.128	4439.246	0.781	1.3	4.2	NO	1.000	NO	bb
2	2	190710M2_7	Standard	2.500	6.13	55.711	4462.217	1.873	2.5	-0.7	NO	1.000	NO	bb
3	3	190710M2_8	Standard	5.000	6.13	128.995	4330.604	4.468	5.3	5.8	NO	1.000	NO	bb
4	4	190710M2_9	Standard	10.000	6.12	224.014	4383.917	7.665	8.7	-12.5	NO	1.000	NO	bb
5	5	190710M2_10	Standard	25.000	6.13	838.738	5295.154	23.760	26.1	4.5	NO	1.000	NO	bb
6	6	190710M2_11	Standard	50.000	6.13	1279.052	4247.957	45.165	49.2	-1.6	NO	1.000	NO	bb
7	7	190710M2_12	Standard	250.000	6.13	10501.848	6715.452	234.575	251.1	0.4	NO	1.000	NO	bb
8	8	190710M2_13	Standard	500.000	6.13	12798.550	4059.624	472.897	499.5	-0.1	NO	1.000	NO	bb

Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.999745
Calibration curve: -0.000493807 * x^2 + 0.756486 * x + 0.0537783
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	6.39	181.705	3440.496	0.264	0.3	11.2	NO	1.000	NO	bb
2	2	190710M2_7	Standard	0.500	6.39	311.225	3551.527	0.438	0.5	1.7	NO	1.000	NO	bb
3	3	190710M2_8	Standard	1.000	6.39	547.227	3591.524	0.762	0.9	-6.3	NO	1.000	NO	bb
4	4	190710M2_9	Standard	2.000	6.39	1046.898	3403.188	1.538	2.0	-1.8	NO	1.000	NO	bb
5	5	190710M2_10	Standard	5.000	6.39	2985.637	4071.111	3.667	4.8	-4.2	NO	1.000	NO	bb
6	6	190710M2_11	Standard	10.000	6.39	4843.048	3262.578	7.422	9.8	-2.0	NO	1.000	NO	bb
7	7	190710M2_12	Standard	50.000	6.39	40627.480	5446.172	37.299	50.9	1.9	NO	1.000	NO	bb
8	8	190710M2_13	Standard	100.000	6.39	43788.574	3107.337	70.460	99.5	-0.5	NO	1.000	NO	bb

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Compound name: PFODA
Correlation coefficient: r = 0.999748, r^2 = 0.999496
Calibration curve: 0.835341 * x + 0.00579687
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	0.250	6.63	144.032	3440.496	0.209	0.2	-2.5	NO	0.999	NO	bb
2	2	190710M2_7	Standard	0.500	6.63	312.756	3551.527	0.440	0.5	4.0	NO	0.999	NO	bb
3	3	190710M2_8	Standard	1.000	6.63	594.852	3591.524	0.828	1.0	-1.6	NO	0.999	NO	bb
4	4	190710M2_9	Standard	2.000	6.63	1122.281	3403.188	1.649	2.0	-1.7	NO	0.999	NO	bb
5	5	190710M2_10	Standard	5.000	6.63	3537.889	4071.111	4.345	5.2	3.9	NO	0.999	NO	bb
6	6	190710M2_11	Standard	10.000	6.63	5598.238	3262.578	8.579	10.3	2.6	NO	0.999	NO	bb
7	7	190710M2_12	Standard	50.000	6.63	44035.457	5446.172	40.428	48.4	-3.2	NO	0.999	NO	bb
8	8	190710M2_13	Standard	100.000	6.63	52533.277	3107.337	84.531	101.2	1.2	NO	0.999	NO	bb

Compound name: N-MeFOSE
Correlation coefficient: r = 0.999631, r^2 = 0.999263
Calibration curve: 1.11841 * x + 0.165536
Response type: Internal Std (Ref 70), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	1.250	6.31	37.031	4007.611	1.386	1.1	-12.7	NO	0.999	NO	bb
2	2	190710M2_7	Standard	2.500	6.30	85.698	3785.716	3.396	2.9	15.5	NO	0.999	NO	bb
3	3	190710M2_8	Standard	5.000	6.31	167.209	3922.123	6.395	5.6	11.4	NO	0.999	NO	bb
4	4	190710M2_9	Standard	10.000	6.30	259.229	3727.673	10.431	9.2	-8.2	NO	0.999	NO	bb
5	5	190710M2_10	Standard	25.000	6.31	836.294	4820.834	26.021	23.1	-7.5	NO	0.999	NO	bb
6	6	190710M2_11	Standard	50.000	6.31	1404.172	3765.545	55.935	49.9	-0.3	NO	0.999	NO	bb
7	7	190710M2_12	Standard	250.000	6.30	11978.623	6250.164	287.479	256.9	2.8	NO	0.999	NO	bb
8	8	190710M2_13	Standard	500.000	6.30	14010.419	3793.865	553.937	495.1	-1.0	NO	0.999	NO	bb

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Compound name: N-EtFOSE
Correlation coefficient: r = 0.999930, r^2 = 0.999860
Calibration curve: 1.41132 * x + -0.260677
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	1.250	6.46	37.607	3845.157	1.467	1.2	-2.1	NO	1.000	NO	bb
2	2	190710M2_7	Standard	2.500	6.46	83.843	3839.792	3.275	2.5	0.2	NO	1.000	NO	bb
3	3	190710M2_8	Standard	5.000	6.46	173.873	3944.296	6.612	4.9	-2.6	NO	1.000	NO	bb
4	4	190710M2_9	Standard	10.000	6.46	371.200	3790.164	14.691	10.6	5.9	NO	1.000	NO	bb
5	5	190710M2_10	Standard	25.000	6.46	1033.909	4610.654	33.637	24.0	-3.9	NO	1.000	NO	bb
6	6	190710M2_11	Standard	50.000	6.46	1783.965	3714.178	72.047	51.2	2.5	NO	1.000	NO	bd
7	7	190710M2_12	Standard	250.000	6.46	14491.547	6151.757	353.351	250.6	0.2	NO	1.000	NO	bb
8	8	190710M2_13	Standard	500.000	6.46	17047.996	3634.249	703.639	498.8	-0.2	NO	1.000	NO	bb

Compound name: 13C3-PFBA
Response Factor: 0.650021
RRF SD: 0.0190623, Relative SD: 2.93256
Response type: Internal Std (Ref 72), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	1.21	1930.395	2921.156	8.260	12.7	1.7	NO		NO	MM
2	2	190710M2_7	Standard	12.500	1.21	2093.751	3200.857	8.177	12.6	0.6	NO		NO	bb
3	3	190710M2_8	Standard	12.500	1.21	1877.004	3042.829	7.711	11.9	-5.1	NO		NO	bb
4	4	190710M2_9	Standard	12.500	1.21	1948.465	3054.028	7.975	12.3	-1.8	NO		NO	bb
5	5	190710M2_10	Standard	12.500	1.21	2587.624	3825.142	8.456	13.0	4.1	NO		NO	bb
6	6	190710M2_11	Standard	12.500	1.21	1944.651	2935.893	8.280	12.7	1.9	NO		NO	bb
7	7	190710M2_12	Standard	12.500	1.22	3149.437	4789.874	8.219	12.6	1.2	NO		NO	bb
8	8	190710M2_13	Standard	12.500	1.21	1784.566	2814.827	7.925	12.2	-2.5	NO		NO	bb

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Compound name: 13C3-PFPeA
Response Factor: 0.407627
RRF SD: 0.0308474, Relative SD: 7.56756
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	2.19	3451.527	9214.552	4.682	11.5	-8.1	NO		NO	bb
2	2 190710M2_7	Standard	12.500	2.19	4278.600	9744.537	5.488	13.5	7.7	NO		NO	MM
3	3 190710M2_8	Standard	12.500	2.20	3455.927	9533.288	4.531	11.1	-11.1	NO		NO	bb
4	4 190710M2_9	Standard	12.500	2.20	3752.667	9794.559	4.789	11.7	-6.0	NO		NO	MM
5	5 190710M2_10	Standard	12.500	2.20	4918.636	11219.285	5.480	13.4	7.6	NO		NO	bb
6	6 190710M2_11	Standard	12.500	2.20	3981.248	9088.471	5.476	13.4	7.5	NO		NO	db
7	7 190710M2_12	Standard	12.500	2.20	6077.235	14844.347	5.117	12.6	0.4	NO		NO	db
8	8 190710M2_13	Standard	12.500	2.20	3455.963	8310.527	5.198	12.8	2.0	NO		NO	MM

Compound name: 13C3-PFBS
Response Factor: 1.03514
RRF SD: 0.0705751, Relative SD: 6.81793
Response type: Internal Std (Ref 74), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	2.49	545.502	506.480	13.463	13.0	4.0	NO		NO	MM
2	2 190710M2_7	Standard	12.500	2.49	500.786	530.060	11.810	11.4	-8.7	NO		NO	bb
3	3 190710M2_8	Standard	12.500	2.49	517.896	516.799	12.527	12.1	-3.2	NO		NO	MM
4	4 190710M2_9	Standard	12.500	2.49	589.041	567.821	12.967	12.5	0.2	NO		NO	MM
5	5 190710M2_10	Standard	12.500	2.49	676.534	643.362	13.145	12.7	1.6	NO		NO	bb
6	6 190710M2_11	Standard	12.500	2.49	516.663	448.826	14.389	13.9	11.2	NO		NO	bb
7	7 190710M2_12	Standard	12.500	2.49	909.570	964.996	11.782	11.4	-8.9	NO		NO	MM
8	8 190710M2_13	Standard	12.500	2.49	504.378	469.394	13.432	13.0	3.8	NO		NO	bb

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Compound name: 13C3-HFPO-DA
Response Factor: 0.306485
RRF SD: 0.0121995, Relative SD: 3.98045
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	5.000	3.20	1155.989	9214.552	1.568	5.1	2.3	NO		NO	bb
2	2 190710M2_7	Standard	5.000	3.20	1192.405	9744.537	1.530	5.0	-0.2	NO		NO	bb
3	3 190710M2_8	Standard	5.000	3.20	1184.265	9533.288	1.553	5.1	1.3	NO		NO	bb
4	4 190710M2_9	Standard	5.000	3.20	1280.574	9794.559	1.634	5.3	6.6	NO		NO	bb
5	5 190710M2_10	Standard	5.000	3.20	1293.869	11219.285	1.442	4.7	-5.9	NO		NO	bb
6	6 190710M2_11	Standard	5.000	3.20	1137.478	9088.471	1.564	5.1	2.1	NO		NO	bb
7	7 190710M2_12	Standard	5.000	3.20	1756.626	14844.347	1.479	4.8	-3.5	NO		NO	bb
8	8 190710M2_13	Standard	5.000	3.20	990.189	8310.527	1.489	4.9	-2.8	NO		NO	bb

Compound name: 13C2-4:2 FTS
Response Factor: 2.2388
RRF SD: 0.285284, Relative SD: 12.7427
Response type: Internal Std (Ref 74), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	2.90	1218.422	506.480	30.071	13.4	7.5	NO		NO	bb
2	2 190710M2_7	Standard	12.500	2.90	1263.342	530.060	29.792	13.3	6.5	NO		NO	bb
3	3 190710M2_8	Standard	12.500	2.90	1209.812	516.799	29.262	13.1	4.6	NO		NO	bb
4	4 190710M2_9	Standard	12.500	2.90	1216.382	567.821	26.777	12.0	-4.3	NO		NO	bb
5	5 190710M2_10	Standard	12.500	2.90	1338.061	643.362	25.997	11.6	-7.1	NO		NO	bb
6	6 190710M2_11	Standard	12.500	2.90	1216.987	448.826	33.894	15.1	21.1	NO		NO	bb
7	7 190710M2_12	Standard	12.500	2.90	1698.185	964.996	21.997	9.8	-21.4	NO		NO	bb
8	8 190710M2_13	Standard	12.500	2.90	979.676	469.394	26.089	11.7	-6.8	NO		NO	bb

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Compound name: 13C2-PFHxA
Response Factor: 0.792375
RRF SD: 0.0291369, Relative SD: 3.67716
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	5.000	2.99	3008.368	9214.552	4.081	5.2	3.0	NO		NO	bb
2	2 190710M2_7	Standard	5.000	2.99	3012.537	9744.537	3.864	4.9	-2.5	NO		NO	bb
3	3 190710M2_8	Standard	5.000	2.99	3100.750	9533.288	4.066	5.1	2.6	NO		NO	bb
4	4 190710M2_9	Standard	5.000	2.99	2883.050	9794.559	3.679	4.6	-7.1	NO		NO	bb
5	5 190710M2_10	Standard	5.000	2.99	3670.589	11219.285	4.090	5.2	3.2	NO		NO	bb
6	6 190710M2_11	Standard	5.000	2.99	2838.096	9088.471	3.903	4.9	-1.5	NO		NO	bb
7	7 190710M2_12	Standard	5.000	2.99	4670.029	14844.347	3.932	5.0	-0.7	NO		NO	bb
8	8 190710M2_13	Standard	5.000	2.99	2711.879	8310.527	4.079	5.1	3.0	NO		NO	bb

Compound name: 13C4-PFHpA
Response Factor: 0.39108
RRF SD: 0.0111122, Relative SD: 2.84141
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	3.61	3685.756	9214.552	5.000	12.8	2.3	NO		NO	bb
2	2 190710M2_7	Standard	12.500	3.61	3854.176	9744.537	4.944	12.6	1.1	NO		NO	bb
3	3 190710M2_8	Standard	12.500	3.61	3764.723	9533.288	4.936	12.6	1.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	3.61	3733.310	9794.559	4.765	12.2	-2.5	NO		NO	bb
5	5 190710M2_10	Standard	12.500	3.61	4336.953	11219.285	4.832	12.4	-1.2	NO		NO	bb
6	6 190710M2_11	Standard	12.500	3.61	3472.715	9088.471	4.776	12.2	-2.3	NO		NO	bb
7	7 190710M2_12	Standard	12.500	3.61	5609.557	14844.347	4.724	12.1	-3.4	NO		NO	bd
8	8 190710M2_13	Standard	12.500	3.61	3411.495	8310.527	5.131	13.1	5.0	NO		NO	bb

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Compound name: 13C3-PFHxS
Response Factor: 2.5469
RRF SD: 0.206434, Relative SD: 8.10532
Response type: Internal Std (Ref 74), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	3.76	1304.722	506.480	32.201	12.6	1.1	NO		NO	bb
2	2 190710M2_7	Standard	12.500	3.76	1441.949	530.060	34.004	13.4	6.8	NO		NO	bb
3	3 190710M2_8	Standard	12.500	3.77	1290.789	516.799	31.221	12.3	-1.9	NO		NO	bb
4	4 190710M2_9	Standard	12.500	3.76	1321.664	567.821	29.095	11.4	-8.6	NO		NO	bb
5	5 190710M2_10	Standard	12.500	3.76	1652.108	643.362	32.099	12.6	0.8	NO		NO	bb
6	6 190710M2_11	Standard	12.500	3.76	1279.918	448.826	35.646	14.0	12.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	3.76	2127.934	964.996	27.564	10.8	-13.4	NO		NO	bb
8	8 190710M2_13	Standard	12.500	3.77	1233.913	469.394	32.859	12.9	3.2	NO		NO	bb

Compound name: 13C2-6:2 FTS
Response Factor: 0.736156
RRF SD: 0.0571117, Relative SD: 7.7581
Response type: Internal Std (Ref 77), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.07	919.066	1327.903	8.651	11.8	-6.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.07	992.943	1384.299	8.966	12.2	-2.6	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.08	961.569	1176.867	10.213	13.9	11.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.07	971.636	1368.032	8.878	12.1	-3.5	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.07	1089.051	1460.771	9.319	12.7	1.3	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.07	927.023	1148.475	10.090	13.7	9.6	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.08	1394.910	2155.362	8.090	11.0	-12.1	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.07	809.234	1075.188	9.408	12.8	2.2	NO		NO	bb

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Compound name: 13C5-PFNA
Response Factor: 0.982718
RRF SD: 0.042308, Relative SD: 4.30521
Response type: Internal Std (Ref 76), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	4.57	7600.508	7993.476	11.885	12.1	-3.2	NO		NO	bb
2	2	190710M2_7	Standard	12.500	4.57	7970.221	7664.316	12.999	13.2	5.8	NO		NO	bb
3	3	190710M2_8	Standard	12.500	4.57	7932.063	8436.873	11.752	12.0	-4.3	NO		NO	bb
4	4	190710M2_9	Standard	12.500	4.57	7851.595	8295.519	11.831	12.0	-3.7	NO		NO	bb
5	5	190710M2_10	Standard	12.500	4.57	9320.955	9350.003	12.461	12.7	1.4	NO		NO	bb
6	6	190710M2_11	Standard	12.500	4.57	7587.184	7605.623	12.470	12.7	1.5	NO		NO	bb
7	7	190710M2_12	Standard	12.500	4.57	11887.996	12539.574	11.850	12.1	-3.5	NO		NO	bb
8	8	190710M2_13	Standard	12.500	4.57	6822.277	6548.345	13.023	13.3	6.0	NO		NO	bb

Compound name: 13C8-PFOSA
Response Factor: 0.130277
RRF SD: 0.00591568, Relative SD: 4.54086
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	4.63	1618.611	11912.648	1.698	13.0	4.3	NO		NO	bb
2	2	190710M2_7	Standard	12.500	4.63	1627.413	12146.531	1.675	12.9	2.8	NO		NO	bb
3	3	190710M2_8	Standard	12.500	4.64	1531.073	11943.670	1.602	12.3	-1.6	NO		NO	bb
4	4	190710M2_9	Standard	12.500	4.63	1466.991	11915.969	1.539	11.8	-5.5	NO		NO	bb
5	5	190710M2_10	Standard	12.500	4.63	1856.207	14305.879	1.622	12.4	-0.4	NO		NO	bb
6	6	190710M2_11	Standard	12.500	4.63	1427.893	11831.388	1.509	11.6	-7.4	NO		NO	bb
7	7	190710M2_12	Standard	12.500	4.63	2379.869	17696.068	1.681	12.9	3.2	NO		NO	bb
8	8	190710M2_13	Standard	12.500	4.64	1338.825	9834.856	1.702	13.1	4.5	NO		NO	bb

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Compound name: 13C2-PFOA
Response Factor: 0.564255
RRF SD: 0.0209217, Relative SD: 3.70784
Response type: Internal Std (Ref 75), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.13	7718.956	13388.436	7.207	12.8	2.2	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.13	7963.359	14093.044	7.063	12.5	0.1	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.13	7400.191	13963.202	6.625	11.7	-6.1	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.13	7808.747	14249.977	6.850	12.1	-2.9	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.13	9244.864	16413.971	7.040	12.5	-0.2	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.13	7521.740	12992.551	7.237	12.8	2.6	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.13	11432.653	20632.490	6.926	12.3	-1.8	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.13	6540.568	10933.404	7.478	13.3	6.0	NO		NO	bb

Compound name: 13C8-PFOS
Response Factor: 1.05996
RRF SD: 0.0850923, Relative SD: 8.02788
Response type: Internal Std (Ref 77), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.66	1347.552	1327.903	12.685	12.0	-4.3	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.66	1416.736	1384.299	12.793	12.1	-3.4	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.66	1422.413	1176.867	15.108	14.3	14.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.66	1341.699	1368.032	12.259	11.6	-7.5	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.66	1597.348	1460.771	13.669	12.9	3.2	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.66	1315.408	1148.475	14.317	13.5	8.1	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.66	2063.788	2155.362	11.969	11.3	-9.7	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.66	1135.065	1075.188	13.196	12.4	-0.4	NO		NO	bb

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Compound name: 13C2-PFDA
Response Factor: 0.662196
RRF SD: 0.016931, Relative SD: 2.55679
Response type: Internal Std (Ref 78), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.95	6483.450	9534.204	8.500	12.8	2.7	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.95	6513.090	9602.725	8.478	12.8	2.4	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.95	6815.267	10121.342	8.417	12.7	1.7	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.95	6311.901	9866.013	7.997	12.1	-3.4	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.95	7586.322	11475.027	8.264	12.5	-0.2	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.95	6184.109	9251.279	8.356	12.6	0.9	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.95	9816.599	14828.290	8.275	12.5	-0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.95	5260.100	8289.135	7.932	12.0	-4.2	NO		NO	bb

Compound name: 13C2-8:2 FTS
Response Factor: 0.695378
RRF SD: 0.0755684, Relative SD: 10.8672
Response type: Internal Std (Ref 77), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.92	888.285	1327.903	8.362	12.0	-3.8	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.92	921.949	1384.299	8.325	12.0	-4.2	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.92	954.638	1176.867	10.140	14.6	16.7	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.92	900.043	1368.032	8.224	11.8	-5.4	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.92	944.165	1460.771	8.079	11.6	-7.1	NO		NO	MM
6	6 190710M2_11	Standard	12.500	4.92	901.200	1148.475	9.809	14.1	12.8	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.92	1269.481	2155.362	7.362	10.6	-15.3	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.92	794.537	1075.188	9.237	13.3	6.3	NO		NO	bb

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Compound name: d3-N-MeFOSAA
Response Factor: 0.129049
RRF SD: 0.00513885, Relative SD: 3.98209
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	5.10	1483.081	11912.648	1.556	12.1	-3.5	NO		NO	bb
2	2	190710M2_7	Standard	12.500	5.10	1539.354	12146.531	1.584	12.3	-1.8	NO		NO	bb
3	3	190710M2_8	Standard	12.500	5.10	1534.459	11943.670	1.606	12.4	-0.4	NO		NO	bb
4	4	190710M2_9	Standard	12.500	5.10	1568.547	11915.969	1.645	12.8	2.0	NO		NO	bb
5	5	190710M2_10	Standard	12.500	5.10	1786.803	14305.879	1.561	12.1	-3.2	NO		NO	bb
6	6	190710M2_11	Standard	12.500	5.10	1481.031	11831.388	1.565	12.1	-3.0	NO		NO	bb
7	7	190710M2_12	Standard	12.500	5.10	2321.898	17696.068	1.640	12.7	1.7	NO		NO	bb
8	8	190710M2_13	Standard	12.500	5.10	1374.590	9834.856	1.747	13.5	8.3	NO		NO	bb

Compound name: 13C2-PFUdA
Response Factor: 0.857069
RRF SD: 0.0312507, Relative SD: 3.64622
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	5.28	10308.564	11912.648	10.817	12.6	1.0	NO		NO	bb
2	2	190710M2_7	Standard	12.500	5.28	9874.773	12146.531	10.162	11.9	-5.1	NO		NO	bb
3	3	190710M2_8	Standard	12.500	5.28	10153.241	11943.670	10.626	12.4	-0.8	NO		NO	bb
4	4	190710M2_9	Standard	12.500	5.28	10535.049	11915.969	11.051	12.9	3.2	NO		NO	bb
5	5	190710M2_10	Standard	12.500	5.27	12195.073	14305.879	10.656	12.4	-0.5	NO		NO	bb
6	6	190710M2_11	Standard	12.500	5.28	9619.693	11831.388	10.163	11.9	-5.1	NO		NO	bb
7	7	190710M2_12	Standard	12.500	5.28	15781.931	17696.068	11.148	13.0	4.1	NO		NO	bb
8	8	190710M2_13	Standard	12.500	5.27	8720.392	9834.856	11.084	12.9	3.5	NO		NO	bb

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Compound name: d5-N-EtFOSAA
Response Factor: 0.147407
RRF SD: 0.00759524, Relative SD: 5.15256
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	5.26	1930.980	11912.648	2.026	13.7	10.0	NO		NO	bb
2	2	190710M2_7	Standard	12.500	5.26	1750.672	12146.531	1.802	12.2	-2.2	NO		NO	bd
3	3	190710M2_8	Standard	12.500	5.26	1820.030	11943.670	1.905	12.9	3.4	NO		NO	bb
4	4	190710M2_9	Standard	12.500	5.26	1715.865	11915.969	1.800	12.2	-2.3	NO		NO	bb
5	5	190710M2_10	Standard	12.500	5.26	2099.478	14305.879	1.834	12.4	-0.4	NO		NO	bb
6	6	190710M2_11	Standard	12.500	5.26	1603.905	11831.388	1.695	11.5	-8.0	NO		NO	bb
7	7	190710M2_12	Standard	12.500	5.26	2599.831	17696.068	1.836	12.5	-0.3	NO		NO	bb
8	8	190710M2_13	Standard	12.500	5.26	1449.809	9834.856	1.843	12.5	0.0	NO		NO	bb

Compound name: 13C2-PFDoA
Response Factor: 1.22913
RRF SD: 0.0199595, Relative SD: 1.62388
Response type: Internal Std (Ref 78), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	5.56	11849.361	9534.204	15.535	12.6	1.1	NO		NO	bb
2	2	190710M2_7	Standard	12.500	5.56	11696.822	9602.725	15.226	12.4	-0.9	NO		NO	bb
3	3	190710M2_8	Standard	12.500	5.56	12098.984	10121.342	14.942	12.2	-2.7	NO		NO	bb
4	4	190710M2_9	Standard	12.500	5.56	12100.947	9866.013	15.332	12.5	-0.2	NO		NO	bb
5	5	190710M2_10	Standard	12.500	5.56	14176.774	11475.027	15.443	12.6	0.5	NO		NO	bb
6	6	190710M2_11	Standard	12.500	5.56	11395.914	9251.279	15.398	12.5	0.2	NO		NO	bb
7	7	190710M2_12	Standard	12.500	5.57	18080.182	14828.290	15.241	12.4	-0.8	NO		NO	bb
8	8	190710M2_13	Standard	12.500	5.56	10474.394	8289.135	15.795	12.9	2.8	NO		NO	bb

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Compound name: d3-N-MeFOSA
Response Factor: 0.0221599
RRF SD: 0.00143849, Relative SD: 6.4914
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	150.000	5.73	3054.399	11912.648	3.205	144.6	-3.6	NO		NO	bd
2	2 190710M2_7	Standard	150.000	5.73	3277.438	12146.531	3.373	152.2	1.5	NO		NO	bb
3	3 190710M2_8	Standard	150.000	5.74	3115.206	11943.670	3.260	147.1	-1.9	NO		NO	bb
4	4 190710M2_9	Standard	150.000	5.73	3084.938	11915.969	3.236	146.0	-2.6	NO		NO	bb
5	5 190710M2_10	Standard	150.000	5.73	3716.070	14305.879	3.247	146.5	-2.3	NO		NO	bb
6	6 190710M2_11	Standard	150.000	5.73	2913.632	11831.388	3.078	138.9	-7.4	NO		NO	bb
7	7 190710M2_12	Standard	150.000	5.73	4802.480	17696.068	3.392	153.1	2.1	NO		NO	bb
8	8 190710M2_13	Standard	150.000	5.73	2989.823	9834.856	3.800	171.5	14.3	NO		NO	bb

Compound name: 13C2-PFTeDA
Response Factor: 0.511371
RRF SD: 0.0226087, Relative SD: 4.42119
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	6.04	5988.523	11912.648	6.284	12.3	-1.7	NO		NO	bb
2	2 190710M2_7	Standard	12.500	6.04	6370.549	12146.531	6.556	12.8	2.6	NO		NO	bb
3	3 190710M2_8	Standard	12.500	6.04	6280.262	11943.670	6.573	12.9	2.8	NO		NO	bb
4	4 190710M2_9	Standard	12.500	6.04	6033.232	11915.969	6.329	12.4	-1.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	6.03	6836.236	14305.879	5.973	11.7	-6.6	NO		NO	bb
6	6 190710M2_11	Standard	12.500	6.04	5715.887	11831.388	6.039	11.8	-5.5	NO		NO	bb
7	7 190710M2_12	Standard	12.500	6.04	9409.312	17696.068	6.646	13.0	4.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	6.04	5300.635	9834.856	6.737	13.2	5.4	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: d5-N-ETFOSA
Response Factor: 0.0311662
RRF SD: 0.00140362, Relative SD: 4.50369
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	150.000	6.15	4439.246	11912.648	4.658	149.5	-0.4	NO		NO	bb
2	2	190710M2_7	Standard	150.000	6.15	4462.217	12146.531	4.592	147.3	-1.8	NO		NO	bb
3	3	190710M2_8	Standard	150.000	6.15	4330.604	11943.670	4.532	145.4	-3.1	NO		NO	bb
4	4	190710M2_9	Standard	150.000	6.15	4383.917	11915.969	4.599	147.6	-1.6	NO		NO	bb
5	5	190710M2_10	Standard	150.000	6.15	5295.154	14305.879	4.627	148.5	-1.0	NO		NO	bb
6	6	190710M2_11	Standard	150.000	6.15	4247.957	11831.388	4.488	144.0	-4.0	NO		NO	bb
7	7	190710M2_12	Standard	150.000	6.15	6715.452	17696.068	4.744	152.2	1.5	NO		NO	bb
8	8	190710M2_13	Standard	150.000	6.15	4059.624	9834.856	5.160	165.6	10.4	NO		NO	bb

Compound name: 13C2-PFHxDA
Response Factor: 0.734859
RRF SD: 0.033246, Relative SD: 4.52414
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	5.000	6.39	3440.496	11912.648	3.610	4.9	-1.7	NO		NO	bb
2	2	190710M2_7	Standard	5.000	6.39	3551.527	12146.531	3.655	5.0	-0.5	NO		NO	bb
3	3	190710M2_8	Standard	5.000	6.39	3591.524	11943.670	3.759	5.1	2.3	NO		NO	bb
4	4	190710M2_9	Standard	5.000	6.39	3403.188	11915.969	3.570	4.9	-2.8	NO		NO	bb
5	5	190710M2_10	Standard	5.000	6.39	4071.111	14305.879	3.557	4.8	-3.2	NO		NO	bb
6	6	190710M2_11	Standard	5.000	6.39	3262.578	11831.388	3.447	4.7	-6.2	NO		NO	bb
7	7	190710M2_12	Standard	5.000	6.39	5446.172	17696.068	3.847	5.2	4.7	NO		NO	bb
8	8	190710M2_13	Standard	5.000	6.39	3107.337	9834.856	3.949	5.4	7.5	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: d7-N-MeFOSE
Response Factor: 0.0279532
RRF SD: 0.00205848, Relative SD: 7.36404
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	150.000	6.30	4007.611	11912.648	4.205	150.4	0.3	NO		NO	bb
2	2 190710M2_7	Standard	150.000	6.30	3785.716	12146.531	3.896	139.4	-7.1	NO		NO	bb
3	3 190710M2_8	Standard	150.000	6.30	3922.123	11943.670	4.105	146.8	-2.1	NO		NO	bb
4	4 190710M2_9	Standard	150.000	6.30	3727.673	11915.969	3.910	139.9	-6.7	NO		NO	bb
5	5 190710M2_10	Standard	150.000	6.30	4820.834	14305.879	4.212	150.7	0.5	NO		NO	bb
6	6 190710M2_11	Standard	150.000	6.30	3765.545	11831.388	3.978	142.3	-5.1	NO		NO	bb
7	7 190710M2_12	Standard	150.000	6.30	6250.164	17696.068	4.415	157.9	5.3	NO		NO	bb
8	8 190710M2_13	Standard	150.000	6.30	3793.865	9834.856	4.822	172.5	15.0	NO		NO	bb

Compound name: d9-N-EtFOSE
Response Factor: 0.0275062
RRF SD: 0.00159928, Relative SD: 5.81424
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	150.000	6.45	3845.157	11912.648	4.035	146.7	-2.2	NO		NO	bb
2	2 190710M2_7	Standard	150.000	6.45	3839.792	12146.531	3.952	143.7	-4.2	NO		NO	bb
3	3 190710M2_8	Standard	150.000	6.45	3944.296	11943.670	4.128	150.1	0.1	NO		NO	bb
4	4 190710M2_9	Standard	150.000	6.45	3790.164	11915.969	3.976	144.5	-3.6	NO		NO	bb
5	5 190710M2_10	Standard	150.000	6.45	4610.654	14305.879	4.029	146.5	-2.4	NO		NO	bb
6	6 190710M2_11	Standard	150.000	6.45	3714.178	11831.388	3.924	142.7	-4.9	NO		NO	bb
7	7 190710M2_12	Standard	150.000	6.45	6151.757	17696.068	4.345	158.0	5.3	NO		NO	bb
8	8 190710M2_13	Standard	150.000	6.45	3634.249	9834.856	4.619	167.9	12.0	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: 13C4-PFBA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 72), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	1.21	2921.156	2921.156	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	1.21	3200.857	3200.857	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	1.21	3042.829	3042.829	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	1.21	3054.028	3054.028	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	1.21	3825.142	3825.142	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	1.21	2935.893	2935.893	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	1.21	4789.874	4789.874	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	1.21	2814.827	2814.827	12.500	12.5	0.0	NO		NO	db

Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 73), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	2.99	9214.552	9214.552	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	2.99	9744.537	9744.537	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	2.99	9533.288	9533.288	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	2.99	9794.559	9794.559	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	2.99	11219.285	11219.285	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	2.99	9088.471	9088.471	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	2.99	14844.347	14844.347	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	2.99	8310.527	8310.527	12.500	12.5	0.0	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: 18O2-PFHxS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 74), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	3.76	506.480	506.480	12.500	12.5	0.0	NO		NO	bb
2	2	190710M2_7	Standard	12.500	3.76	530.060	530.060	12.500	12.5	0.0	NO		NO	bb
3	3	190710M2_8	Standard	12.500	3.76	516.799	516.799	12.500	12.5	0.0	NO		NO	bb
4	4	190710M2_9	Standard	12.500	3.76	567.821	567.821	12.500	12.5	0.0	NO		NO	bb
5	5	190710M2_10	Standard	12.500	3.76	643.362	643.362	12.500	12.5	0.0	NO		NO	bb
6	6	190710M2_11	Standard	12.500	3.76	448.826	448.826	12.500	12.5	0.0	NO		NO	bb
7	7	190710M2_12	Standard	12.500	3.76	964.996	964.996	12.500	12.5	0.0	NO		NO	bb
8	8	190710M2_13	Standard	12.500	3.76	469.394	469.394	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 75), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	190710M2_6	Standard	12.500	4.13	13388.436	13388.436	12.500	12.5	0.0	NO		NO	bb
2	2	190710M2_7	Standard	12.500	4.13	14093.044	14093.044	12.500	12.5	0.0	NO		NO	bb
3	3	190710M2_8	Standard	12.500	4.13	13963.202	13963.202	12.500	12.5	0.0	NO		NO	bb
4	4	190710M2_9	Standard	12.500	4.13	14249.977	14249.977	12.500	12.5	0.0	NO		NO	bb
5	5	190710M2_10	Standard	12.500	4.13	16413.971	16413.971	12.500	12.5	0.0	NO		NO	bb
6	6	190710M2_11	Standard	12.500	4.13	12992.551	12992.551	12.500	12.5	0.0	NO		NO	bb
7	7	190710M2_12	Standard	12.500	4.13	20632.490	20632.490	12.500	12.5	0.0	NO		NO	bb
8	8	190710M2_13	Standard	12.500	4.13	10933.404	10933.404	12.500	12.5	0.0	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 76), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.57	7993.476	7993.476	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.57	7664.316	7664.316	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.57	8436.873	8436.873	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.57	8295.519	8295.519	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.57	9350.003	9350.003	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.57	7605.623	7605.623	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.57	12539.574	12539.574	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.57	6548.345	6548.345	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 77), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.66	1327.903	1327.903	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.66	1384.299	1384.299	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.66	1176.867	1176.867	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.66	1368.032	1368.032	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.66	1460.771	1460.771	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.66	1148.475	1148.475	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.66	2155.362	2155.362	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.66	1075.188	1075.188	12.500	12.5	0.0	NO		NO	bb

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

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Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 78), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	4.95	9534.204	9534.204	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	4.95	9602.725	9602.725	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	4.95	10121.342	10121.342	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	4.95	9866.013	9866.013	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	4.95	11475.027	11475.027	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	4.95	9251.279	9251.279	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	4.95	14828.290	14828.290	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	4.95	8289.135	8289.135	12.500	12.5	0.0	NO		NO	bb

Compound name: 13C7-PFUdA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 79), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 190710M2_6	Standard	12.500	5.27	11912.648	11912.648	12.500	12.5	0.0	NO		NO	bb
2	2 190710M2_7	Standard	12.500	5.27	12146.531	12146.531	12.500	12.5	0.0	NO		NO	bb
3	3 190710M2_8	Standard	12.500	5.28	11943.670	11943.670	12.500	12.5	0.0	NO		NO	bb
4	4 190710M2_9	Standard	12.500	5.28	11915.969	11915.969	12.500	12.5	0.0	NO		NO	bb
5	5 190710M2_10	Standard	12.500	5.27	14305.879	14305.879	12.500	12.5	0.0	NO		NO	bb
6	6 190710M2_11	Standard	12.500	5.28	11831.388	11831.388	12.500	12.5	0.0	NO		NO	bb
7	7 190710M2_12	Standard	12.500	5.28	17696.068	17696.068	12.500	12.5	0.0	NO		NO	bb
8	8 190710M2_13	Standard	12.500	5.27	9834.856	9834.856	12.500	12.5	0.0	NO		NO	bb

Quantify Compound Summary Report **MassLynx MassLynx V4.1 SCN945 SCN960**
Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Thursday, July 11, 2019 10:43:20 Pacific Daylight Time
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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_070719_ICV.mdb 08 Jul 2019 08:37:29
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Compound name: PFBA

Ⓐ Not used. am 7/11/19

	#	Name	ID	Acq.Date	Acq.Time
1	1	190710M2_5	IPA	10-Jul-19	13:33:09
2	2	190710M2_6	ST190710M2-1 PFC CS-2 19G0801	10-Jul-19	13:43:47
3	3	190710M2_7	ST190710M2-2 PFC CS-1 19G0802	10-Jul-19	13:54:21
4	4	190710M2_8	ST190710M2-3 PFC CS0 19G0803	10-Jul-19	14:04:59
5	5	190710M2_9	ST190710M2-4 PFC CS1 19G0804	10-Jul-19	14:15:32
6	6	190710M2_10	ST190710M2-5 PFC CS2 19G0805	10-Jul-19	14:26:10
7	7	190710M2_11	ST190710M2-6 PFC CS3 19G0806	10-Jul-19	14:36:42
8	8	190710M2_12	ST190710M2-7 PFC CS4 19G0807	10-Jul-19	14:47:21
9	9	190710M2_13	ST190710M2-8 PFC CS5 19G0808	10-Jul-19	14:57:59
10	10	190710M2_14	ST190710M2-9 PFC CS6 19G0809	10-Jul-19	15:08:31
11	11	190710M2_15	ST190710M2-10 PFC CS7 19G0810	10-Jul-19	15:19:10
12	12	190710M2_16	IB	10-Jul-19	15:29:49
13	13	190710M2_17	ST190710M2-1 PFC ICV 19G0811	10-Jul-19	15:40:21
14	14	190710M2_18	IPA		

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:59:12 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

	#	Name	IS#	CoD	CoD Flag	%RSD
1	1	PFBA	47	0.9994	NO	
2	2	PFPrS	49	0.9979	NO	
3	3	3:3 FTCA	48	0.9971	NO	
4	4	PFPeA	48	0.9973	NO	
5	5	PFBS	49	0.9988	NO	
6	6	4:2 FTS	51	0.9993	NO	
7	7	PFHxA	52	0.9999	NO	
8	8	PFPeS	49	0.9989	NO	
9	9	HFPO-DA	50	0.9981	NO	
10	10	5:3 FTCA	53	0.9955	NO	
11	11	PFHpA	53	0.9982	NO	
12	12	ADONA	53	0.9989	NO	
13	13	L-PFHxS	54	0.9993	NO	
14	15	6:2 FTS	55	0.9991	NO	
15	16	L-PFOA	58	0.9997	NO	
16	18	PFecHS	58	0.9995	NO	
17	19	PFHpS	59	0.9990	NO	
18	20	7:3 FTCA	56	0.9954	NO	
19	21	PFNA	56	0.9994	NO	
20	22	PFOSA	57	0.9993	NO	
21	23	L-PFOS	59	0.9959	NO	
22	25	9Cl-PF30NS	59	0.9997	NO	
23	26	PFDA	60	0.9970	NO	
24	27	8:2 FTS	61	0.9944	NO	
25	28	PFNS	59	0.9989	NO	
26	29	L-MeFOSAA	62	0.9989	NO	

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:33:50 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

	#	Name	IS#	CoD	CoD Flag	%RSD
1	31	L-EtFOSAA	64	0.9994	NO	
2	33	PFUdA	63	0.9993	NO	
3	34	PFDS	61	0.9953	NO	
4	35	11Cl-PF30UdS	65	0.9910	NO	
5	36	10:2 FTS	61	0.9987	NO	
6	37	PFDoA	65	0.9998	NO	
7	38	N-MeFOSA	66	0.9991	NO	
8	39	PFTrDA	65	0.9998	NO	
9	40	PFDoS	67	0.9986	NO	
10	41	PFTeDA	67	0.9996	NO	
11	42	N-EtFOSA	68	0.9997	NO	
12	43	PFHxDA	69	0.9997	NO	
13	44	PFODA	69	0.9995	NO	
14	45	N-MeFOSE	70	0.9993	NO	
15	46	N-EtFOSE	71	0.9999	NO	
16	47	13C3-PFBA	72		NO	2.933
17	48	13C3-PFPeA	73		NO	7.568
18	49	13C3-PFBS	74		NO	6.818
19	50	13C3-HFPO-DA	73		NO	3.980
20	51	13C2-4:2 FTS	74		NO	12.743
21	52	13C2-PFHxA	73		NO	3.677
22	53	13C4-PFHpA	73		NO	2.841
23	54	13C3-PFHxS	74		NO	8.105
24	55	13C2-6:2 FTS	77		NO	7.758
25	56	13C5-PFNA	76		NO	4.305
26	57	13C8-PFOSA	79		NO	4.541
27	58	13C2-PFOA	75		NO	3.708
28	59	13C8-PFOS	77		NO	8.028
29	60	13C2-PFDA	78		NO	2.557
30	61	13C2-8:2 FTS	77		NO	10.867
31	62	d3-N-MeFOSAA	79		NO	3.982
32	63	13C2-PFUdA	79		NO	3.646

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:33:50 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

	#	Name	IS#	CoD	CoD Flag	%RSD
33	64	d5-N-EtFOSAA	79		NO	5.153
34	65	13C2-PFDoA	78		NO	1.624
35	66	d3-N-MeFOSA	79		NO	6.491
36	67	13C2-PFTeDA	79		NO	4.421
37	68	d5-N-ETFOSA	79		NO	4.504
38	69	13C2-PFHxDA	79		NO	4.524
39	70	d7-N-MeFOSE	79		NO	7.364
40	71	d9-N-EtFOSE	79		NO	5.814
41	72	13C4-PFBA	72		NO	0.000
42	73	13C5-PFHxA	73		NO	0.000
43	74	18O2-PFHxS	74		NO	0.000
44	75	13C8-PFOA	75		NO	0.000
45	76	13C9-PFNA	76		NO	0.000
46	77	13C4-PFOS	77		NO	0.000
47	78	13C6-PFDA	78		NO	0.000
48	79	13C7-PFUdA	79		NO	0.000

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:35:12 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

	Name	Pred.RT	RT	Pred. Ratio	Ion Ratio	Ratio out?
1	PFBA	1.21	1.21			
2	PFPrS	1.57	1.57	2.705	2.705	NO
3	3:3 FTCA	2.06	2.04	2.165	2.165	NO
4	PFPeA	2.20	2.20			
5	PFBS	2.49	2.49	3.037	3.037	NO
6	4:2 FTS	2.90	2.91	1.792	1.792	NO
7	PFHxA	2.99	2.99	15.832	15.832	NO
8	PFPeS	3.19	3.19	1.560	1.560	NO
9	HFPO-DA	3.20	3.20	2.415	2.415	NO
10	5:3 FTCA	3.53	3.54	1.572	1.572	NO
11	PFHpA	3.61	3.61	5.429	5.429	NO
12	ADONA	3.72	3.72	3.002	3.002	NO
13	L-PFHxS	3.76	3.76	2.036	2.036	NO
14	6:2 FTS	4.07	4.08	2.148	2.148	NO
15	L-PFOA	4.13	4.13	3.683	3.683	NO
16	PFecHS	4.15	4.15	0.908	0.908	NO
17	PFHpS	4.25	4.25	1.746	1.746	NO
18	7:3 FTCA	4.57	4.56	1.658	1.658	NO
19	PFNA	4.57	4.57	2.983	2.983	NO
20	PFOSA	4.63	4.63	41.487	41.487	NO
21	L-PFOS	4.66	4.66	2.058	2.058	NO
22	9Cl-PF30NS	4.88	4.88	24.430	24.430	NO
23	PFDA	4.95	4.95	4.278	4.278	NO
24	8:2 FTS	4.92	4.92	1.509	1.509	NO
25	PFNS	5.01	5.01	1.715	1.715	NO
26	L-MeFOSAA	5.10	5.10	2.376	2.376	NO

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:35:32 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

	Name	Pred.RT	RT	Pred. Ratio	Ion Ratio	Ratio out?
1	L-EtFOSAA	5.26	5.27	1.336	1.336	NO
2	PFUdA	5.28	5.28	6.095	6.095	NO
3	PFDS	5.33	5.33	1.629	1.629	NO
4	11Cl-PF30UdS	5.49	5.49	4.658	4.658	NO
5	10:2 FTS	5.55	5.55	1.474	1.474	NO
6	PFDoA	5.56	5.56	7.462	7.462	NO
7	N-MeFOSA	5.70	5.70	1.760	1.760	NO
8	PFTrDA	5.81	5.81	14.360	14.360	NO
9	PFDoS	5.84	5.84	1.916	1.916	NO
10	PFTeDA	6.04	6.04	14.838	14.838	NO
11	N-EtFOSA	6.13	6.13	1.854	1.854	NO
12	PFHxDA	6.39	6.39	17.070	17.070	NO
13	PFODA	6.63	6.63			
14	N-MeFOSE	6.31	6.31			
15	N-EtFOSE	6.46	6.46			

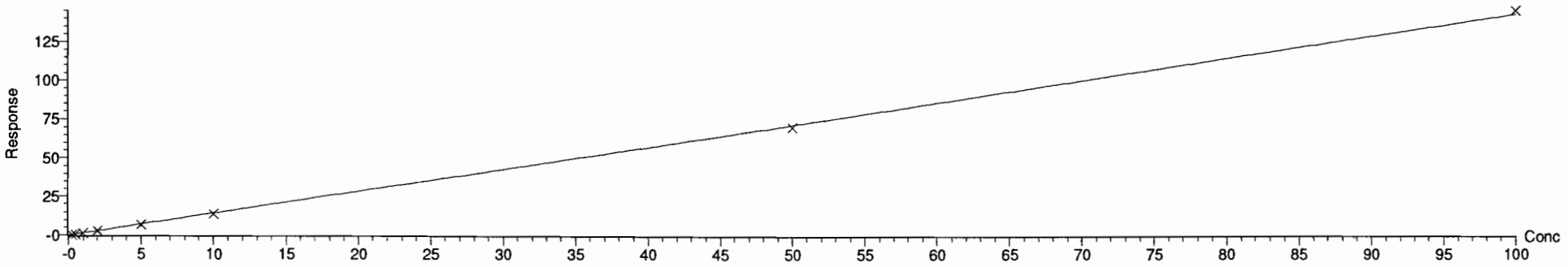
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

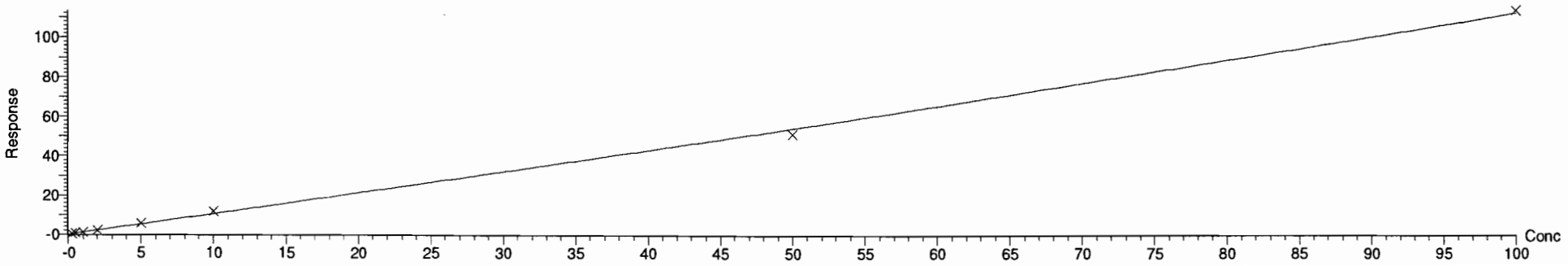
Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:09:57 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFBA
Correlation coefficient: r = 0.999710, r^2 = 0.999420
Calibration curve: 1.42744 * x + -0.0673711
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



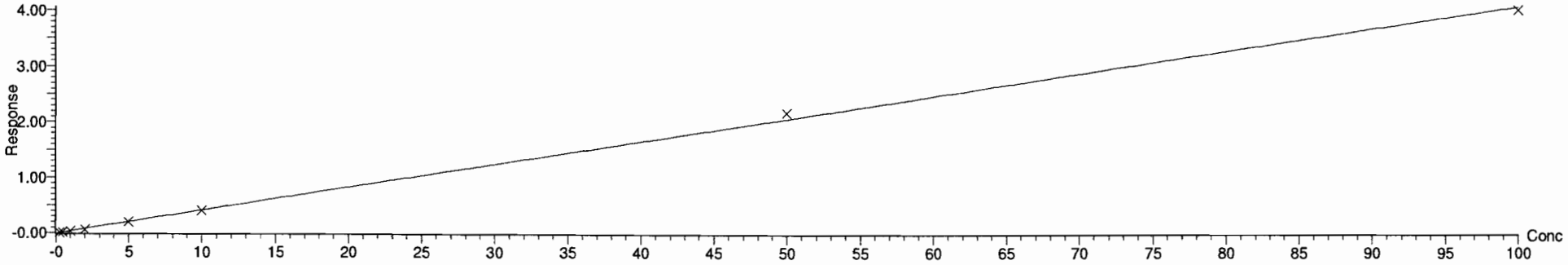
Compound name: PFPrS
Coefficient of Determination: R^2 = 0.997891
Calibration curve: 0.000772076 * x^2 + 1.04403 * x + 0.0148423
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



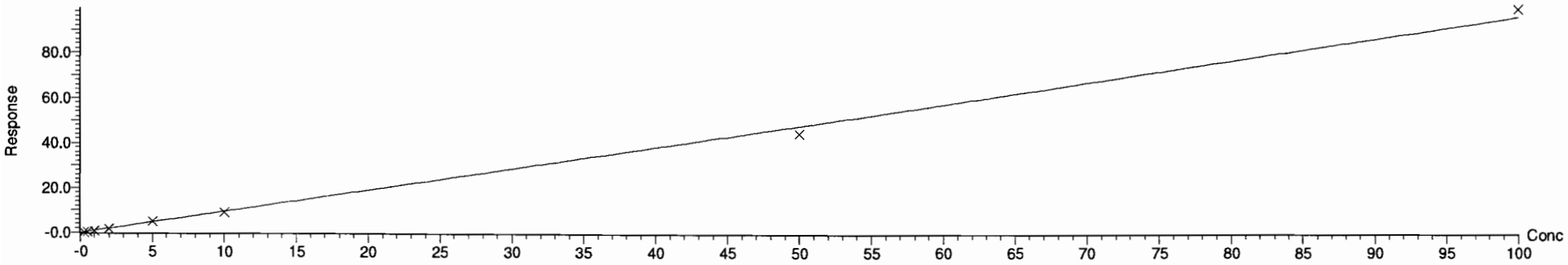
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: 3:3 FTCA
Coefficient of Determination: R^2 = 0.997073
Calibration curve: -1.28403e-005 * x^2 + 0.0420476 * x + -0.00551054
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



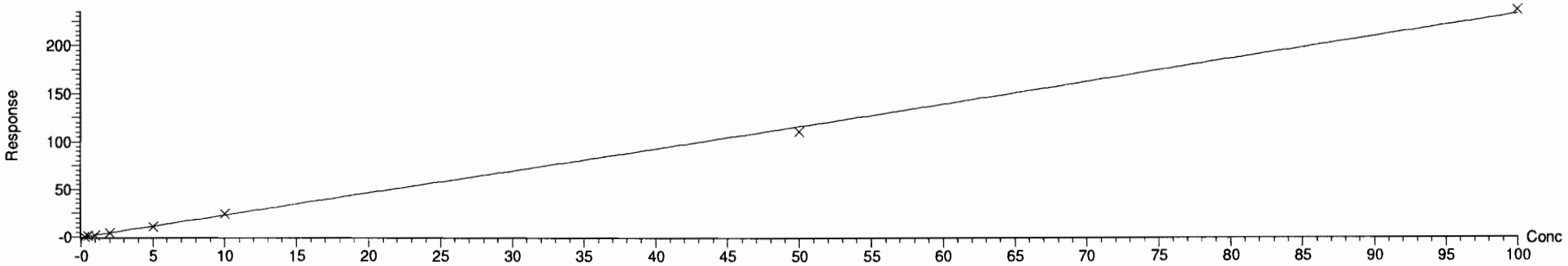
Compound name: PFPeA
Correlation coefficient: r = 0.998647, r^2 = 0.997296
Calibration curve: 0.957887 * x + -0.0507044
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



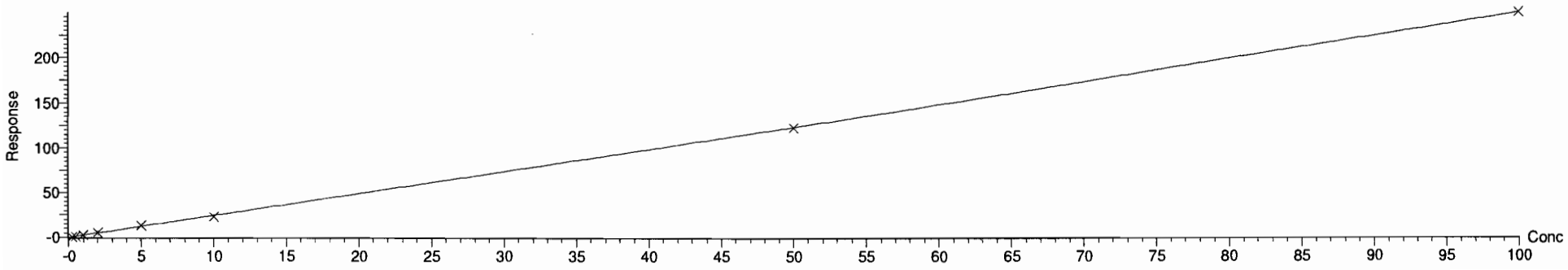
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: PFBS
Correlation coefficient: r = 0.999402, r^2 = 0.998804
Calibration curve: 2.32197 * x + -0.263256
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



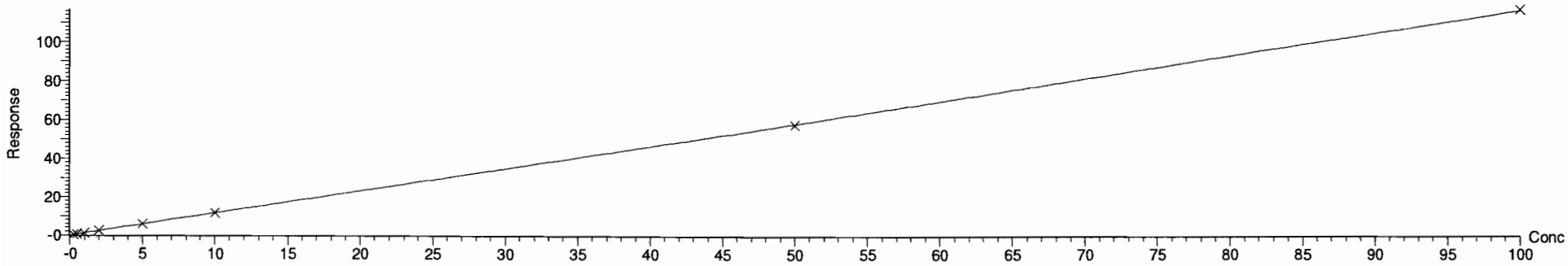
Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.999259
Calibration curve: 0.000507604 * x^2 + 2.44029 * x + -0.0250945
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



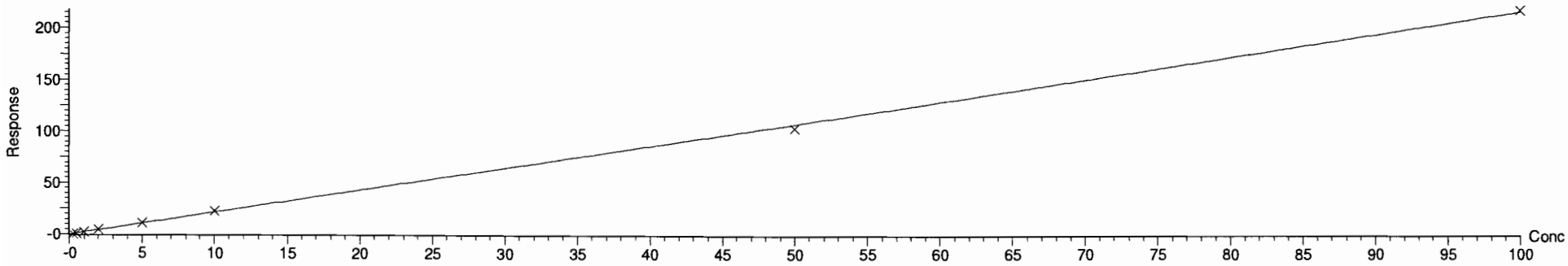
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: PFHxA
Correlation coefficient: r = 0.999958, r^2 = 0.999917
Calibration curve: 1.1618 * x + 0.000973487
Response type: Internal Std (Ref 52), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



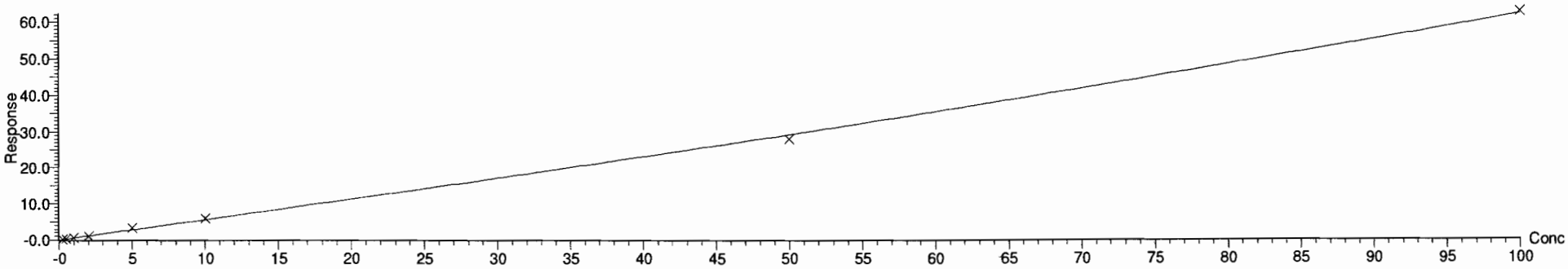
Compound name: PFPeS
Coefficient of Determination: R^2 = 0.998874
Calibration curve: 0.000269775 * x^2 + 2.12841 * x + 0.0156908
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



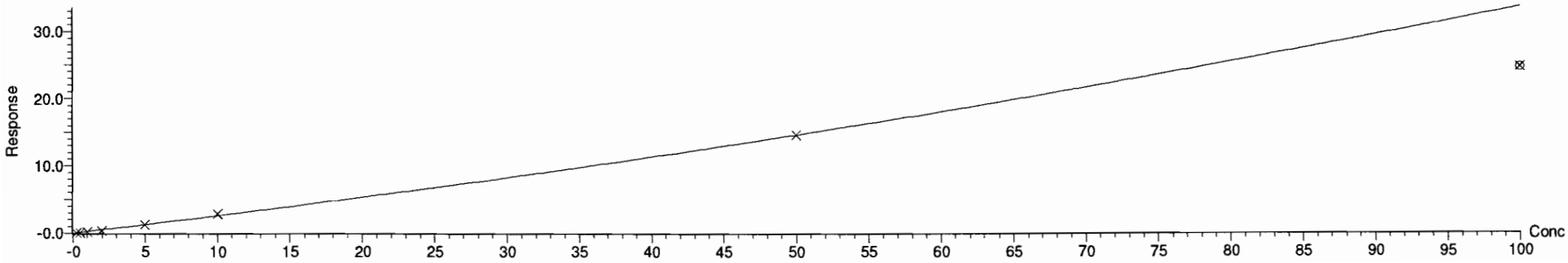
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: HFPO-DA
Coefficient of Determination: R^2 = 0.998150
Calibration curve: 0.000712906 * x^2 + 0.547378 * x + -0.00436396
Response type: Internal Std (Ref 50), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



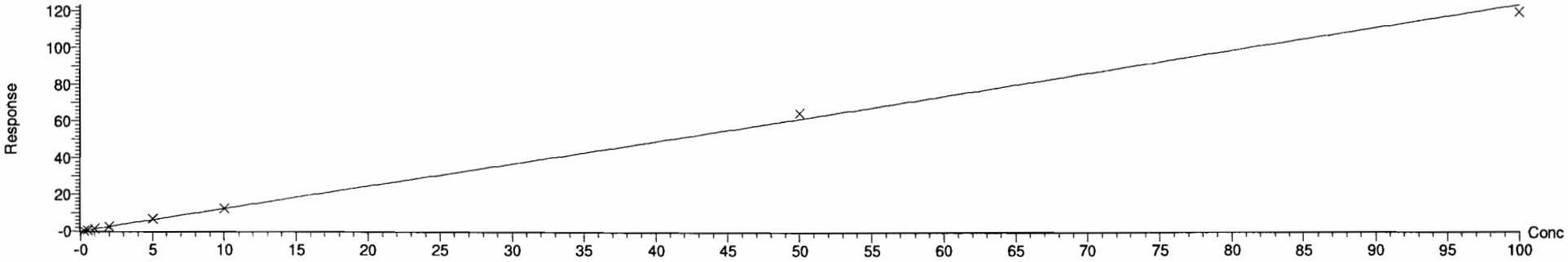
Compound name: 5:3 FTCA
Coefficient of Determination: R^2 = 0.995477
Calibration curve: 0.000863776 * x^2 + 0.248802 * x + -0.0186935
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



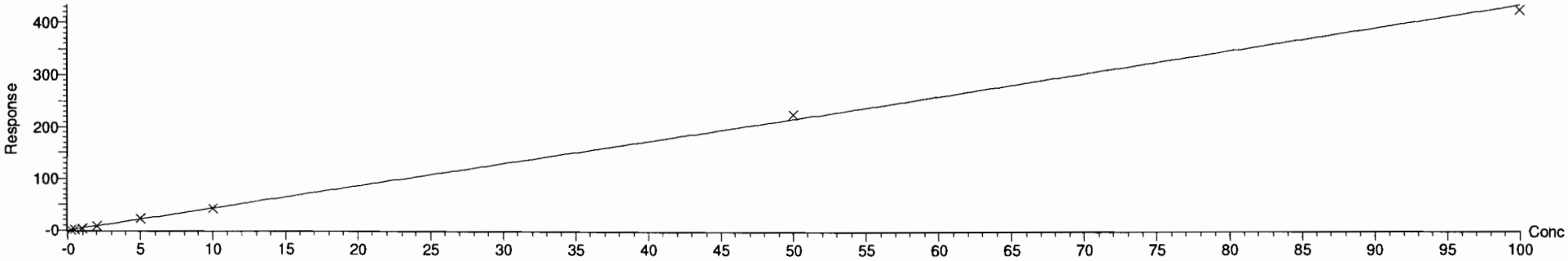
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: PFHpA
Correlation coefficient: r = 0.999078, r^2 = 0.998158
Calibration curve: 1.2318 * x + -0.044697
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



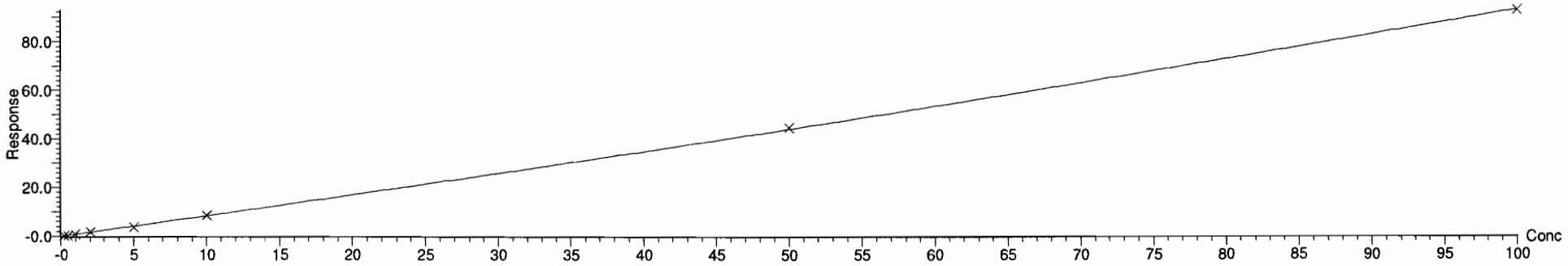
Compound name: ADONA
Correlation coefficient: r = 0.999468, r^2 = 0.998936
Calibration curve: 4.33675 * x + -0.0191729
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



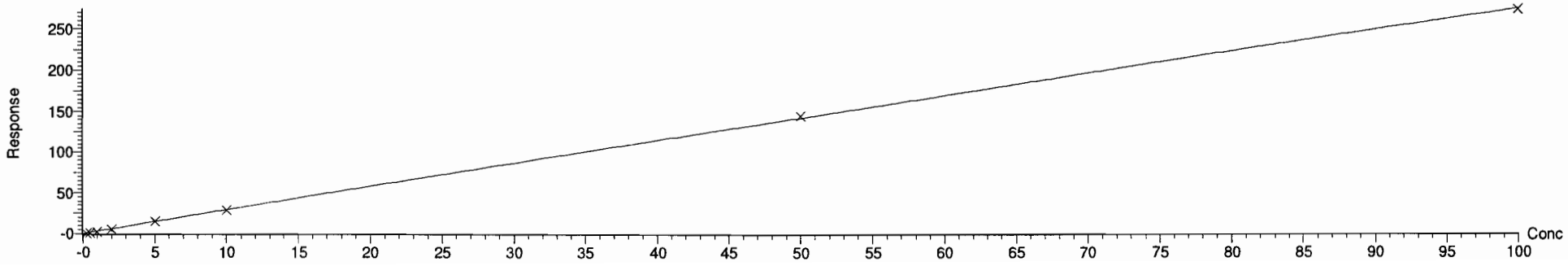
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.999253
Calibration curve: 0.000954922 * x^2 + 0.833847 * x + -0.0703303
Response type: Internal Std (Ref 54), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



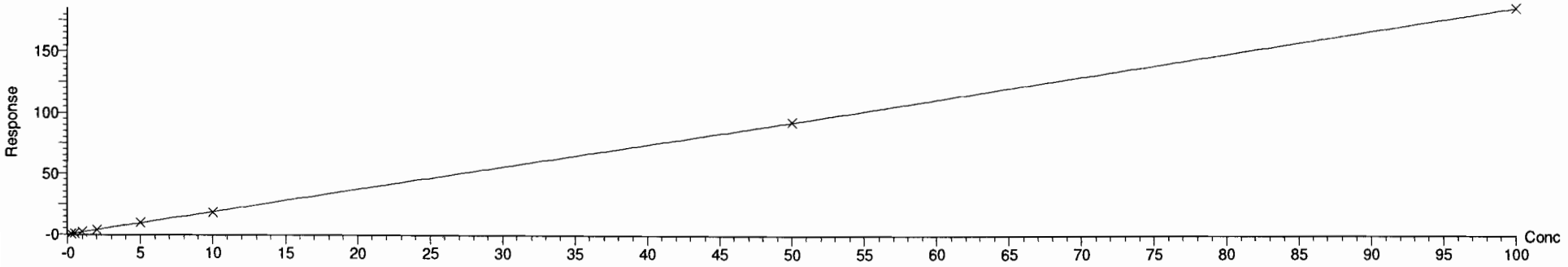
Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.999098
Calibration curve: -0.00219189 * x^2 + 2.96391 * x + -0.232571
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



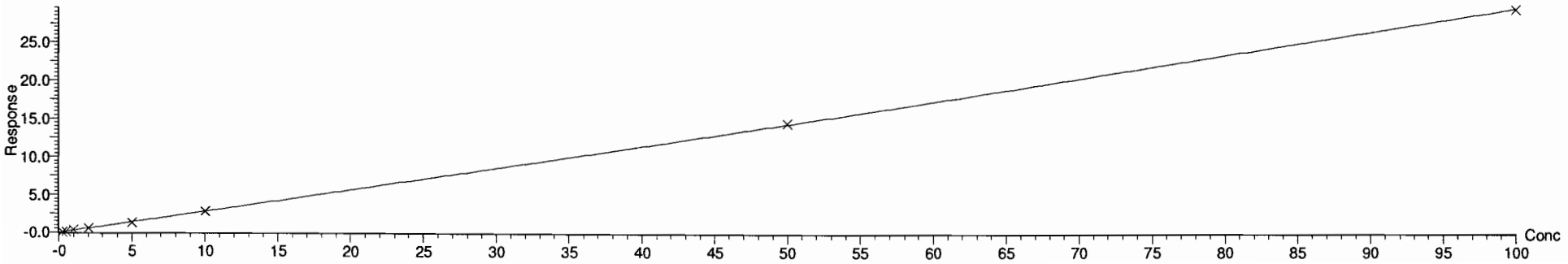
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: L-PFOA
Correlation coefficient: r = 0.999875, r^2 = 0.999749
Calibration curve: 1.84829 * x + 0.038532
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: PFecHS
Coefficient of Determination: R^2 = 0.999465
Calibration curve: 0.000151504 * x^2 + 0.280359 * x + -0.022501
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



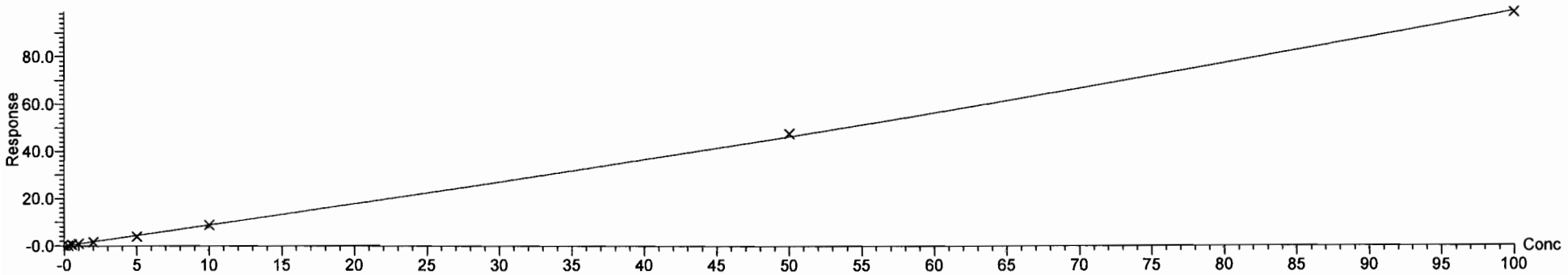
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

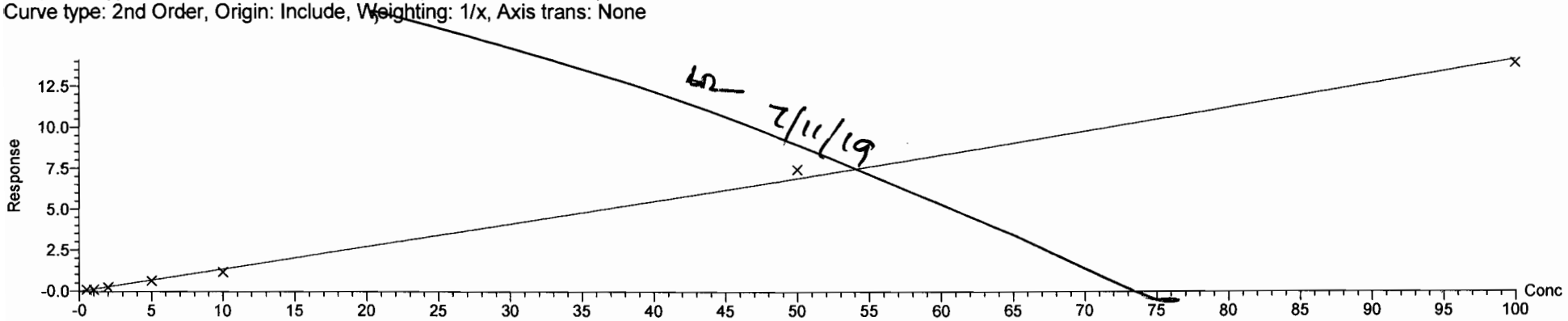
Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:57:45 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999024
Calibration curve: 0.00125826 * x^2 + 0.86234 * x + -0.0187748
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



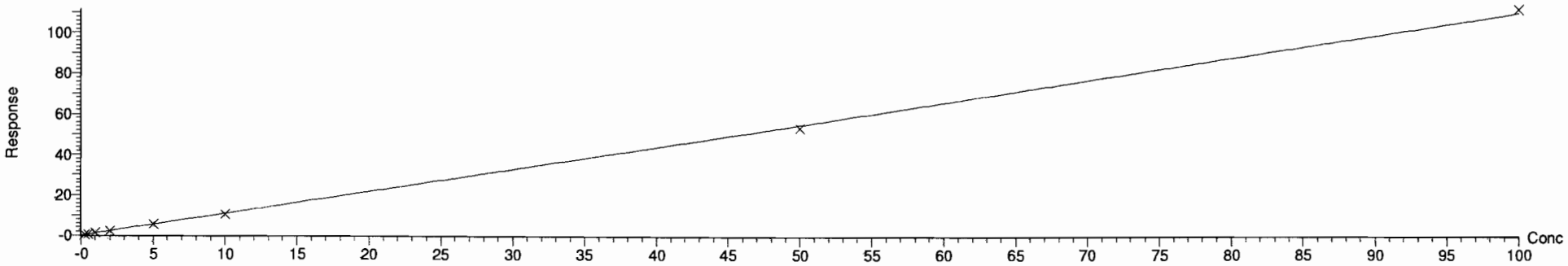
Compound name: 7:3 FTCA
Coefficient of Determination: R^2 = 0.995389
Calibration curve: 5.99689e-005 * x^2 + 0.135121 * x + -0.0173495
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



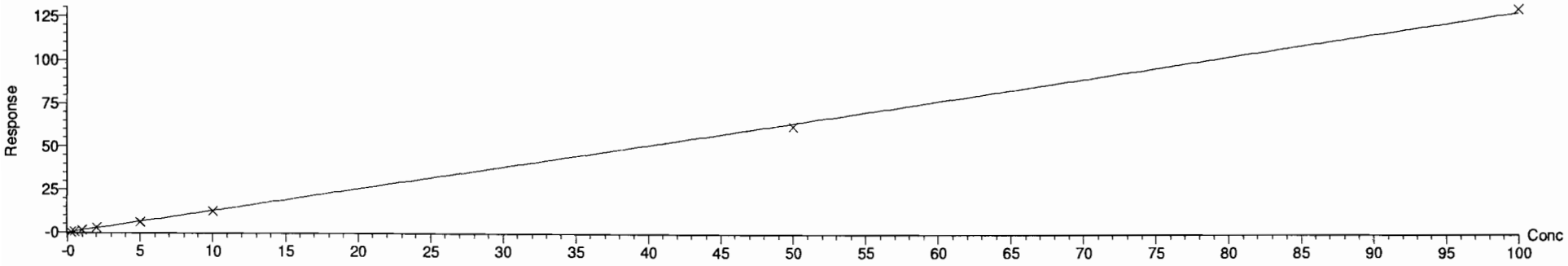
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: PFNA
Correlation coefficient: r = 0.999712, r^2 = 0.999423
Calibration curve: 1.09616 * x + 0.0302511
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



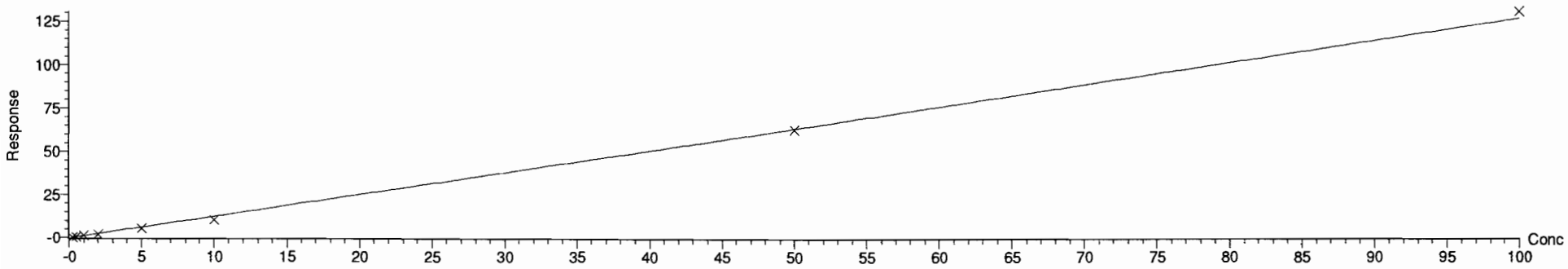
Compound name: PFOSA
Correlation coefficient: r = 0.999643, r^2 = 0.999286
Calibration curve: 1.27955 * x + -0.0326972
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



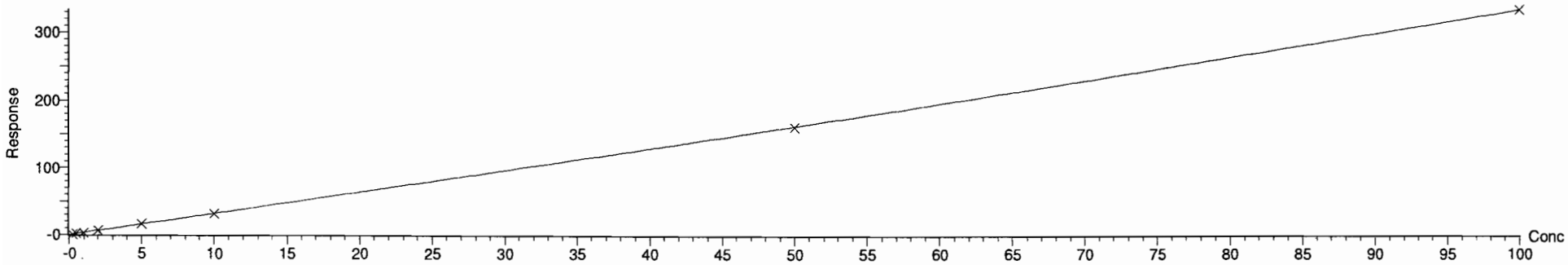
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: L-PFOS
Correlation coefficient: r = 0.997967, r^2 = 0.995937
Calibration curve: 1.26946 * x + -0.175183
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



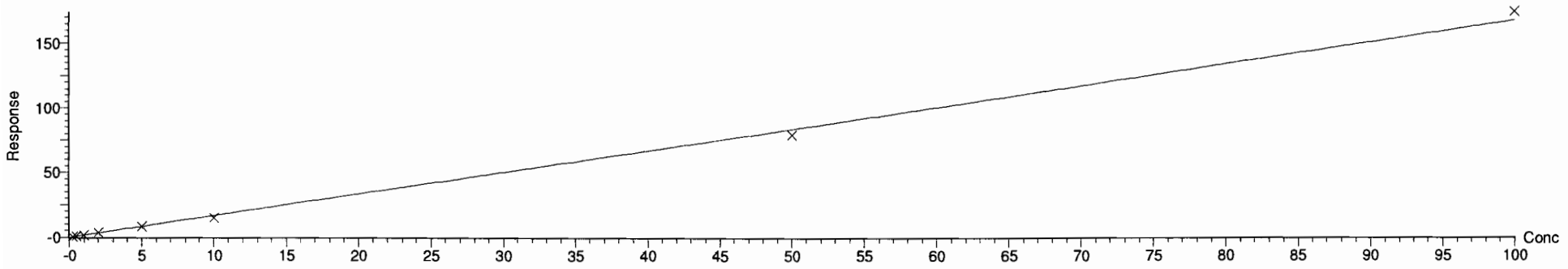
Compound name: 9Cl-PF30NS
Coefficient of Determination: R^2 = 0.999653
Calibration curve: 0.0017864 * x^2 + 3.15352 * x + -0.22686
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



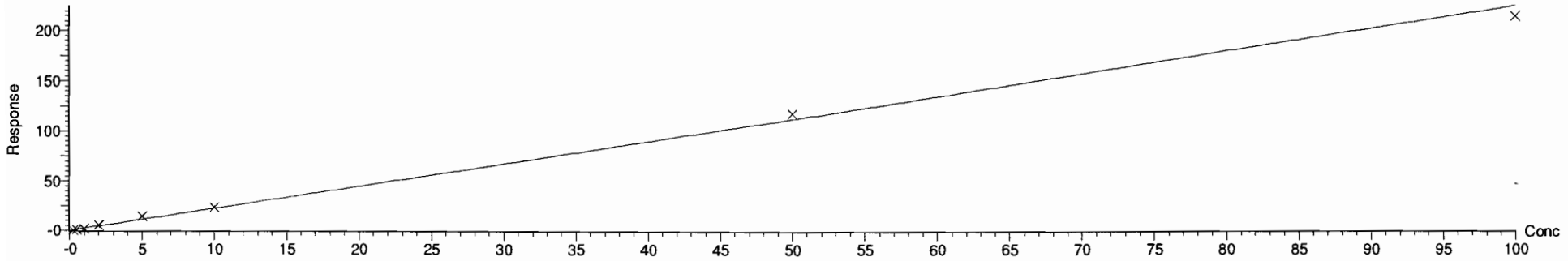
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:36:58 Pacific Daylight Time

Compound name: PFDA
Correlation coefficient: r = 0.998522, r^2 = 0.997046
Calibration curve: 1.67351 * x + -0.11586
Response type: Internal Std (Ref 60), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: 8:2 FTS
Correlation coefficient: r = 0.997198, r^2 = 0.994405
Calibration curve: 2.24647 * x + 0.0322693
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



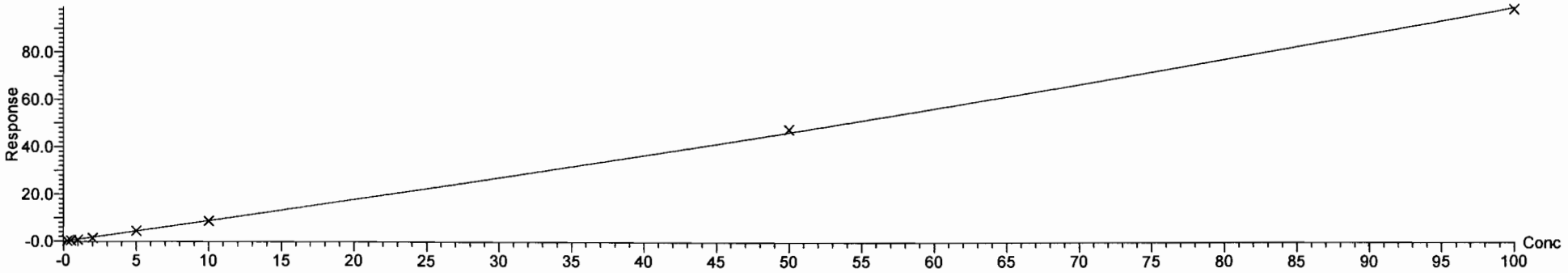
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

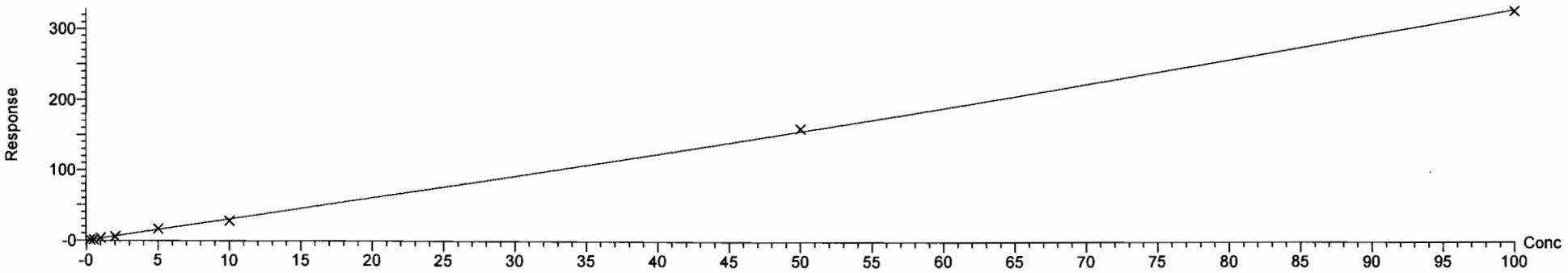
Last Altered: Thursday, July 11, 2019 10:56:26 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:05:39 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Compound name: PFNS
Coefficient of Determination: R^2 = 0.998948
Calibration curve: 0.0012104 * x^2 + 0.869148 * x + -0.063694
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: L-MeFOSAA
Coefficient of Determination: R^2 = 0.998887
Calibration curve: 0.003255 * x^2 + 2.95538 * x + -0.018678
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



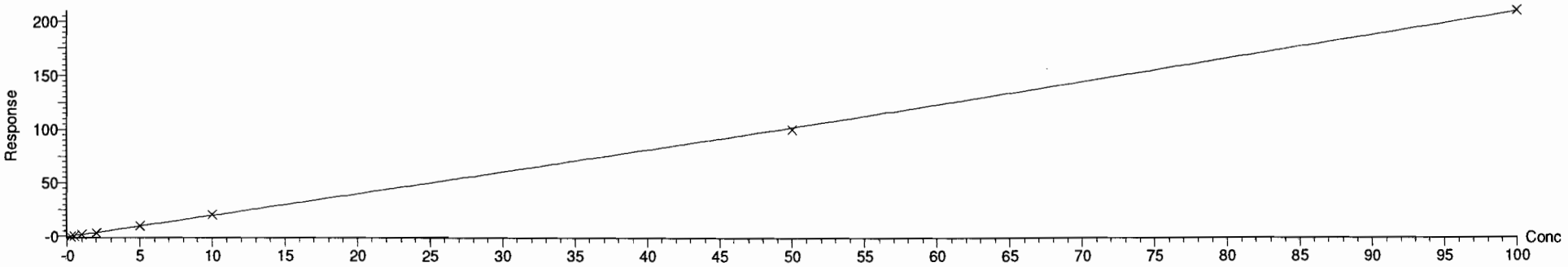
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

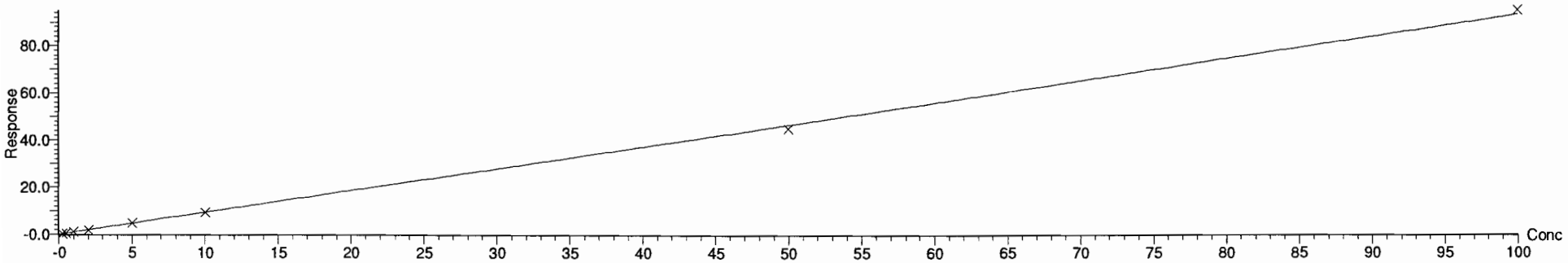
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999414
Calibration curve: 0.000968179 * x^2 + 1.99529 * x + -0.24728
Response type: Internal Std (Ref 64), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



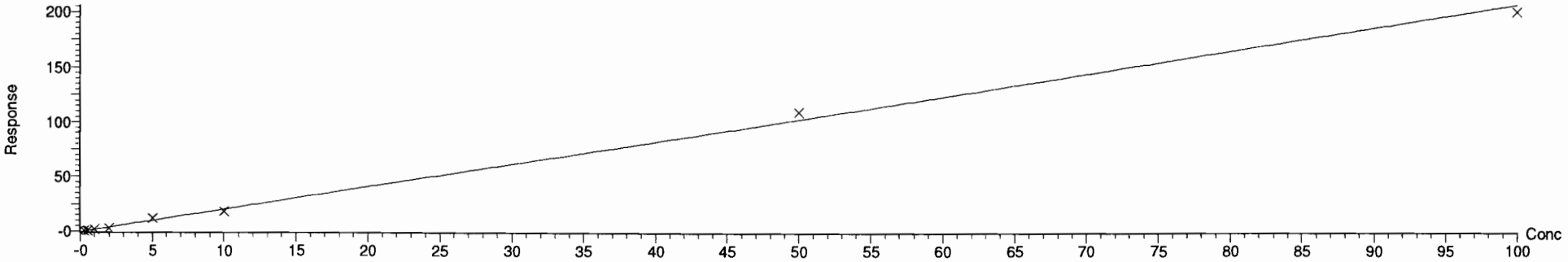
Compound name: PFUdA
Correlation coefficient: r = 0.999664, r^2 = 0.999328
Calibration curve: 0.930582 * x + 0.0128571
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



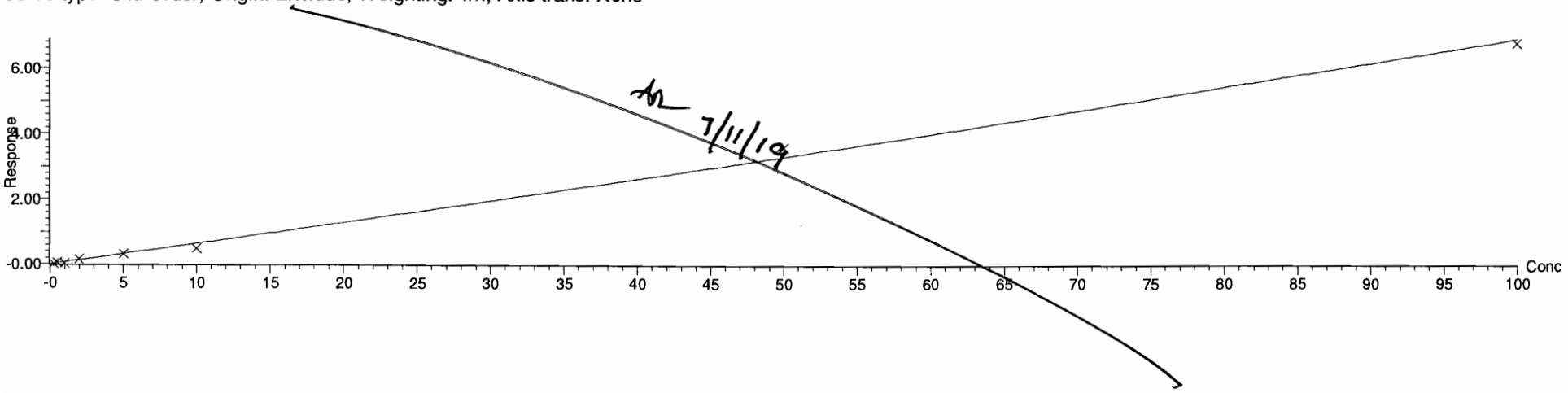
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: PFDS
Correlation coefficient: r = 0.997649, r^2 = 0.995303
Calibration curve: 2.06378 * x + -0.389745
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



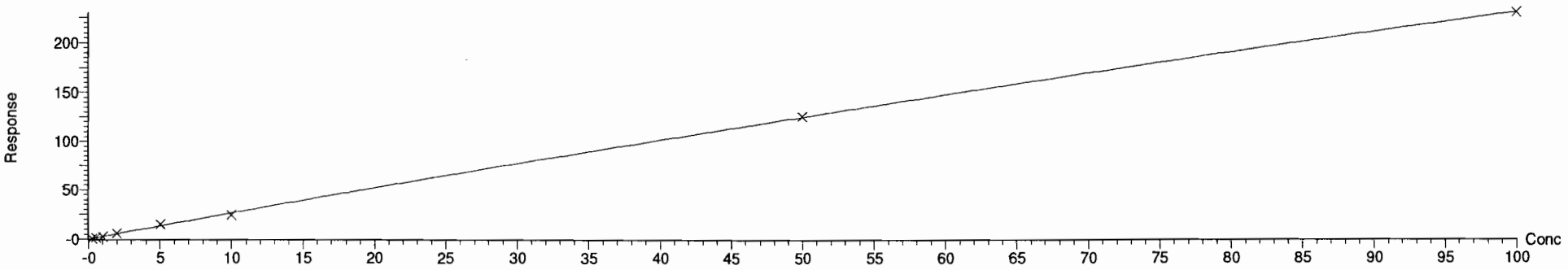
Compound name: 11Cl-PF30UdS
Coefficient of Determination: R^2 = 0.990993
Calibration curve: 5.10585e-005 * x^2 + 0.0636606 * x + 0.00127315
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



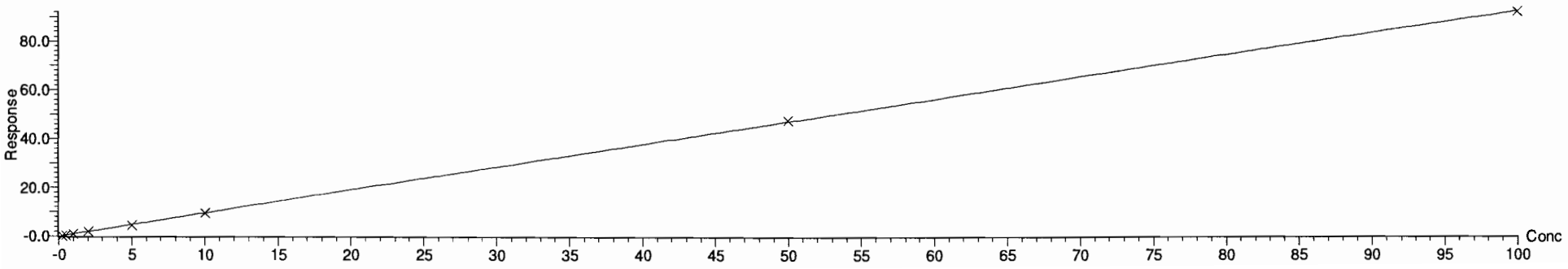
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: 10:2 FTS
Coefficient of Determination: R^2 = 0.998698
Calibration curve: -0.00397372 * x^2 + 2.69789 * x + -0.0745551
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



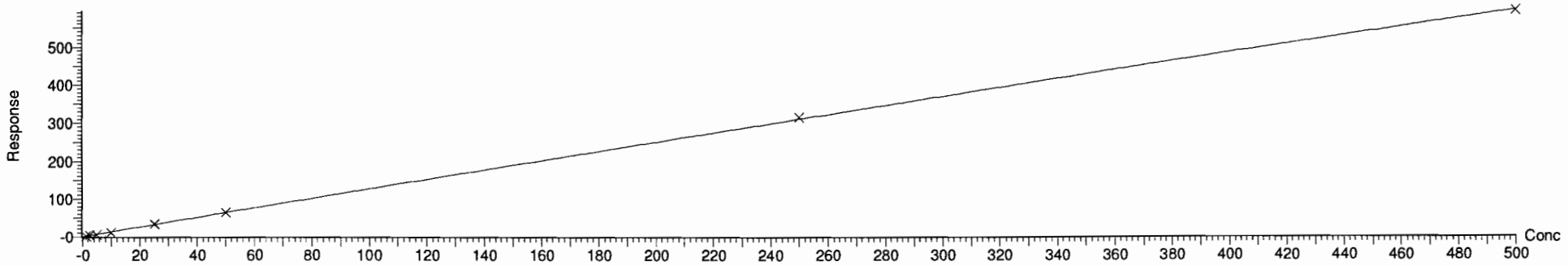
Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999847
Calibration curve: -0.000390936 * x^2 + 0.961264 * x + -0.0303905
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



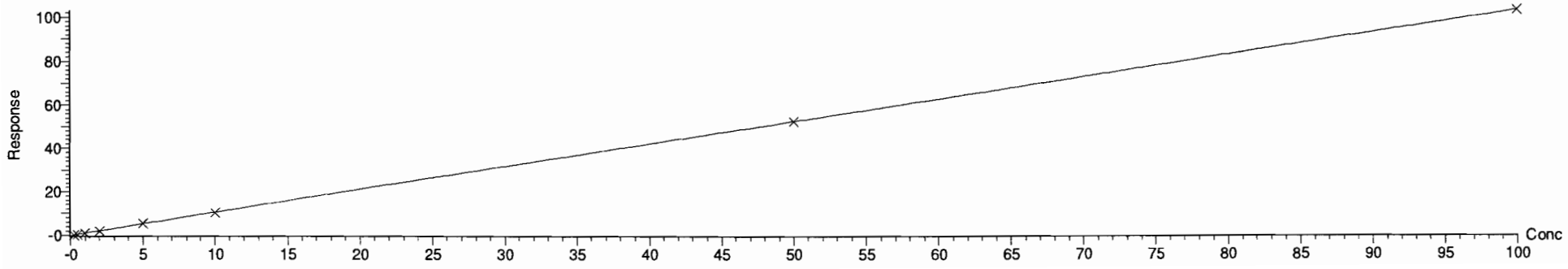
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999075
Calibration curve: -0.000216151 * x^2 + 1.29923 * x + -0.534727
Response type: Internal Std (Ref 66), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



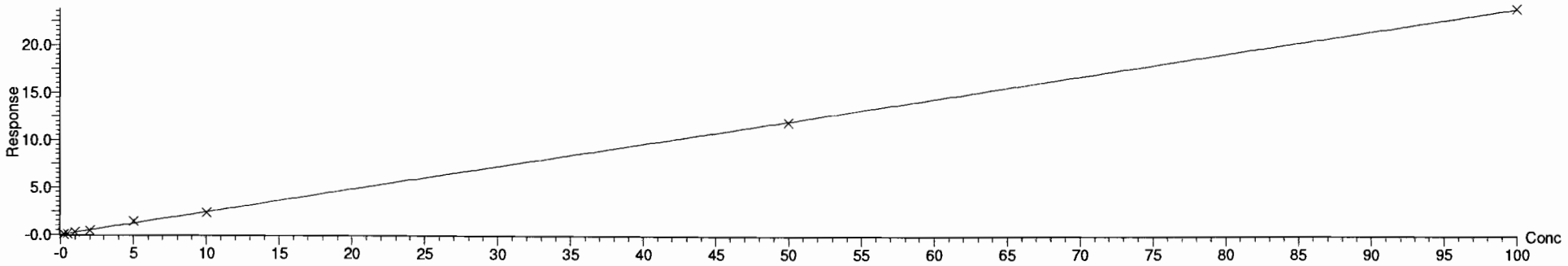
Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999791
Calibration curve: -0.000400083 * x^2 + 1.06843 * x + -0.0442094
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



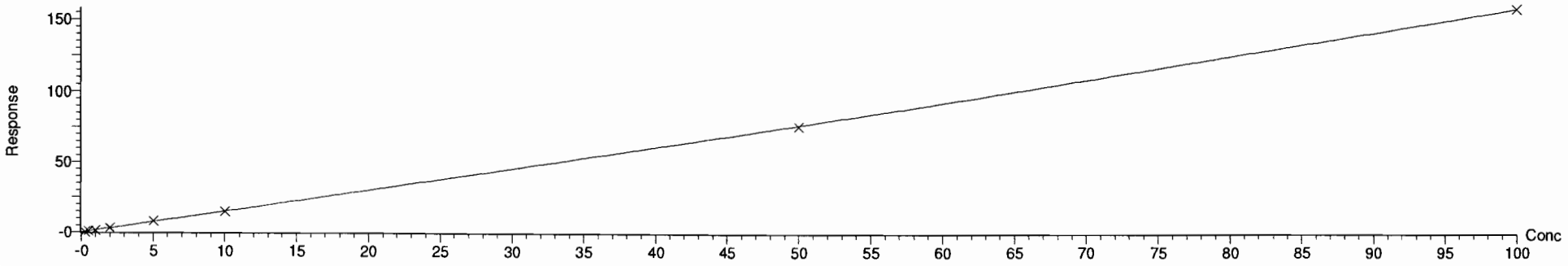
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: PFDoS
Coefficient of Determination: R^2 = 0.998596
Calibration curve: -6.19262e-005 * x^2 + 0.244112 * x + -0.0199214
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



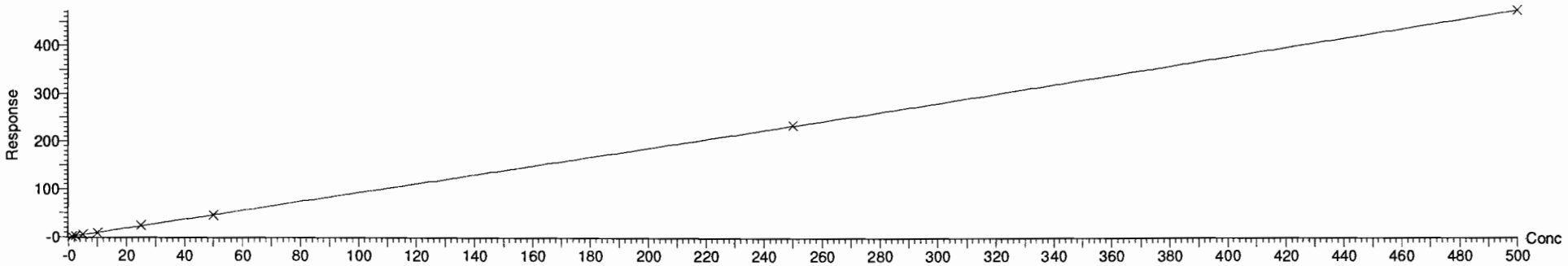
Compound name: PFTeDA
Coefficient of Determination: R^2 = 0.999560
Calibration curve: 0.000924303 * x^2 + 1.48528 * x + 0.0369753
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



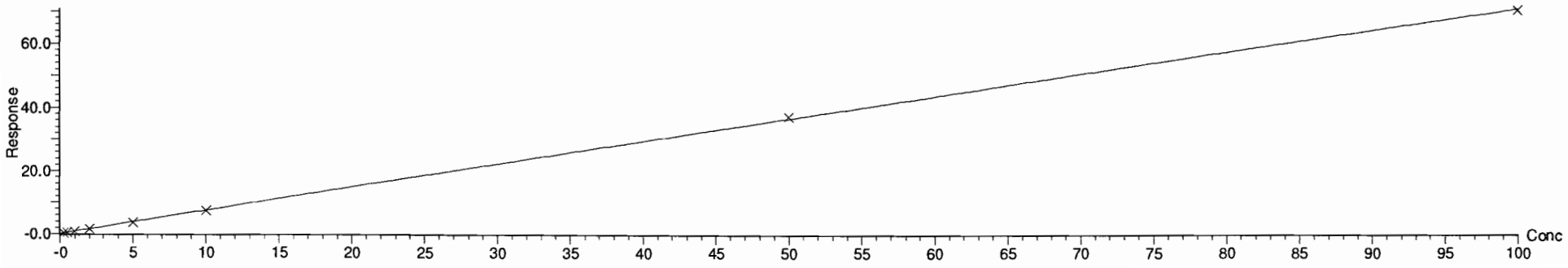
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999705
Calibration curve: 4.67147e-005 * x^2 + 0.924219 * x + -0.422102
Response type: Internal Std (Ref 68), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



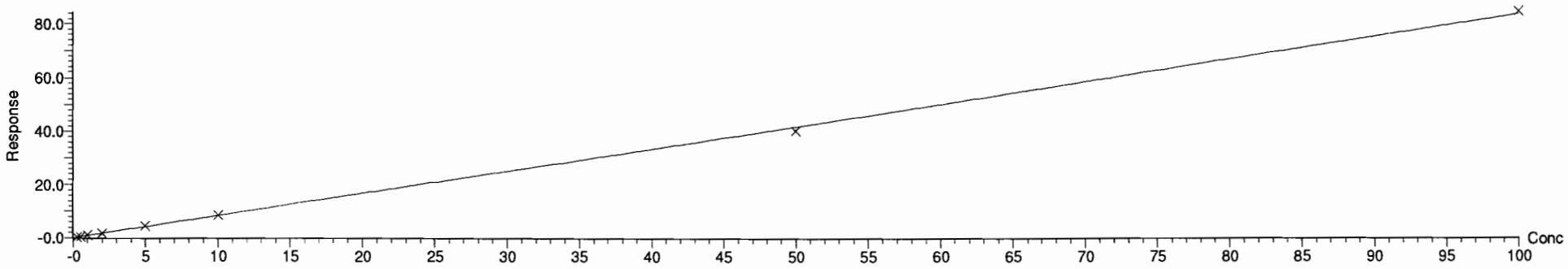
Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.999745
Calibration curve: -0.000493807 * x^2 + 0.756486 * x + 0.0537783
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



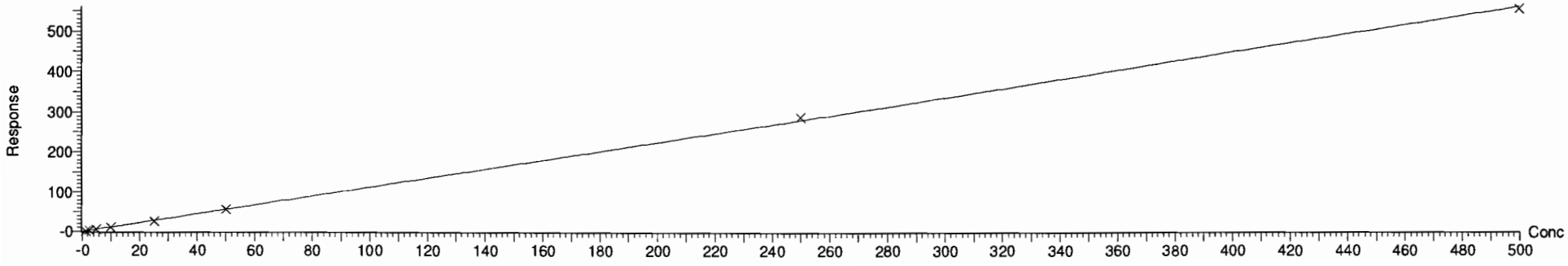
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: PFODA
Correlation coefficient: r = 0.999748, r^2 = 0.999496
Calibration curve: 0.835341 * x + 0.00579687
Response type: Internal Std (Ref 69), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



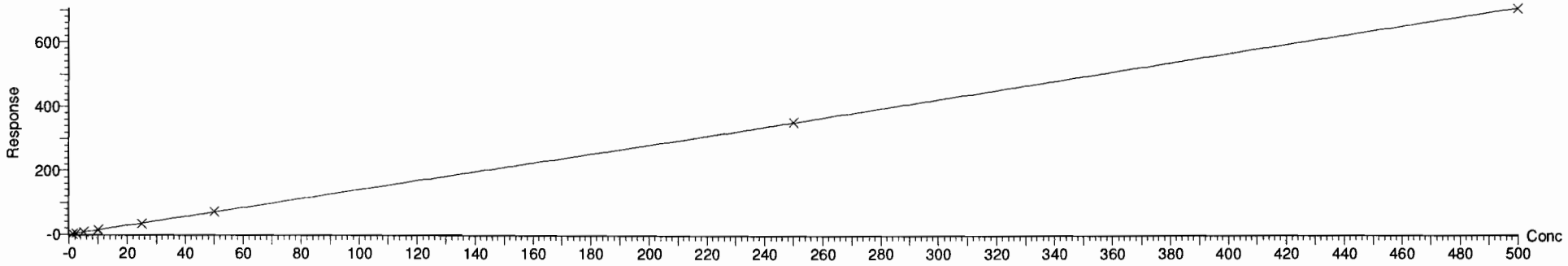
Compound name: N-MeFOSE
Correlation coefficient: r = 0.999631, r^2 = 0.999263
Calibration curve: 1.11841 * x + 0.165536
Response type: Internal Std (Ref 70), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:37:15 Pacific Daylight Time

Compound name: N-EtFOSE
Correlation coefficient: r = 0.999930, r^2 = 0.999860
Calibration curve: 1.41132 * x + -0.260677
Response type: Internal Std (Ref 71), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



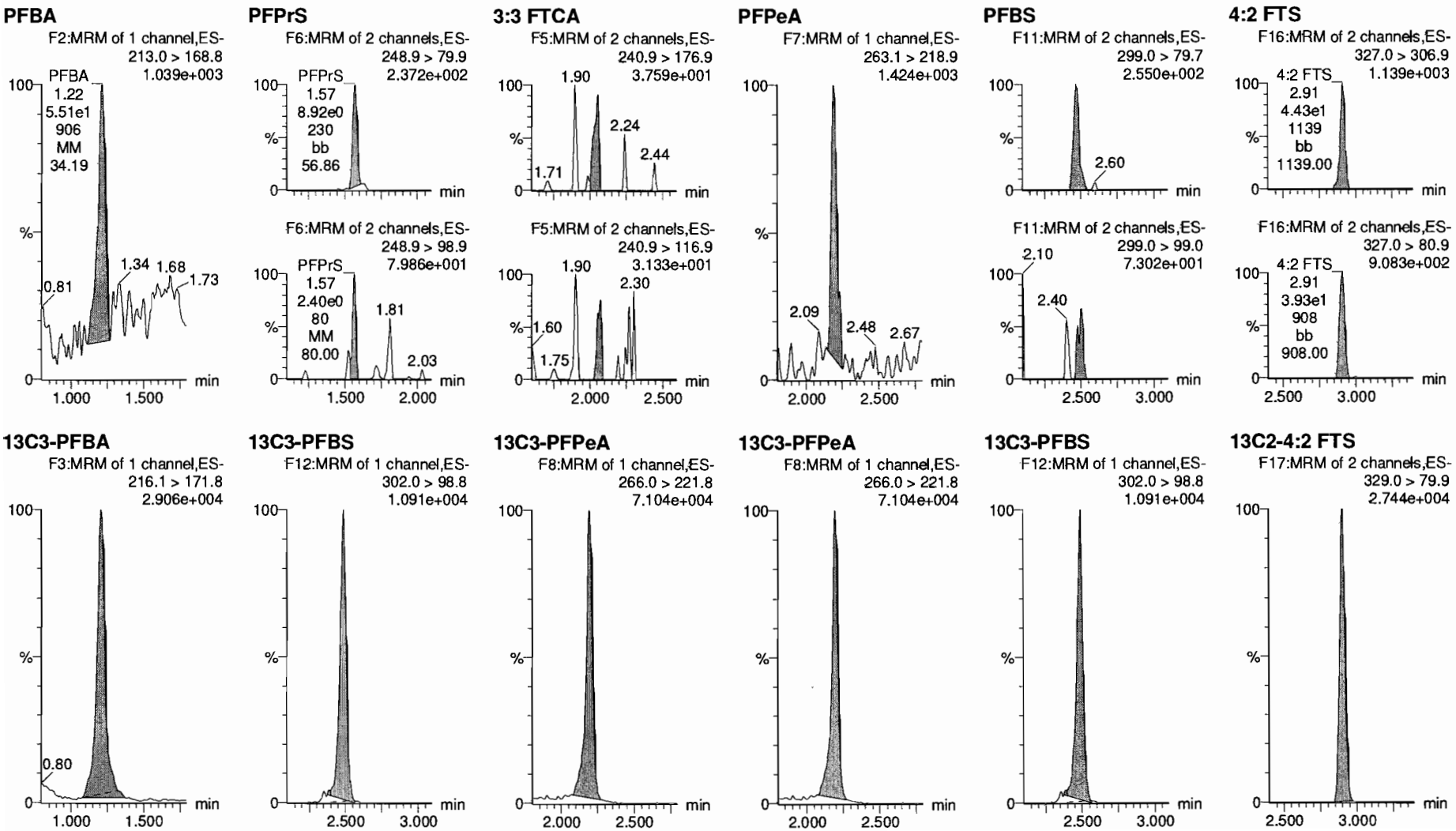
Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:22:28

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

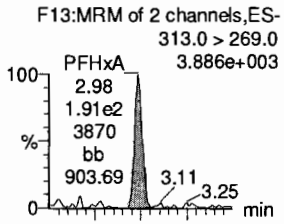


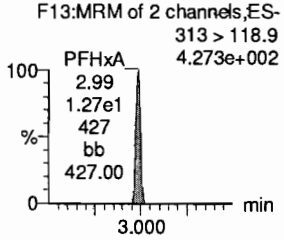
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

PFHxA





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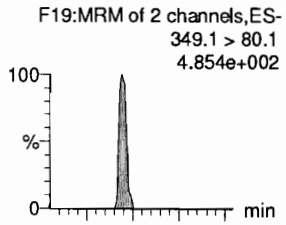
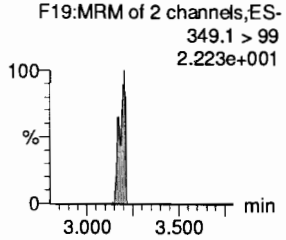
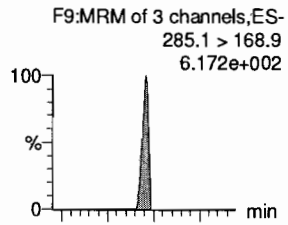
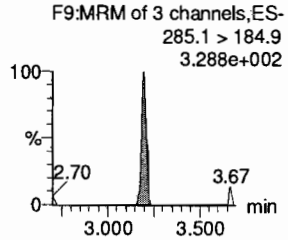


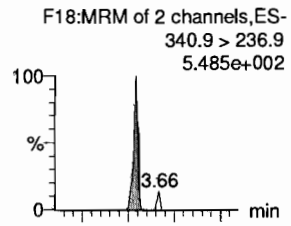


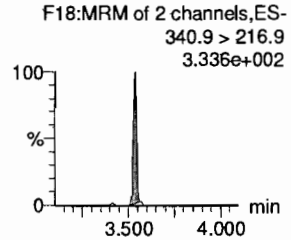
HFPO-DA



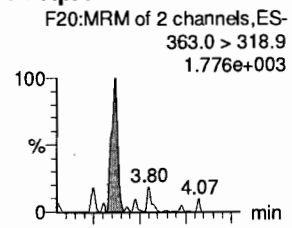


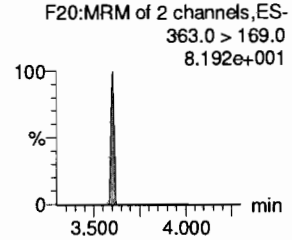
5:3 FTCA





PFHpA





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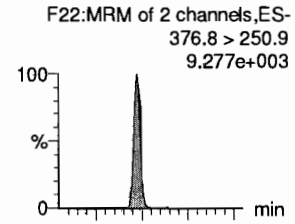
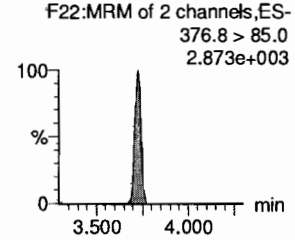
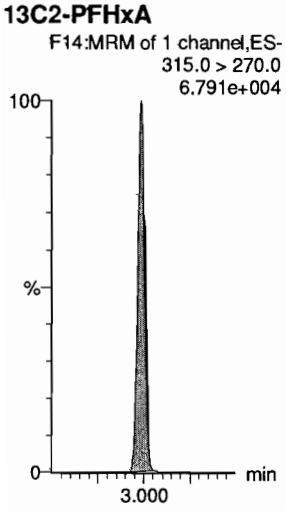
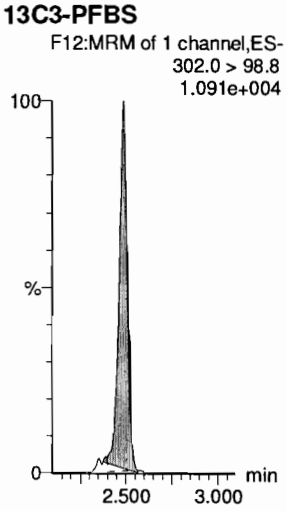




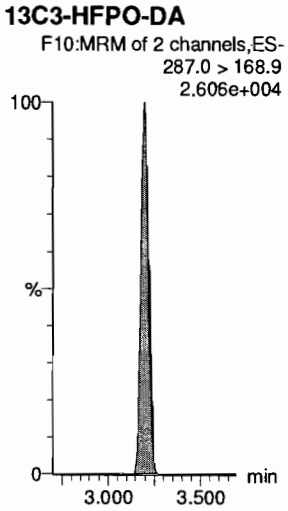
13C2-PFHxA



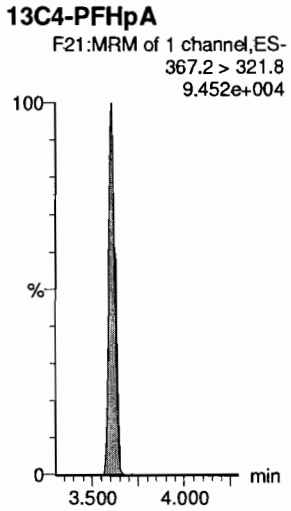
13C3-PFBS



13C3-HFPO-DA



13C4-PFHpA



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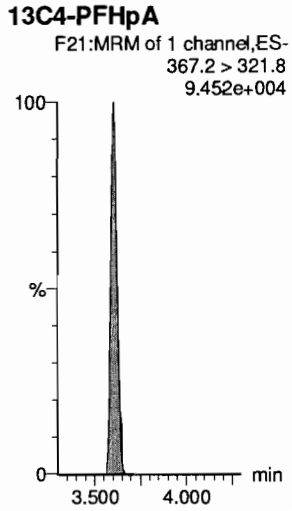

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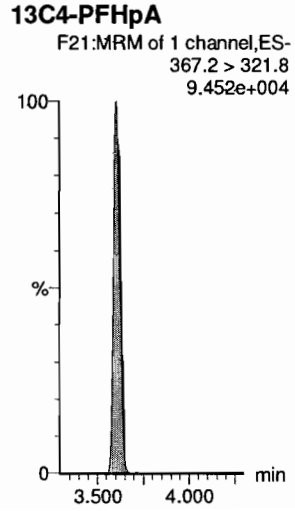
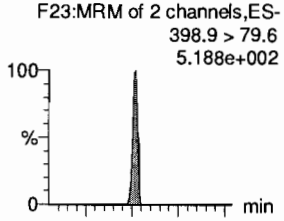


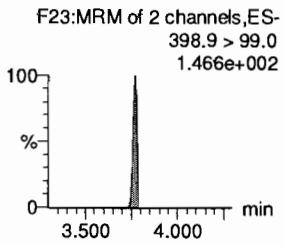
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

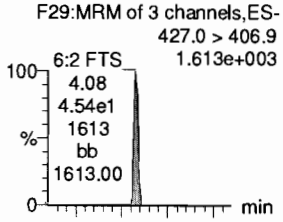
Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

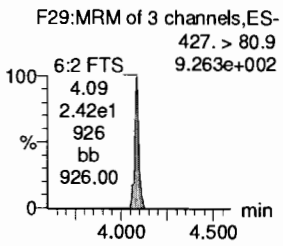
L-PFHxS



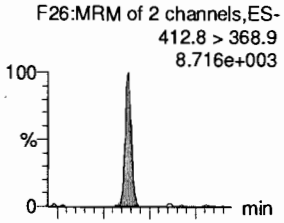


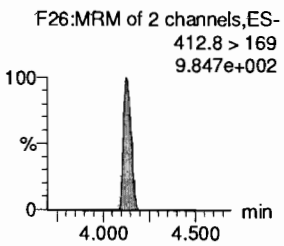
6:2 FTS





L-PFOA





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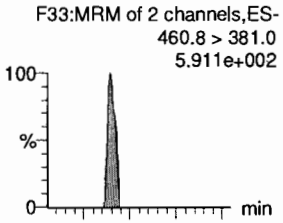
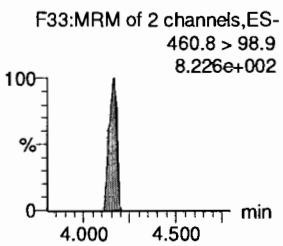
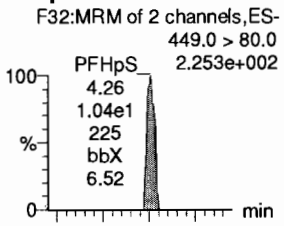
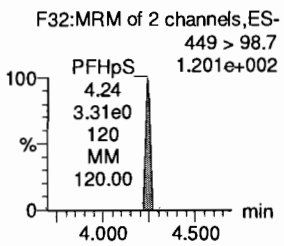


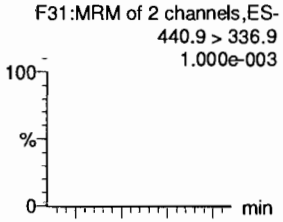


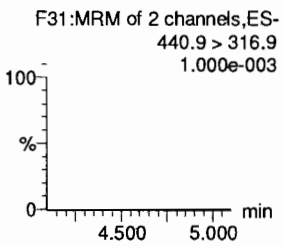
PFHpS



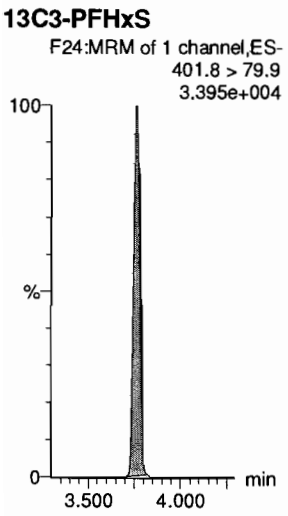


7:3 FTCA

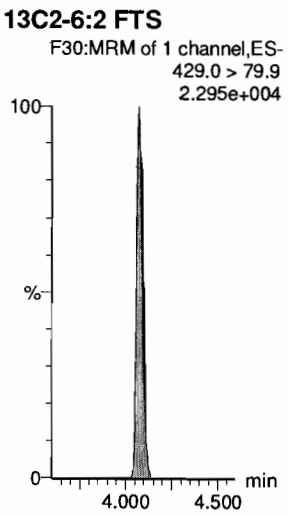




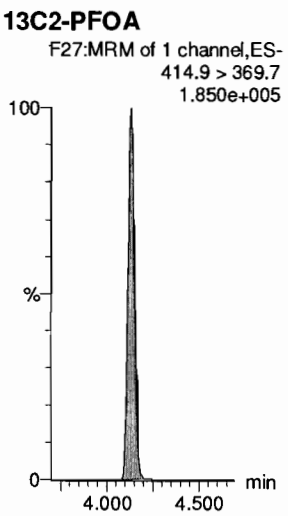
13C3-PFHxS



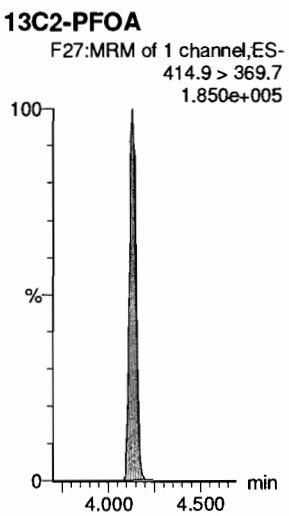
13C2-6:2 FTS



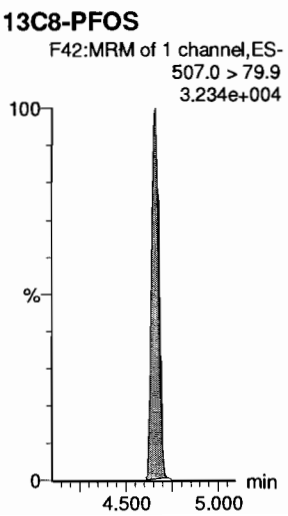
13C2-PFOA



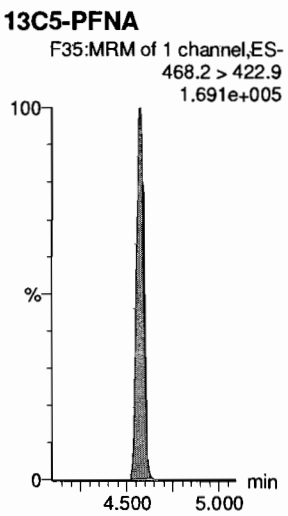
13C2-PFOA



13C8-PFOS



13C5-PFNA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

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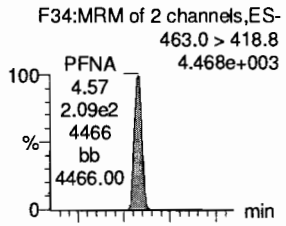
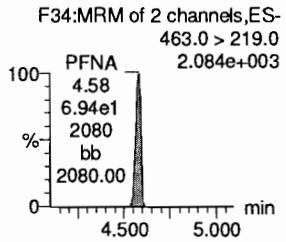
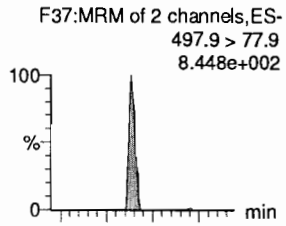
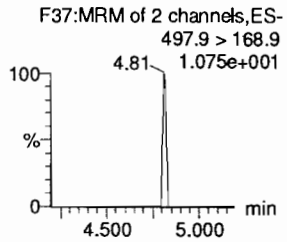


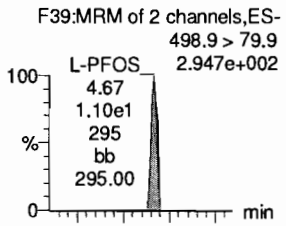


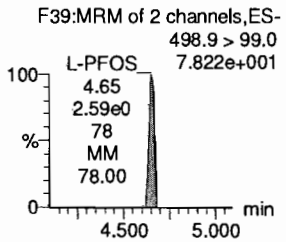
PFOSA



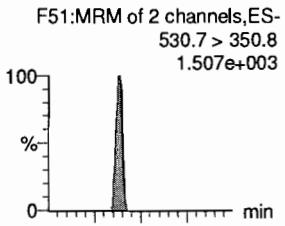


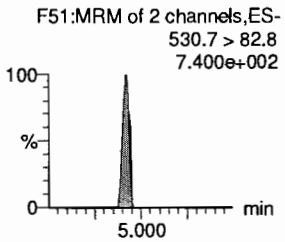
L-PFOS



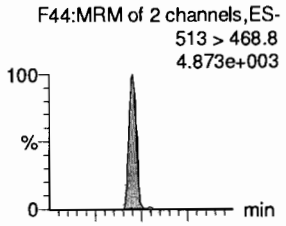


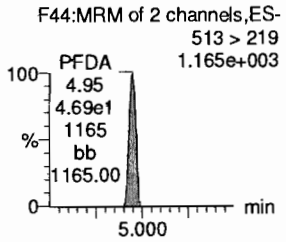
9Cl-PF30NS



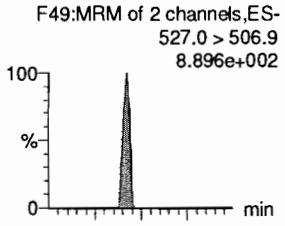


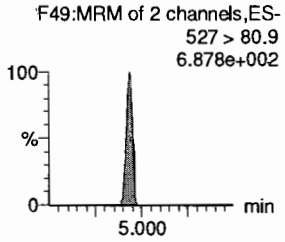
PFDA



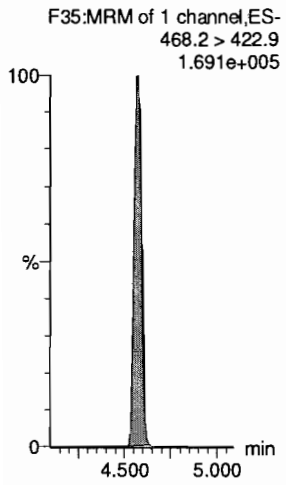


8:2 FTS

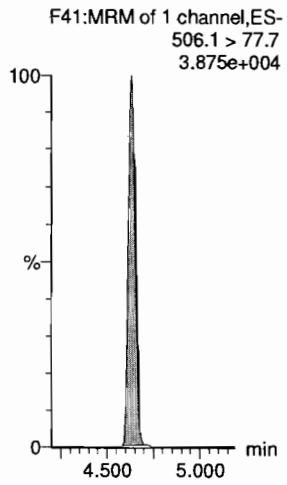




13C5-PFNA



13C8-PFOSA



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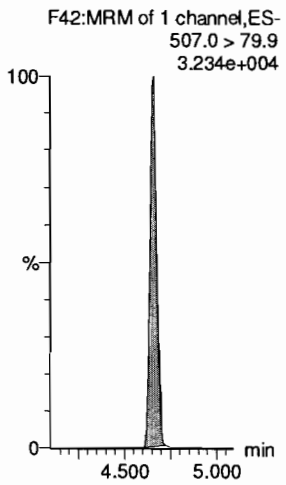

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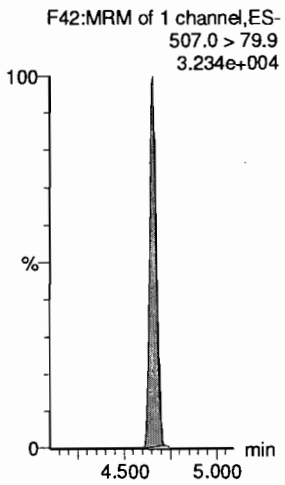

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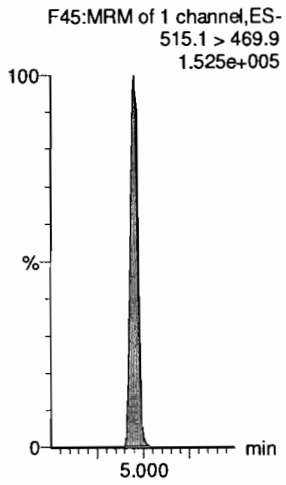
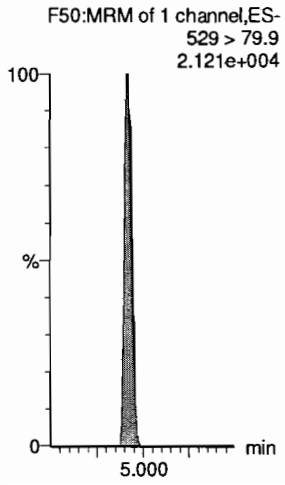


13C2-8:2 FTS

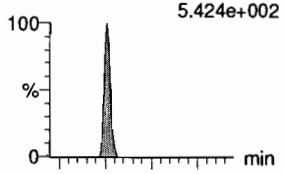


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

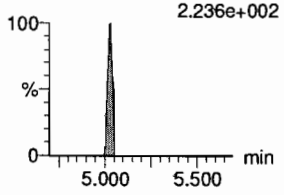
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

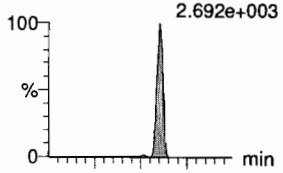
PFNS
F53:MRM of 2 channels,ES-
549.1 > 80.1
5.424e+002



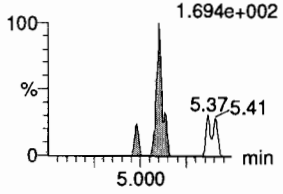
F53:MRM of 2 channels,ES-
549.1 > 99.1
2.236e+002



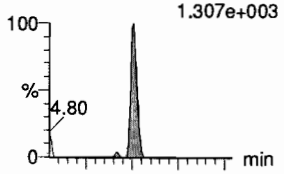
L-MeFOSAA
F56:MRM of 2 channels,ES-
570 > 419
2.692e+003



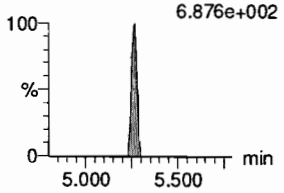
F56:MRM of 2 channels,ES-
570. > 512
1.694e+002



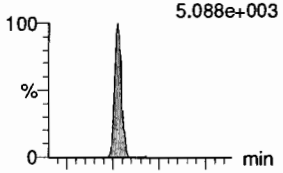
L-EtFOSAA
F59:MRM of 2 channels,ES-
584.1 > 419
1.307e+003



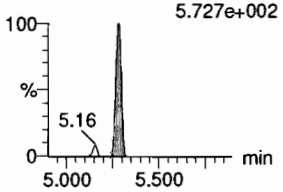
F59:MRM of 2 channels,ES-
584.1 > 526
6.876e+002



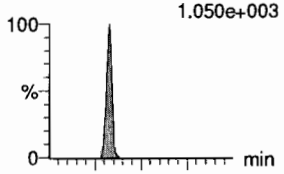
PFUdA
F54:MRM of 2 channels,ES-
563.0 > 518.9
5.088e+003



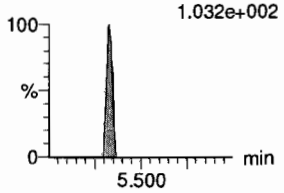
F54:MRM of 2 channels,ES-
563.0 > 269
5.727e+002



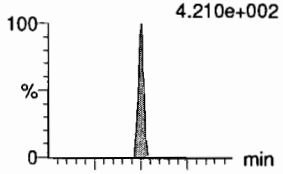
PFDS
F61:MRM of 2 channels,ES-
598.8 > 79.9
1.050e+003



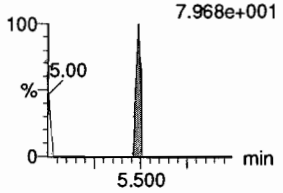
F61:MRM of 2 channels,ES-
598.8 > 98.9
1.032e+002



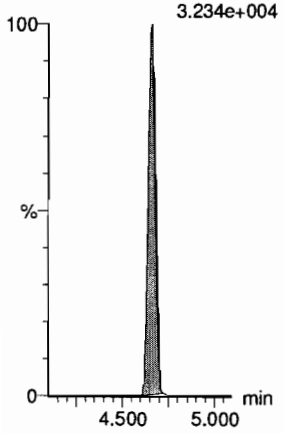
11Cl-PF30UdS
F68:MRM of 2 channels,ES-
632.6 > 452.7
4.210e+002



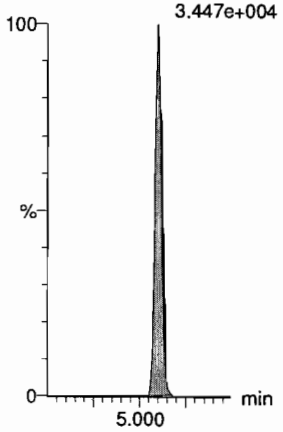
F68:MRM of 2 channels,ES-
632.6 > 450.7
7.968e+001



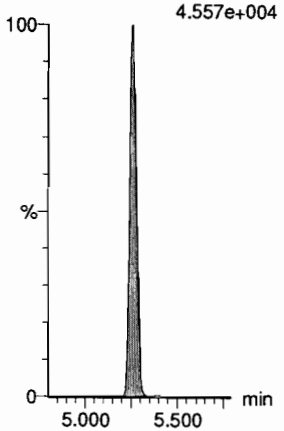
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.234e+004



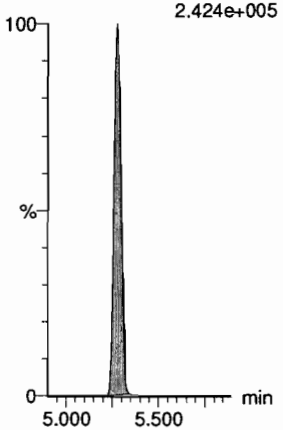
d3-N-MeFOSAA
F58:MRM of 1 channel,ES-
573.3 > 419
3.447e+004



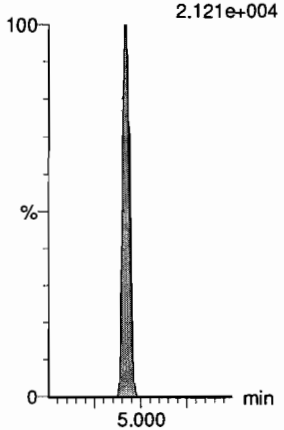
d5-N-EtFOSAA
F60:MRM of 1 channel,ES-
589.3 > 419
4.557e+004



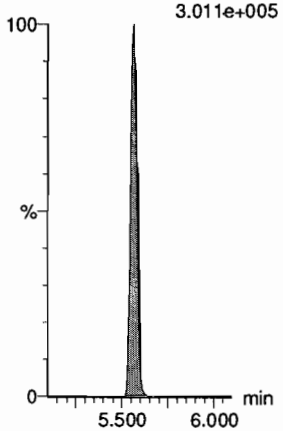
13C2-PFUdA
F55:MRM of 1 channel,ES-
565 > 519.8
2.424e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.121e+004



13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.011e+005

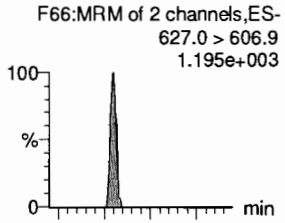


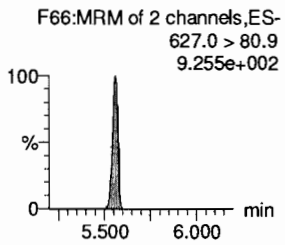
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

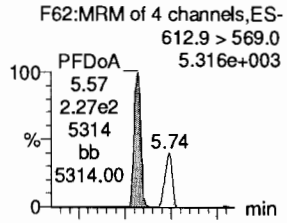
Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

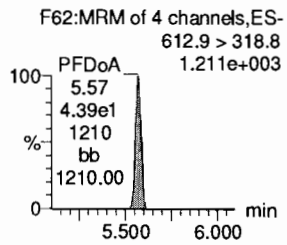
10:2 FTS



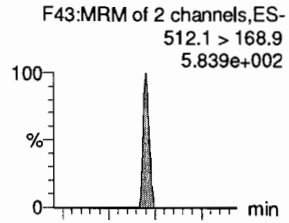


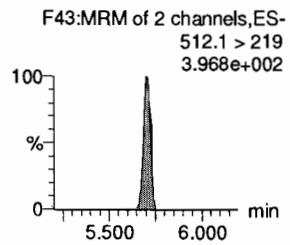
PFDoA



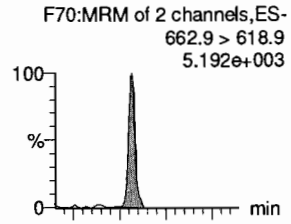


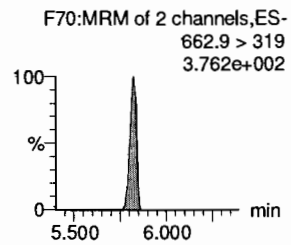
N-MeFOSA



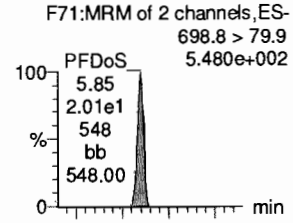


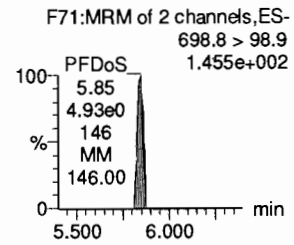
PFTrDA



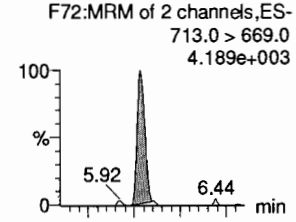


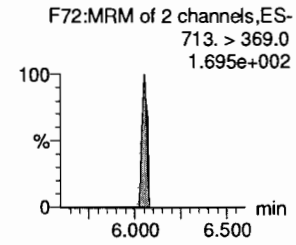
PFDoS



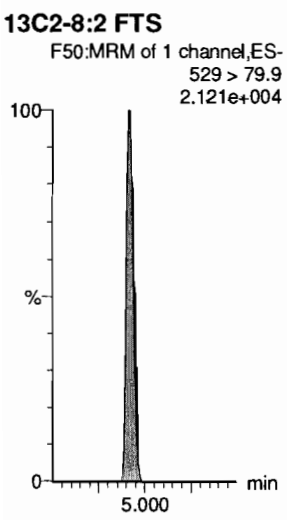


PFTeDA

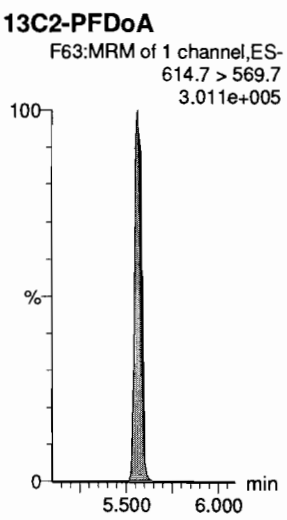




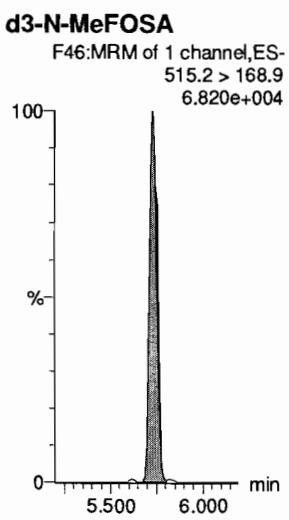
13C2-8:2 FTS



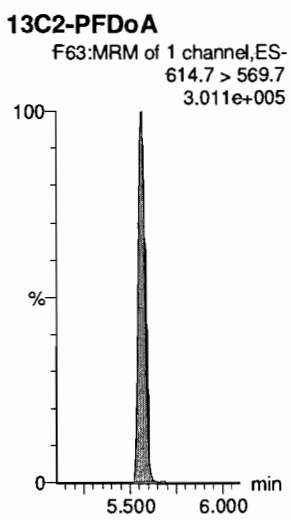
13C2-PFDoA



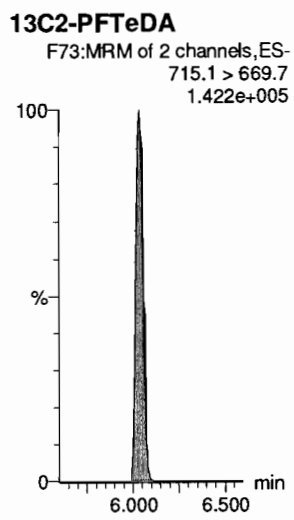
d3-N-MeFOSA



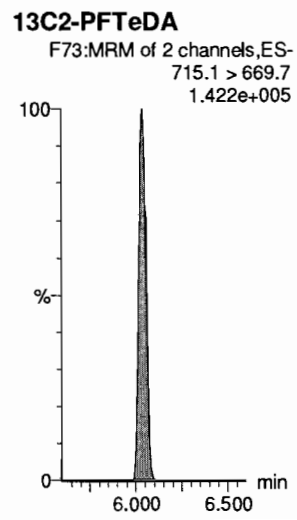
13C2-PFDoA



13C2-PFTeDA



13C2-PFTeDA

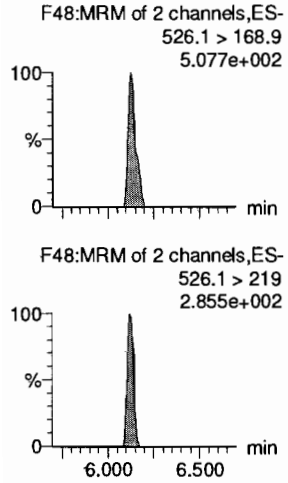


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

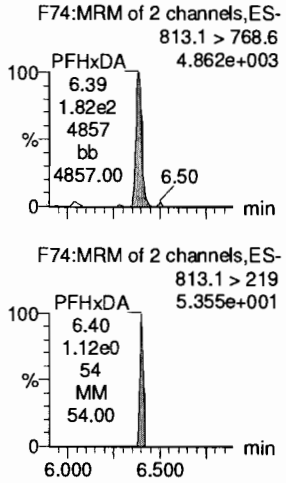
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

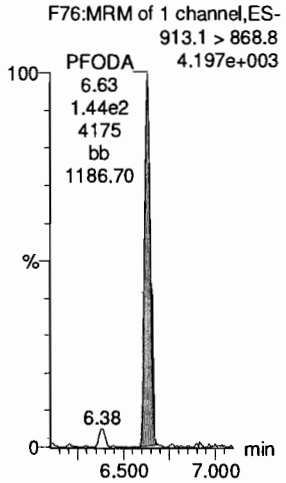
N-EtFOSA



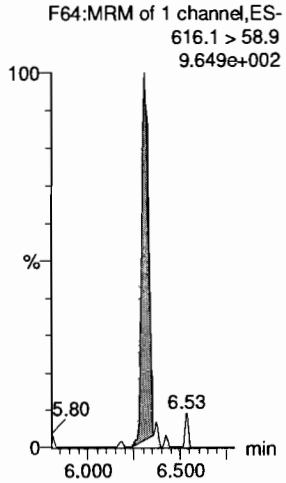
PFHxDA



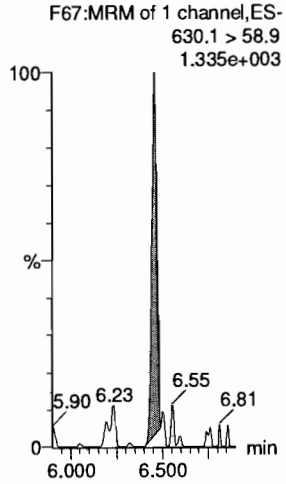
PFODA



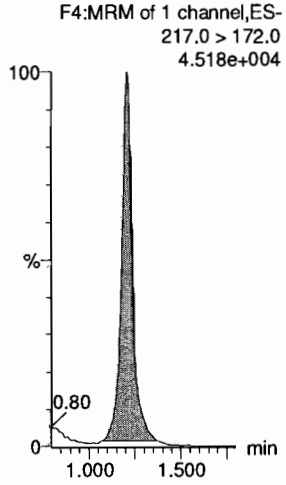
N-MeFOSE



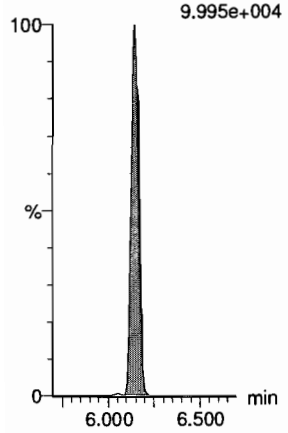
N-EtFOSE



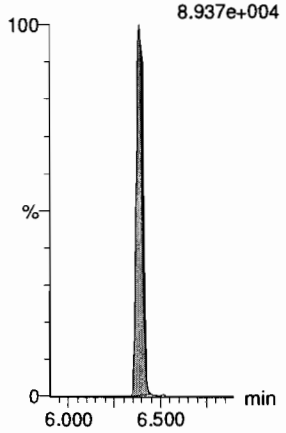
13C4-PFBA



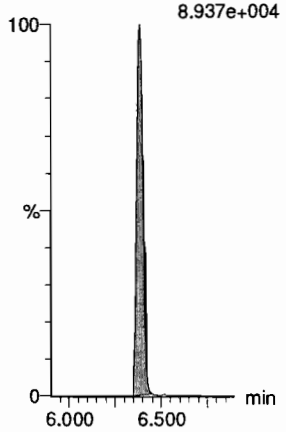
d5-N-ETFOSA



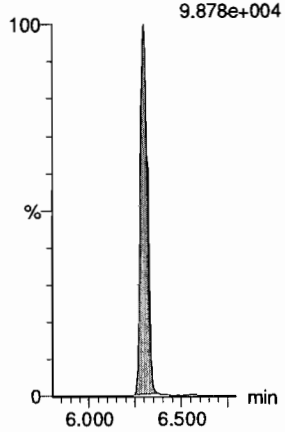
13C2-PFHxDA



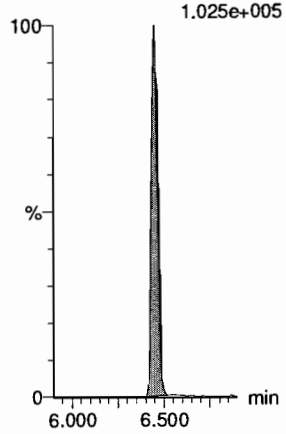
13C2-PFHxDA



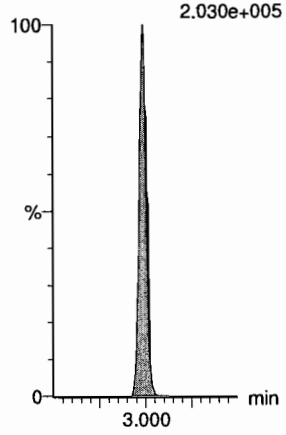
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

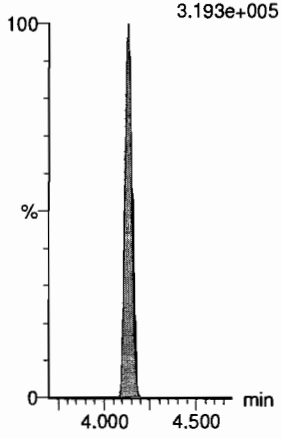


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

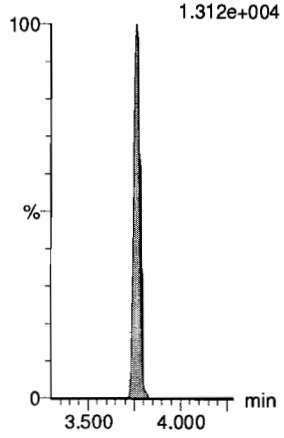
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_6, Date: 10-Jul-2019, Time: 13:43:47, ID: ST190710M2-1 PFC CS-2 19G0801, Description: PFC CS-2 19G0801

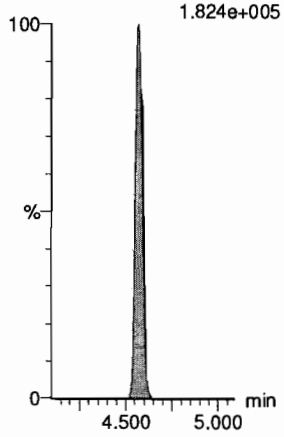
13C8-PFOA



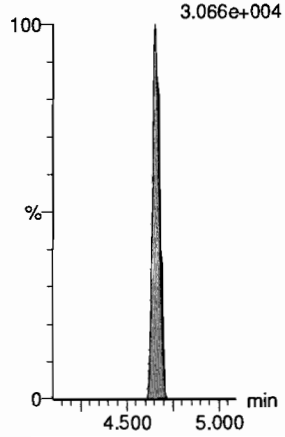
18O2-PFHxS



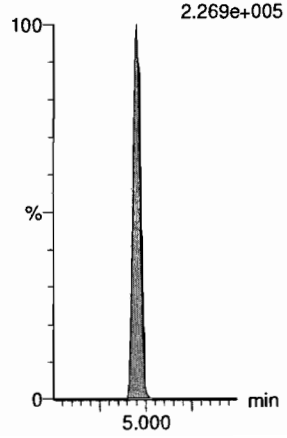
13C9-PFNA



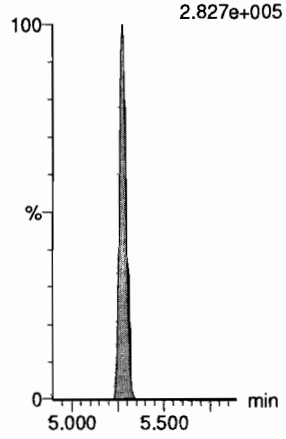
13C4-PFOS



13C6-PFDA



13C7-PFUdA

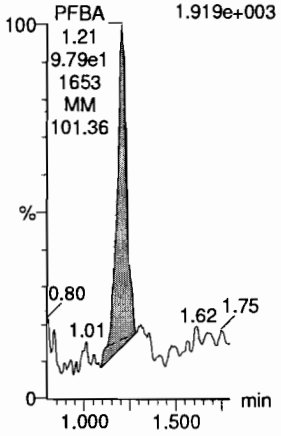


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

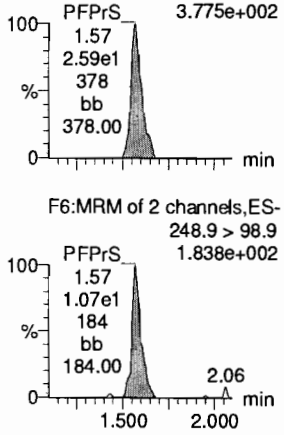
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

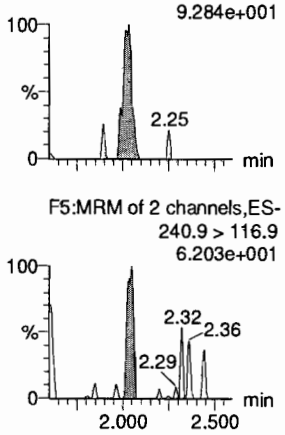
PFBA



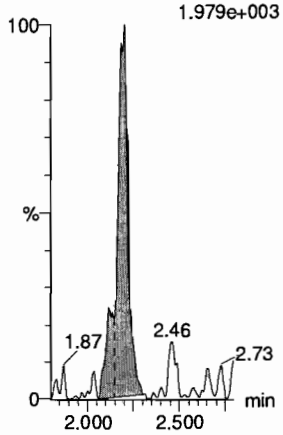
PFPrS



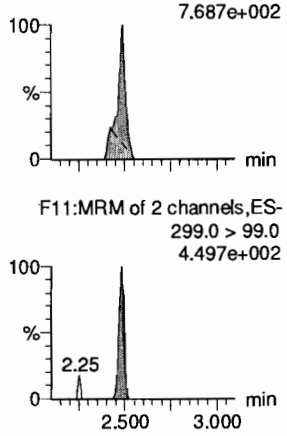
3:3 FTCA



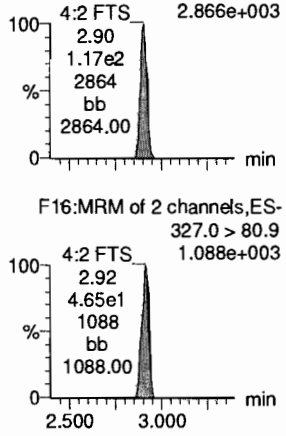
PFPeA



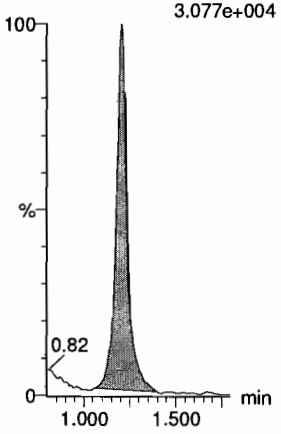
PFBS



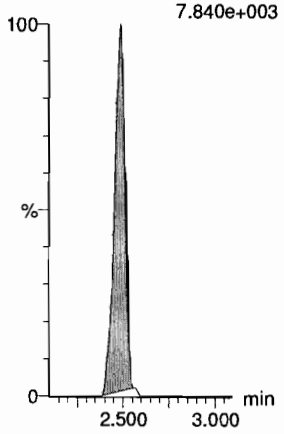
4:2 FTS



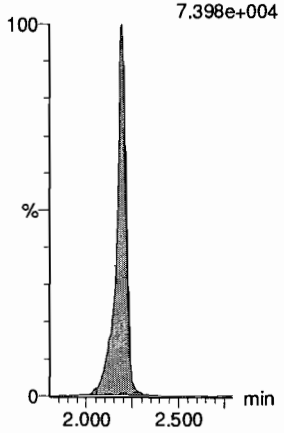
13C3-PFBA



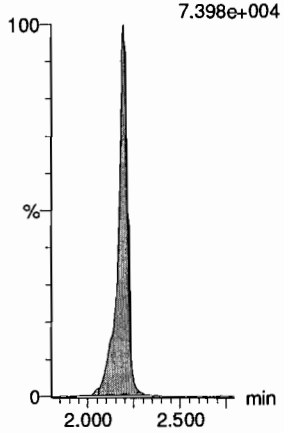
13C3-PFBS



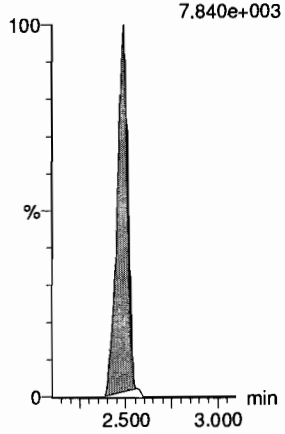
13C3-PFPeA



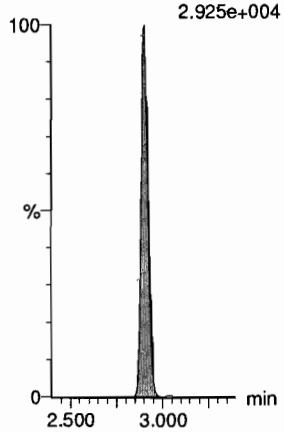
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

PFHxA
F13:MRM of 2 channels,ES-
313.0 > 269.0
7.161e+003
PFHxA
2.99
3.37e2
7097
bb
466.44
3.40
min

F13:MRM of 2 channels,ES-
313 > 118.9
6.939e+002
PFHxA
2.98
2.66e1
694
bb
694.00
min

PFPeS
F19:MRM of 2 channels,ES-
349.1 > 80.1
7.785e+002
min

F19:MRM of 2 channels,ES-
349.1 > 99
4.120e+002
min

HFPO-DA
F9:MRM of 3 channels,ES-
285.1 > 168.9
1.559e+003
min

F9:MRM of 3 channels,ES-
285.1 > 184.9
9.701e+002
2.97
3.63
min

5:3 FTCA
F18:MRM of 2 channels,ES-
340.9 > 236.9
9.857e+002
3.13
3.96
min

F18:MRM of 2 channels,ES-
340.9 > 216.9
4.562e+002
3.29
min

PFHpA
F20:MRM of 2 channels,ES-
363.0 > 318.9
4.256e+003
4.23
min

F20:MRM of 2 channels,ES-
363.0 > 169.0
9.131e+002
min

ADONA
F22:MRM of 2 channels,ES-
376.8 > 250.9
1.478e+004
min

F22:MRM of 2 channels,ES-
376.8 > 85.0
4.416e+003
min

13C2-PFHxA
F14:MRM of 1 channel,ES-
315.0 > 270.0
6.757e+004
min

13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
7.840e+003
min

13C3-HFPO-DA
F10:MRM of 2 channels,ES-
287.0 > 168.9
2.842e+004
min

13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.668e+004
min

13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.668e+004
min

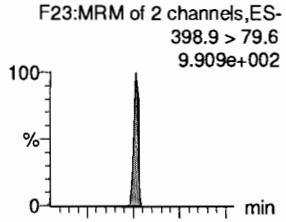
13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
9.668e+004
min

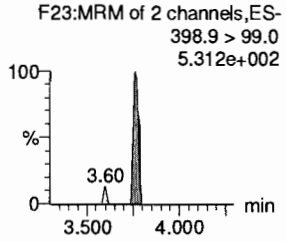
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

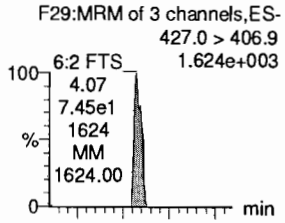
Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

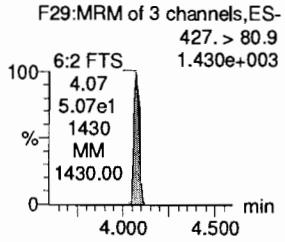
L-PFHxS



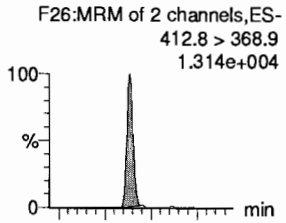


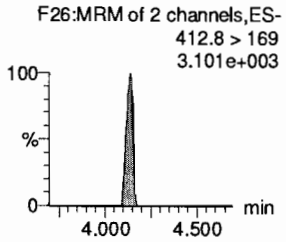
6:2 FTS



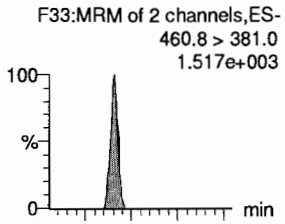


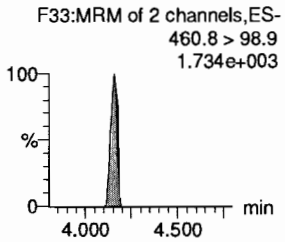
L-PFOA



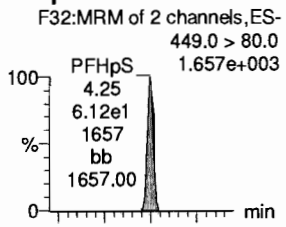


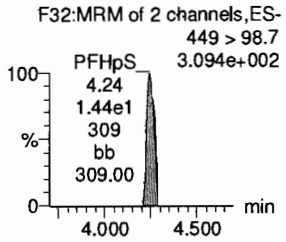
PFEChS



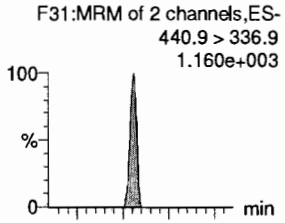


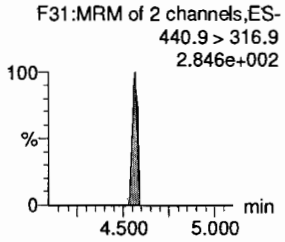
PFHpS



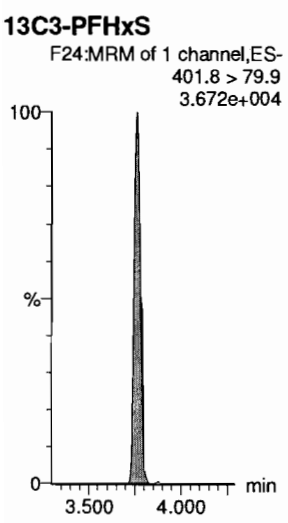


7:3 FTCA

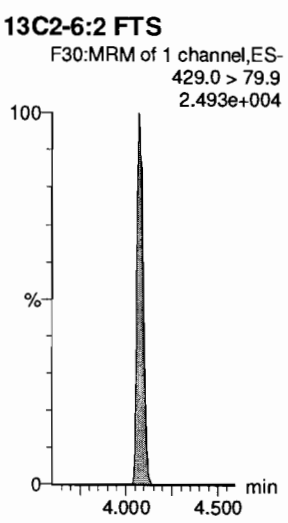




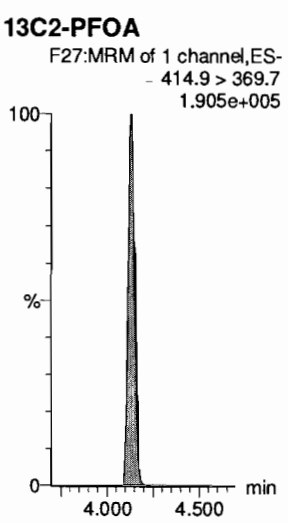
13C3-PFHxS



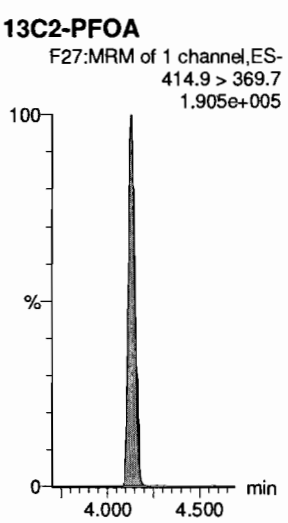
13C2-6:2 FTS



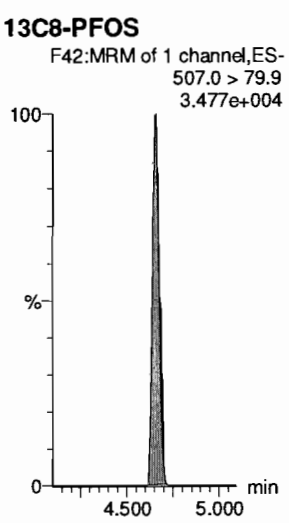
13C2-PFOA



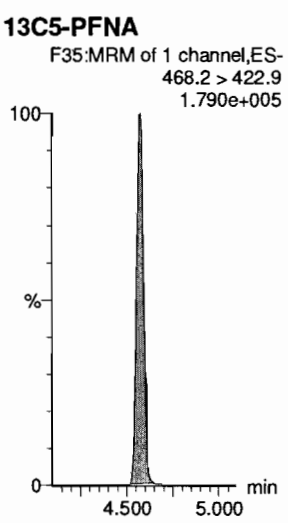
13C2-PFOA



13C8-PFOS



13C5-PFNA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
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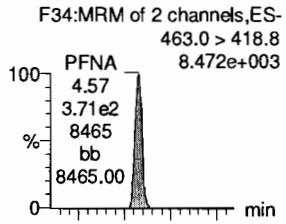
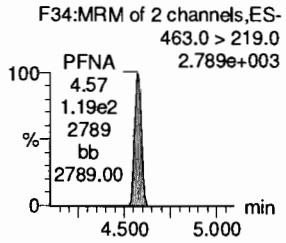
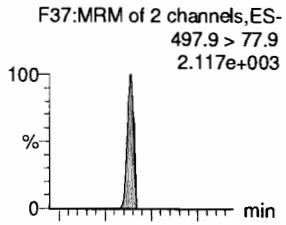
Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

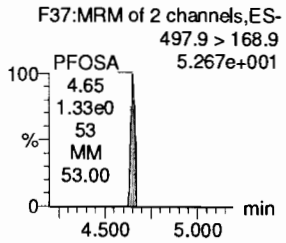
PFNA



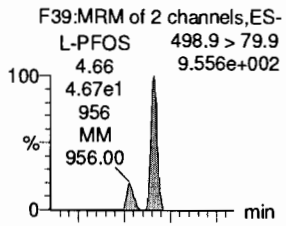


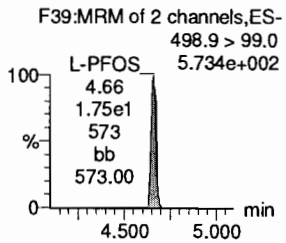
PFOSA



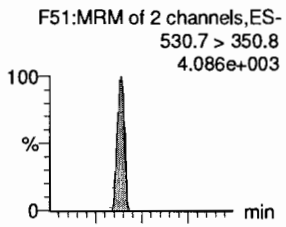


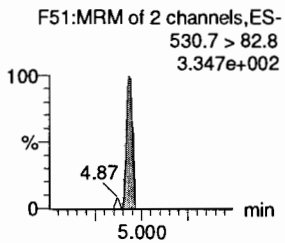
L-PFOS



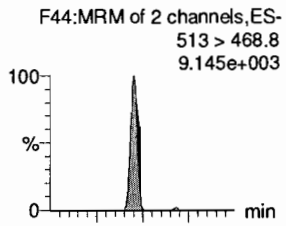


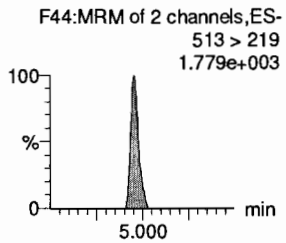
9Cl-PF30NS



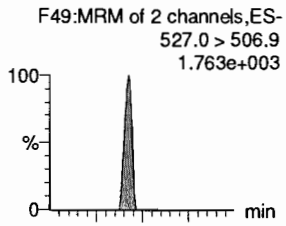


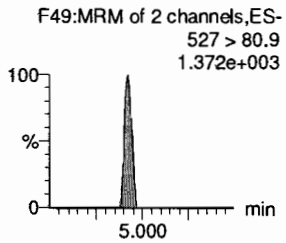
PFDA



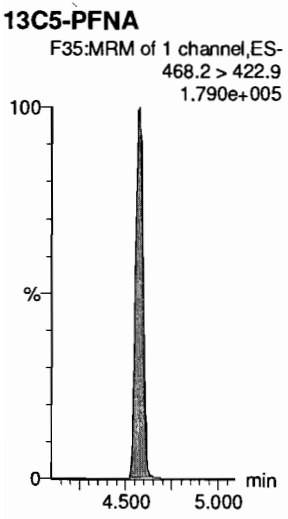


8:2 FTS

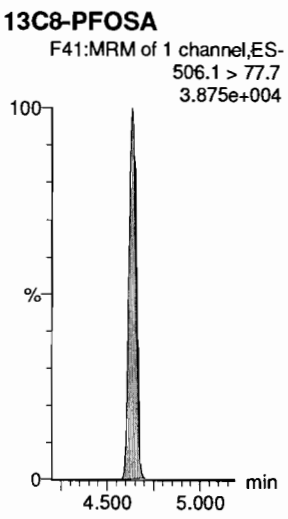




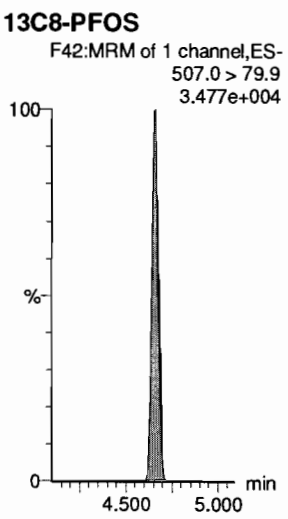
13C5-PFNA



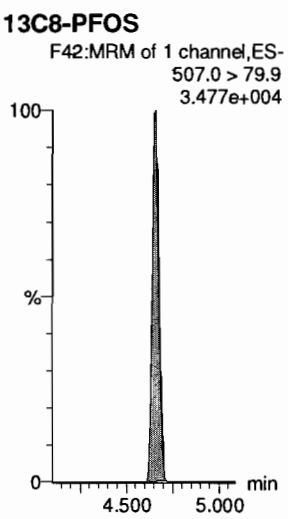
13C8-PFOSA



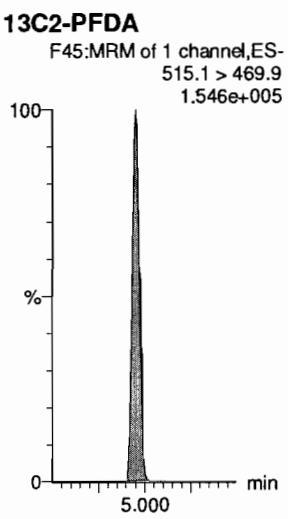
13C8-PFOS



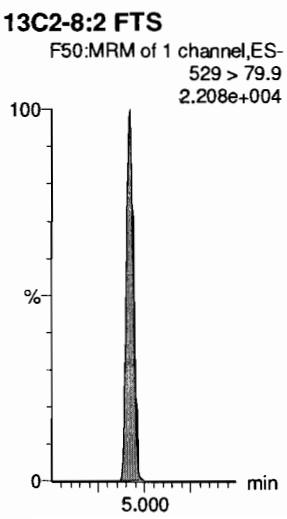
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

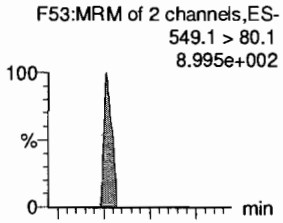


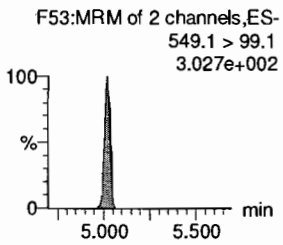
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

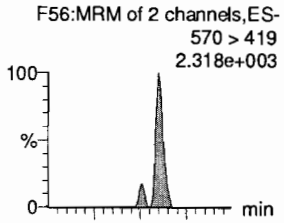
Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

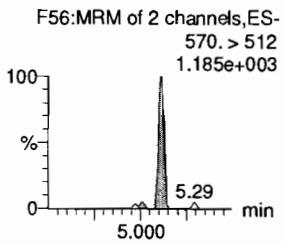
PFNS





L-MeFOSAA





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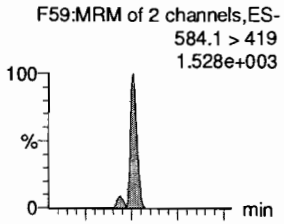
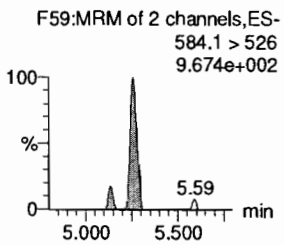
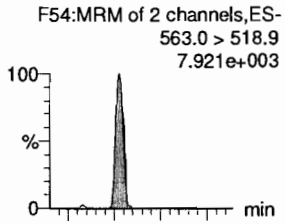
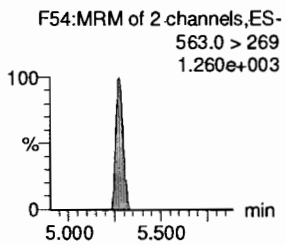




PFUdA





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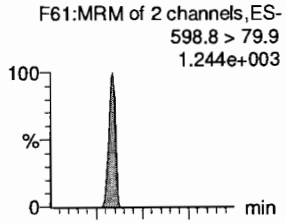

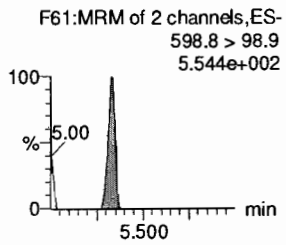

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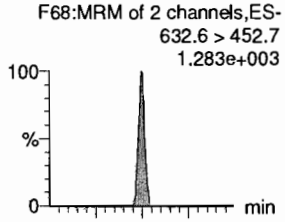
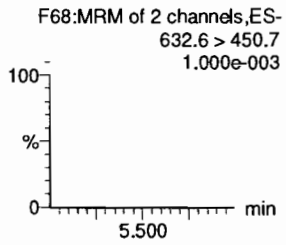
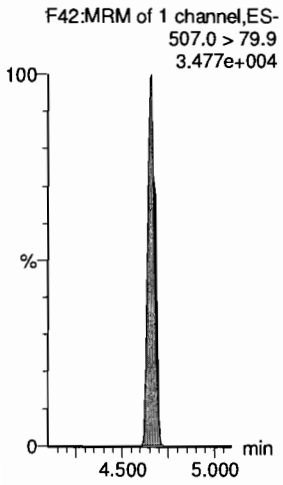
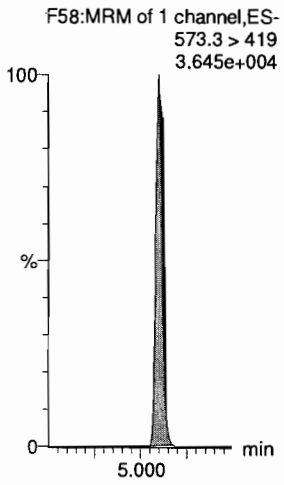




13C8-PFOS



d3-N-MeFOSAA



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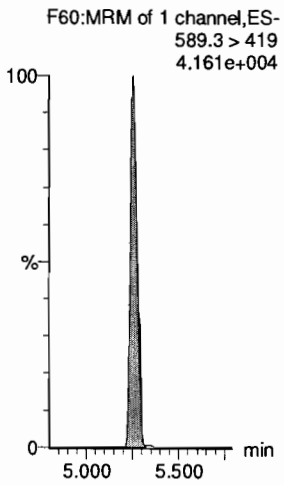
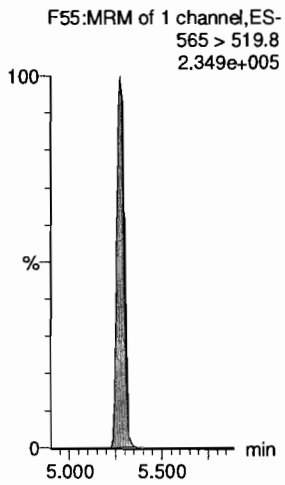
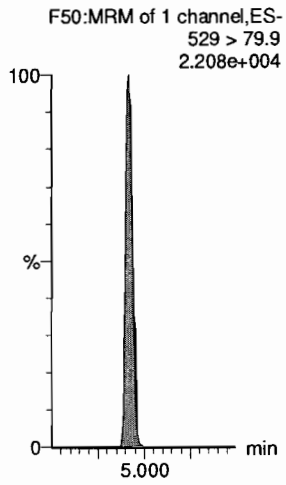


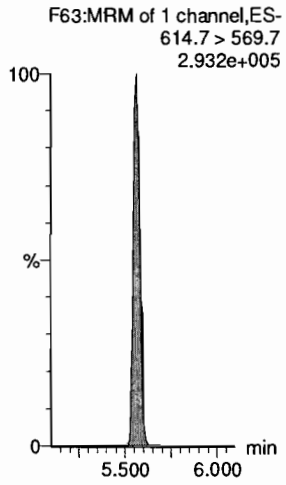
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA

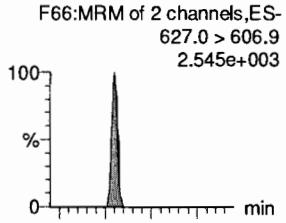


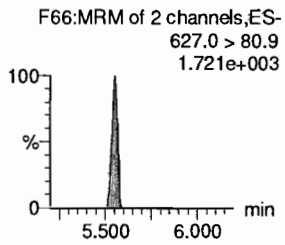
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

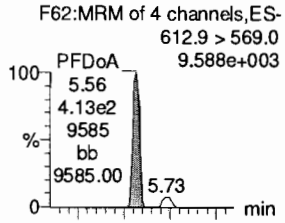
Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

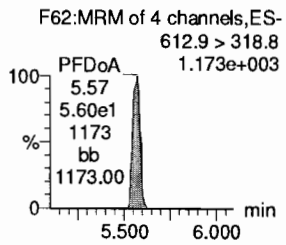
10:2 FTS



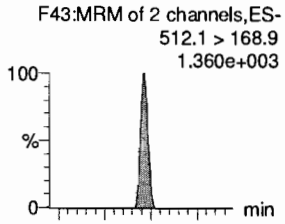


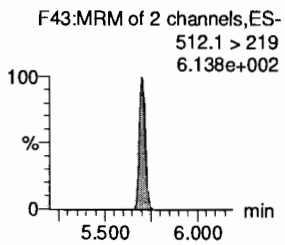
PFDoA





N-MeFOSA





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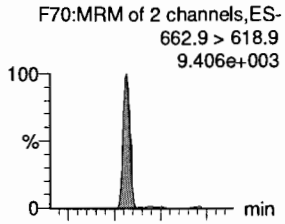
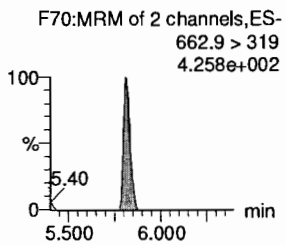
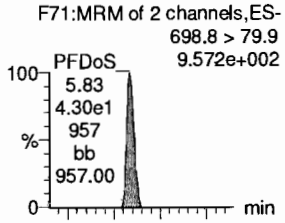
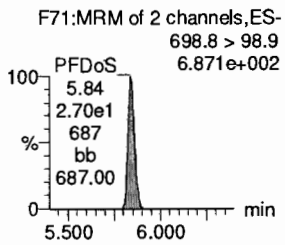




PFDoS





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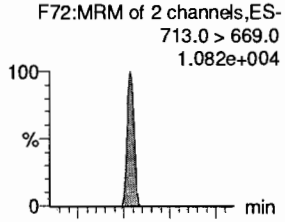
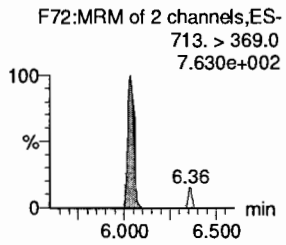
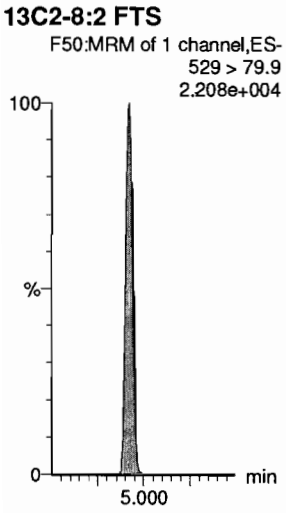
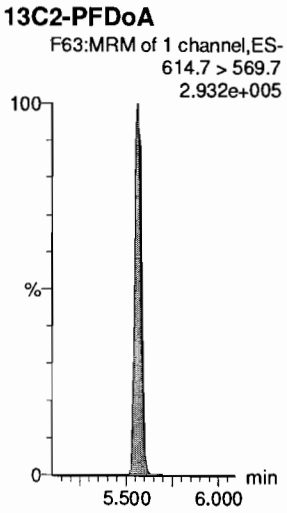




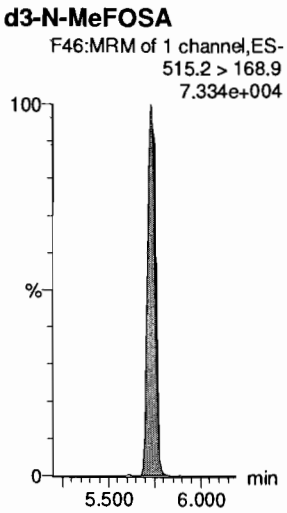
13C2-8:2 FTS



13C2-PFDoA



d3-N-MeFOSA



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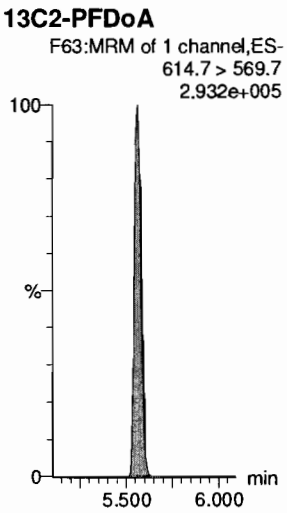
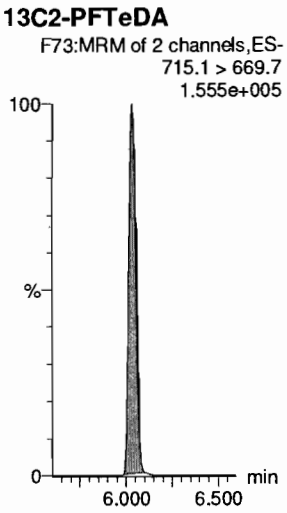


13C2-PFTeDA



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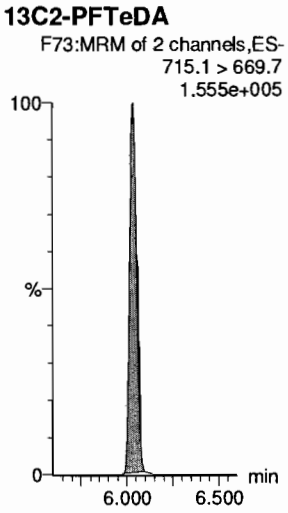
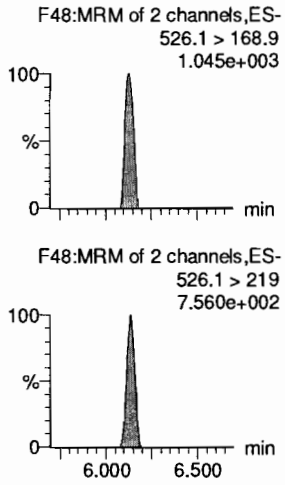


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

N-EtFOSA



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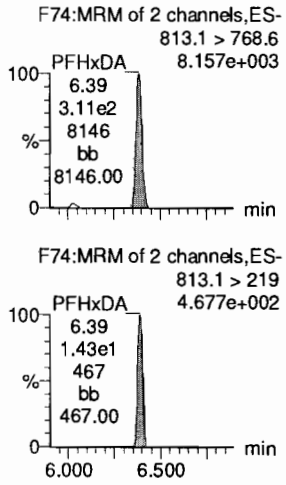

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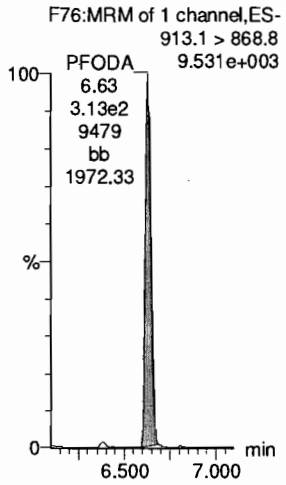
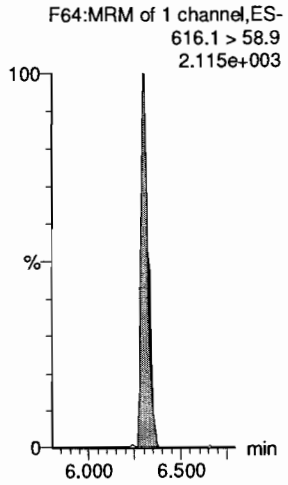


N-MeFOSE



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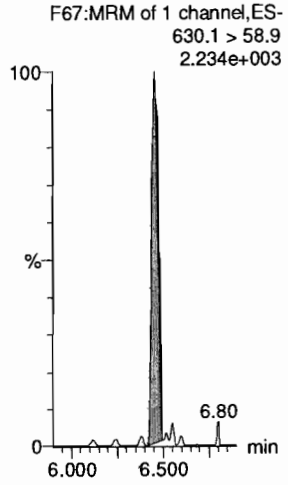
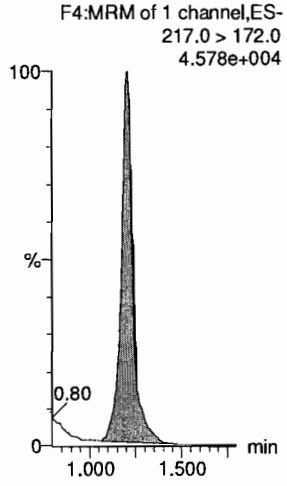
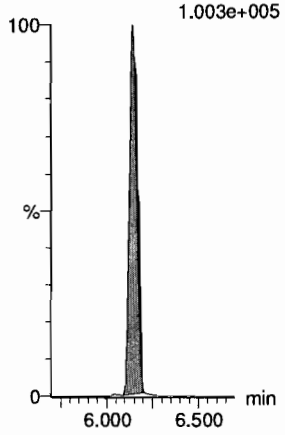


13C4-PFBA



d5-N-ETFOSA



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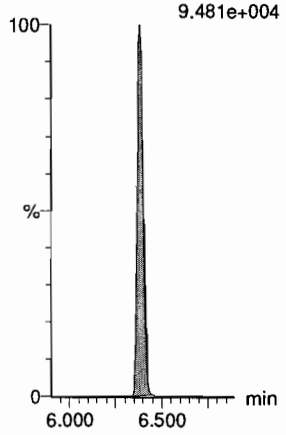

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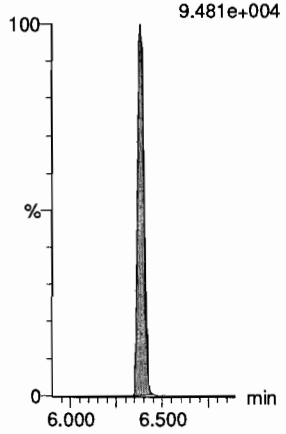
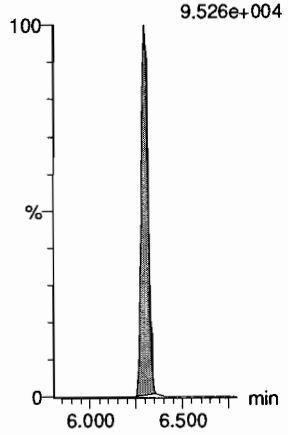
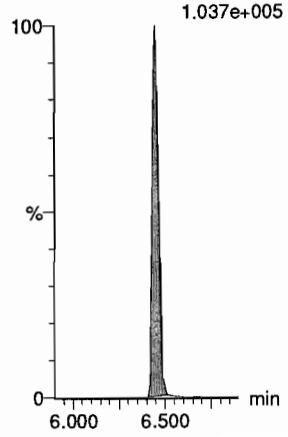


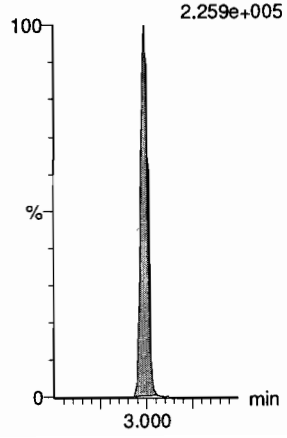
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

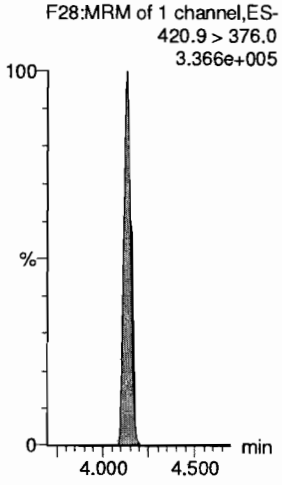


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

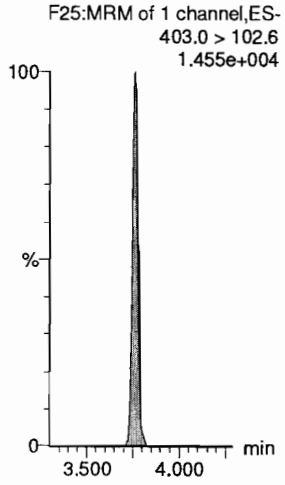
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_7, Date: 10-Jul-2019, Time: 13:54:21, ID: ST190710M2-2 PFC CS-1 19G0802, Description: PFC CS-1 19G0802

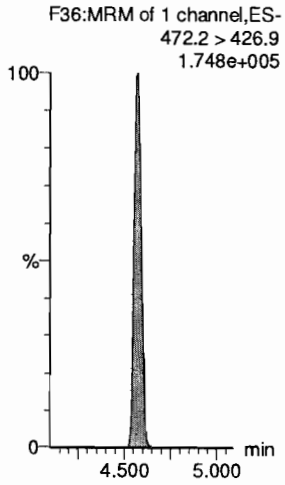
13C8-PFOA



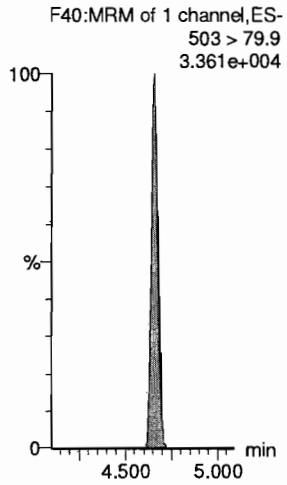
18O2-PFHxS



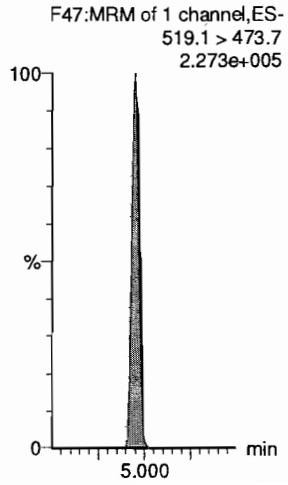
13C9-PFNA



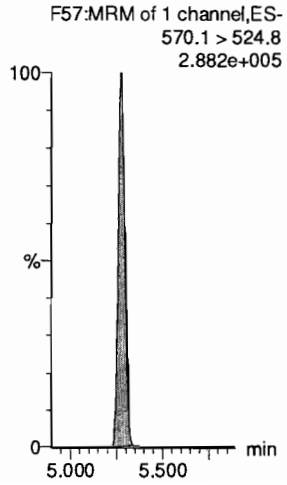
13C4-PFOS



13C6-PFDA



13C7-PFUdA

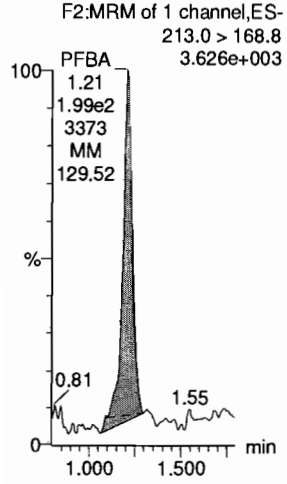


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

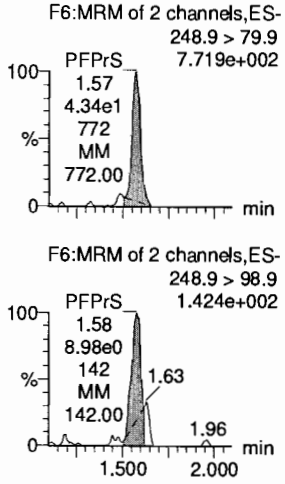
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

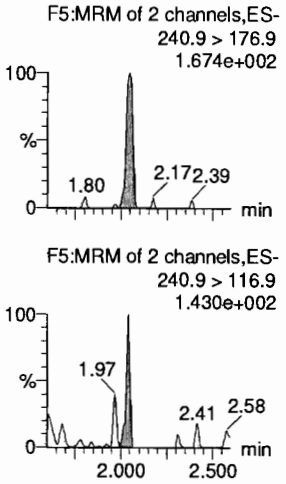
PFBA



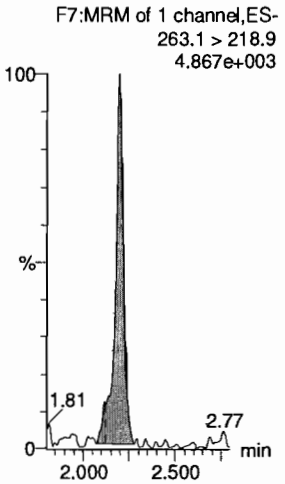
PFPrS



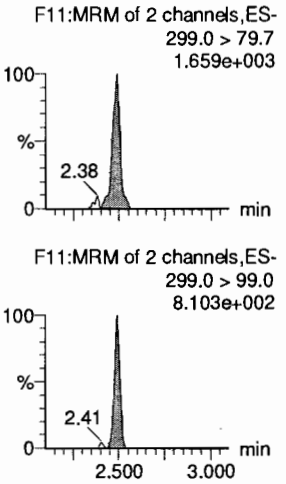
3:3 FTCA



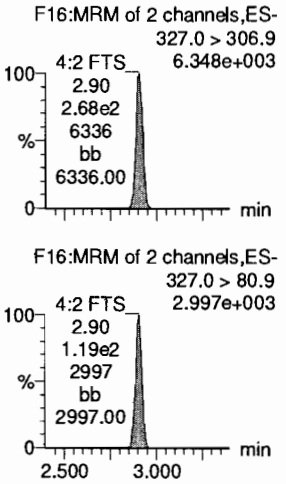
PFPeA



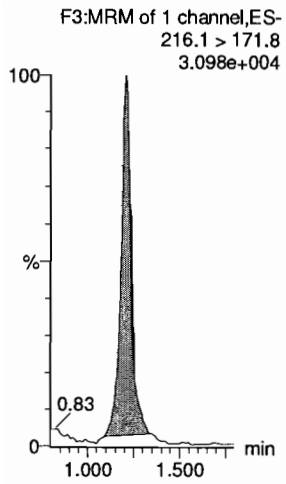
PFBS



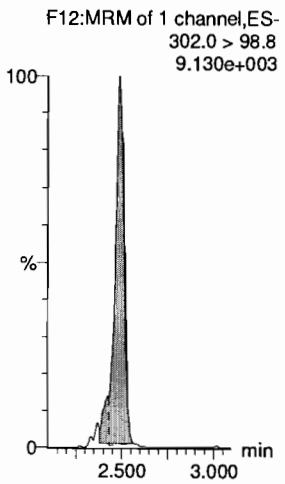
4:2 FTS



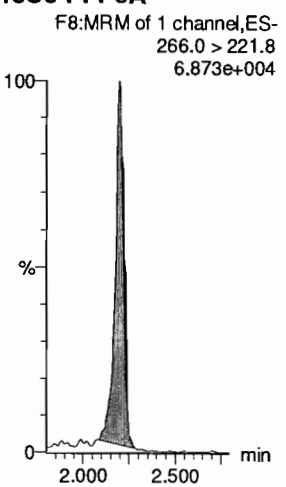
13C3-PFBA



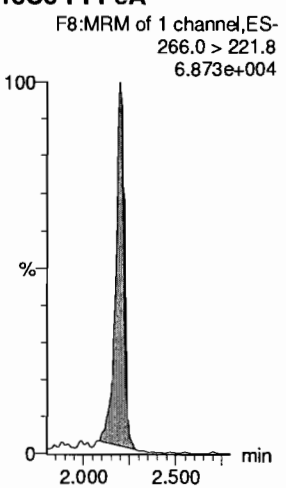
13C3-PFBS



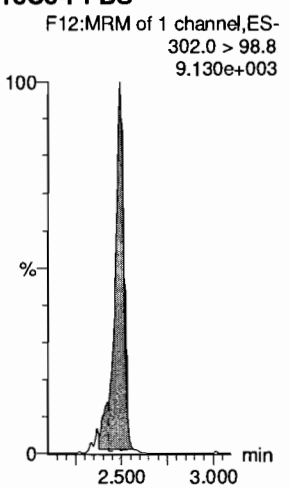
13C3-PFPeA



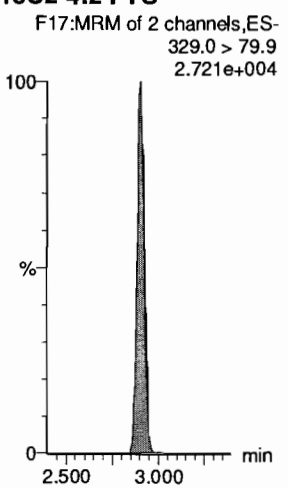
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

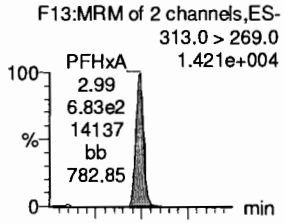


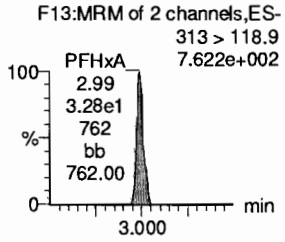
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

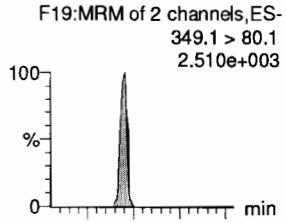
Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

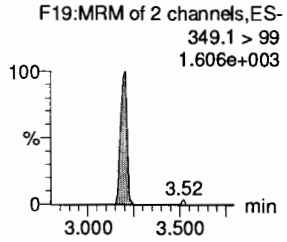
PFHxA



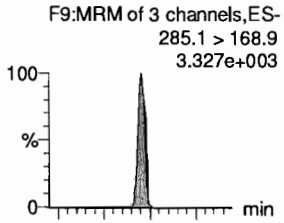


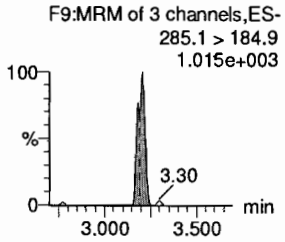
PFPeS



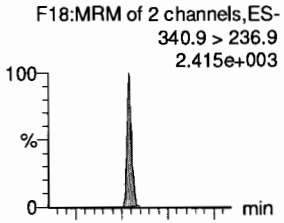


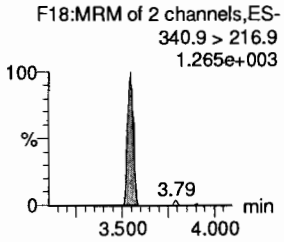
HFPO-DA



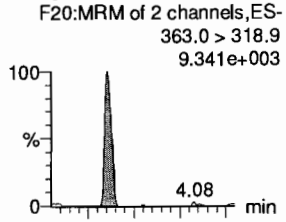


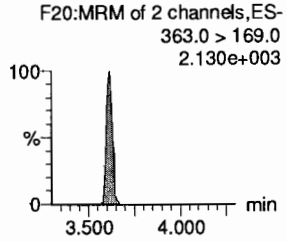
5:3 FTCA



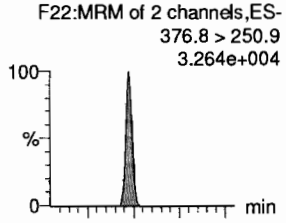


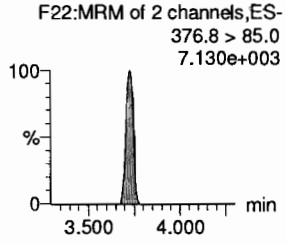
PFHpA



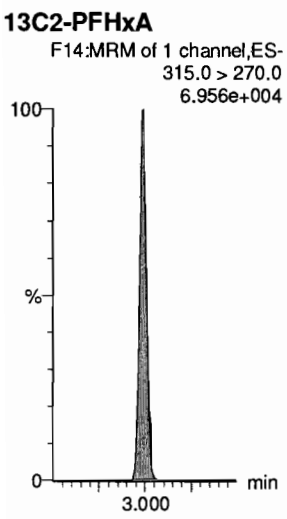


ADONA

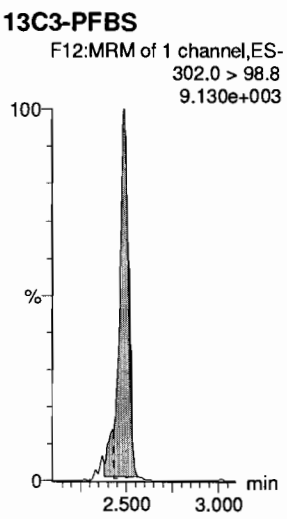




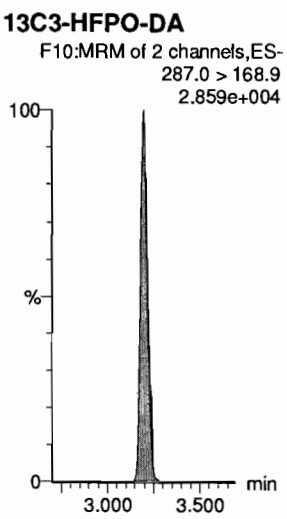
13C2-PFHxA



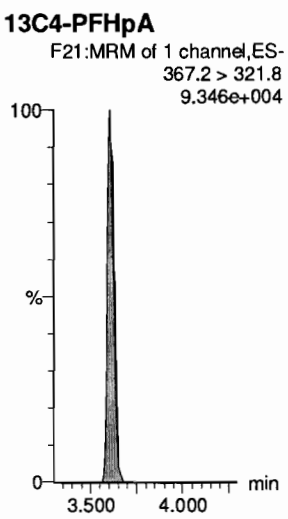
13C3-PFBS



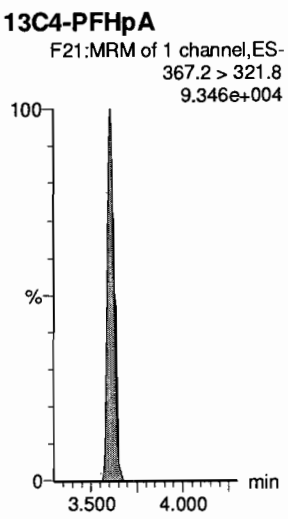
13C3-HFPO-DA



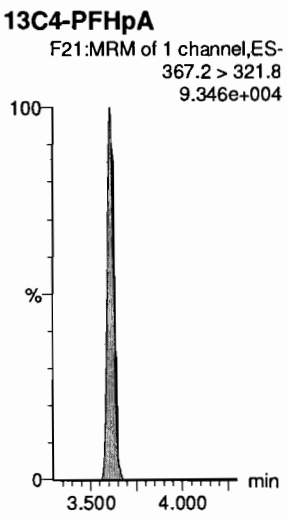
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA

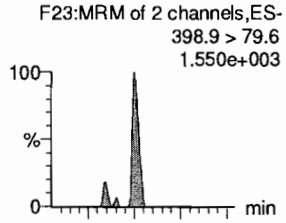


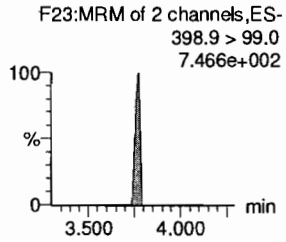
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

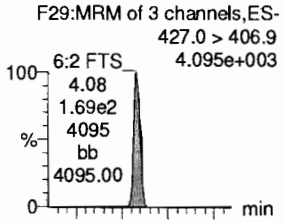
Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

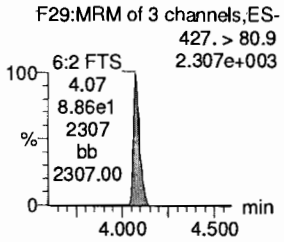
L-PFHxS



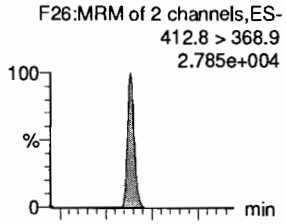


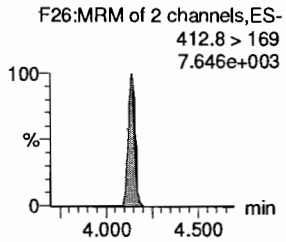
6:2 FTS



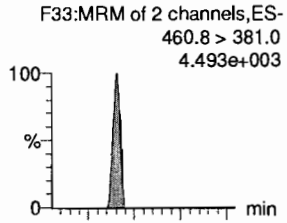


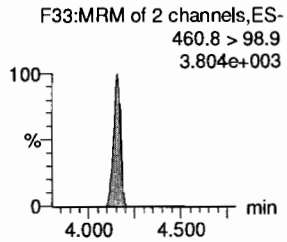
L-PFOA



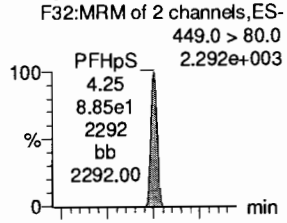


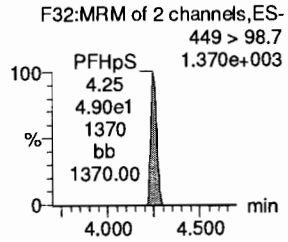
PFEChS



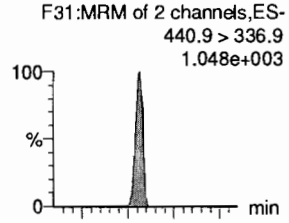


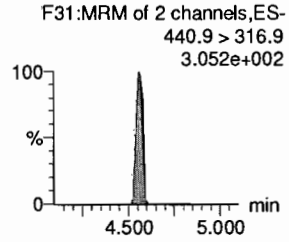
PFHpS



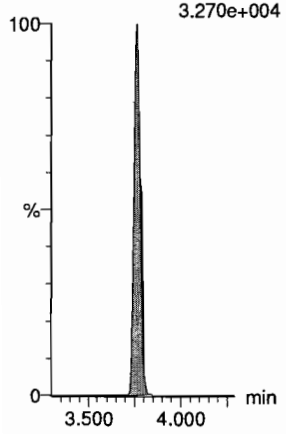


7:3 FTCA

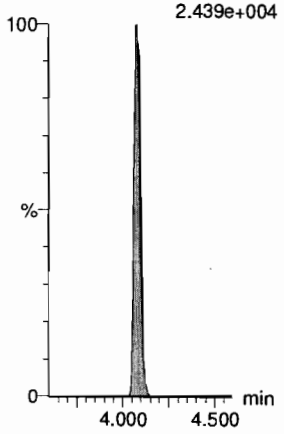




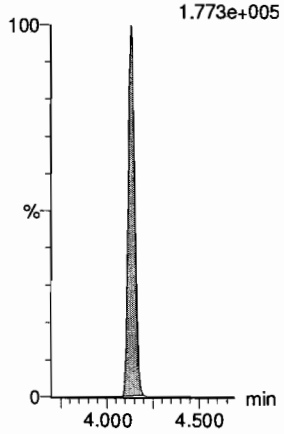
13C3-PFHxS



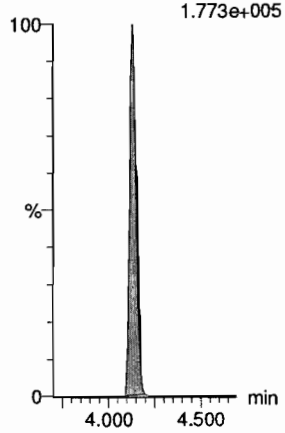
13C2-6:2 FTS



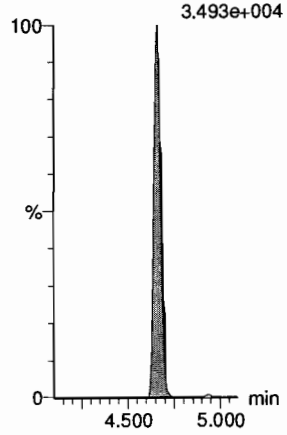
13C2-PFOA



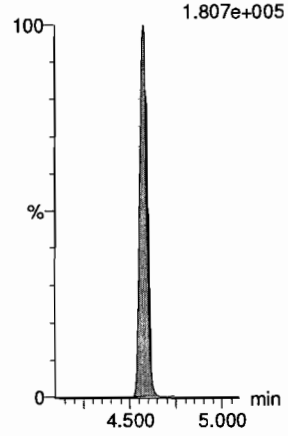
13C2-PFOA



13C8-PFOS



13C5-PFNA

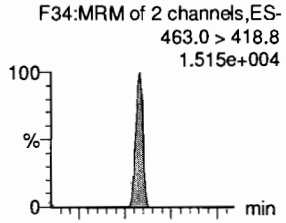


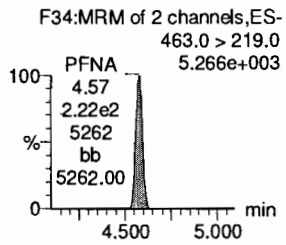
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

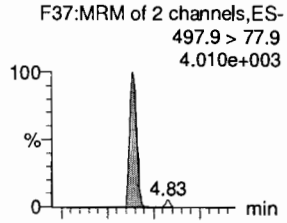
Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

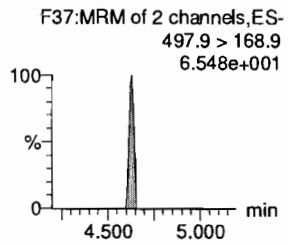
PFNA



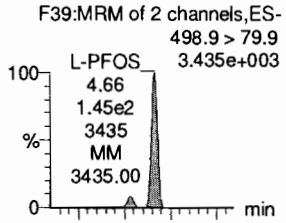


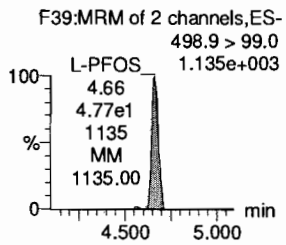
PFOSA



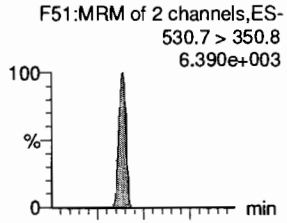


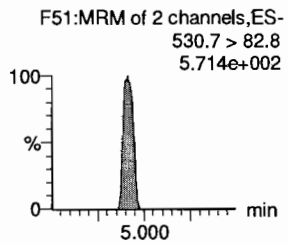
L-PFOS



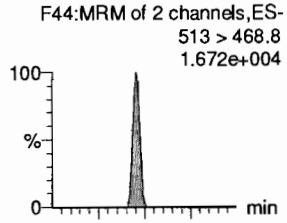


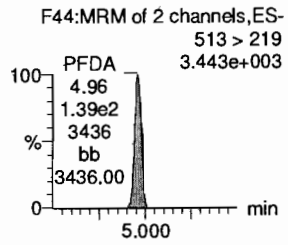
9Cl-PF30NS



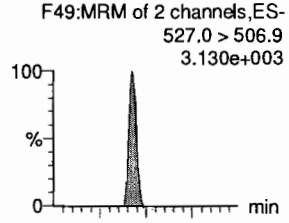


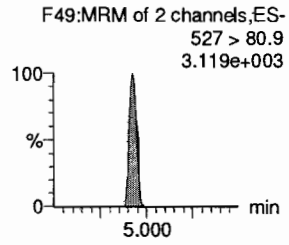
PFDA



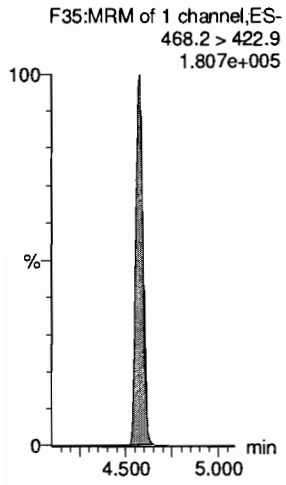


8:2 FTS

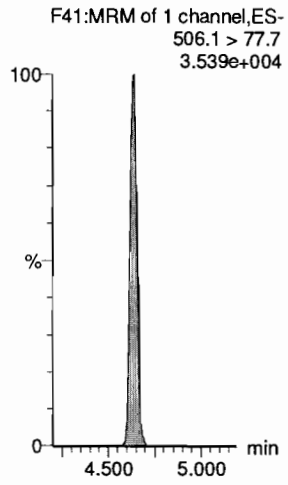




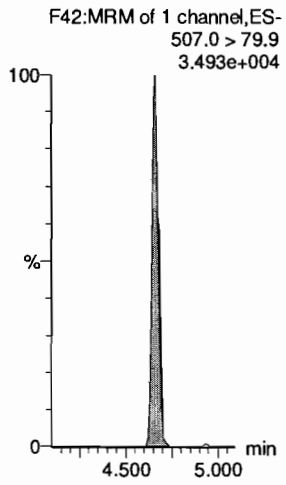
13C5-PFNA



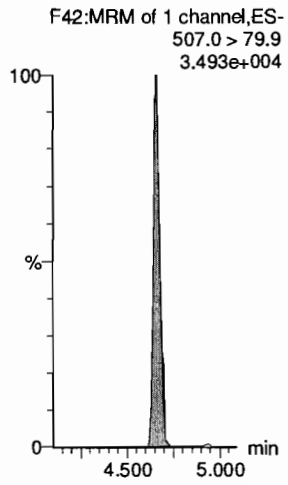
13C8-PFOSA



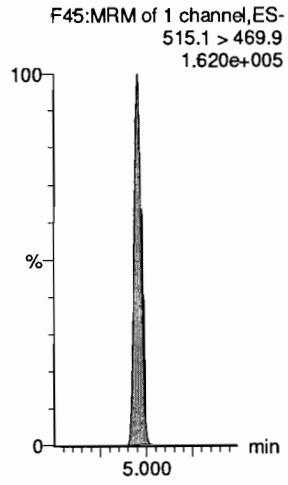
13C8-PFOS



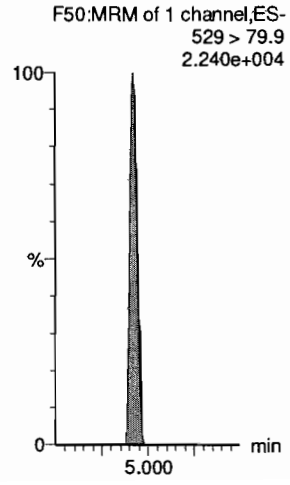
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

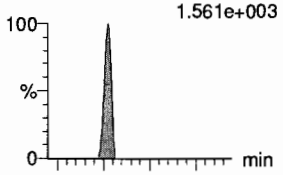


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

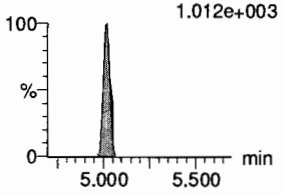
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

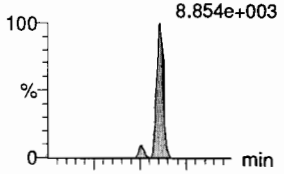
PFNS
F53:MRM of 2 channels,ES-
549.1 > 80.1
1.561e+003



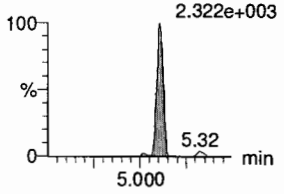
F53:MRM of 2 channels,ES-
549.1 > 99.1
1.012e+003



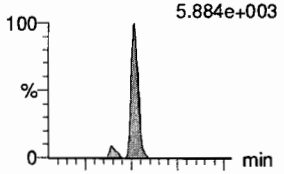
L-MeFOSAA
F56:MRM of 2 channels,ES-
570 > 419
8.854e+003



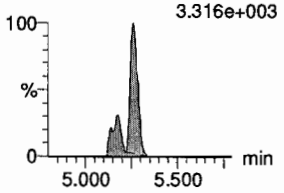
F56:MRM of 2 channels,ES-
570. > 512
2.322e+003



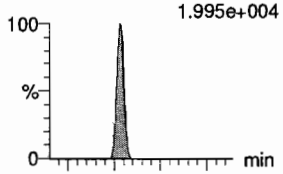
L-EtFOSAA
F59:MRM of 2 channels,ES-
584.1 > 419
5.884e+003



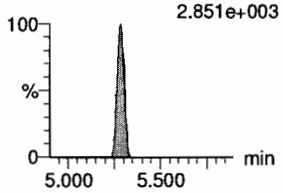
F59:MRM of 2 channels,ES-
584.1 > 526
3.316e+003



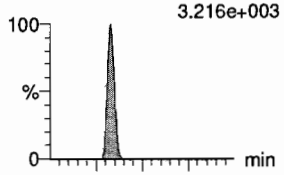
PFUdA
F54:MRM of 2 channels,ES-
563.0 > 518.9
1.995e+004



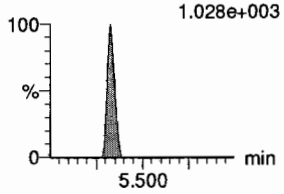
F54:MRM of 2 channels,ES-
563.0 > 269
2.851e+003



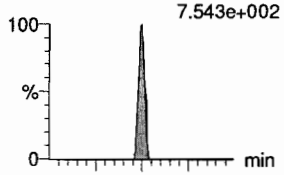
PFDS
F61:MRM of 2 channels,ES-
598.8 > 79.9
3.216e+003



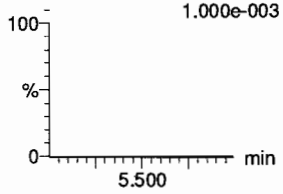
F61:MRM of 2 channels,ES-
598.8 > 98.9
1.028e+003



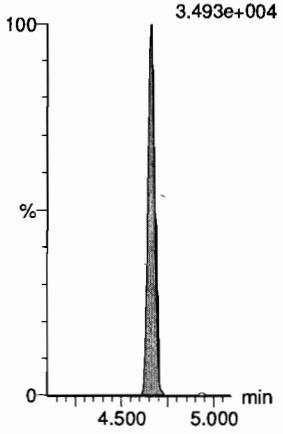
11Cl-PF30UdS
F68:MRM of 2 channels,ES-
632.6 > 452.7
7.543e+002



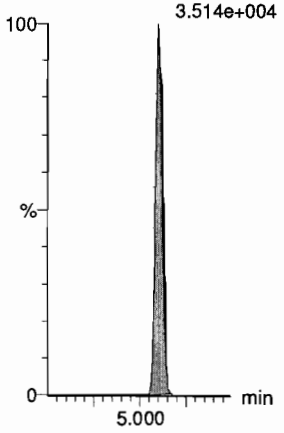
F68:MRM of 2 channels,ES-
632.6 > 450.7
1.000e-003



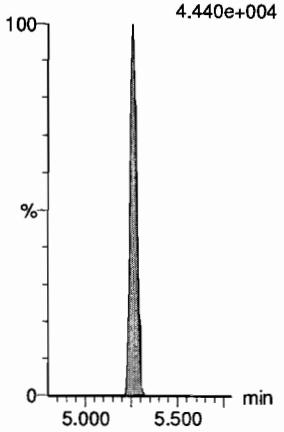
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.493e+004



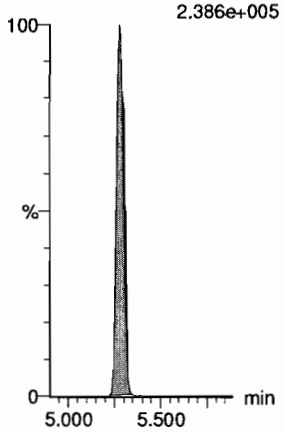
d3-N-MeFOSAA
F58:MRM of 1 channel,ES-
573.3 > 419
3.514e+004



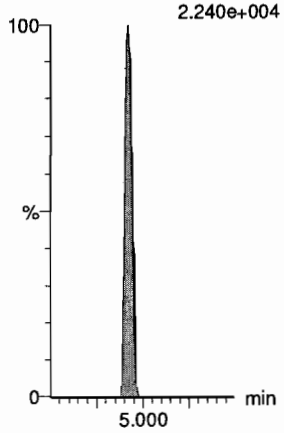
d5-N-EtFOSAA
F60:MRM of 1 channel,ES-
589.3 > 419
4.440e+004



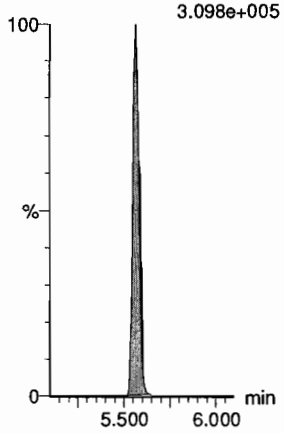
13C2-PFUdA
F55:MRM of 1 channel,ES-
565 > 519.8
2.386e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.240e+004



13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.098e+005

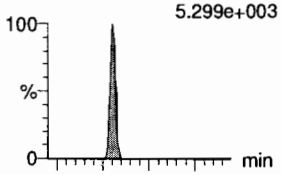


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

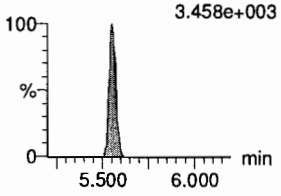
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

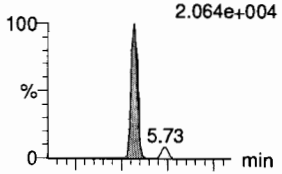
10:2 FTS
F66:MRM of 2 channels,ES-
627.0 > 606.9
5.299e+003



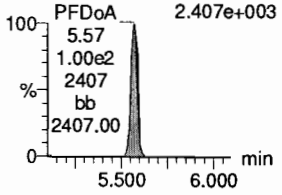
F66:MRM of 2 channels,ES-
627.0 > 80.9
3.458e+003



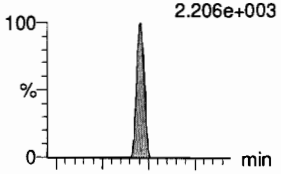
PFDoA
F62:MRM of 4 channels,ES-
612.9 > 569.0
2.064e+004



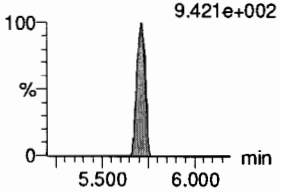
F62:MRM of 4 channels,ES-
612.9 > 318.8
2.407e+003



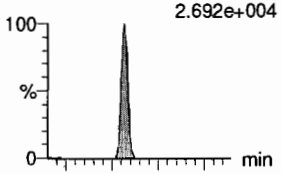
N-MeFOSA
F43:MRM of 2 channels,ES-
512.1 > 168.9
2.206e+003



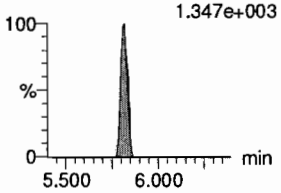
F43:MRM of 2 channels,ES-
512.1 > 219
9.421e+002



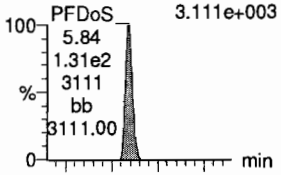
PFTrDA
F70:MRM of 2 channels,ES-
662.9 > 618.9
2.692e+004



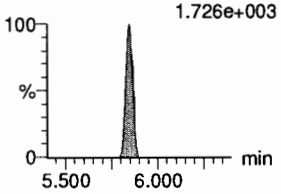
F70:MRM of 2 channels,ES-
662.9 > 319
1.347e+003



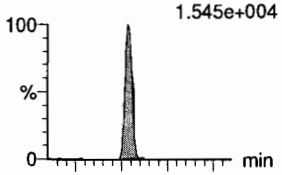
PFDoS
F71:MRM of 2 channels,ES-
698.8 > 79.9
3.111e+003



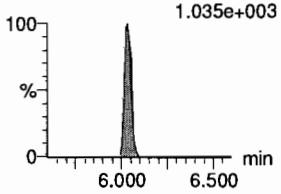
F71:MRM of 2 channels,ES-
698.8 > 98.9
1.726e+003



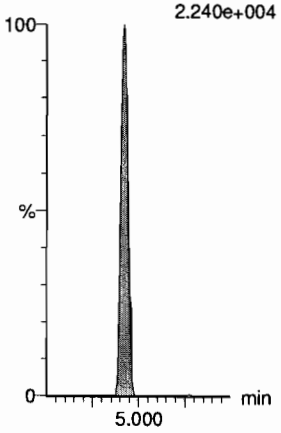
PFTeDA
F72:MRM of 2 channels,ES-
713.0 > 669.0
1.545e+004



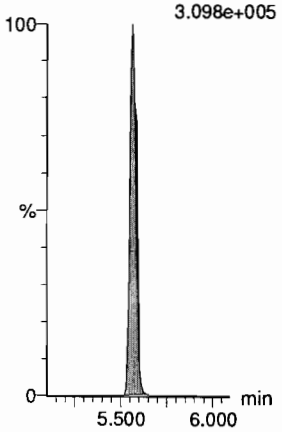
F72:MRM of 2 channels,ES-
713. > 369.0
1.035e+003



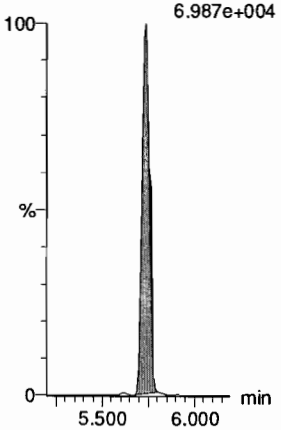
13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.240e+004



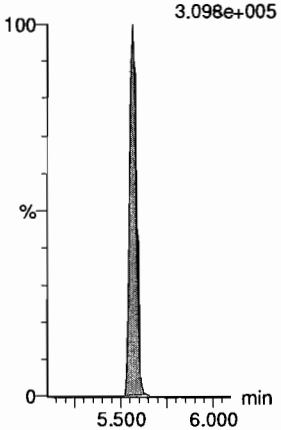
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.098e+005



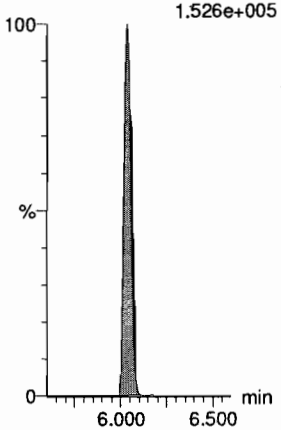
d3-N-MeFOSA
F46:MRM of 1 channel,ES-
515.2 > 168.9
6.987e+004



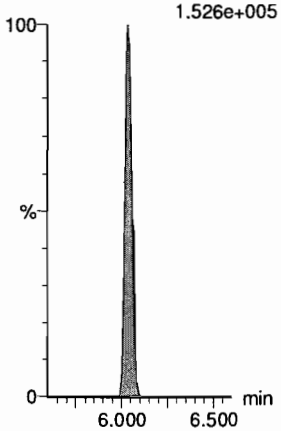
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.098e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.526e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.526e+005

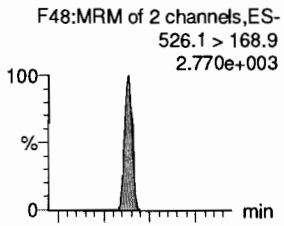


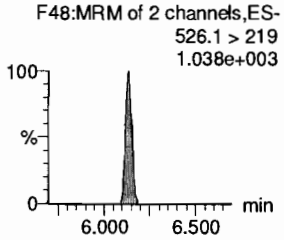
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

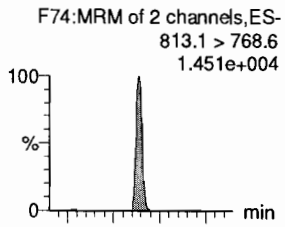
Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

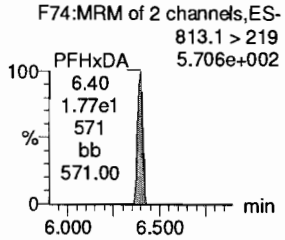
N-EtFOSA



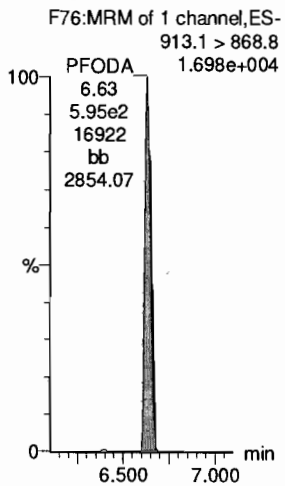


PFHxDA

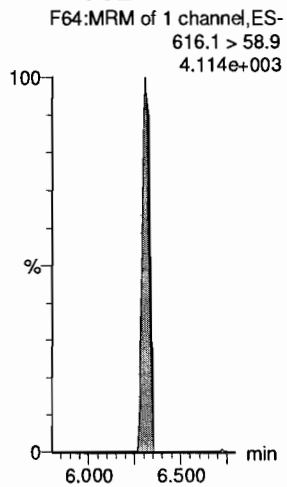




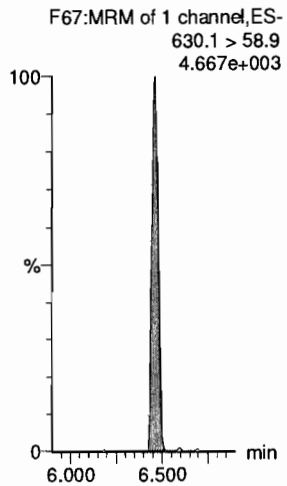
PFODA



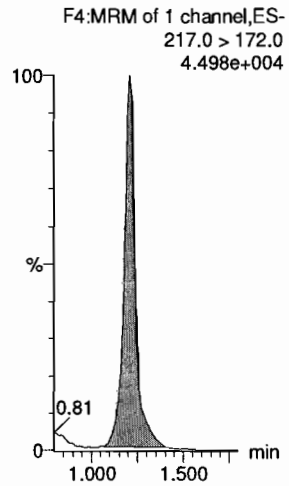
N-MeFOSE



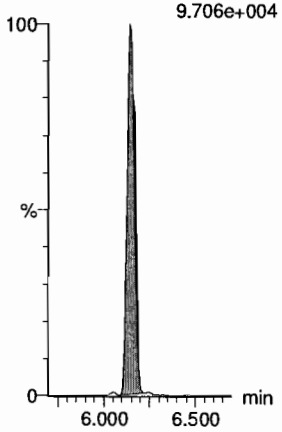
N-EtFOSE



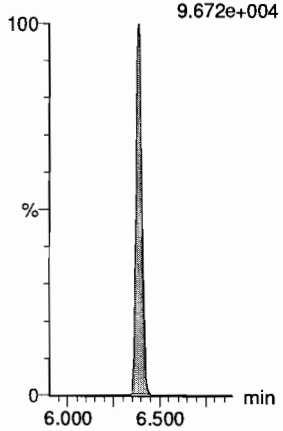
13C4-PFBA



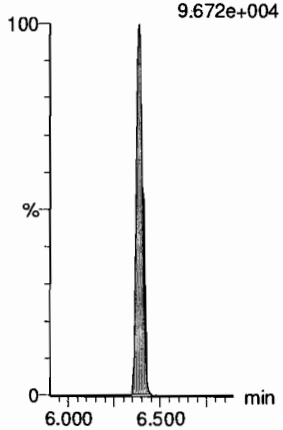
d5-N-ETFOSA



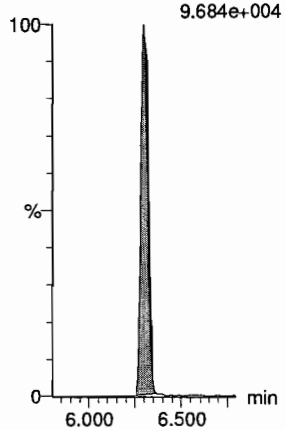
13C2-PFHxDA



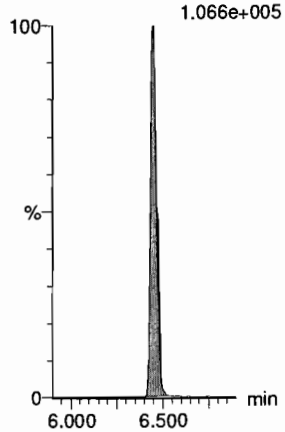
13C2-PFHxDA



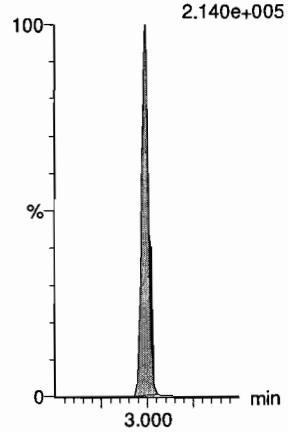
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

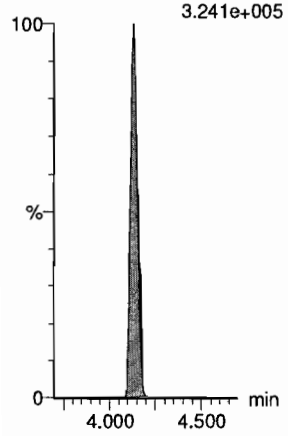


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

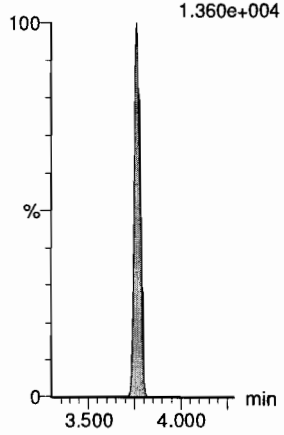
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_8, Date: 10-Jul-2019, Time: 14:04:59, ID: ST190710M2-3 PFC CS0 19G0803, Description: PFC CS0 19G0803

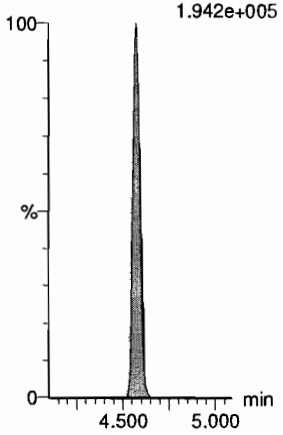
13C8-PFOA



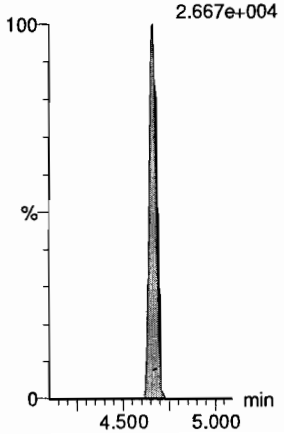
18O2-PFHxS



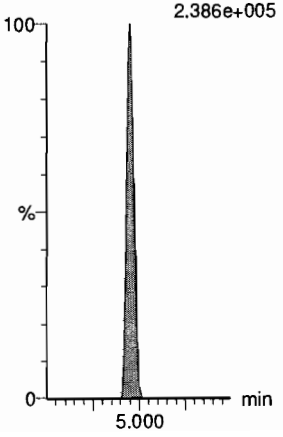
13C9-PFNA



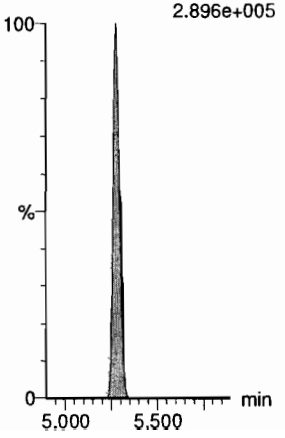
13C4-PFOS



13C6-PFDA



13C7-PFUdA

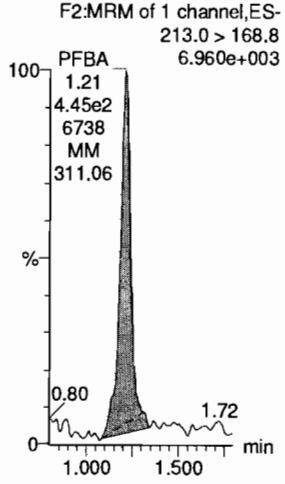


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

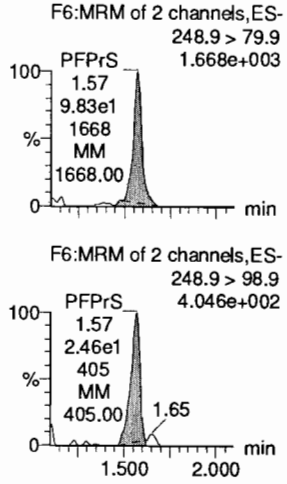
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

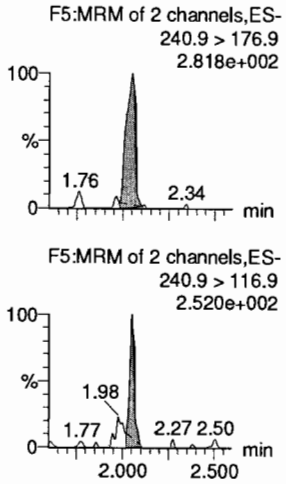
PFBA



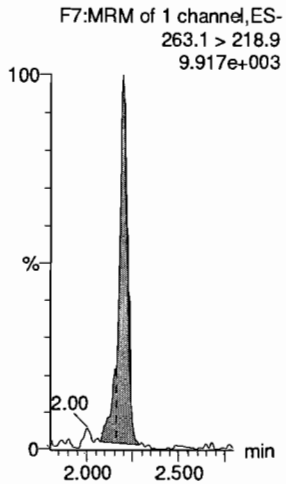
PFPrS



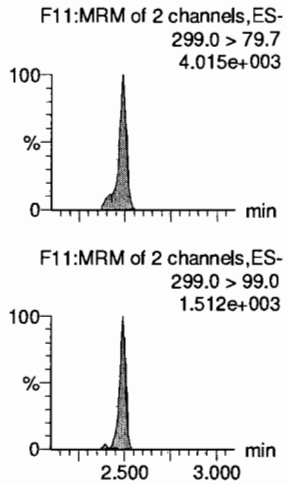
3:3 FTCA



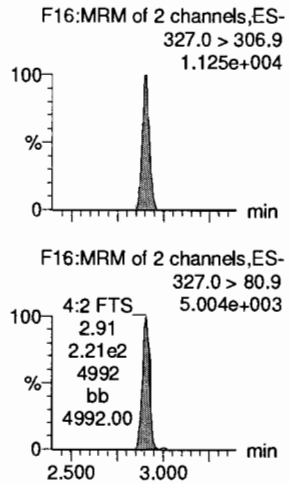
PFPeA



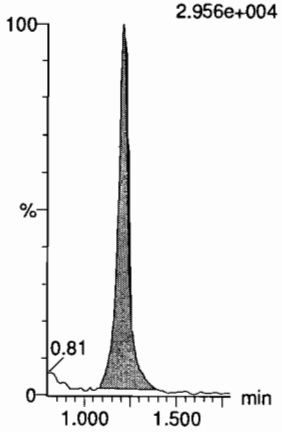
PFBS



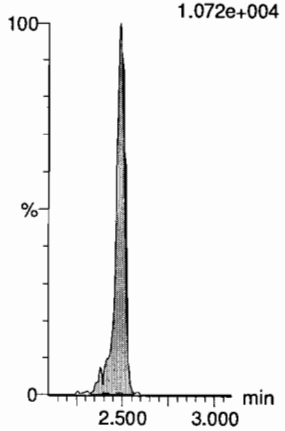
4:2 FTS



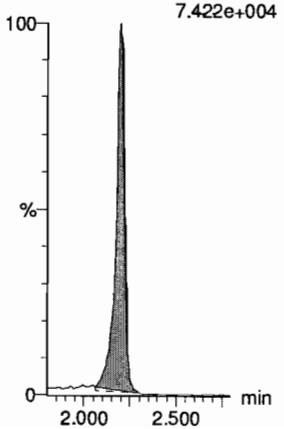
13C3-PFBA



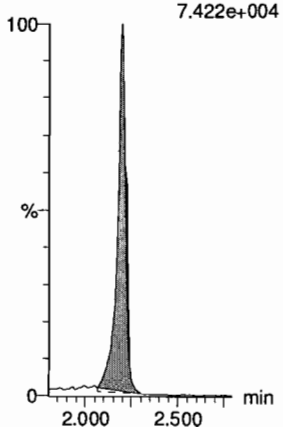
13C3-PFBS



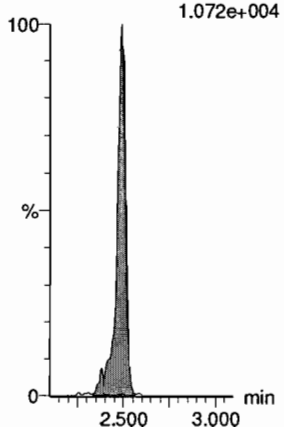
13C3-PFPeA



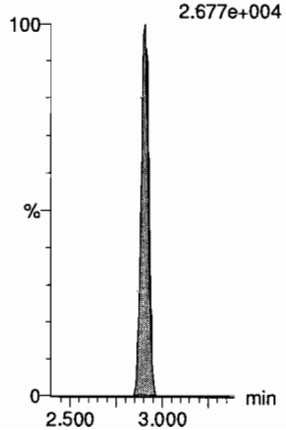
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

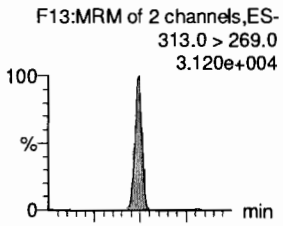


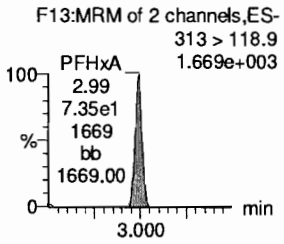
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

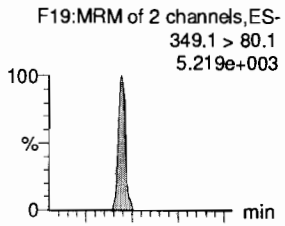
Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

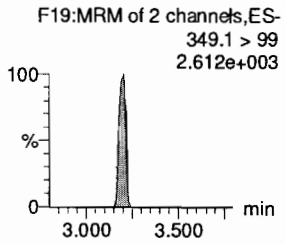
PFHxA



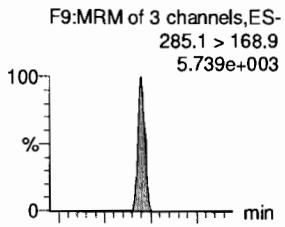


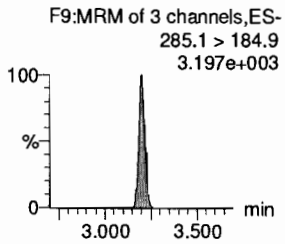
PFPeS



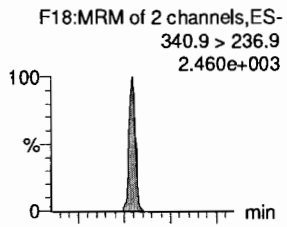


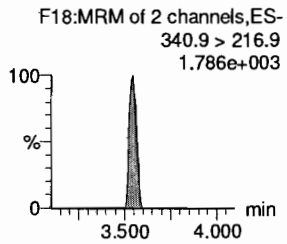
HFPO-DA



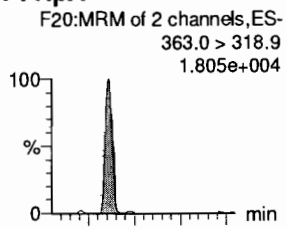


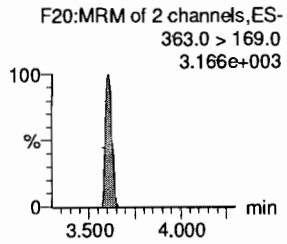
5:3 FTCA





PFHpA





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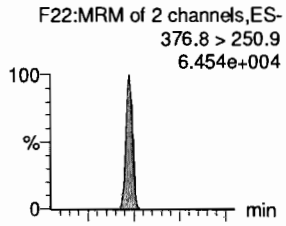
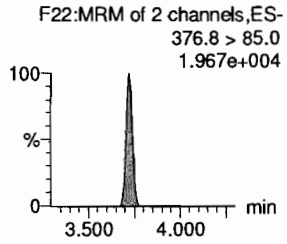
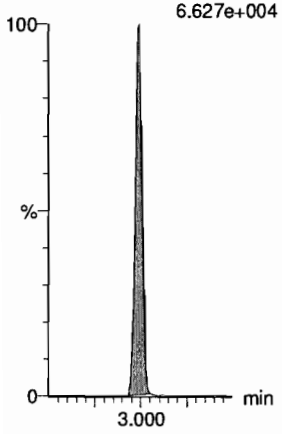
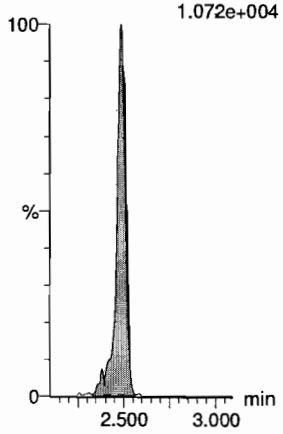




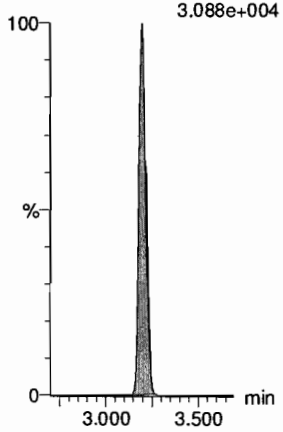
13C2-PFHxA



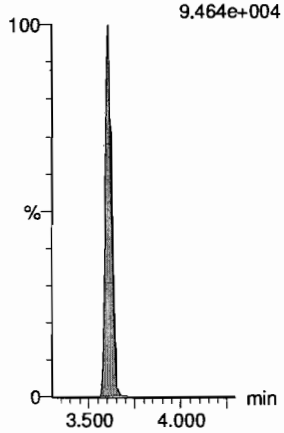
13C3-PFBS



13C3-HFPO-DA



13C4-PFHpA



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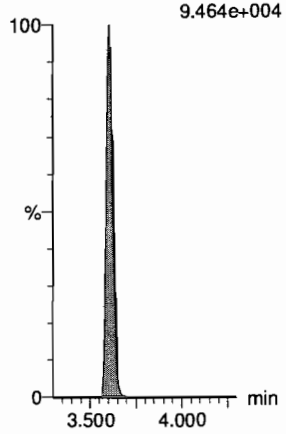

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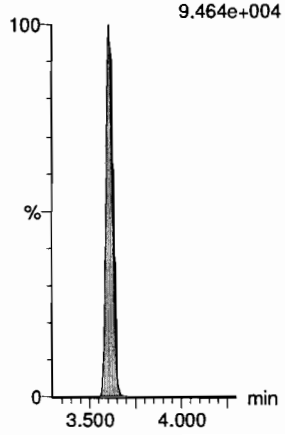
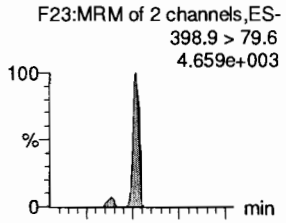


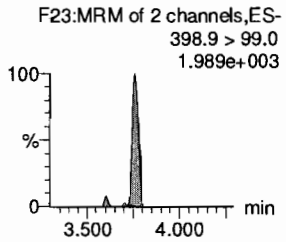
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

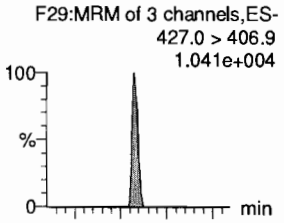
Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

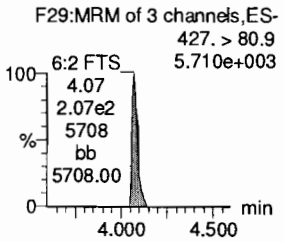
L-PFHxS



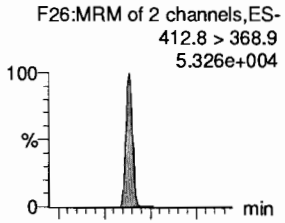


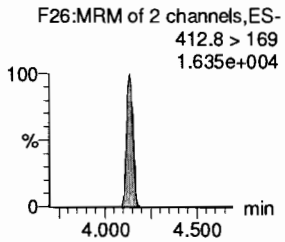
6:2 FTS





L-PFOA





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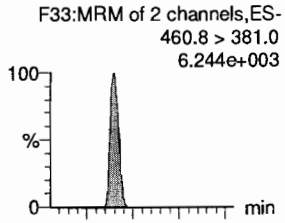

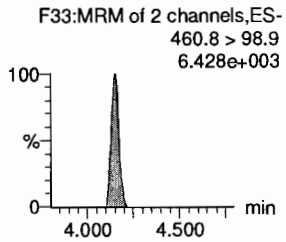

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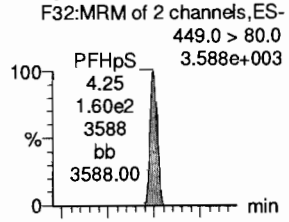
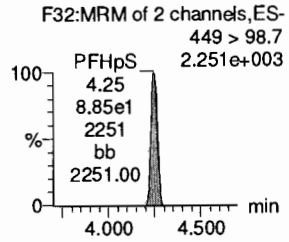
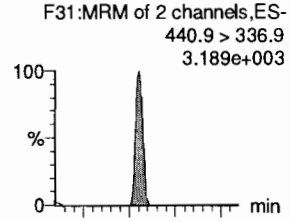
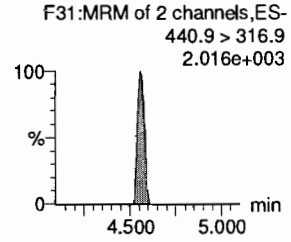


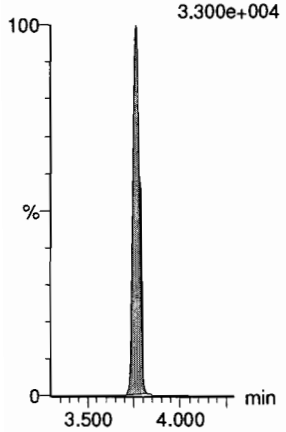


7:3 FTCA

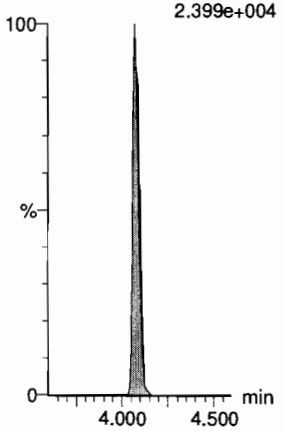




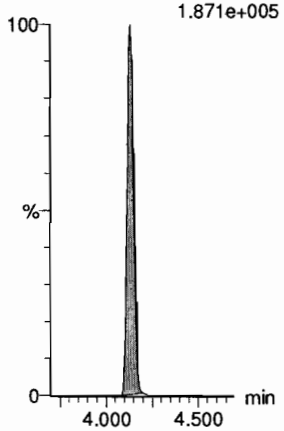
13C3-PFHxS



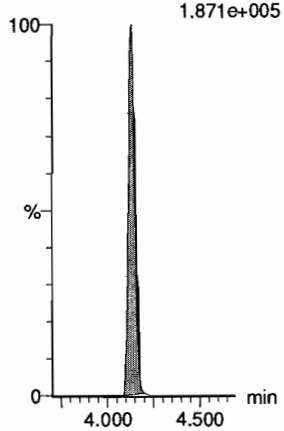
13C2-6:2 FTS



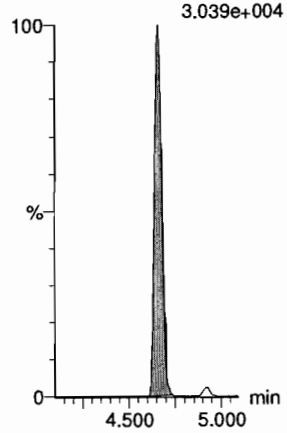
13C2-PFOA



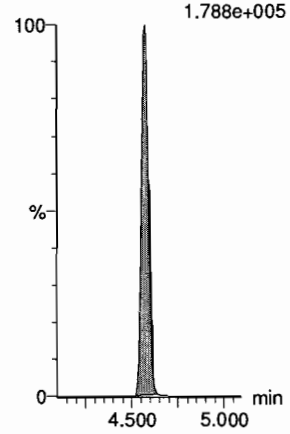
13C2-PFOA



13C8-PFOS



13C5-PFNA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

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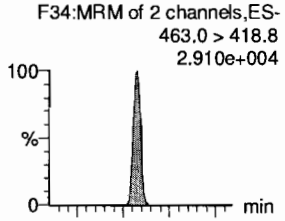
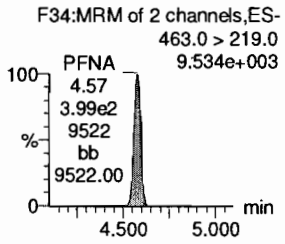
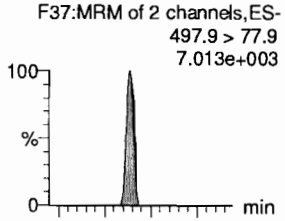
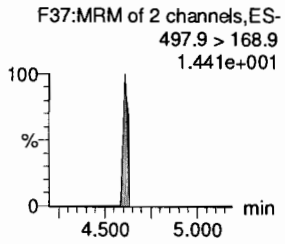


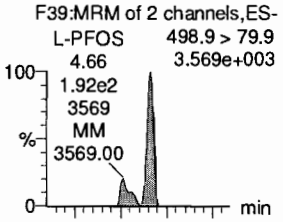


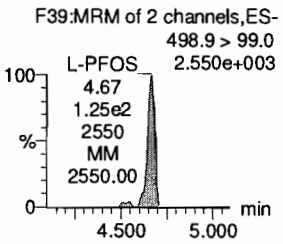
PFOSA



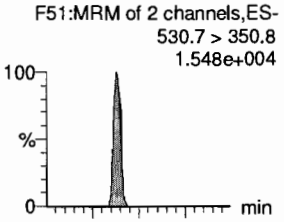


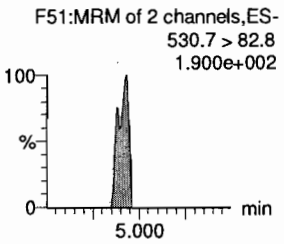
L-PFOS





9Cl-PF30NS





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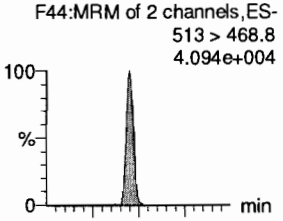
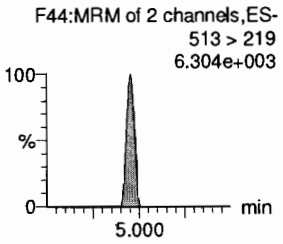
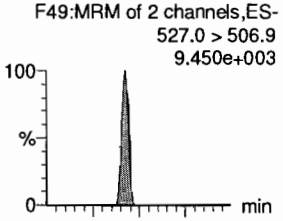
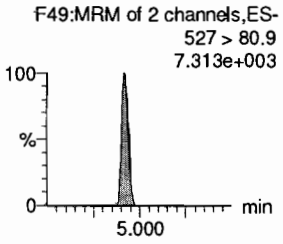


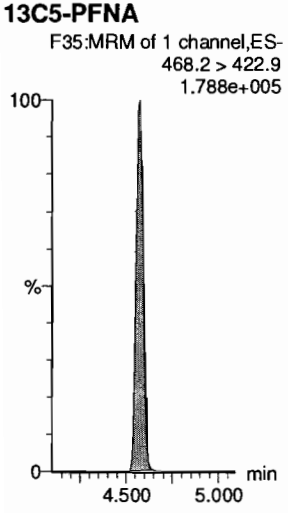


8:2 FTS

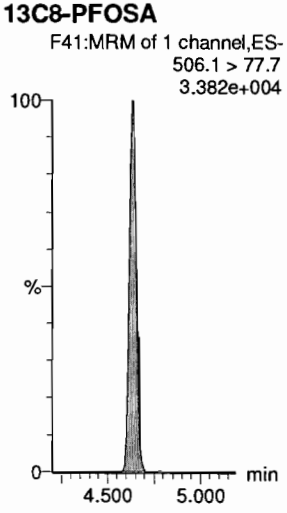




13C5-PFNA



13C8-PFOSA



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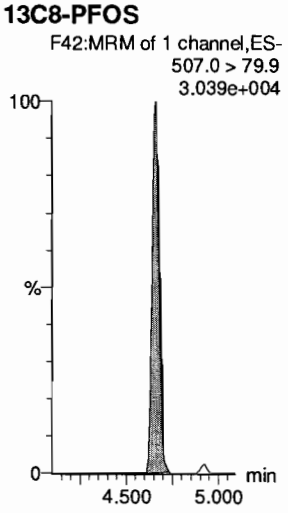

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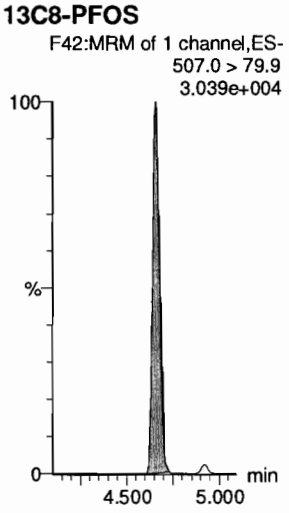
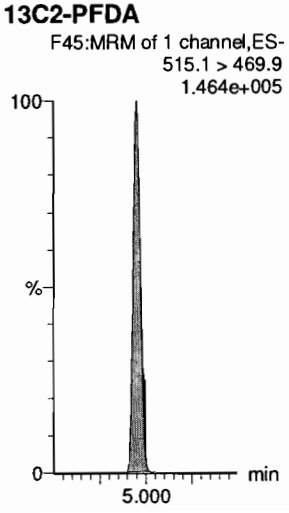
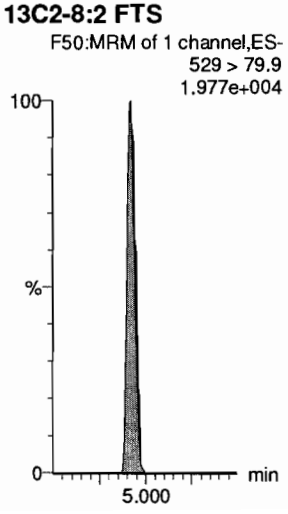


13C2-PFDA



13C2-8:2 FTS

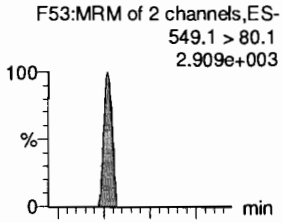


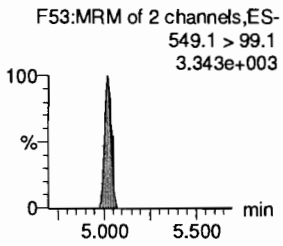
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

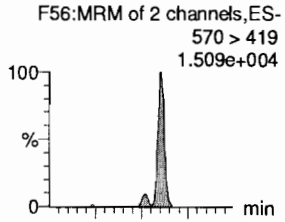
Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

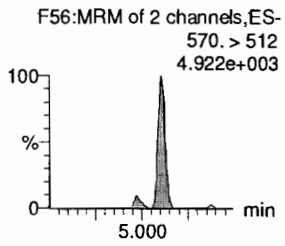
PFNS





L-MeFOSAA





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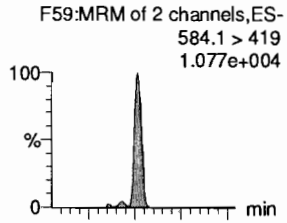
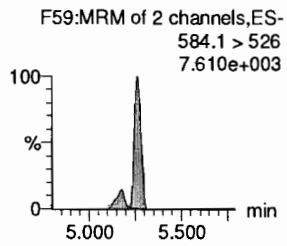
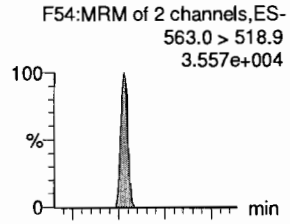
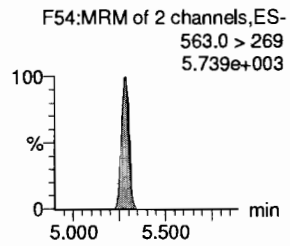


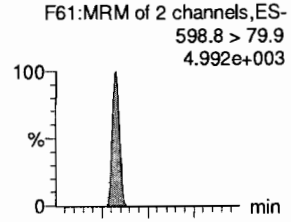


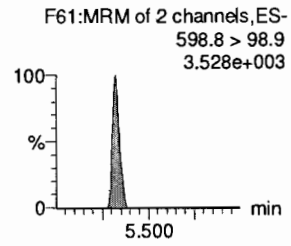
PFUdA



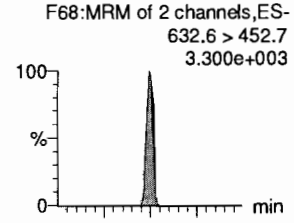


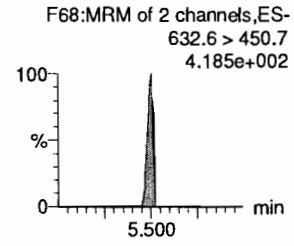
PFDS



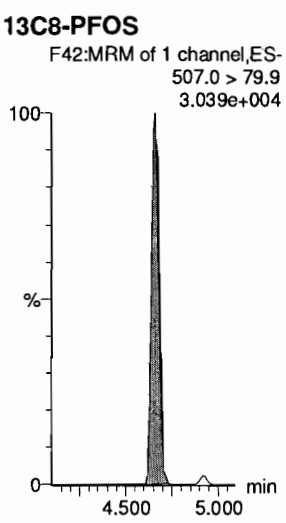


11Cl-PF30UdS

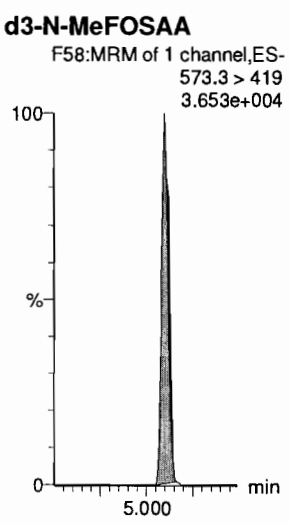




13C8-PFOS



d3-N-MeFOSAA



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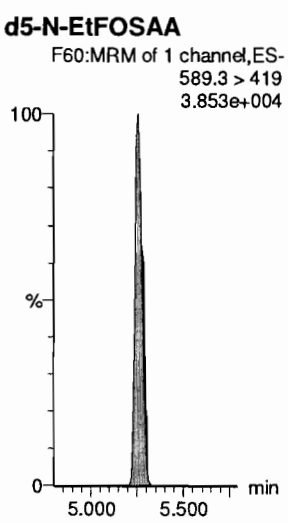
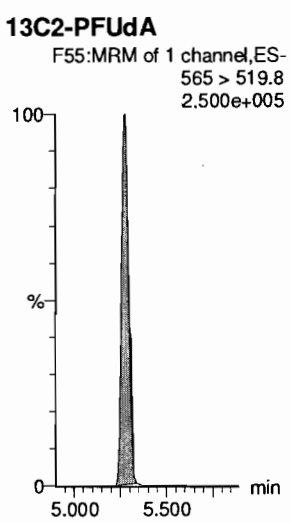
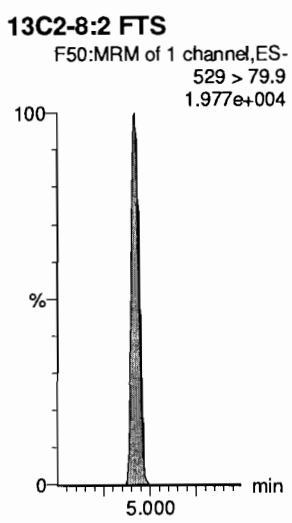


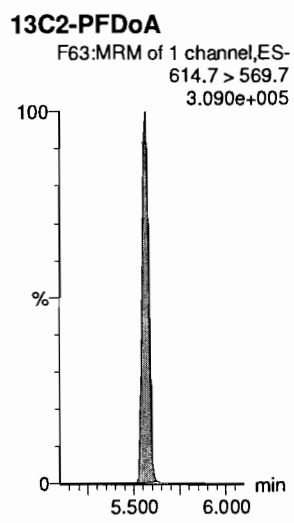
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA

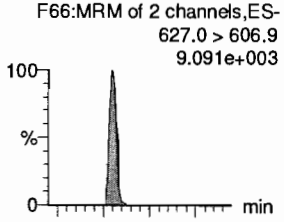


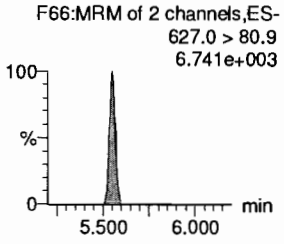
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

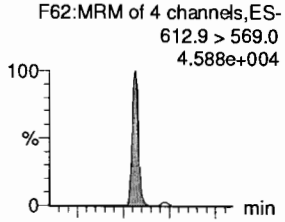
Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

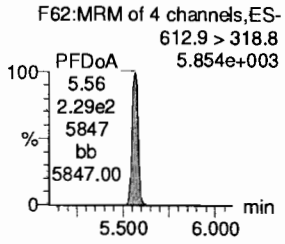
10:2 FTS



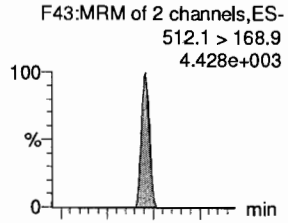


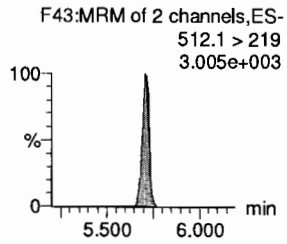
PFDoA



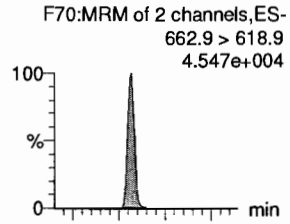


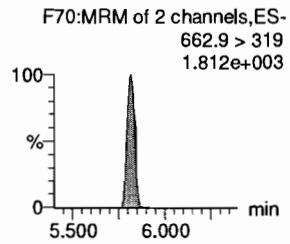
N-MeFOSA



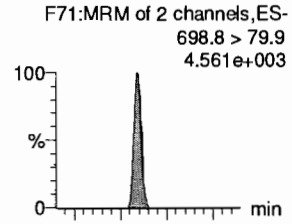


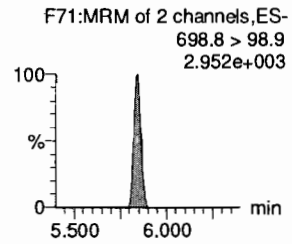
PFTrDA



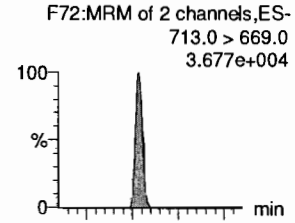


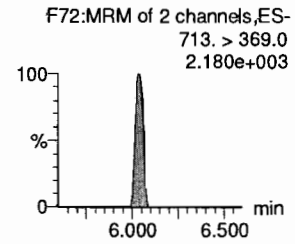
PFDoS



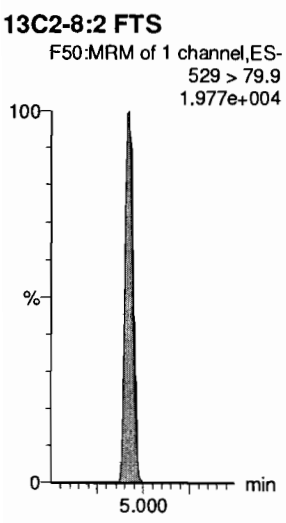


PFTeDA

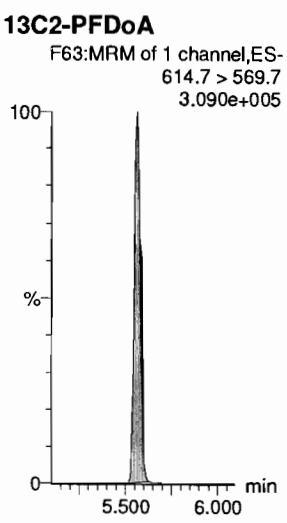




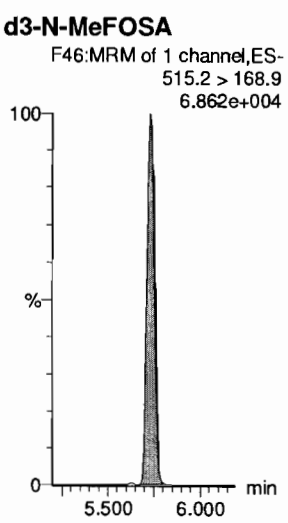
13C2-8:2 FTS



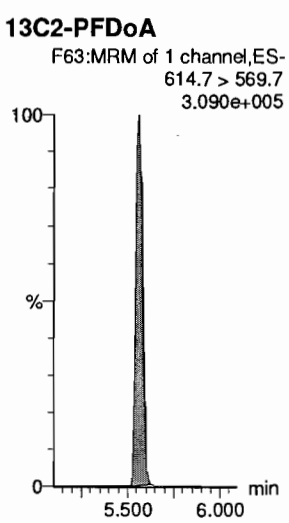
13C2-PFDoA



d3-N-MeFOSA



13C2-PFDoA



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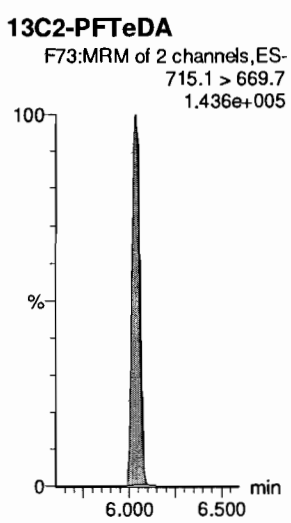
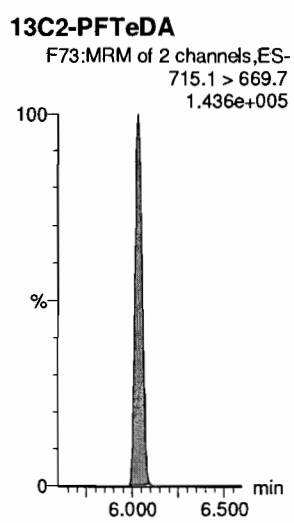


13C2-PFTeDA

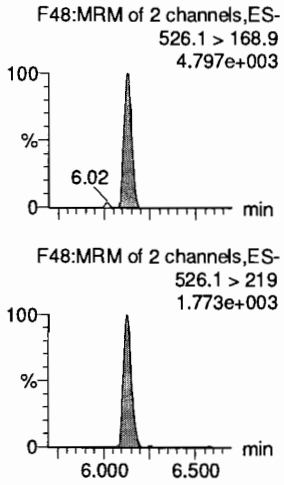


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

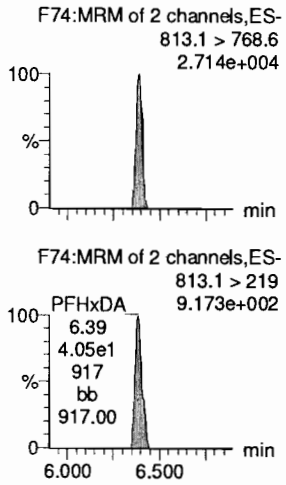
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

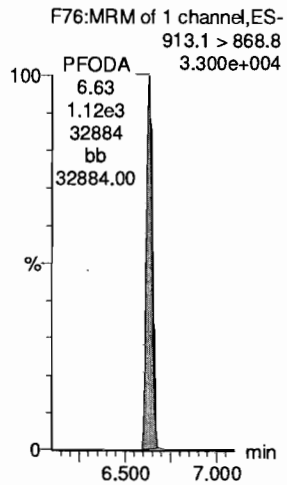
N-EtFOSA



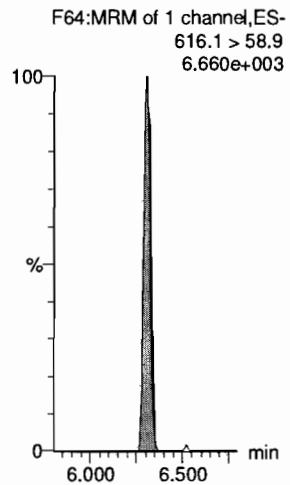
PFHxDA



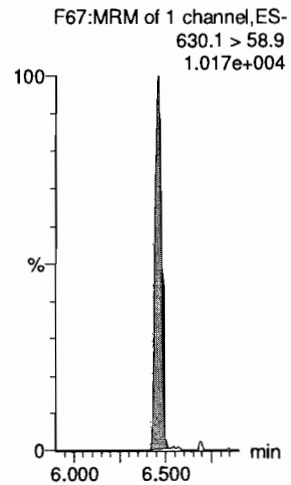
PFODA



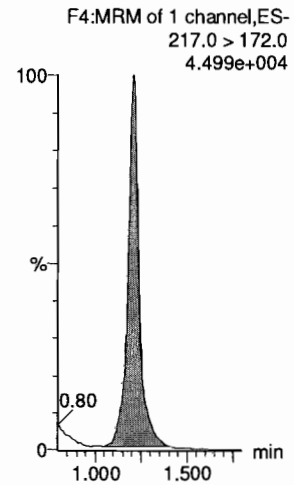
N-MeFOSE



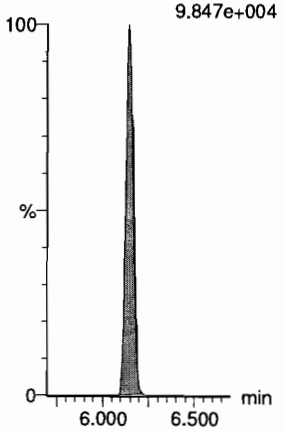
N-EtFOSE



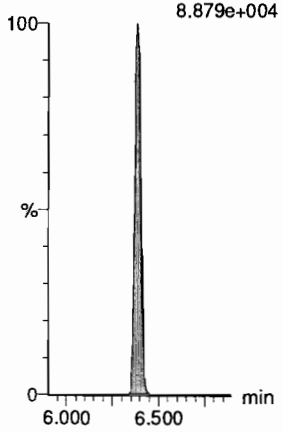
13C4-PFBA



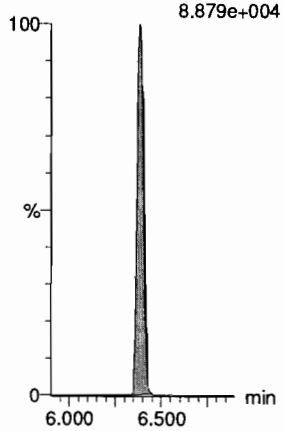
d5-N-ETFOSA



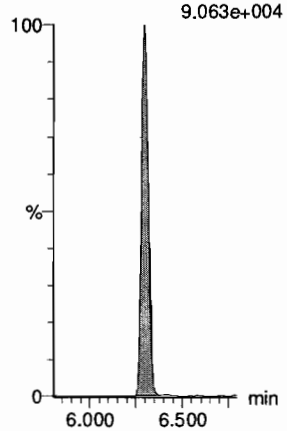
13C2-PFHxDA



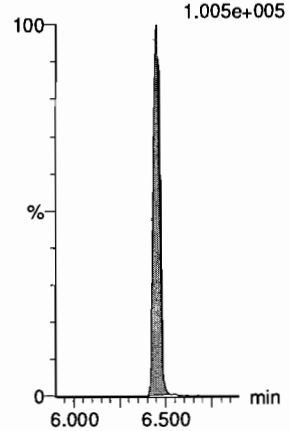
13C2-PFHxDA



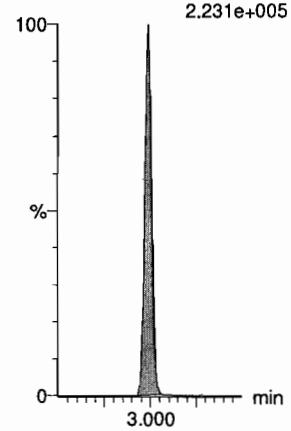
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

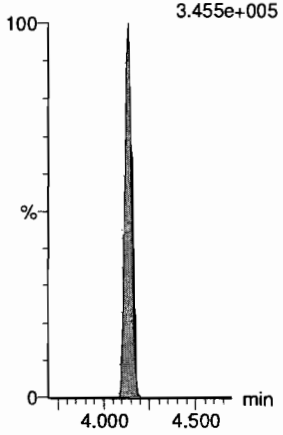


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

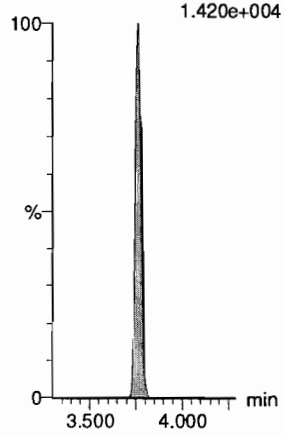
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_9, Date: 10-Jul-2019, Time: 14:15:32, ID: ST190710M2-4 PFC CS1 19G0804, Description: PFC CS1 19G0804

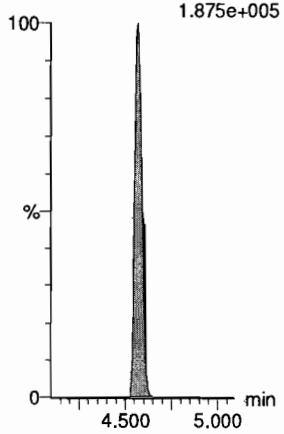
13C8-PFOA



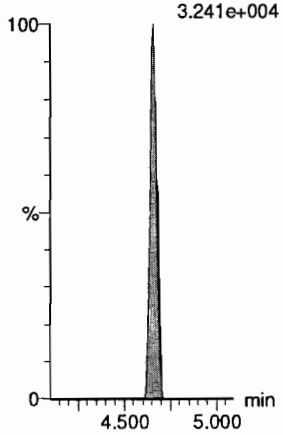
18O2-PFHxS



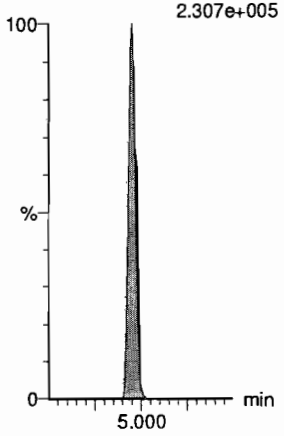
13C9-PFNA



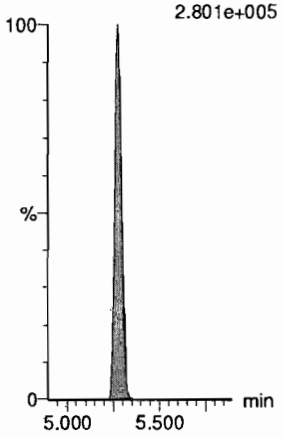
13C4-PFOS



13C6-PFDA



13C7-PFUdA

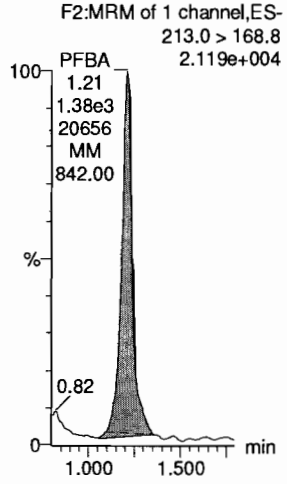


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

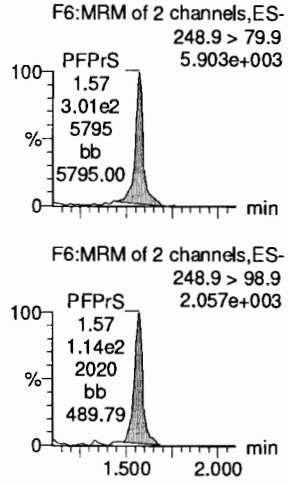
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

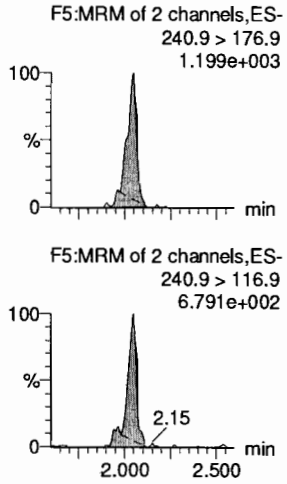
PFBA



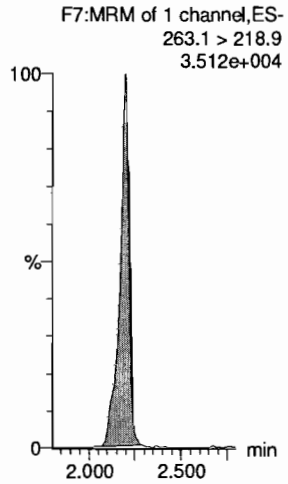
PFPrS



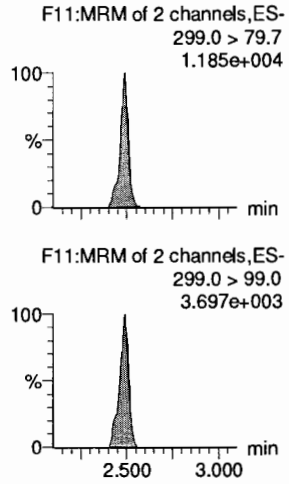
3:3 FTCA



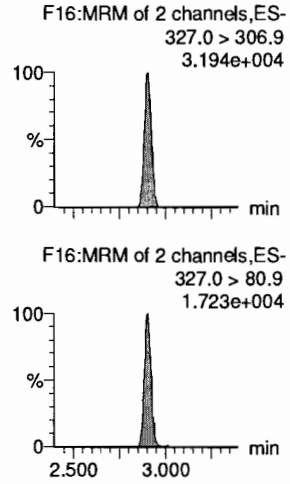
PFPeA



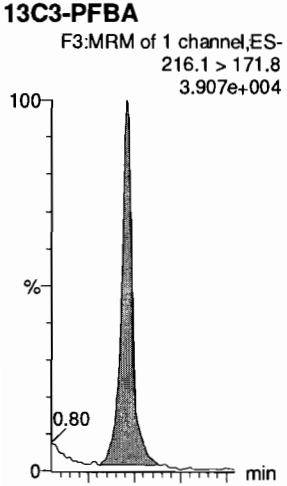
PFBS



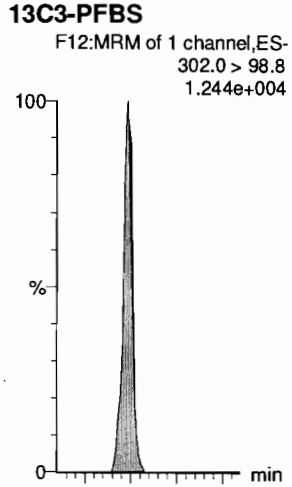
4:2 FTS



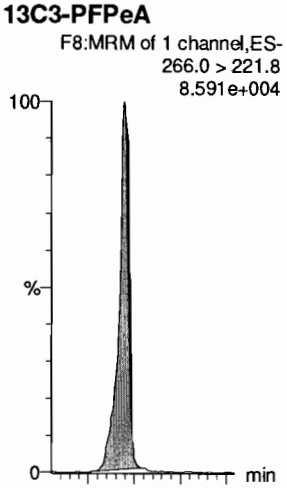
13C3-PFBA



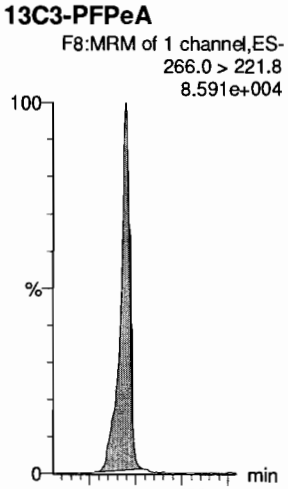
13C3-PFBS



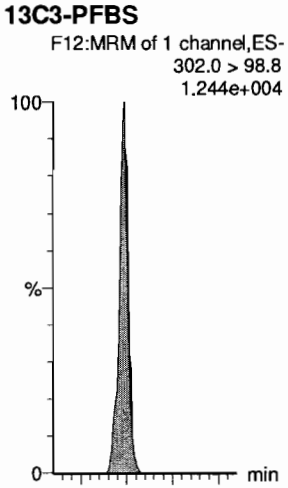
13C3-PFPeA



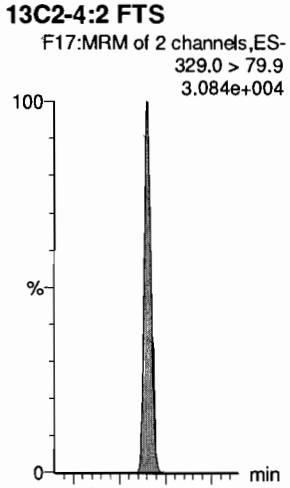
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

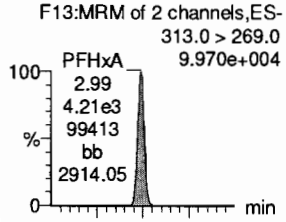


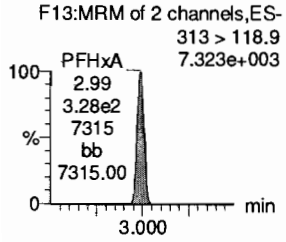
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

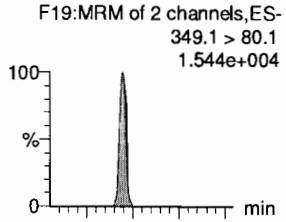
Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

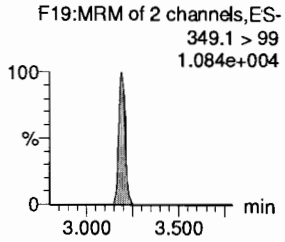
PFHxA



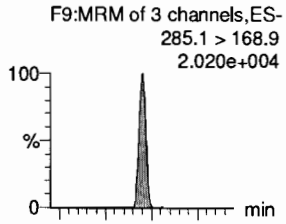


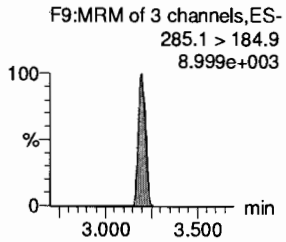
PFPeS



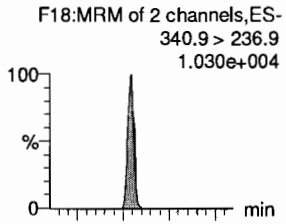


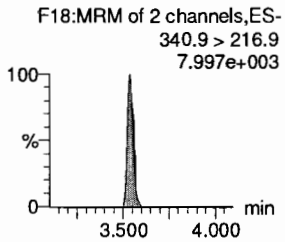
HFPO-DA



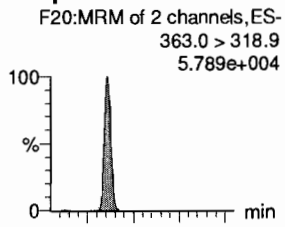


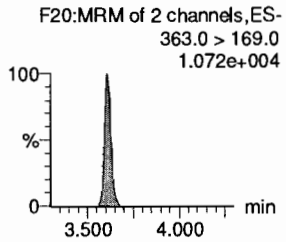
5:3 FTCA



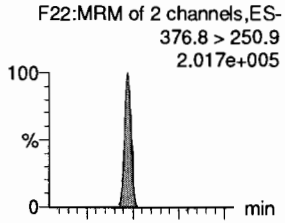


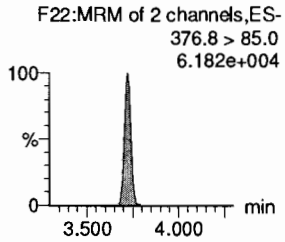
PFHpA



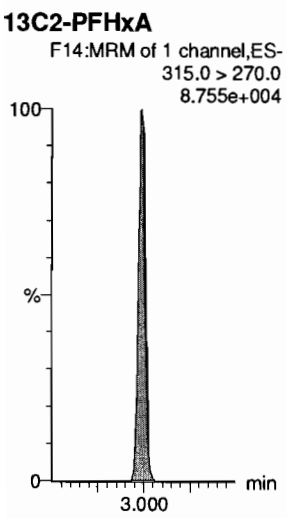


ADONA

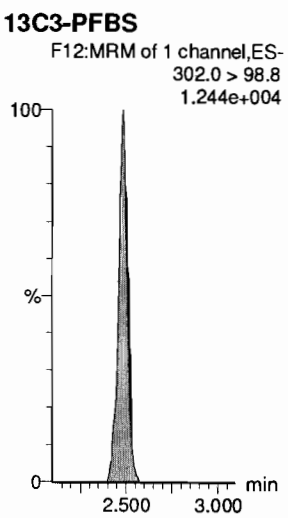




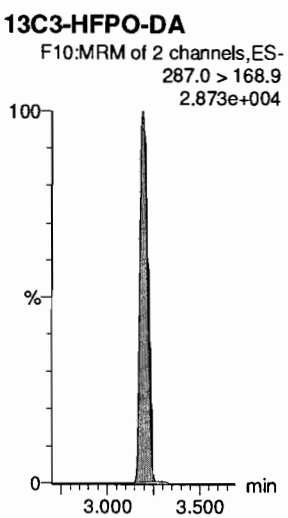
13C2-PFHxA



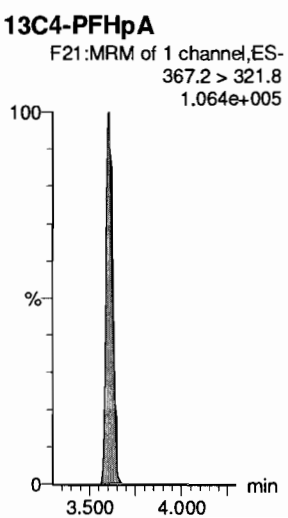
13C3-PFBS



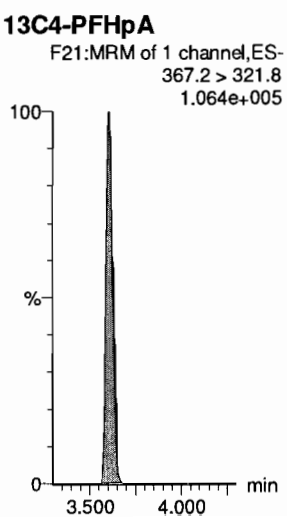
13C3-HFPO-DA



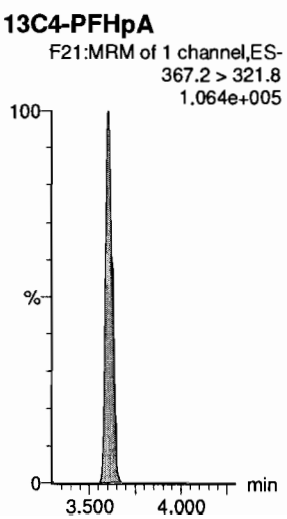
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA

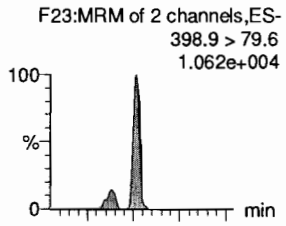


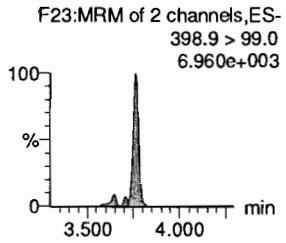
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

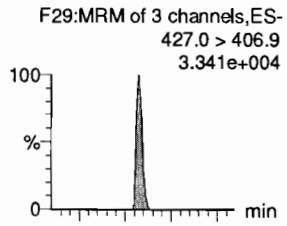
Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

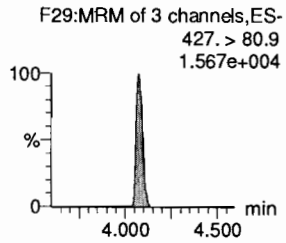
L-PFHxS



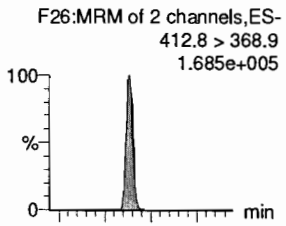


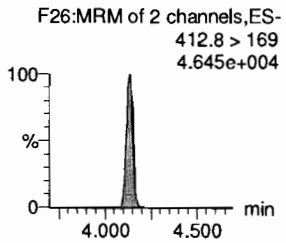
6:2 FTS



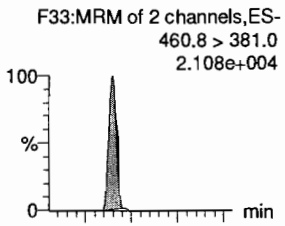


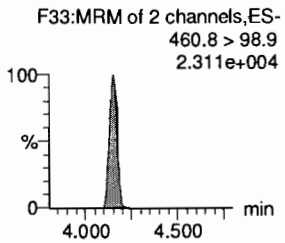
L-PFOA



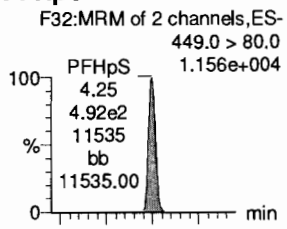


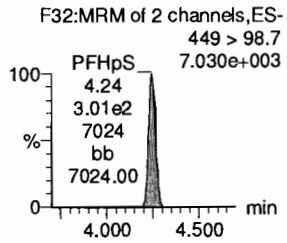
PFEChS



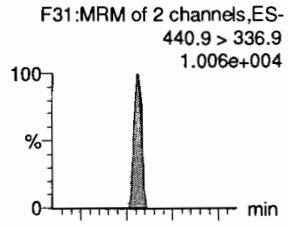


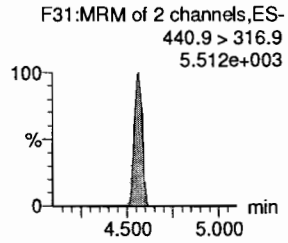
PFHpS



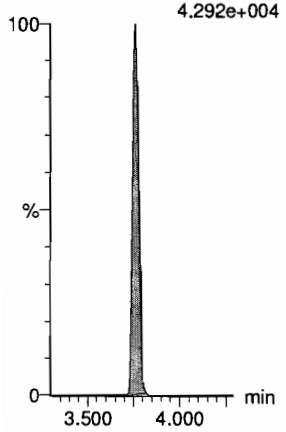


7:3 FTCA

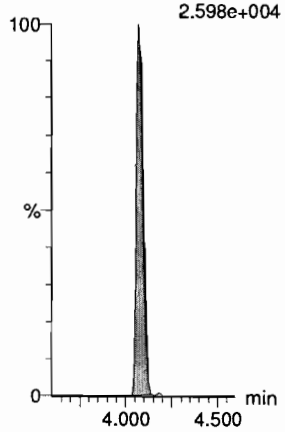




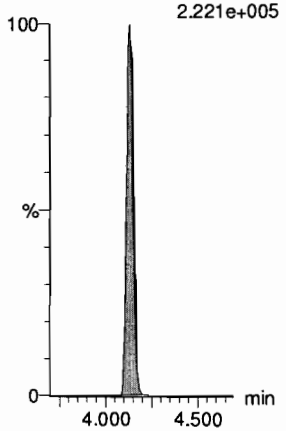
13C3-PFHxS



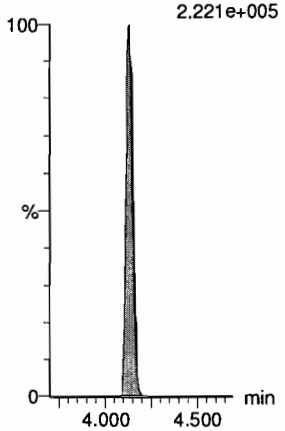
13C2-6:2 FTS



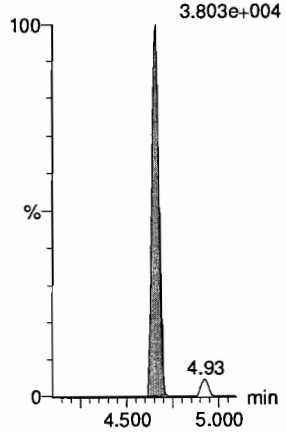
13C2-PFOA



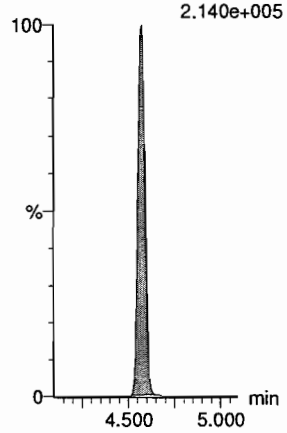
13C2-PFOA



13C8-PFOS



13C5-PFNA

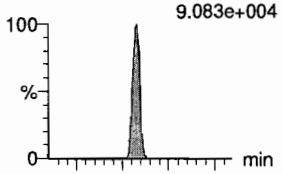


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

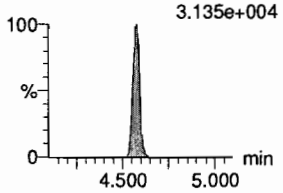
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

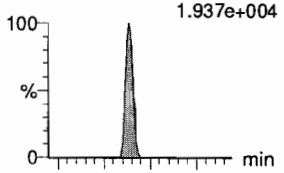
PFNA
F34:MRM of 2 channels,ES-
463.0 > 418.8
9.083e+004



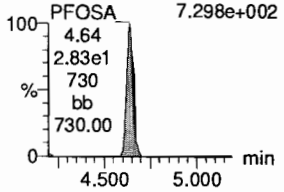
F34:MRM of 2 channels,ES-
463.0 > 219.0
3.135e+004



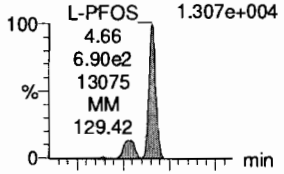
PFOSA
F37:MRM of 2 channels,ES-
497.9 > 77.9
1.937e+004



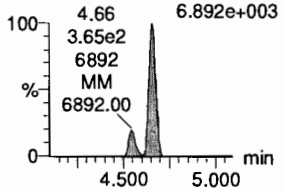
F37:MRM of 2 channels,ES-
497.9 > 168.9
7.298e+002



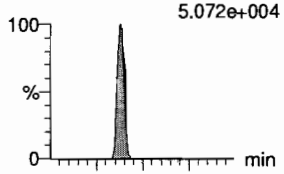
L-PFOS
F39:MRM of 2 channels,ES-
498.9 > 79.9
1.307e+004



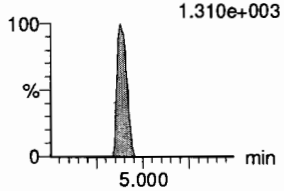
F39:MRM of 2 channels,ES-
498.9 > 99.0
6.892e+003



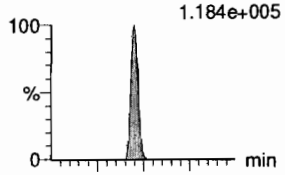
9Cl-PF30NS
F51:MRM of 2 channels,ES-
530.7 > 350.8
5.072e+004



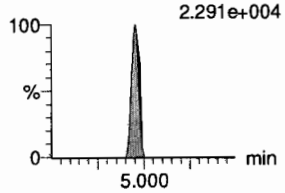
F51:MRM of 2 channels,ES-
530.7 > 82.8
1.310e+003



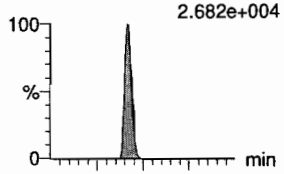
PFDA
F44:MRM of 2 channels,ES-
513 > 468.8
1.184e+005



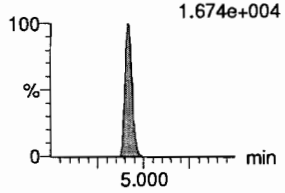
F44:MRM of 2 channels,ES-
513 > 219
2.291e+004



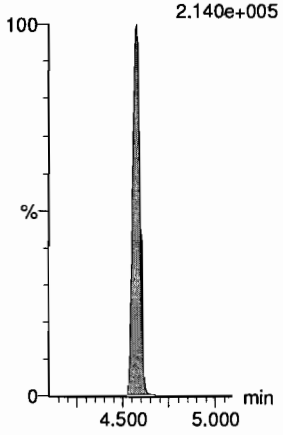
8:2 FTS
F49:MRM of 2 channels,ES-
527.0 > 506.9
2.682e+004



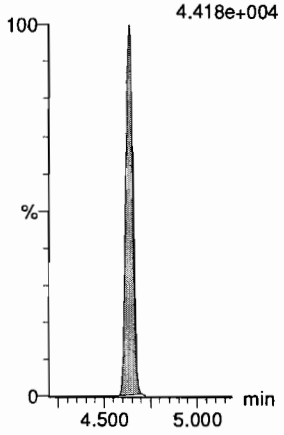
F49:MRM of 2 channels,ES-
527 > 80.9
1.674e+004



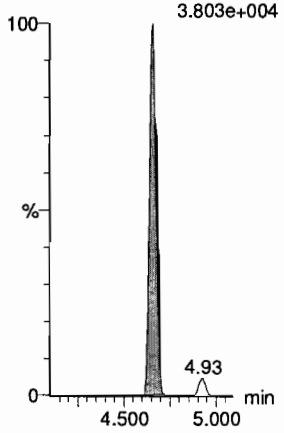
13C5-PFNA
F35:MRM of 1 channel,ES-
468.2 > 422.9
2.140e+005



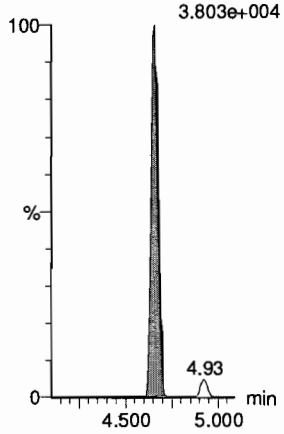
13C8-PFOSA
F41:MRM of 1 channel,ES-
506.1 > 77.7
4.418e+004



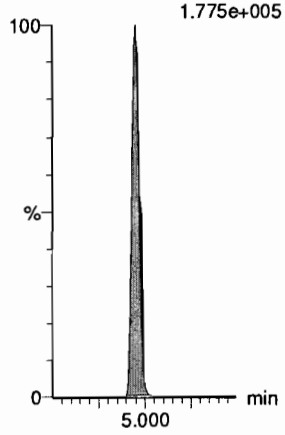
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.803e+004



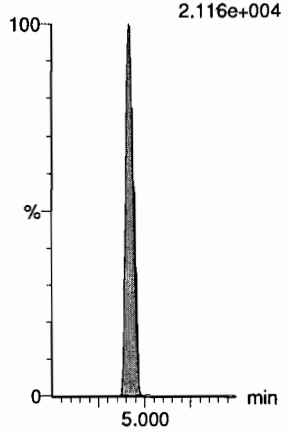
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.803e+004



13C2-PFDA
F45:MRM of 1 channel,ES-
515.1 > 469.9
1.775e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.116e+004

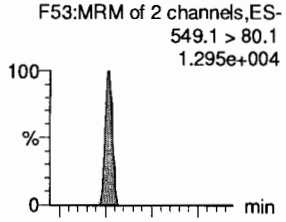


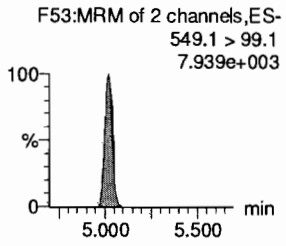
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

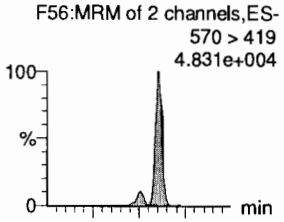
Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

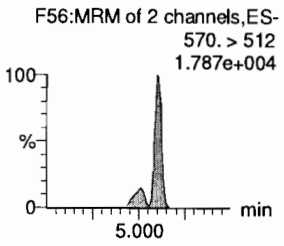
PFNS



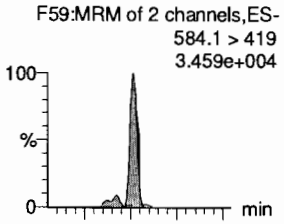


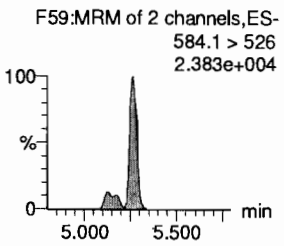
L-MeFOSAA



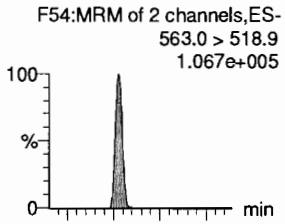


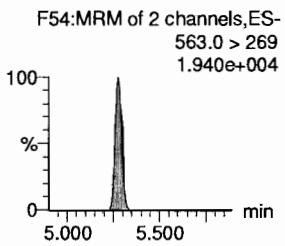
L-EtFOSAA



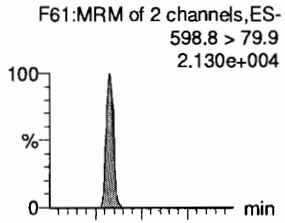


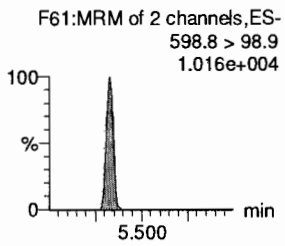
PFUdA



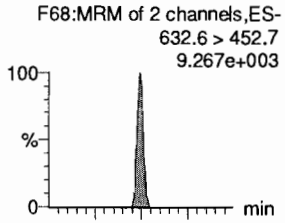


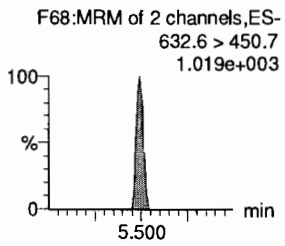
PFDS



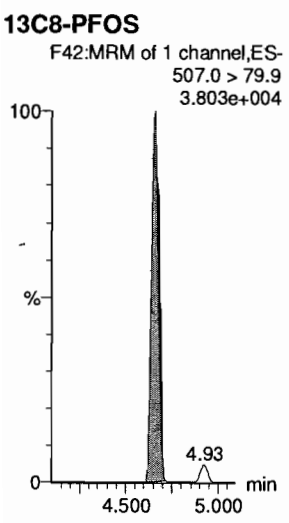


11Cl-PF30UdS

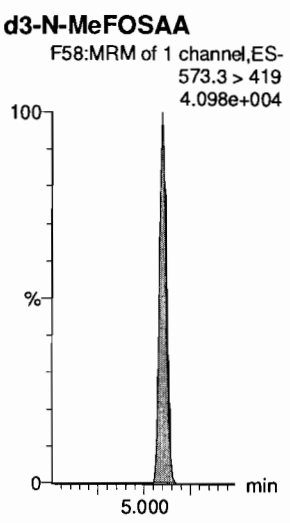




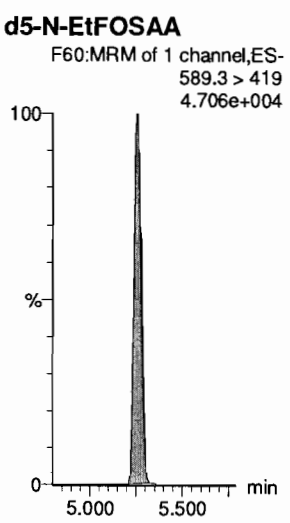
13C8-PFOS



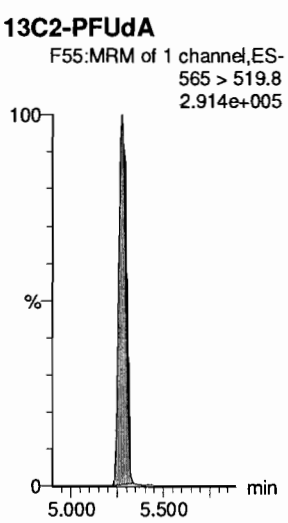
d3-N-MeFOSAA



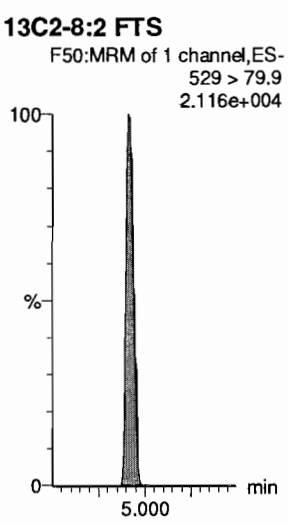
d5-N-EtFOSAA



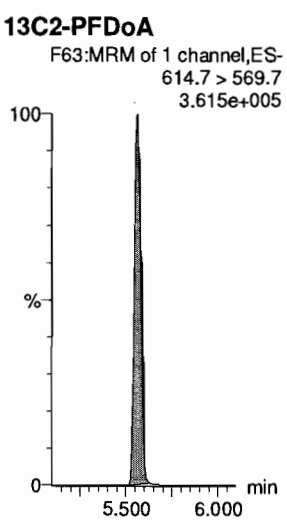
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA

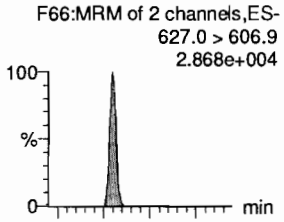


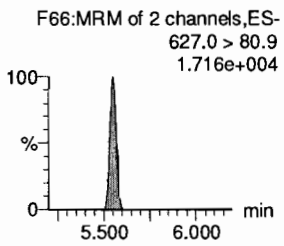
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

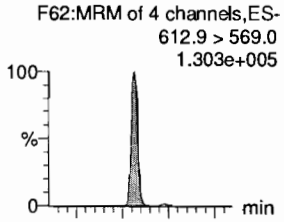
Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

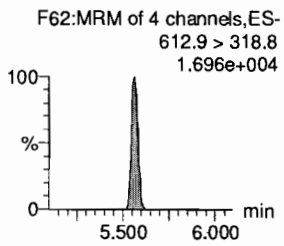
10:2 FTS



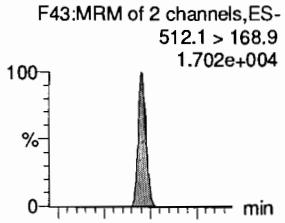


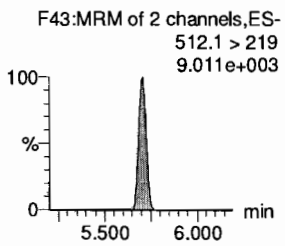
PFDoA



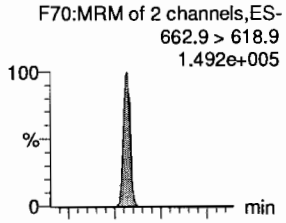


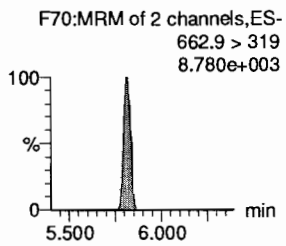
N-MeFOSA



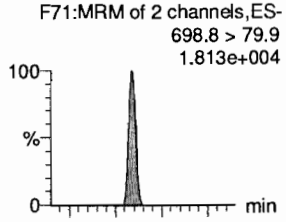


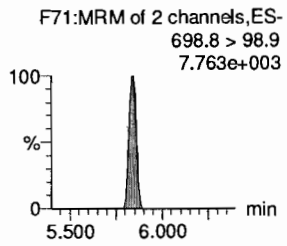
PFTrDA



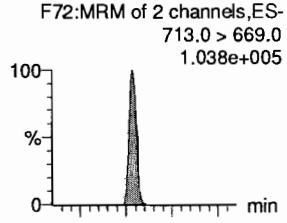


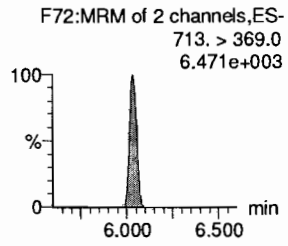
PFDoS



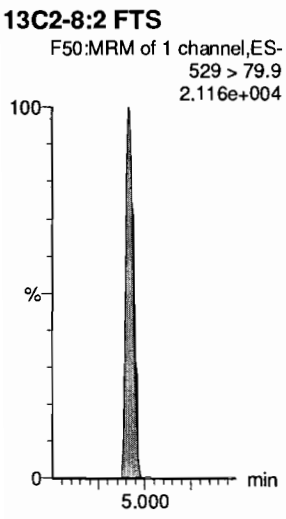


PFTeDA

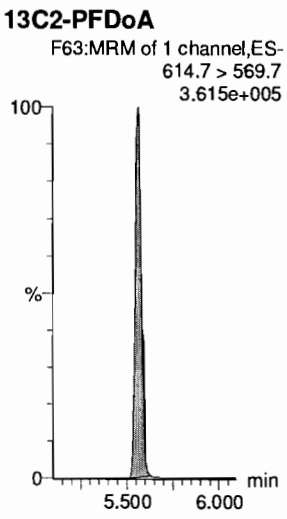




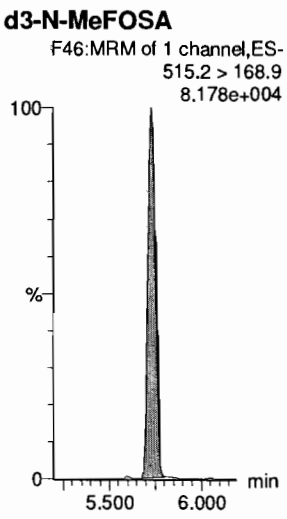
13C2-8:2 FTS



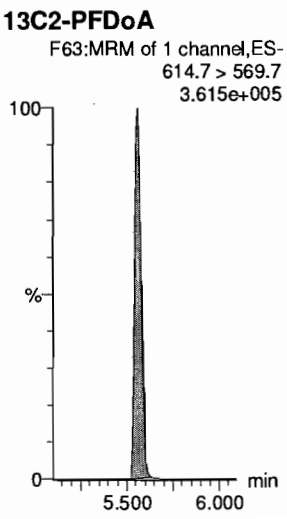
13C2-PFDoA



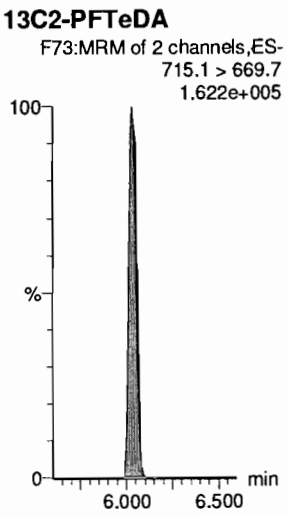
d3-N-MeFOSA



13C2-PFDoA



13C2-PFTeDA



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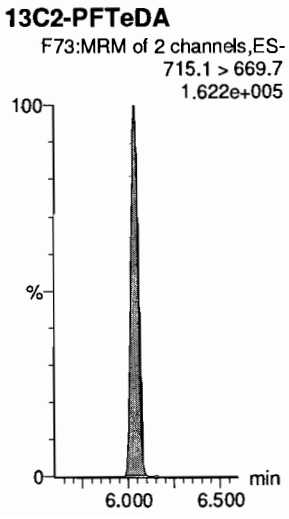
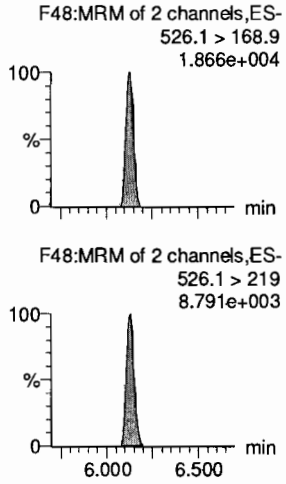


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

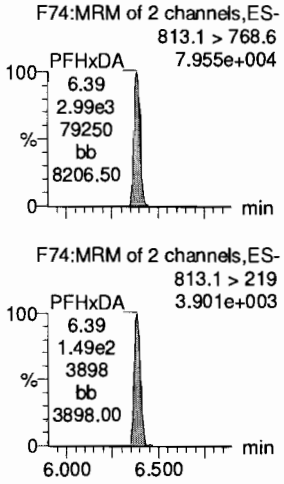
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

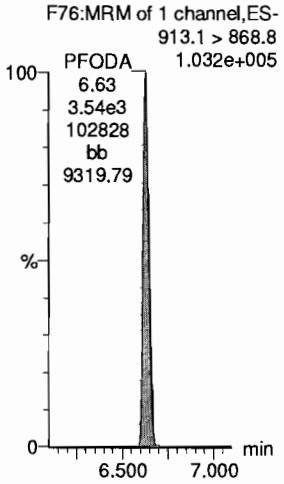
N-EtFOSA



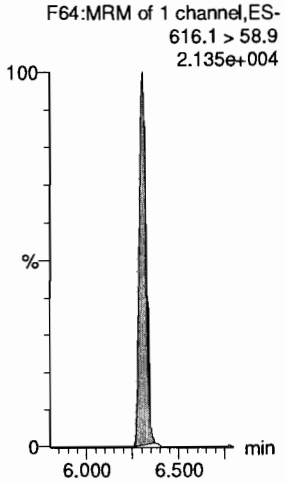
PFHxDA



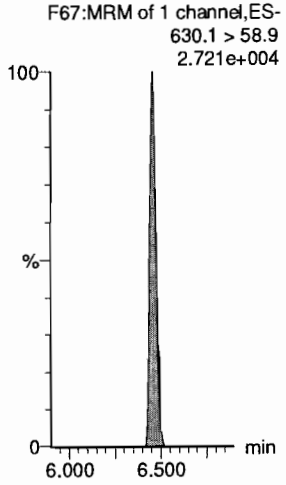
PFODA



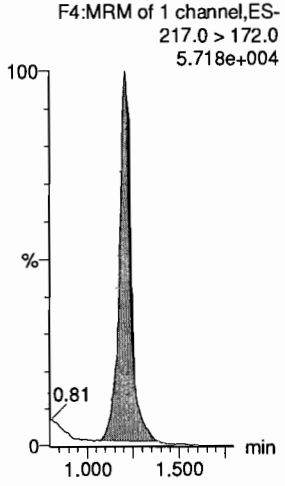
N-MeFOSE



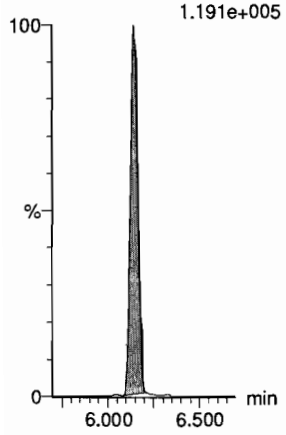
N-EtFOSE



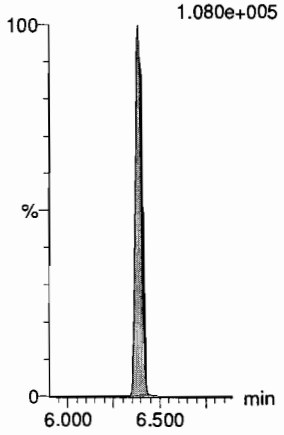
13C4-PFBA



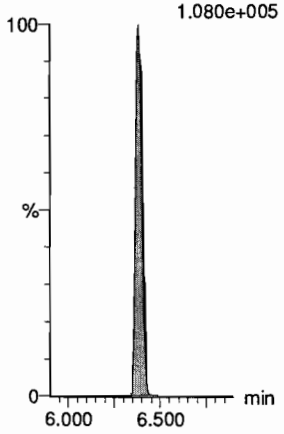
d5-N-ETFOSA



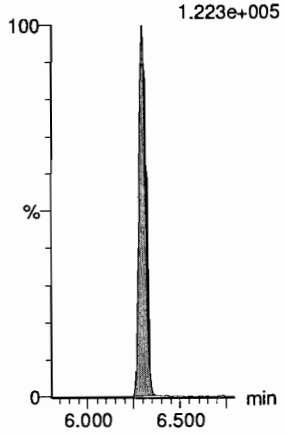
13C2-PFHxDA



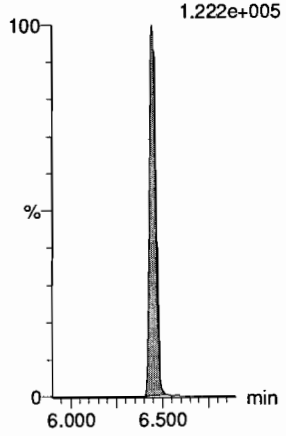
13C2-PFHxDA



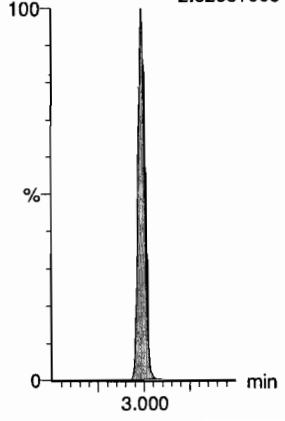
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

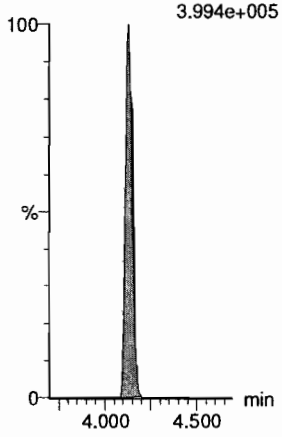


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

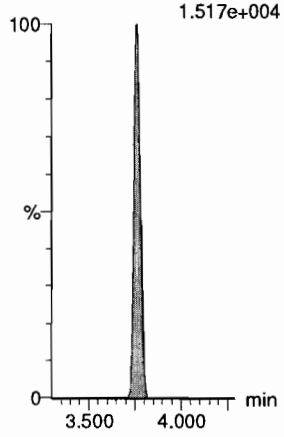
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_10, Date: 10-Jul-2019, Time: 14:26:10, ID: ST190710M2-5 PFC CS2 19G0805, Description: PFC CS2 19G0805

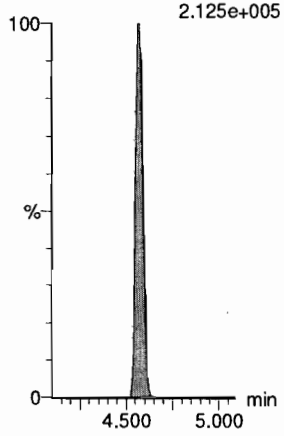
13C8-PFOA



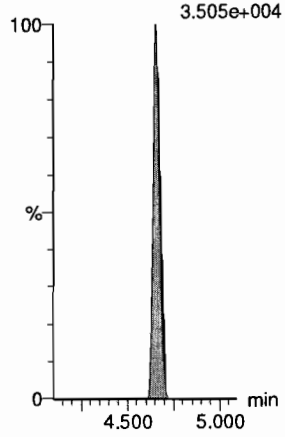
18O2-PFHxS



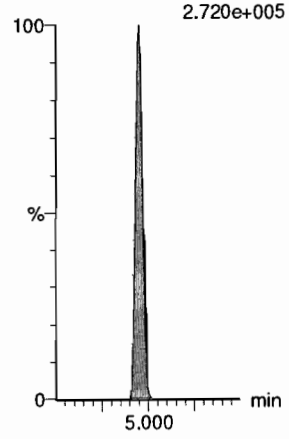
13C9-PFNA



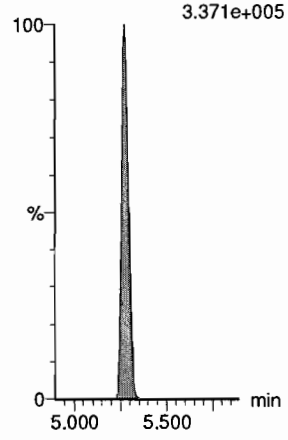
13C4-PFOS



13C6-PFDA



13C7-PFUdA

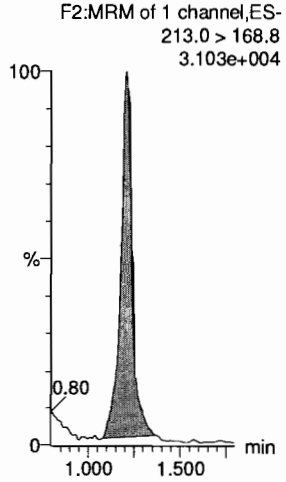


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

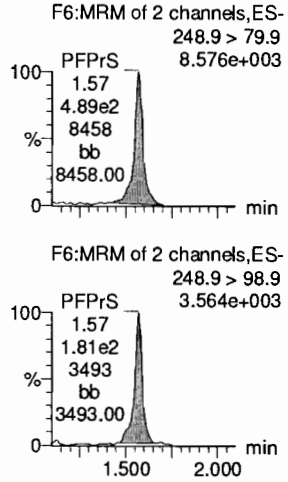
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

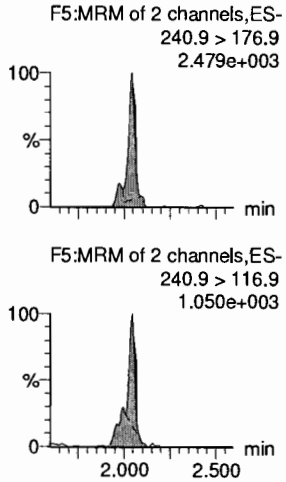
PFBA



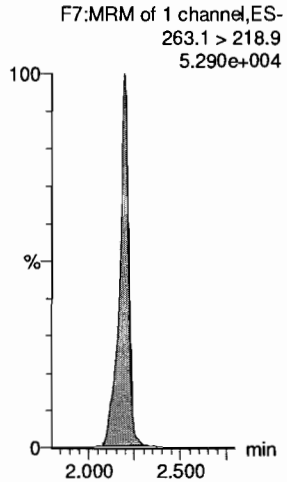
PFPrS



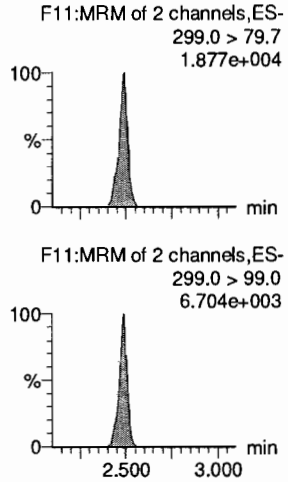
3:3 FTCA



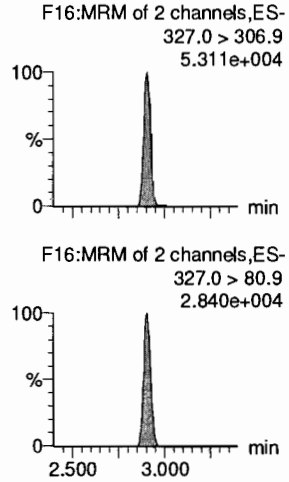
PFPeA



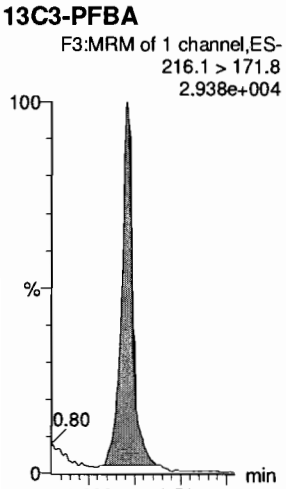
PFBS



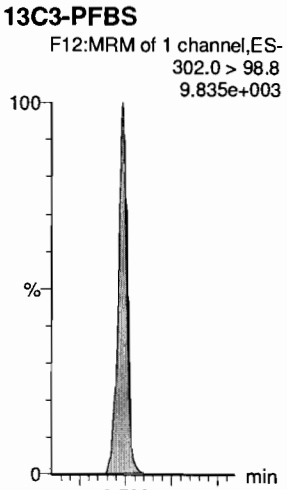
4:2 FTS



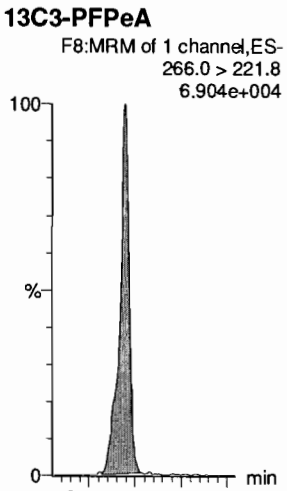
13C3-PFBA



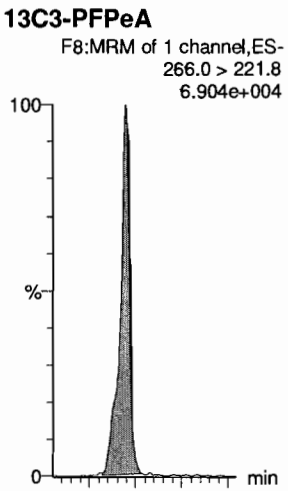
13C3-PFBS



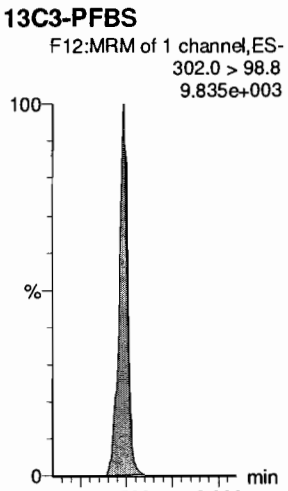
13C3-PFPeA



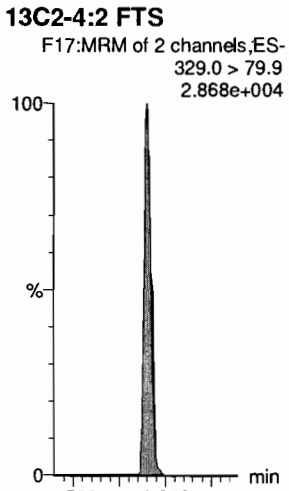
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

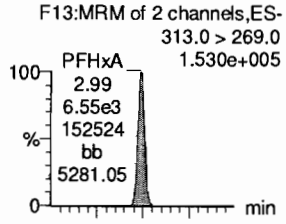


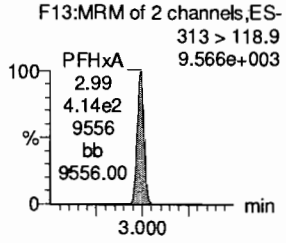
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

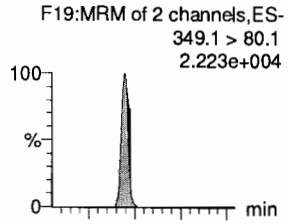
Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

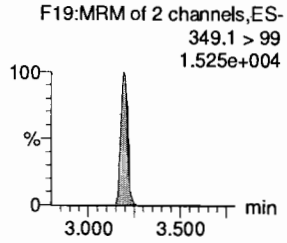
PFHxA



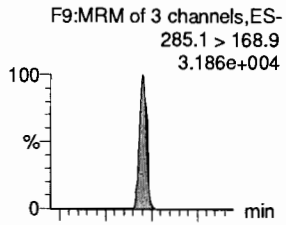


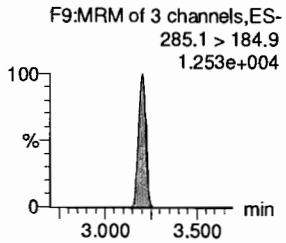
PFPeS



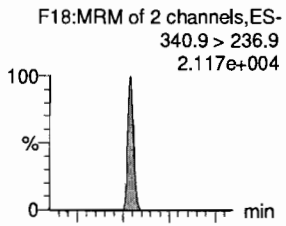


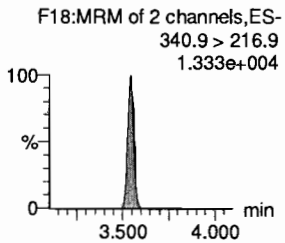
HFPO-DA



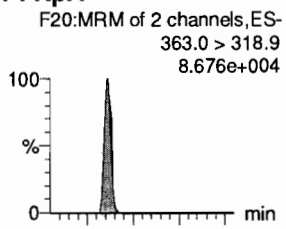


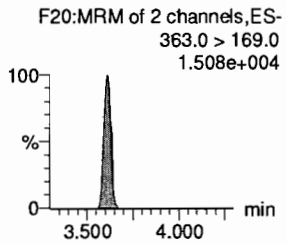
5:3 FTCA



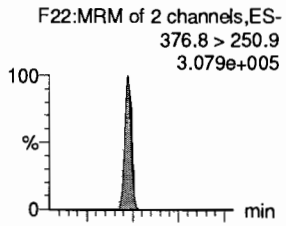


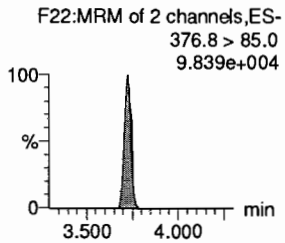
PFHpA



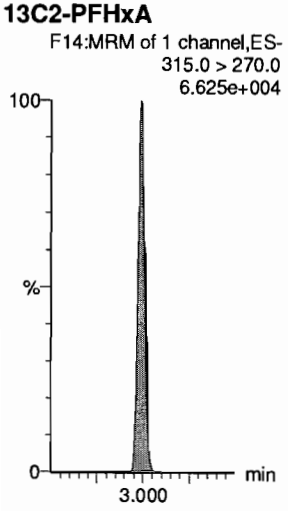


ADONA

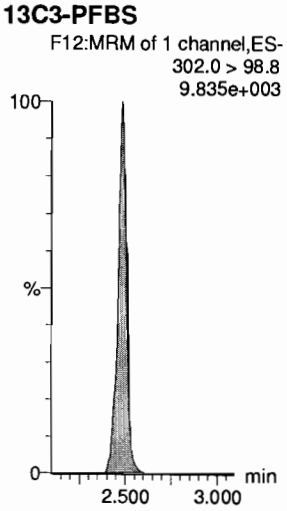




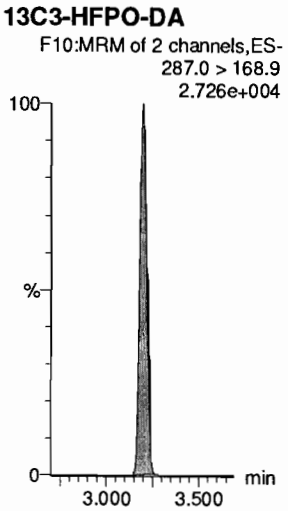
13C2-PFHxA



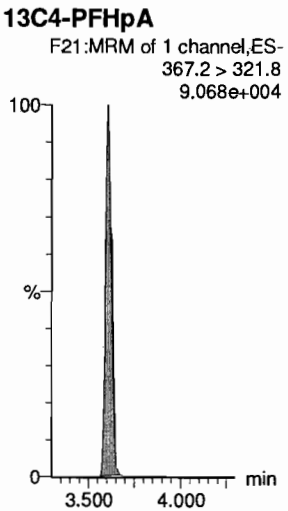
13C3-PFBS



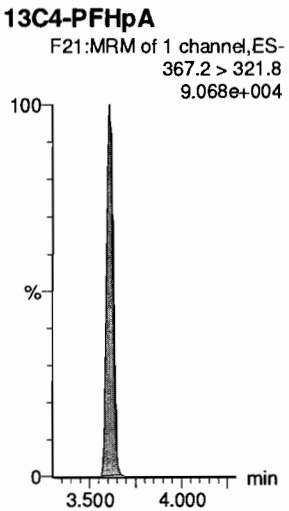
13C3-HFPO-DA



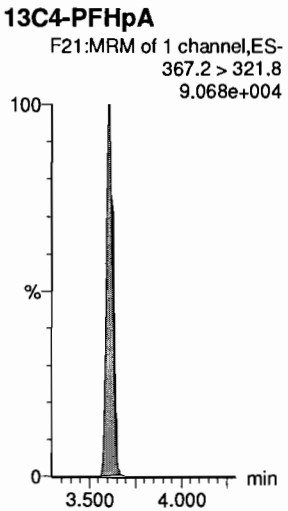
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA

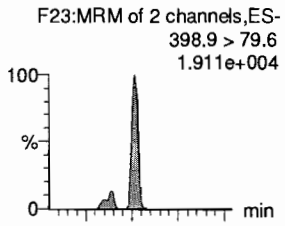


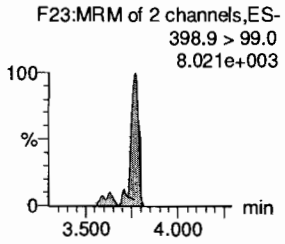
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

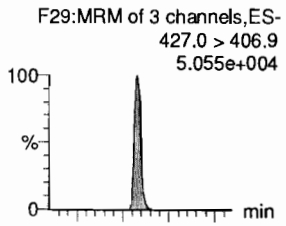
Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

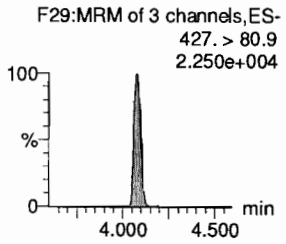
L-PFHxS



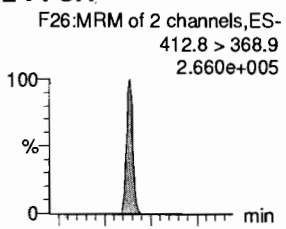


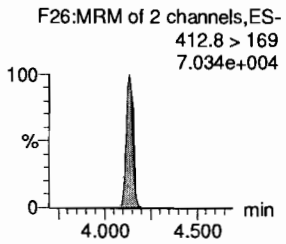
6:2 FTS



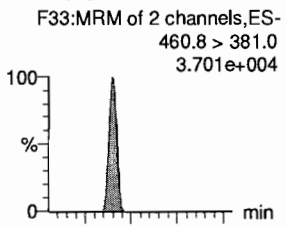


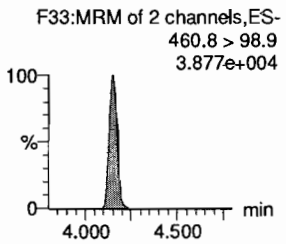
L-PFOA



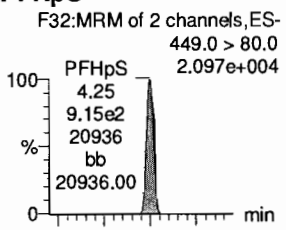


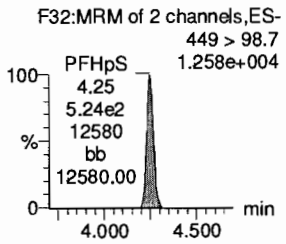
PFEChS



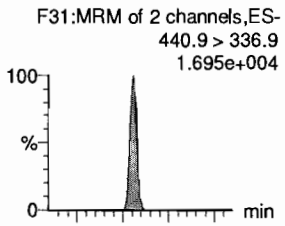


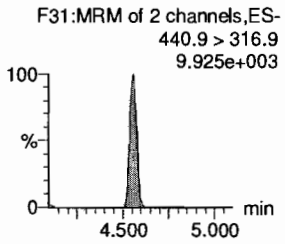
PFHpS



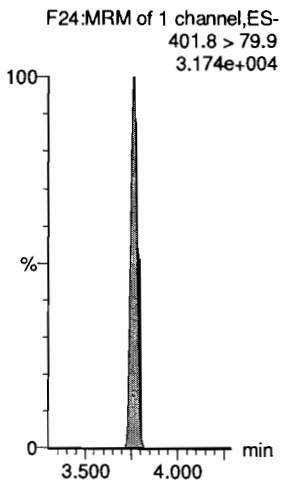


7:3 FTCA

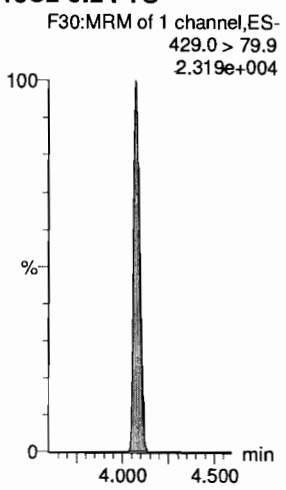




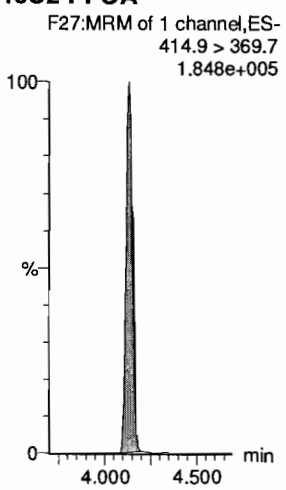
13C3-PFHxS



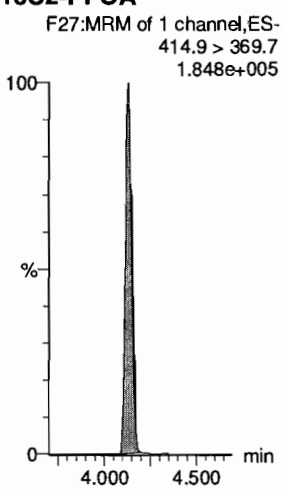
13C2-6:2 FTS



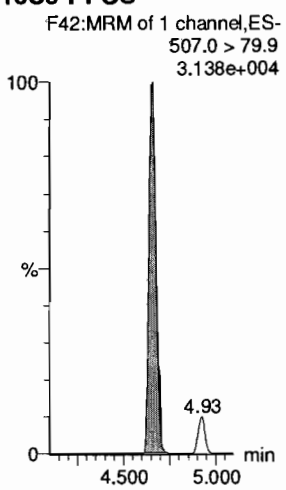
13C2-PFOA



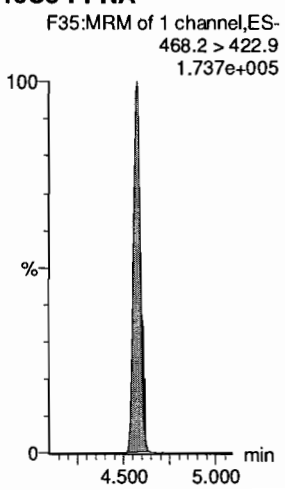
13C2-PFOA



13C8-PFOS



13C5-PFNA

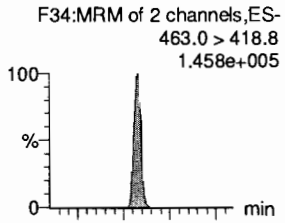


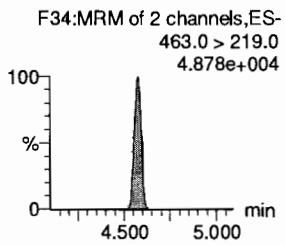
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

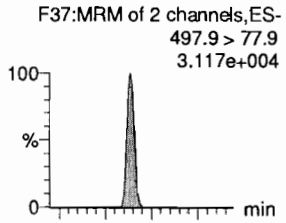
Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

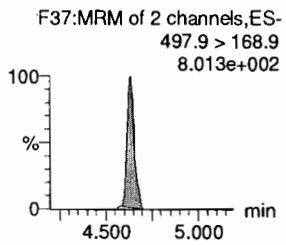
PFNA



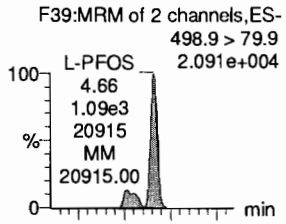


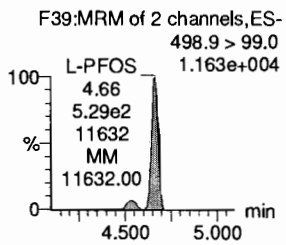
PFOSA



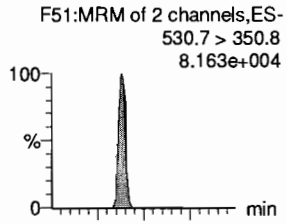


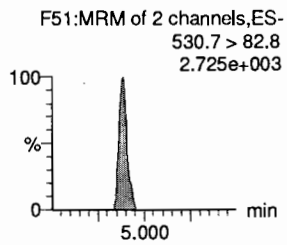
L-PFOS



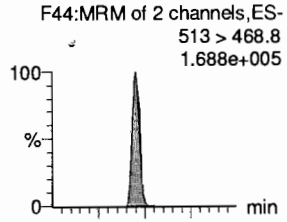


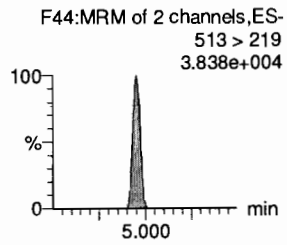
9Cl-PF30NS



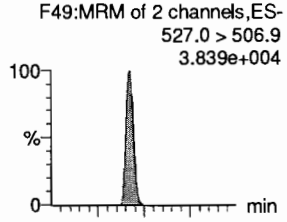


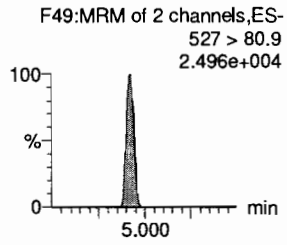
PFDA



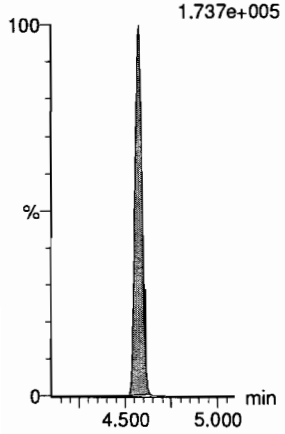


8:2 FTS

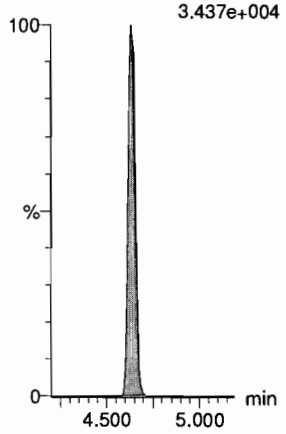




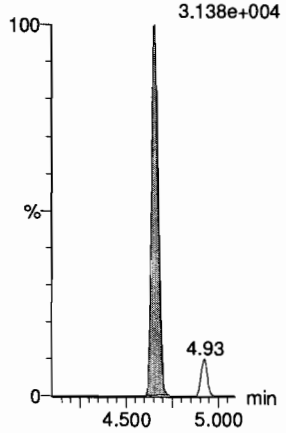
13C5-PFNA



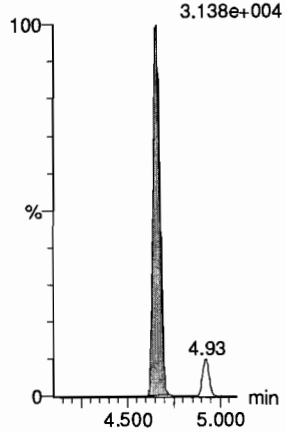
13C8-PFOSA



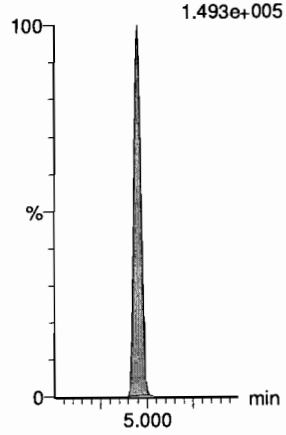
13C8-PFOS



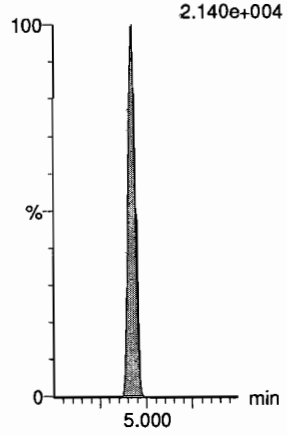
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

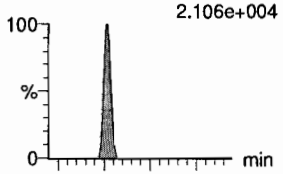


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

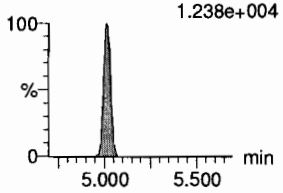
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

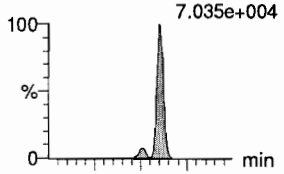
PFNS
F53:MRM of 2 channels,ES-
549.1 > 80.1
2.106e+004



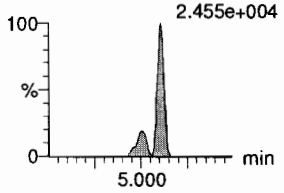
F53:MRM of 2 channels,ES-
549.1 > 99.1
1.238e+004



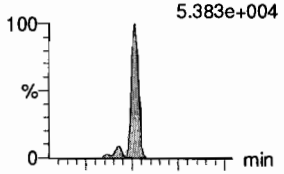
L-MeFOSAA
F56:MRM of 2 channels,ES-
570 > 419
7.035e+004



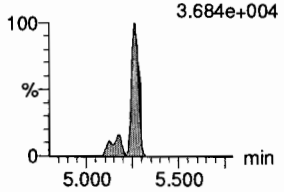
F56:MRM of 2 channels,ES-
570. > 512
2.455e+004



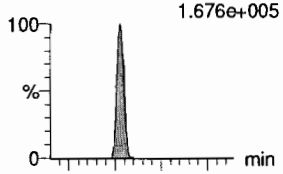
L-EtFOSAA
F59:MRM of 2 channels,ES-
584.1 > 419
5.383e+004



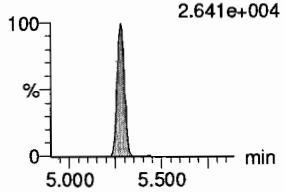
F59:MRM of 2 channels,ES-
584.1 > 526
3.684e+004



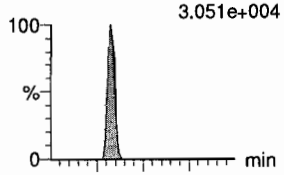
PFUdA
F54:MRM of 2 channels,ES-
563.0 > 518.9
1.676e+005



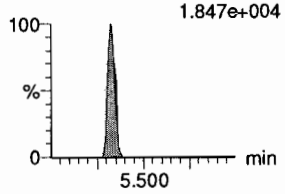
F54:MRM of 2 channels,ES-
563.0 > 269
2.641e+004



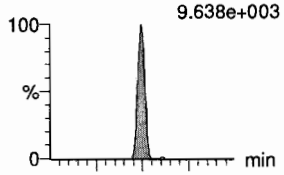
PFDS
F61:MRM of 2 channels,ES-
598.8 > 79.9
3.051e+004



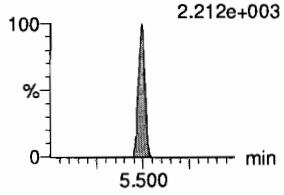
F61:MRM of 2 channels,ES-
598.8 > 98.9
1.847e+004



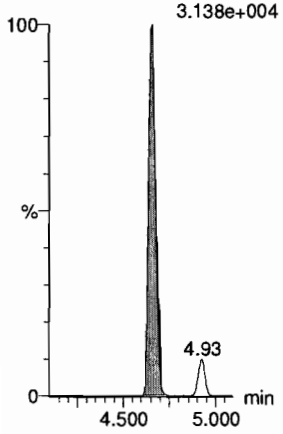
11Cl-PF30UdS
F68:MRM of 2 channels,ES-
632.6 > 452.7
9.638e+003



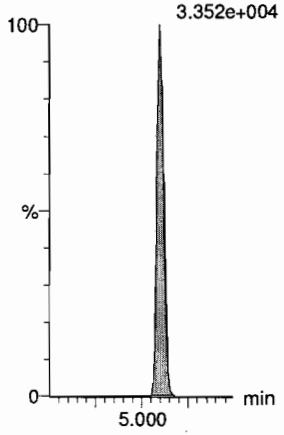
F68:MRM of 2 channels,ES-
632.6 > 450.7
2.212e+003



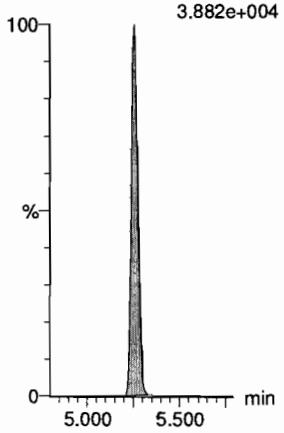
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
3.138e+004



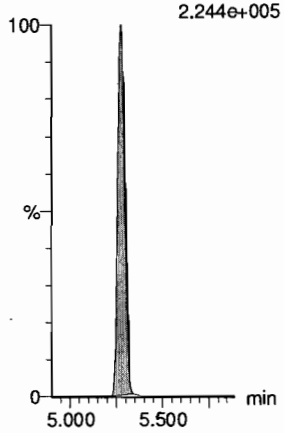
d3-N-MeFOSAA
F58:MRM of 1 channel,ES-
573.3 > 419
3.352e+004



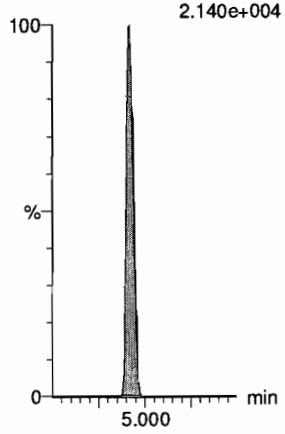
d5-N-EtFOSAA
F60:MRM of 1 channel,ES-
589.3 > 419
3.882e+004



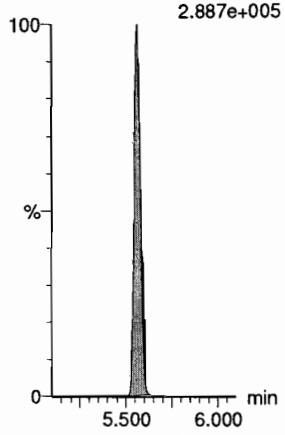
13C2-PFUdA
F55:MRM of 1 channel,ES-
565 > 519.8
2.244e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.140e+004



13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
2.887e+005

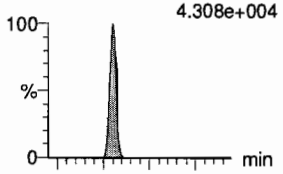


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

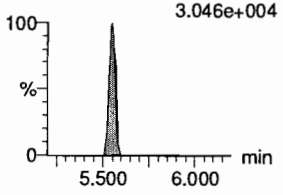
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

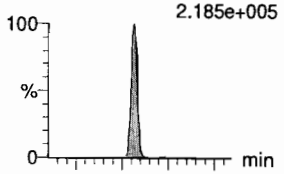
10:2 FTS
F66:MRM of 2 channels,ES-
627.0 > 606.9
4.308e+004



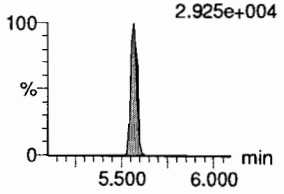
F66:MRM of 2 channels,ES-
627.0 > 80.9
3.046e+004



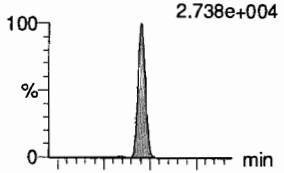
PFDoA
F62:MRM of 4 channels,ES-
612.9 > 569.0
2.185e+005



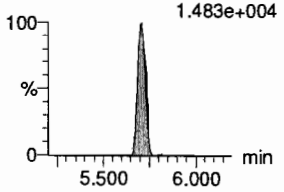
F62:MRM of 4 channels,ES-
612.9 > 318.8
2.925e+004



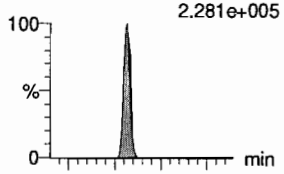
N-MeFOSA
F43:MRM of 2 channels,ES-
512.1 > 168.9
2.738e+004



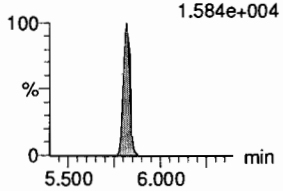
F43:MRM of 2 channels,ES-
512.1 > 219
1.483e+004



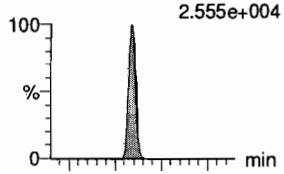
PFTrDA
F70:MRM of 2 channels,ES-
662.9 > 618.9
2.281e+005



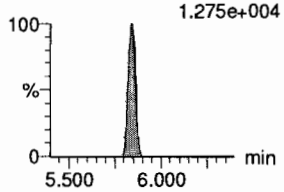
F70:MRM of 2 channels,ES-
662.9 > 319
1.584e+004



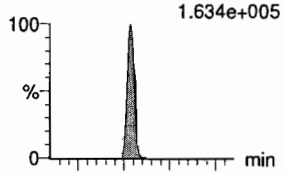
PFDoS
F71:MRM of 2 channels,ES-
698.8 > 79.9
2.555e+004



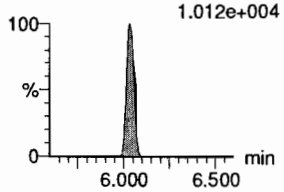
F71:MRM of 2 channels,ES-
698.8 > 98.9
1.275e+004



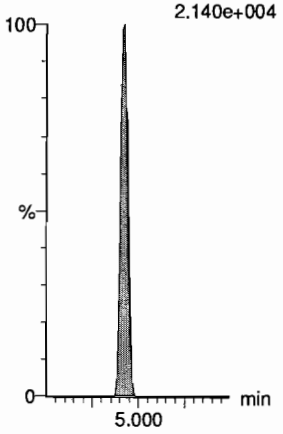
PFTeDA
F72:MRM of 2 channels,ES-
713.0 > 669.0
1.634e+005



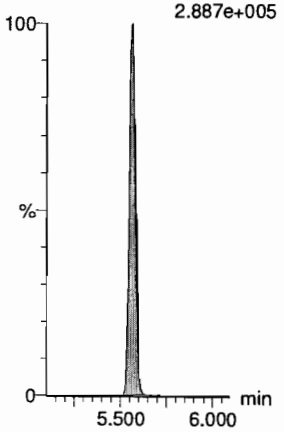
F72:MRM of 2 channels,ES-
713. > 369.0
1.012e+004



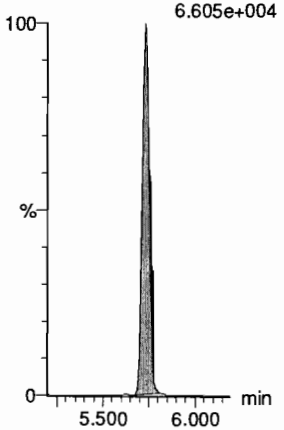
13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.140e+004



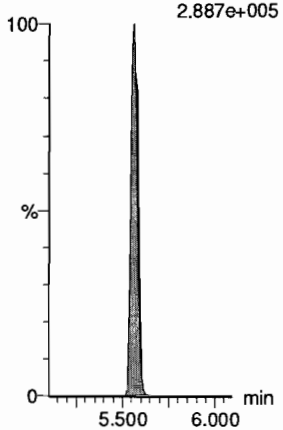
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
2.887e+005



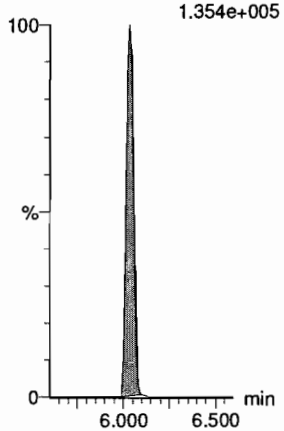
d3-N-MeFOSA
F46:MRM of 1 channel,ES-
515.2 > 168.9
6.605e+004



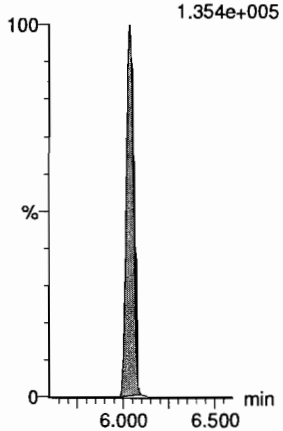
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
2.887e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.354e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.354e+005

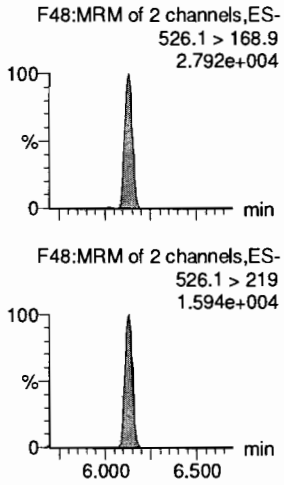


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

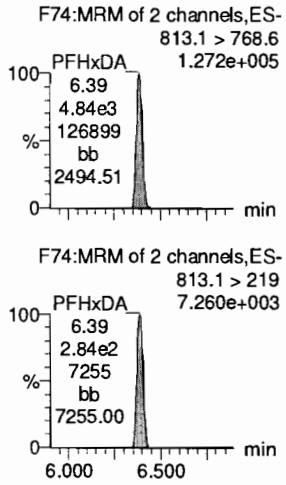
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

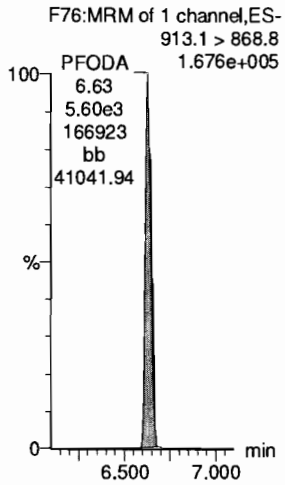
N-EtFOSA



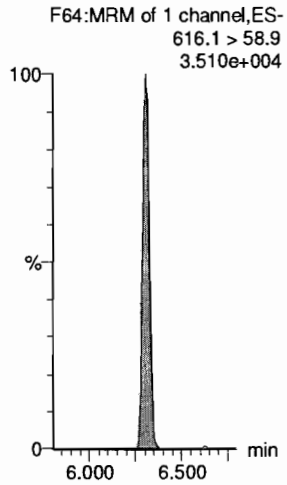
PFHxDA



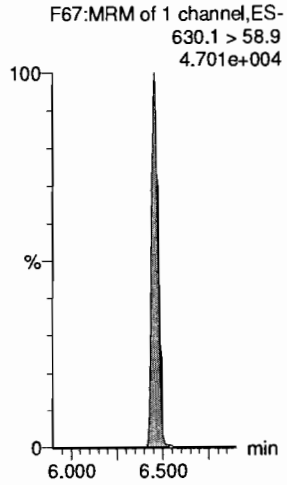
PFODA



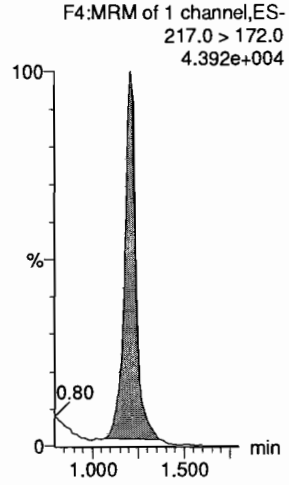
N-MeFOSE



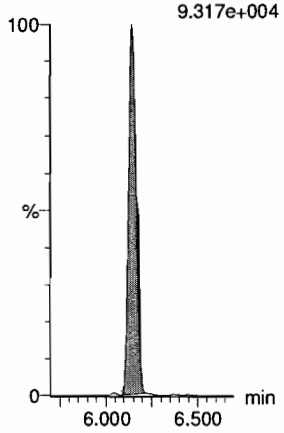
N-EtFOSE



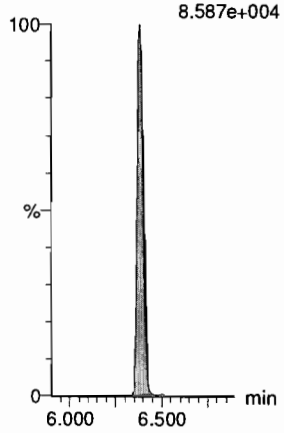
13C4-PFBA



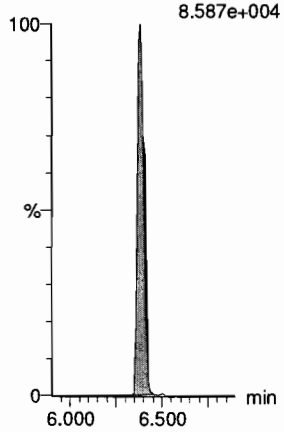
d5-N-ETFOSA



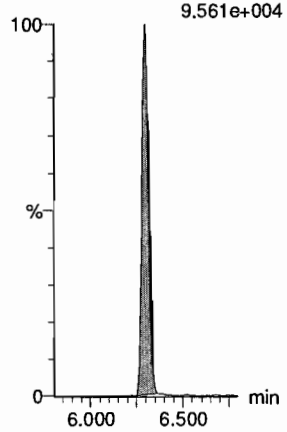
13C2-PFHxDA



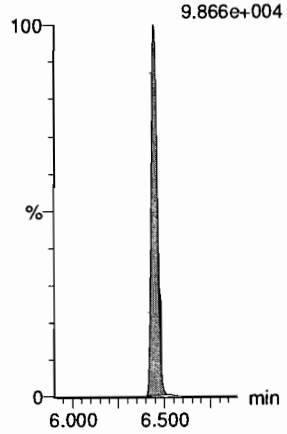
13C2-PFHxDA



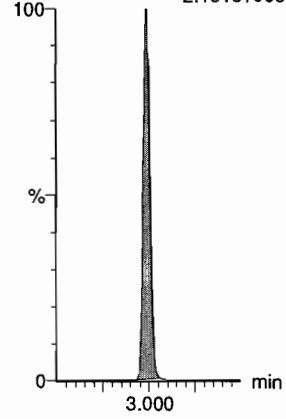
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

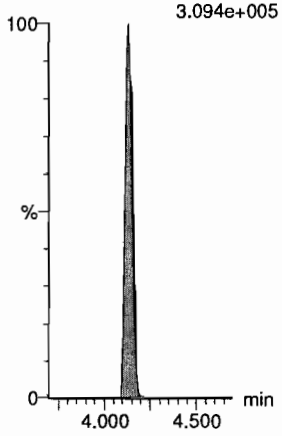


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

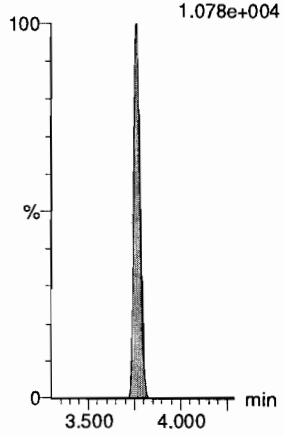
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_11, Date: 10-Jul-2019, Time: 14:36:42, ID: ST190710M2-6 PFC CS3 19G0806, Description: PFC CS3 19G0806

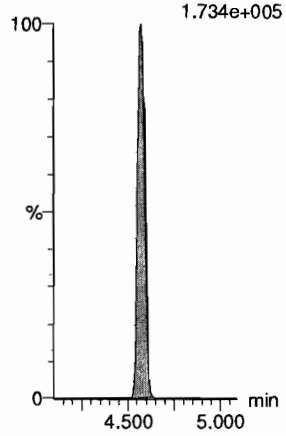
13C8-PFOA
F28:MRM of 1 channel,ES-
420.9 > 376.0
3.094e+005



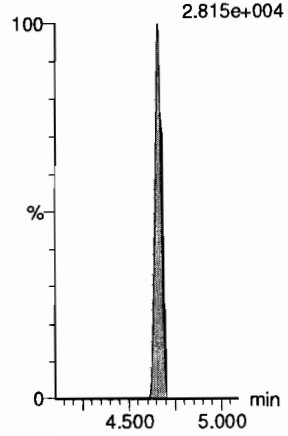
18O2-PFHxS
F25:MRM of 1 channel,ES-
403.0 > 102.6
1.078e+004



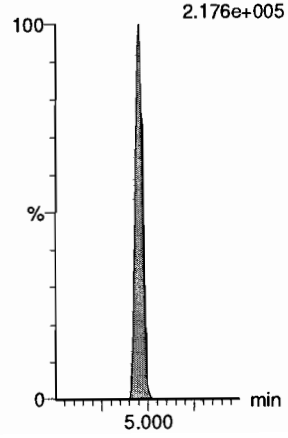
13C9-PFNA
F36:MRM of 1 channel,ES-
472.2 > 426.9
1.734e+005



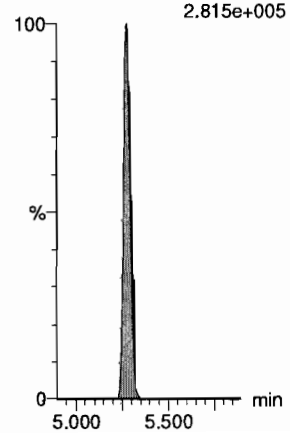
13C4-PFOS
F40:MRM of 1 channel,ES-
503 > 79.9
2.815e+004



13C6-PFDA
F47:MRM of 1 channel,ES-
519.1 > 473.7
2.176e+005



13C7-PFUdA
F57:MRM of 1 channel,ES-
570.1 > 524.8
2.815e+005

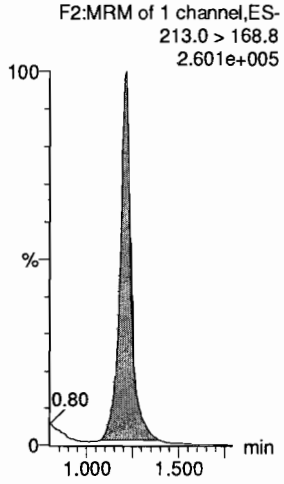


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

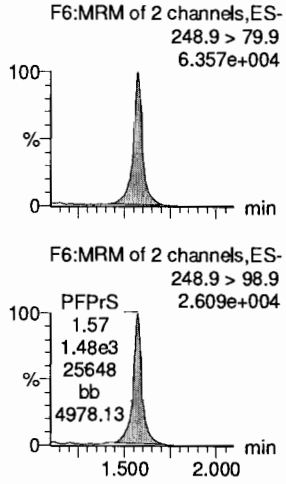
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

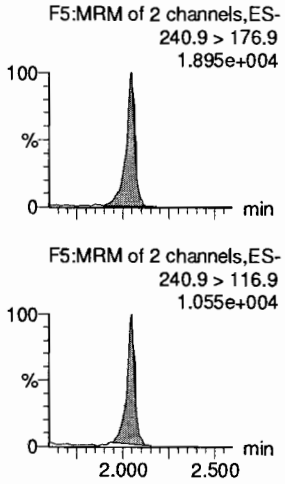
PFBA



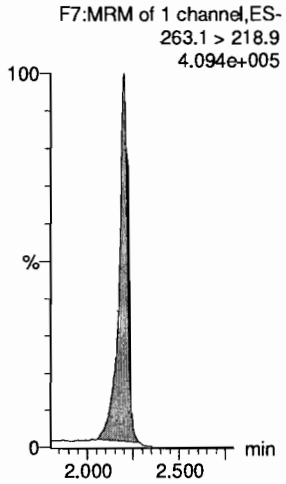
PFPrS



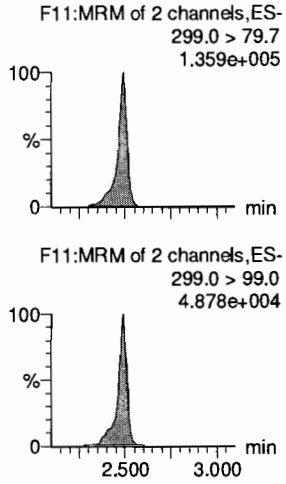
3:3 FTCA



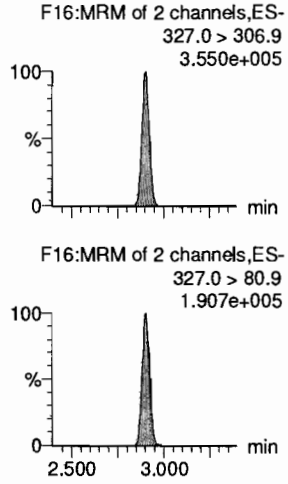
PFPeA



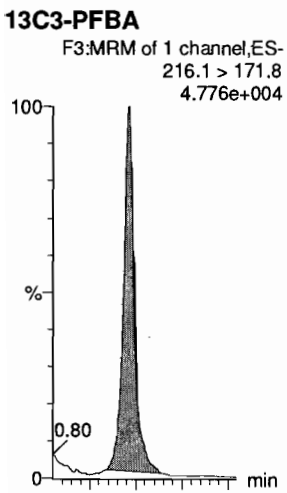
PFBS



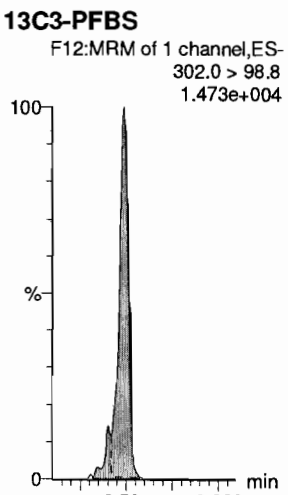
4:2 FTS



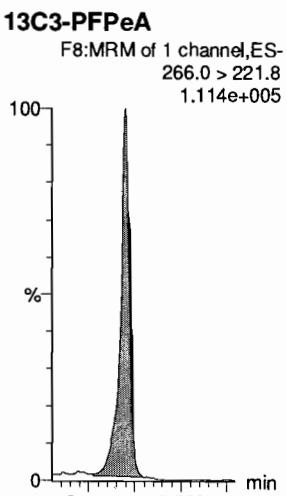
13C3-PFBA



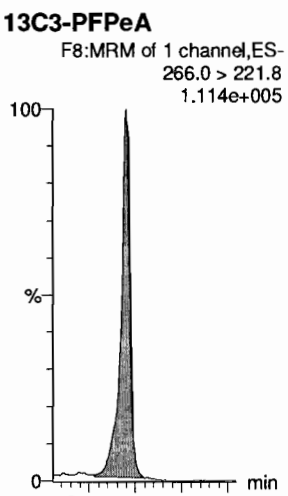
13C3-PFBS



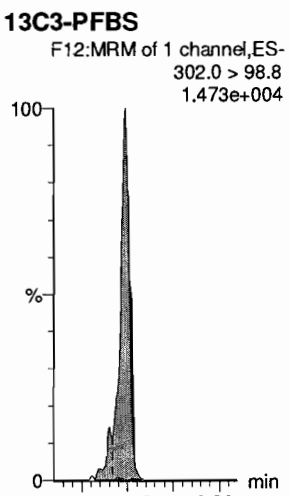
13C3-PFPeA



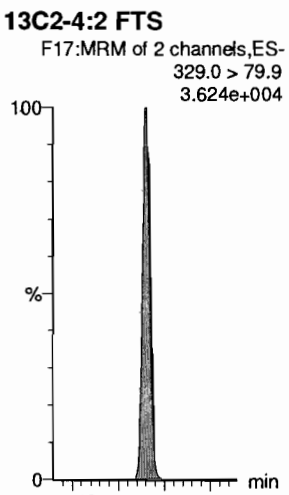
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

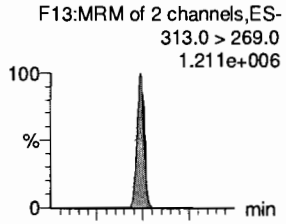


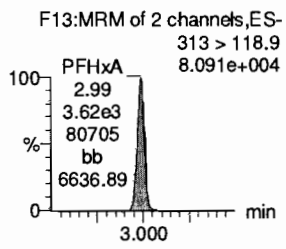
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

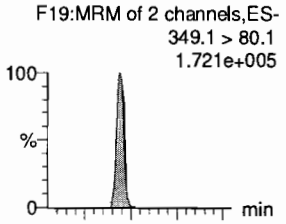
Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

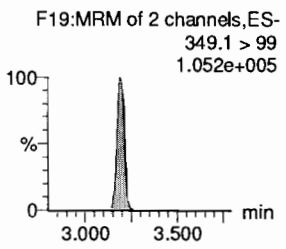
PFHxA



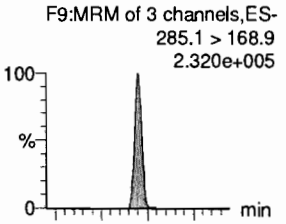


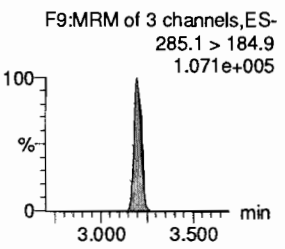
PFPeS



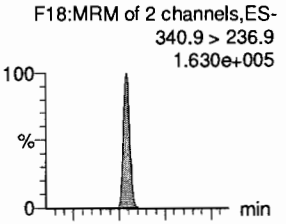


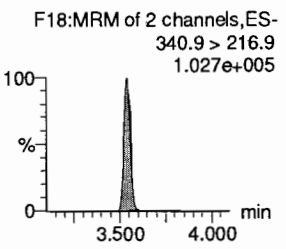
HFPO-DA



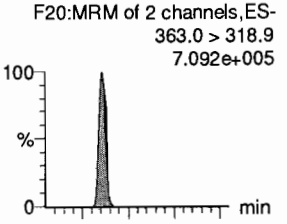


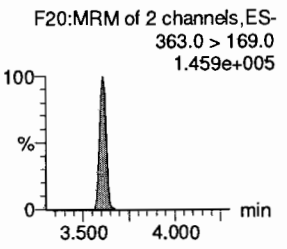
5:3 FTCA



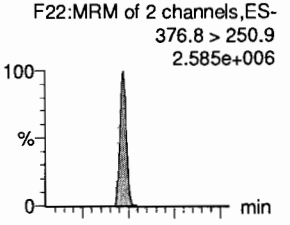


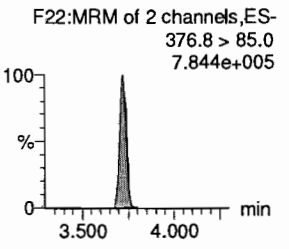
PFHpA



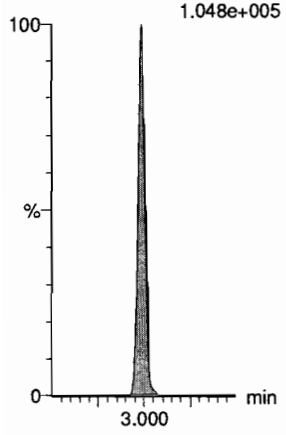


ADONA

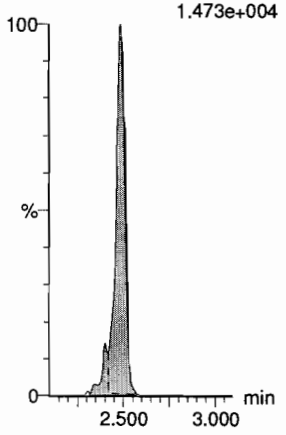




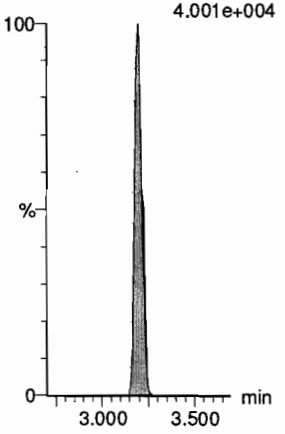
13C2-PFHxA



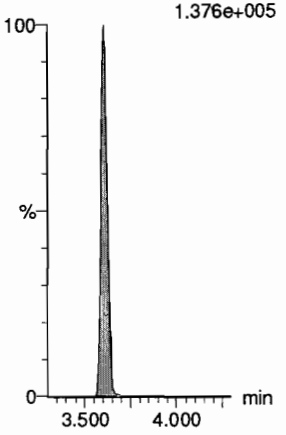
13C3-PFBS



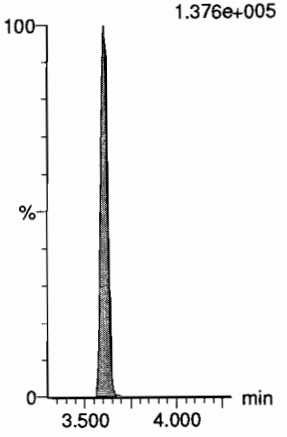
13C3-HFPO-DA



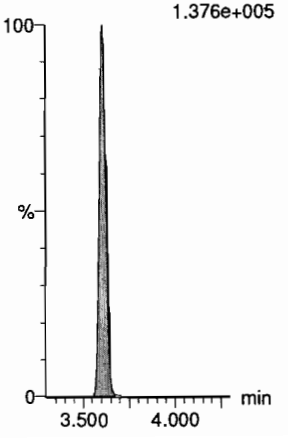
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA

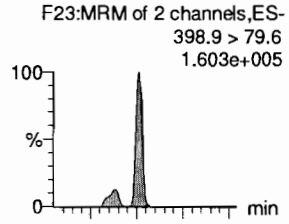


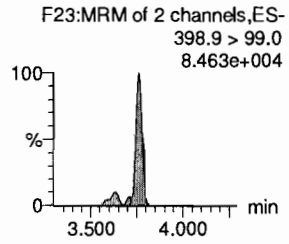
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

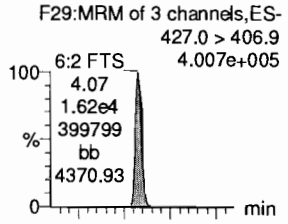
Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

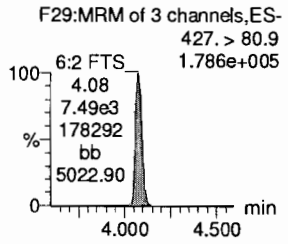
L-PFHxS



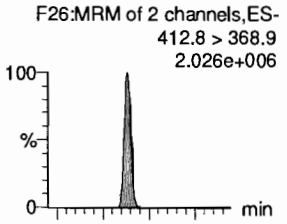


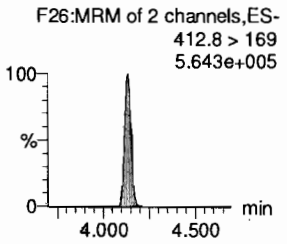
6:2 FTS



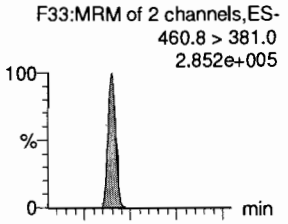


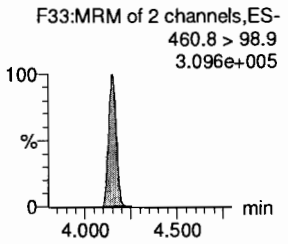
L-PFOA



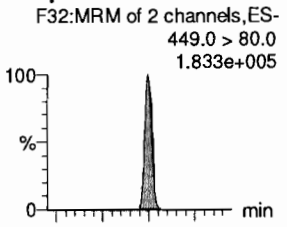


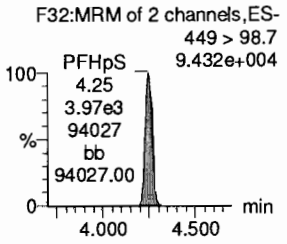
PFEChS



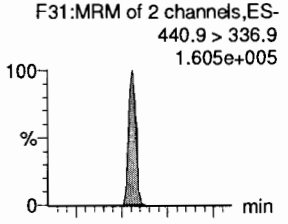


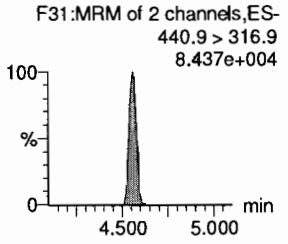
PFHpS



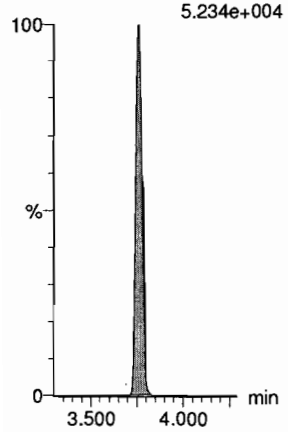


7:3 FTCA

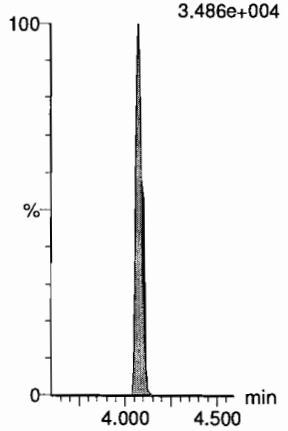




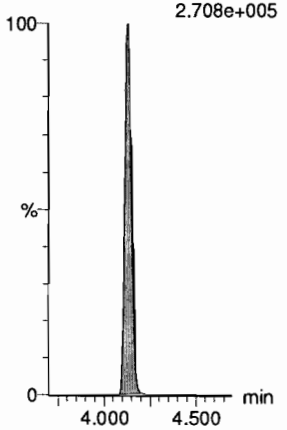
13C3-PFHxS



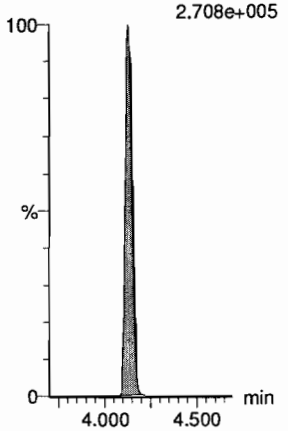
13C2-6:2 FTS



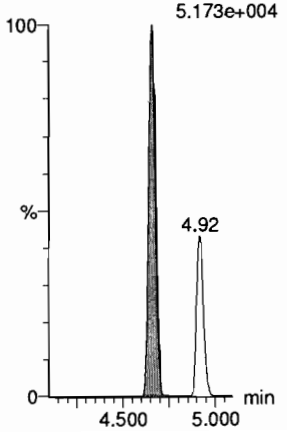
13C2-PFOA



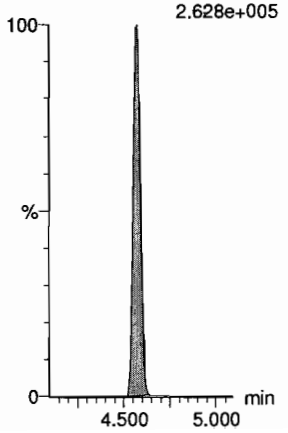
13C2-PFOA



13C8-PFOS



13C5-PFNA

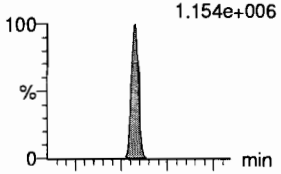


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

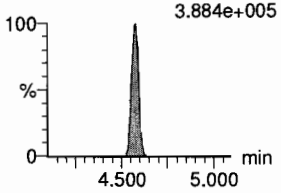
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

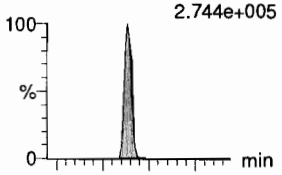
PFNA
F34:MRM of 2 channels,ES-
463.0 > 418.8
1.154e+006



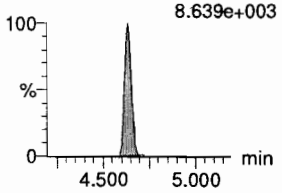
F34:MRM of 2 channels,ES-
463.0 > 219.0
3.884e+005



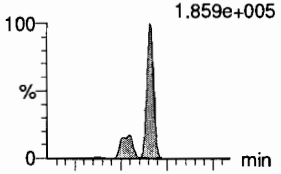
PFOSA
F37:MRM of 2 channels,ES-
497.9 > 77.9
2.744e+005



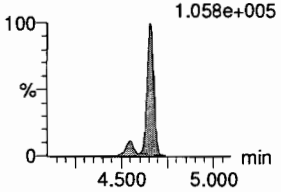
F37:MRM of 2 channels,ES-
497.9 > 168.9
8.639e+003



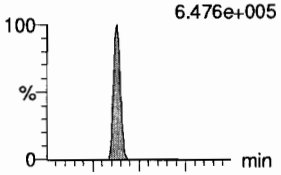
L-PFOS
F39:MRM of 2 channels,ES-
498.9 > 79.9
1.859e+005



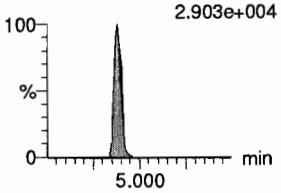
F39:MRM of 2 channels,ES-
498.9 > 99.0
1.058e+005



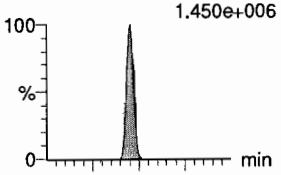
9Cl-PF30NS
F51:MRM of 2 channels,ES-
530.7 > 350.8
6.476e+005



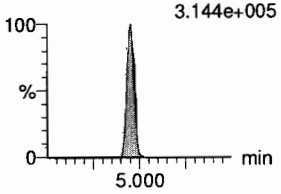
F51:MRM of 2 channels,ES-
530.7 > 82.8
2.903e+004



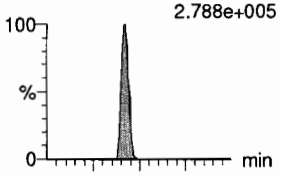
PFDA
F44:MRM of 2 channels,ES-
513 > 468.8
1.450e+006



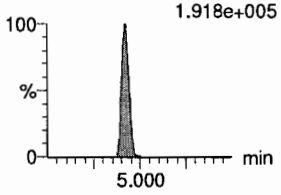
F44:MRM of 2 channels,ES-
513 > 219
3.144e+005



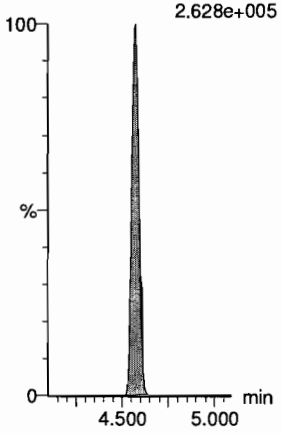
8:2 FTS
F49:MRM of 2 channels,ES-
527.0 > 506.9
2.788e+005



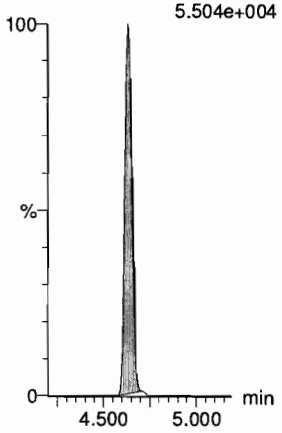
F49:MRM of 2 channels,ES-
527 > 80.9
1.918e+005



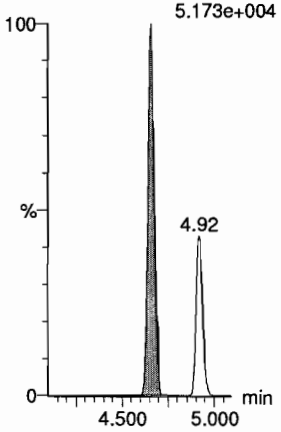
13C5-PFNA
F35:MRM of 1 channel,ES-
468.2 > 422.9
2.628e+005



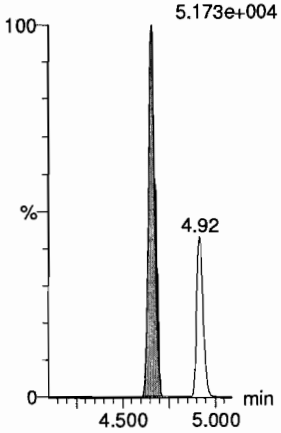
13C8-PFOSA
F41:MRM of 1 channel,ES-
506.1 > 77.7
5.504e+004



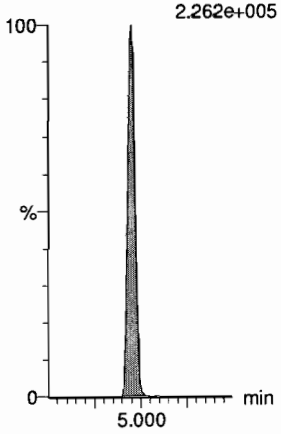
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
5.173e+004



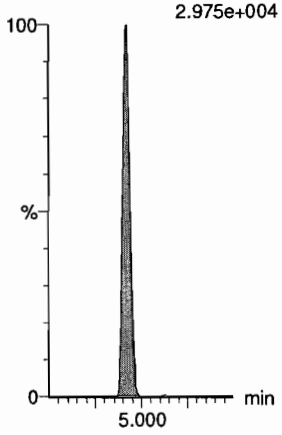
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
5.173e+004



13C2-PFDA
F45:MRM of 1 channel,ES-
515.1 > 469.9
2.262e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.975e+004

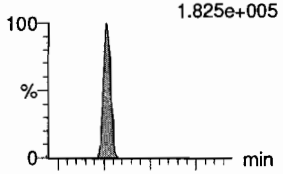


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

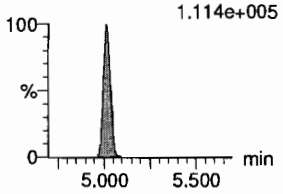
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

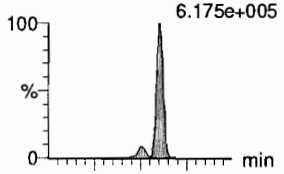
PFNS
F53:MRM of 2 channels,ES-
549.1 > 80.1
1.825e+005



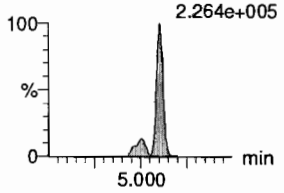
F53:MRM of 2 channels,ES-
549.1 > 99.1
1.114e+005



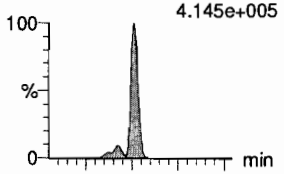
L-MeFOSAA
F56:MRM of 2 channels,ES-
570 > 419
6.175e+005



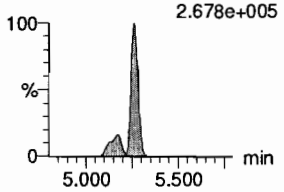
F56:MRM of 2 channels,ES-
570. > 512
2.264e+005



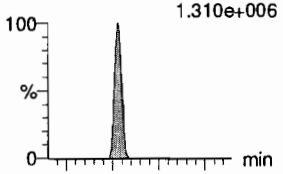
L-EtFOSAA
F59:MRM of 2 channels,ES-
584.1 > 419
4.145e+005



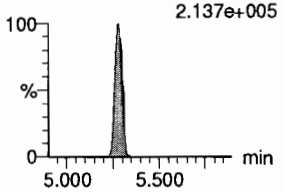
F59:MRM of 2 channels,ES-
584.1 > 526
2.678e+005



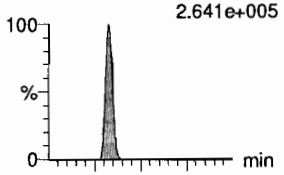
PFUdA
F54:MRM of 2 channels,ES-
563.0 > 518.9
1.310e+006



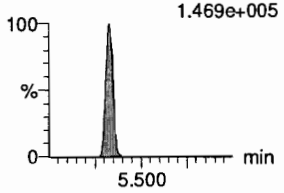
F54:MRM of 2 channels,ES-
563.0 > 269
2.137e+005



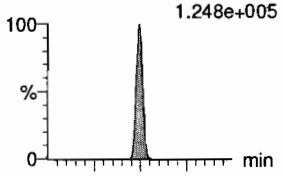
PFDS
F61:MRM of 2 channels,ES-
598.8 > 79.9
2.641e+005



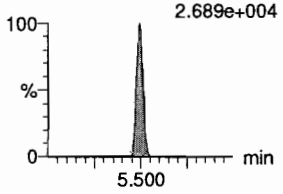
F61:MRM of 2 channels,ES-
598.8 > 98.9
1.469e+005



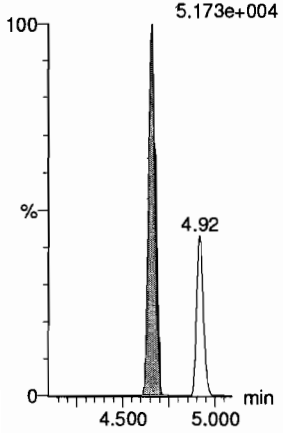
11Cl-PF30UdS
F68:MRM of 2 channels,ES-
632.6 > 452.7
1.248e+005



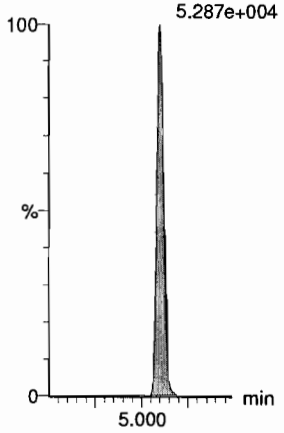
F68:MRM of 2 channels,ES-
632.6 > 450.7
2.689e+004



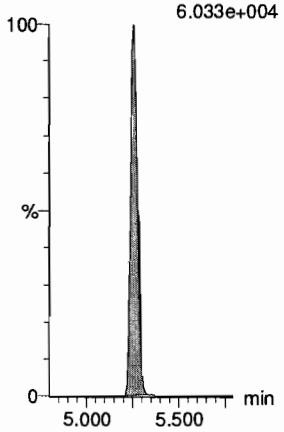
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
5.173e+004



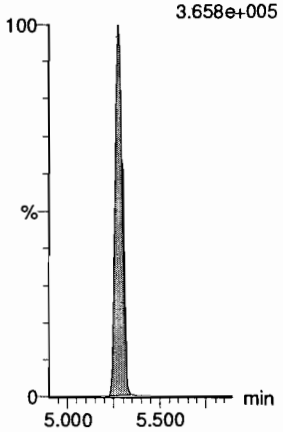
d3-N-MeFOSAA
F58:MRM of 1 channel,ES-
573.3 > 419
5.287e+004



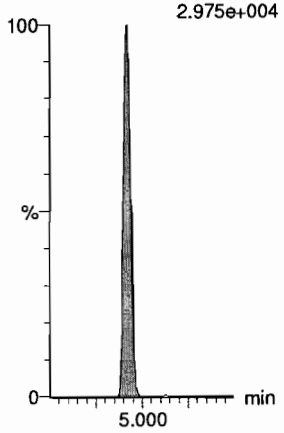
d5-N-EtFOSAA
F60:MRM of 1 channel,ES-
589.3 > 419
6.033e+004



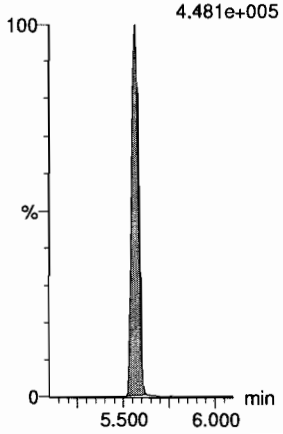
13C2-PFUdA
F55:MRM of 1 channel,ES-
565 > 519.8
3.658e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
2.975e+004



13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
4.481e+005

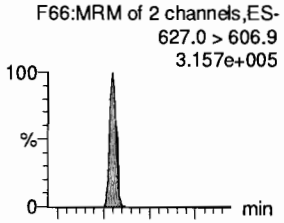


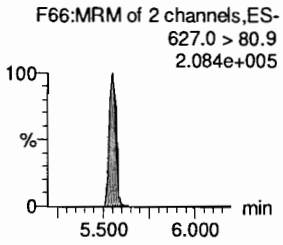
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

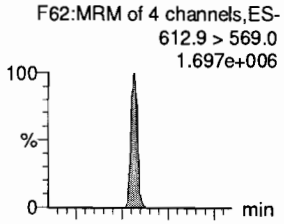
Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

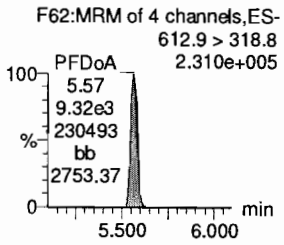
10:2 FTS



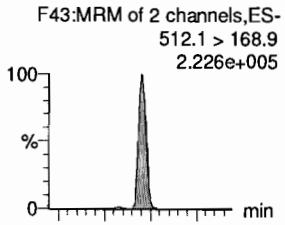


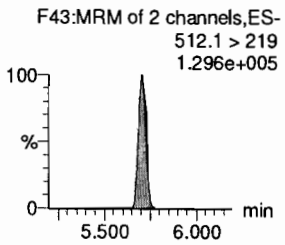
PFDoA



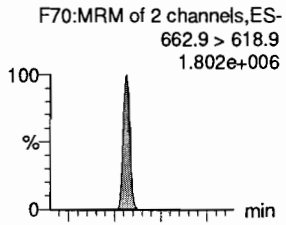


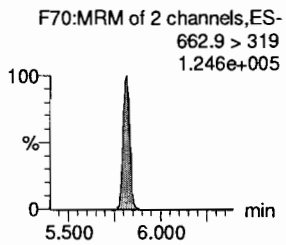
N-MeFOSA



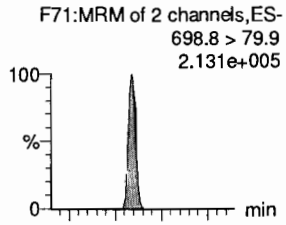


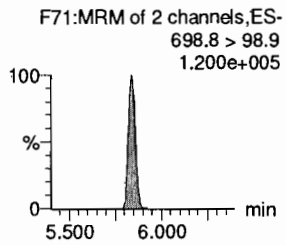
PFTrDA





PFDoS





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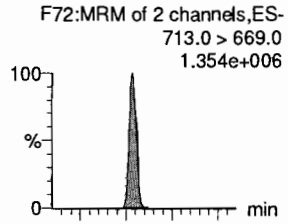
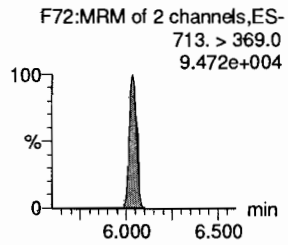
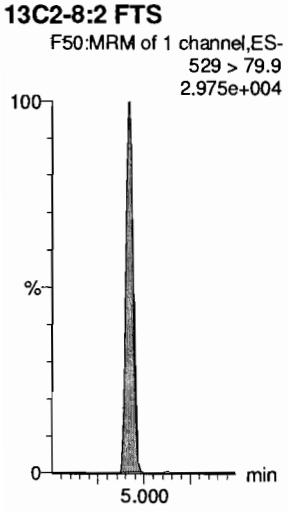
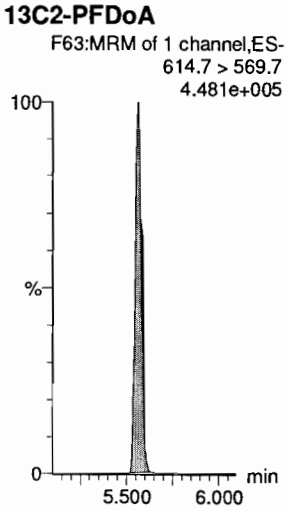




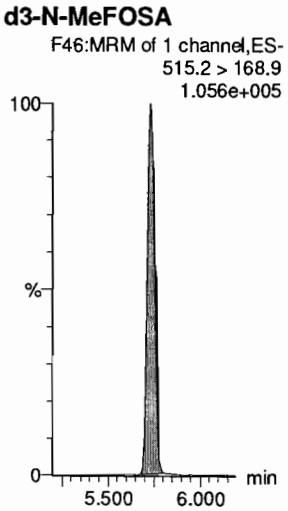
13C2-8:2 FTS



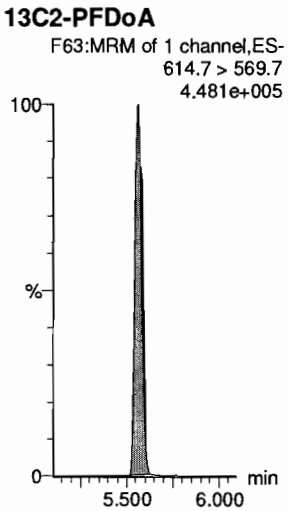
13C2-PFDoA



d3-N-MeFOSA



13C2-PFDoA



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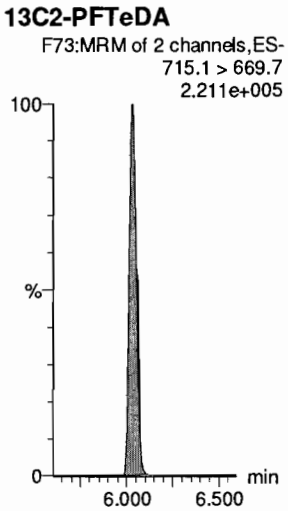
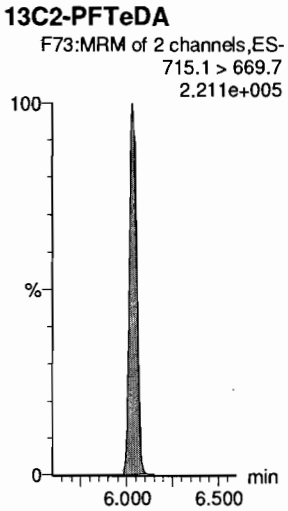


13C2-PFTeDA

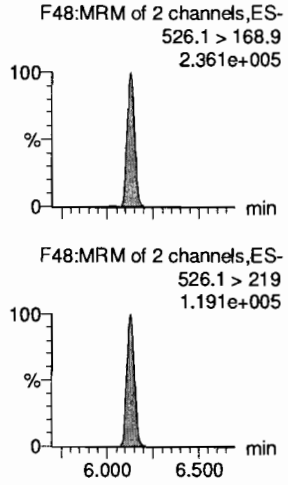


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

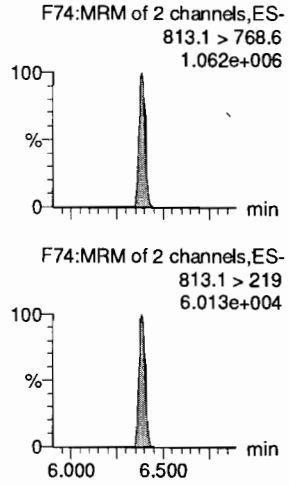
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

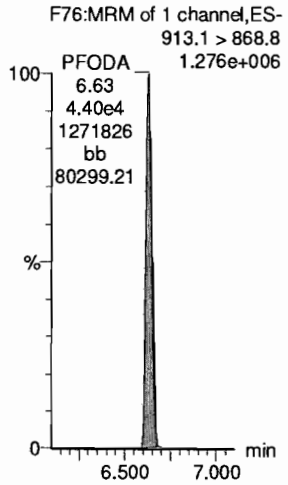
N-EtFOSA



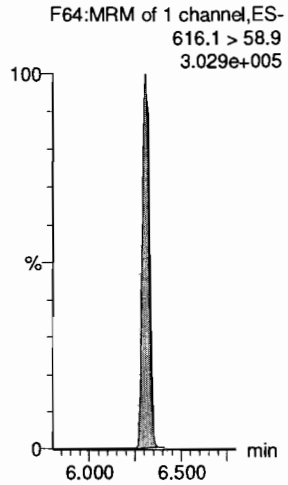
PFHxDA



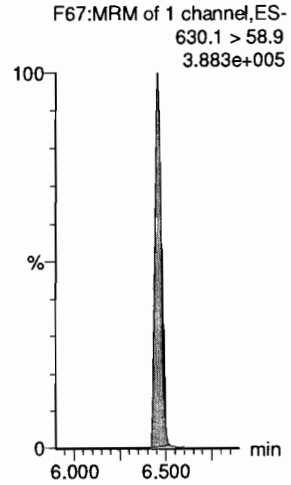
PFODA



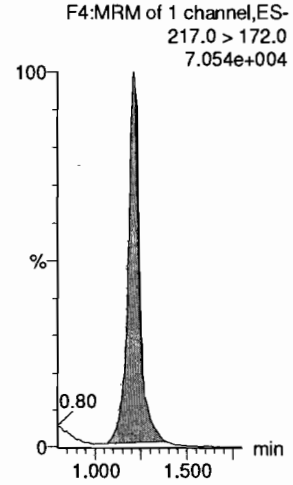
N-MeFOSE



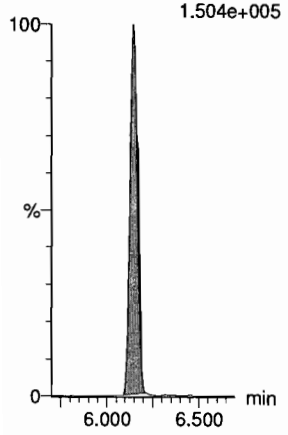
N-EtFOSE



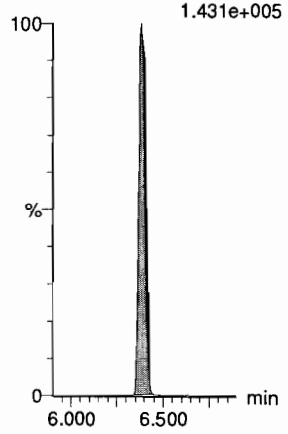
13C4-PFBA



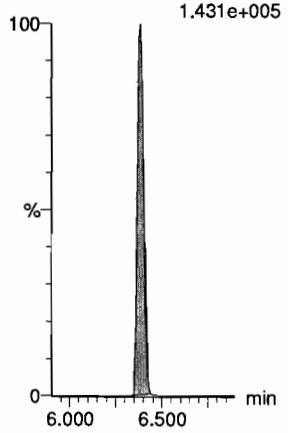
d5-N-ETFOSA



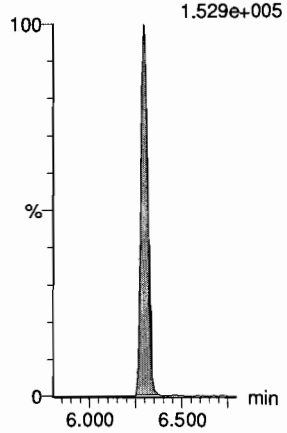
13C2-PFHxDA



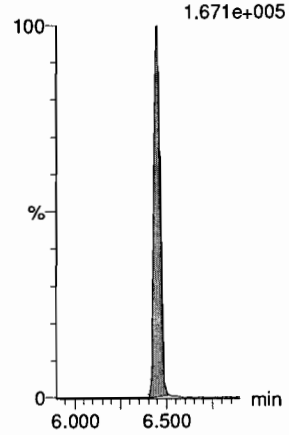
13C2-PFHxDA



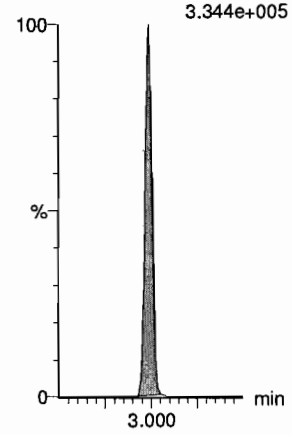
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

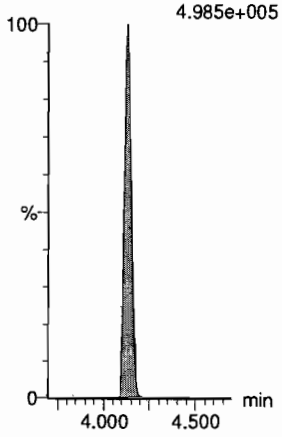


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

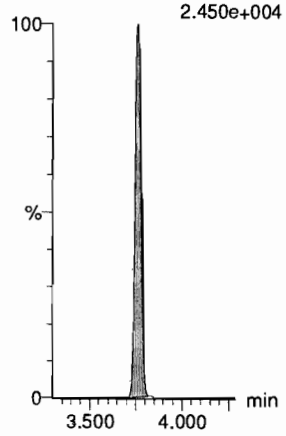
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_12, Date: 10-Jul-2019, Time: 14:47:21, ID: ST190710M2-7 PFC CS4 19G0807, Description: PFC CS4 19G0807

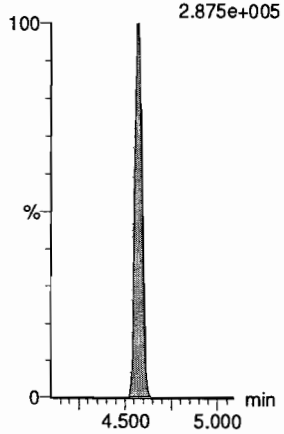
13C8-PFOA



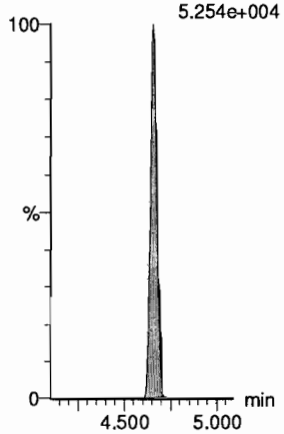
18O2-PFHxS



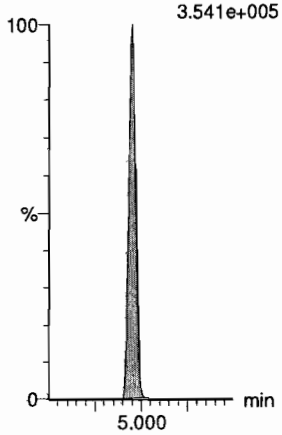
13C9-PFNA



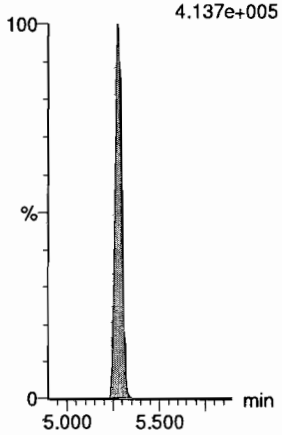
13C4-PFOS



13C6-PFDA



13C7-PFUdA

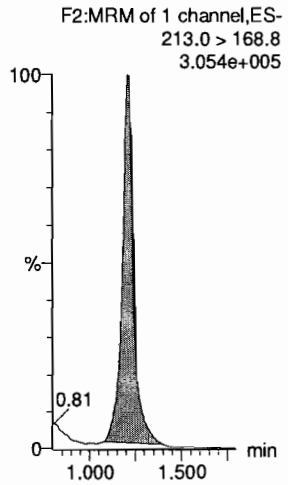


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

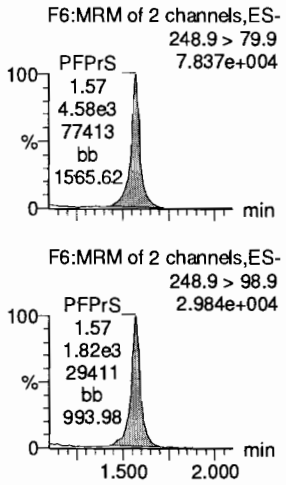
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

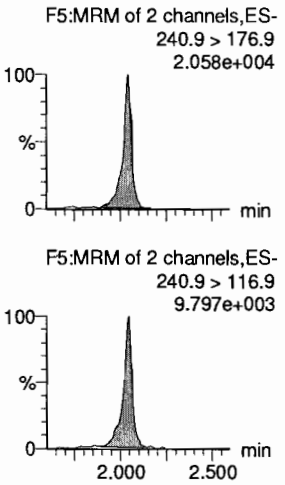
PFBA



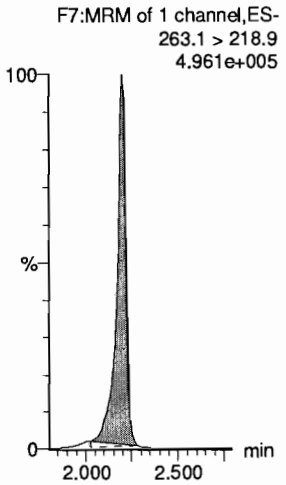
PFPrS



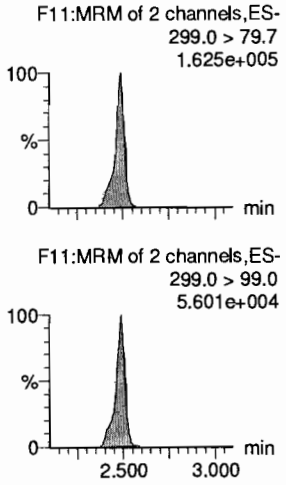
3:3 FTCA



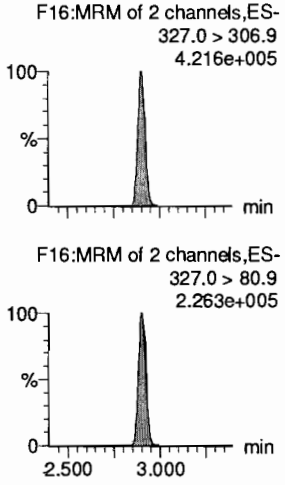
PFPeA



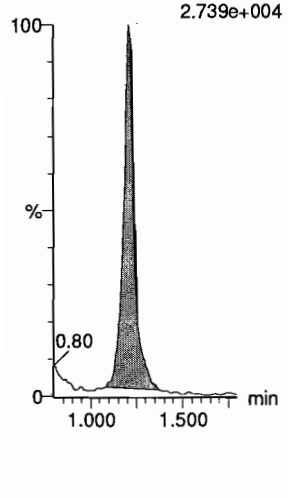
PFBS



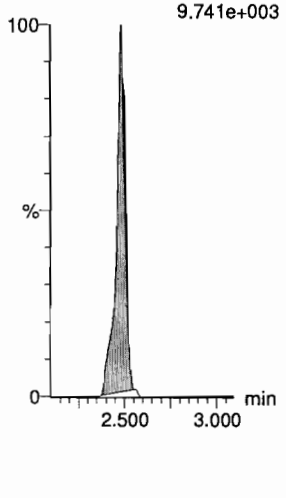
4:2 FTS



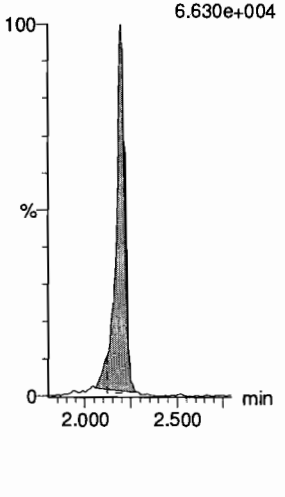
13C3-PFBA



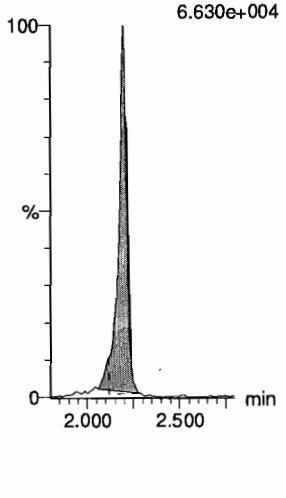
13C3-PFBS



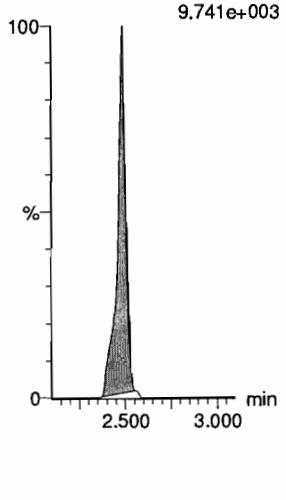
13C3-PFPeA



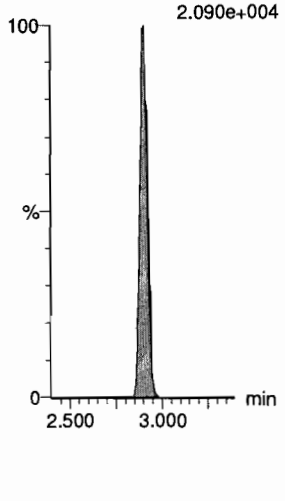
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS

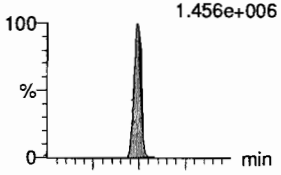


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

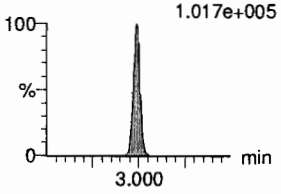
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

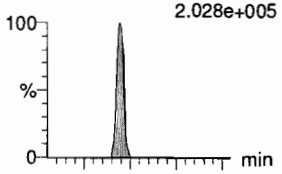
PFHxA
F13:MRM of 2 channels,ES-
313.0 > 269.0
1.456e+006



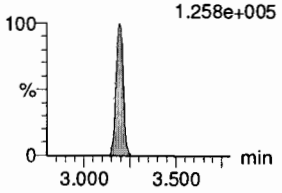
F13:MRM of 2 channels,ES-
313 > 118.9
1.017e+005



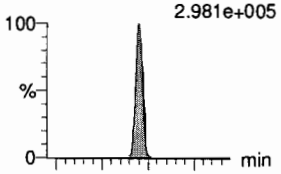
PFPeS
F19:MRM of 2 channels,ES-
349.1 > 80.1
2.028e+005



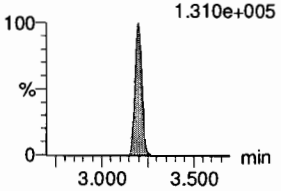
F19:MRM of 2 channels,ES-
349.1 > 99
1.258e+005



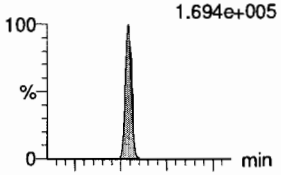
HFPO-DA
F9:MRM of 3 channels,ES-
285.1 > 168.9
2.981e+005



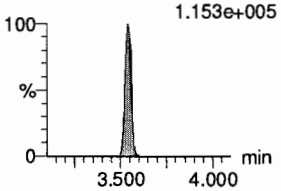
F9:MRM of 3 channels,ES-
285.1 > 184.9
1.310e+005



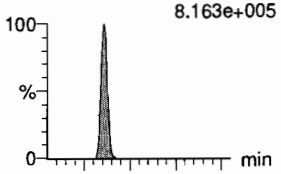
5:3 FTCA
F18:MRM of 2 channels,ES-
340.9 > 236.9
1.694e+005



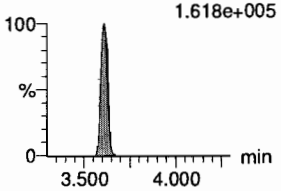
F18:MRM of 2 channels,ES-
340.9 > 216.9
1.153e+005



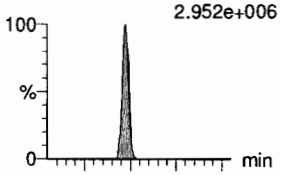
PFHpA
F20:MRM of 2 channels,ES-
363.0 > 318.9
8.163e+005



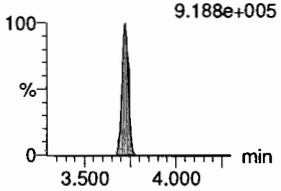
F20:MRM of 2 channels,ES-
363.0 > 169.0
1.618e+005



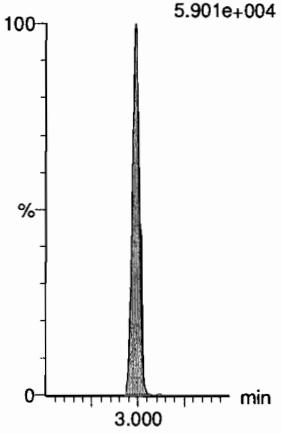
ADONA
F22:MRM of 2 channels,ES-
376.8 > 250.9
2.952e+006



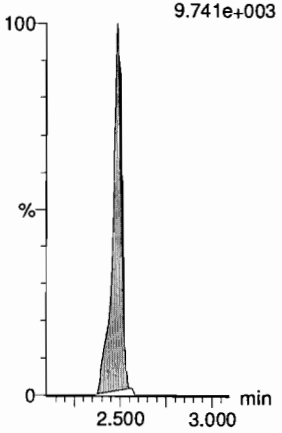
F22:MRM of 2 channels,ES-
376.8 > 85.0
9.188e+005



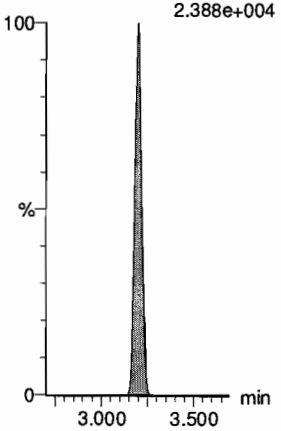
13C2-PFHxA
F14:MRM of 1 channel,ES-
315.0 > 270.0
5.901e+004



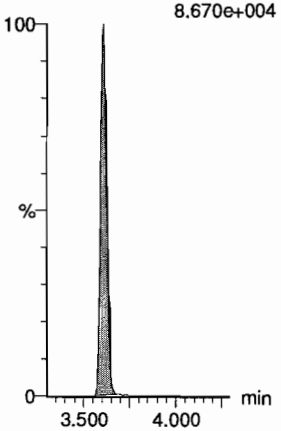
13C3-PFBS
F12:MRM of 1 channel,ES-
302.0 > 98.8
9.741e+003



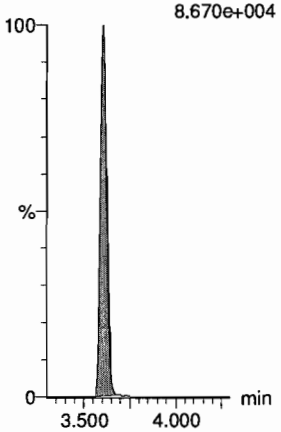
13C3-HFPO-DA
F10:MRM of 2 channels,ES-
287.0 > 168.9
2.388e+004



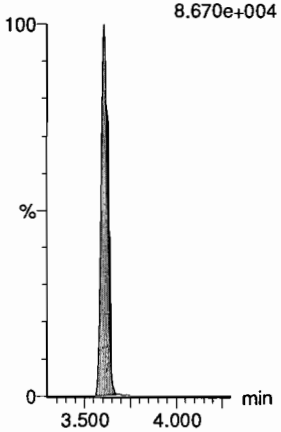
13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
8.670e+004



13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
8.670e+004



13C4-PFHpA
F21:MRM of 1 channel,ES-
367.2 > 321.8
8.670e+004

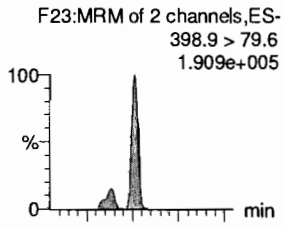


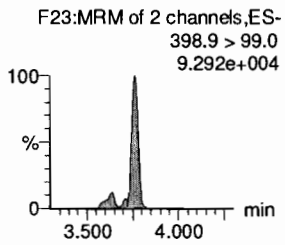
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

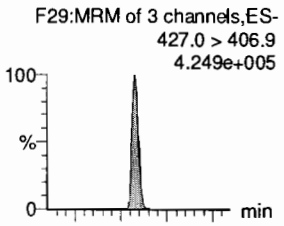
Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

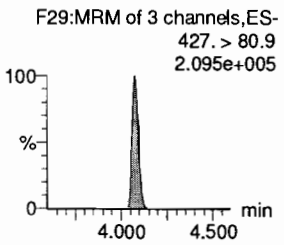
L-PFHxS



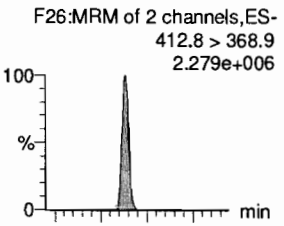


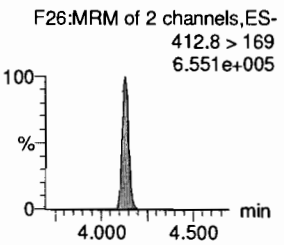
6:2 FTS



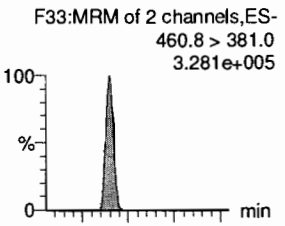


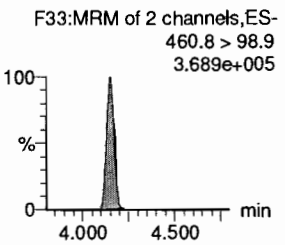
L-PFOA



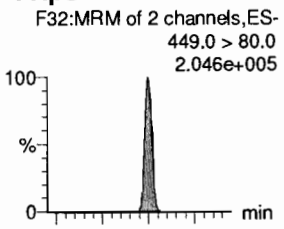


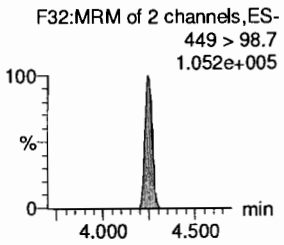
PFEChS



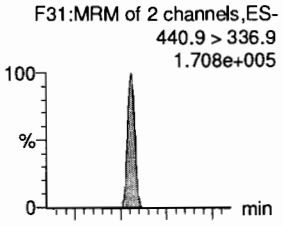


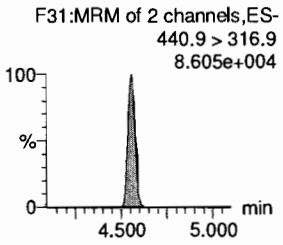
PFHpS



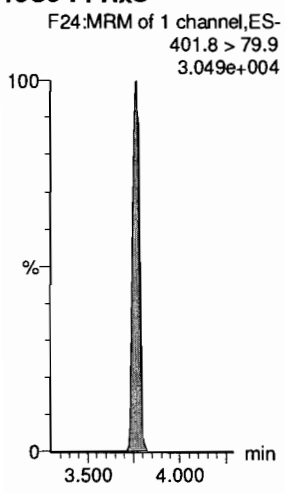


7:3 FTCA

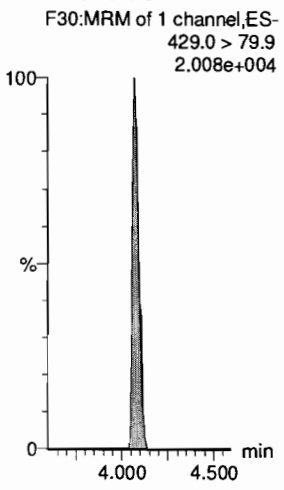




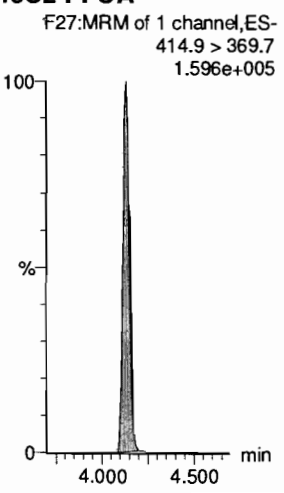
13C3-PFHxS



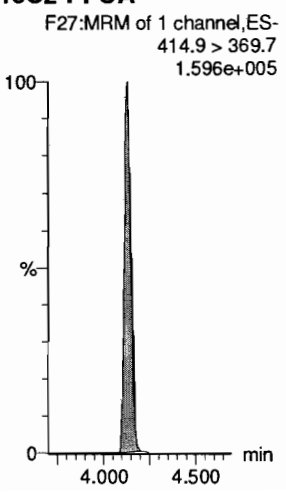
13C2-6:2 FTS



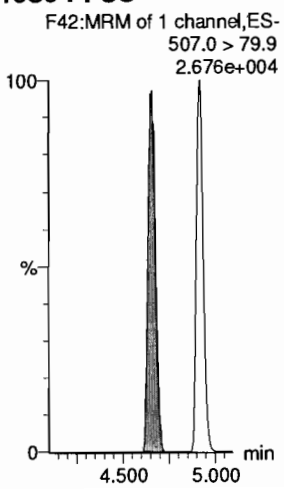
13C2-PFOA



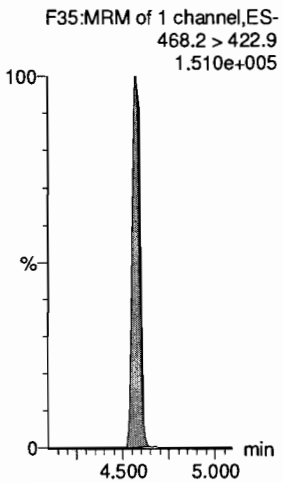
13C2-PFOA



13C8-PFOS



13C5-PFNA

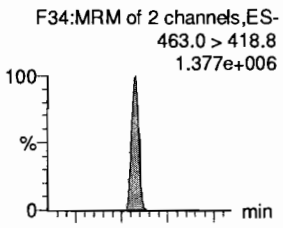


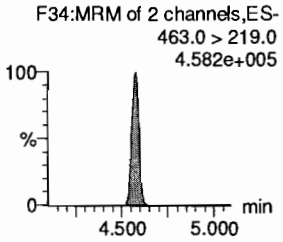
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

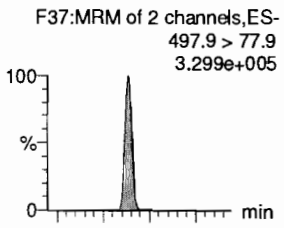
Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

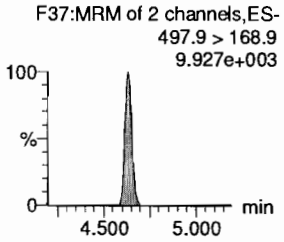
PFNA



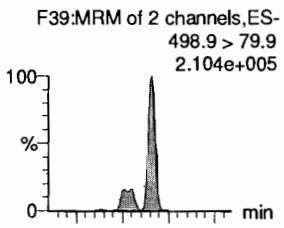


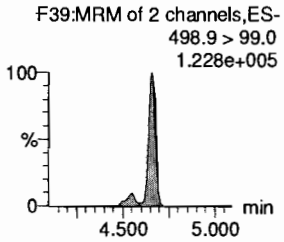
PFOSA



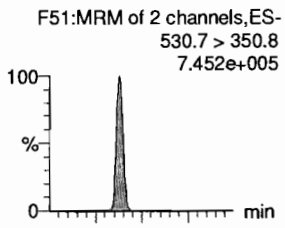


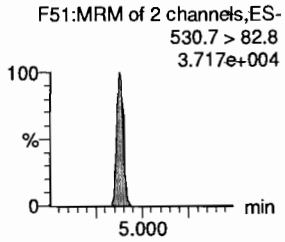
L-PFOS



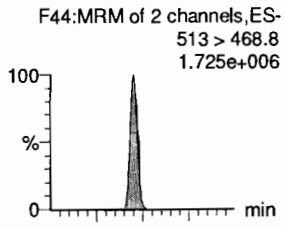


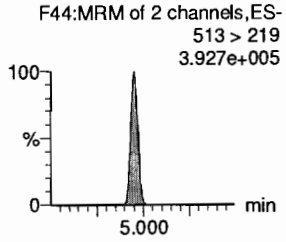
9Cl-PF30NS



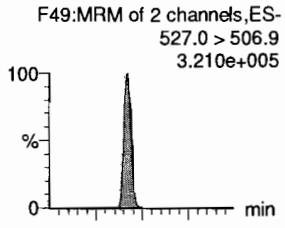


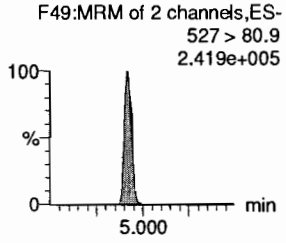
PFDA



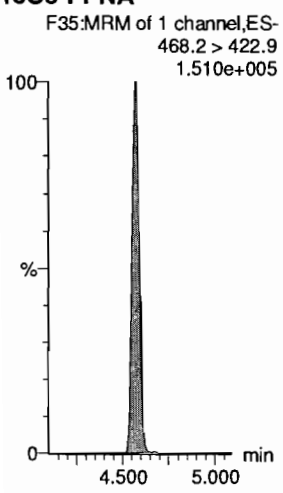


8:2 FTS

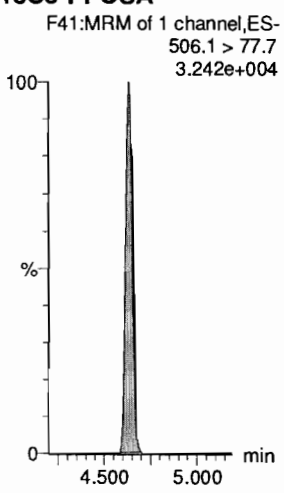




13C5-PFNA



13C8-PFOSA



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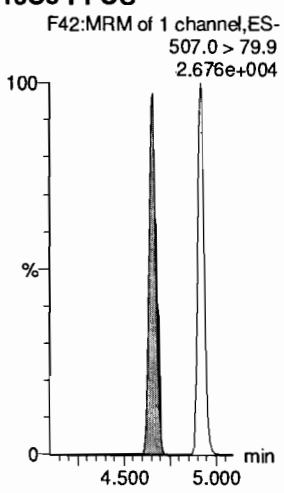
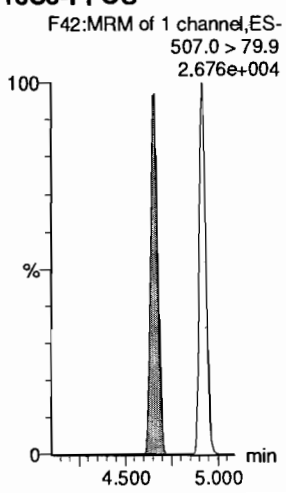
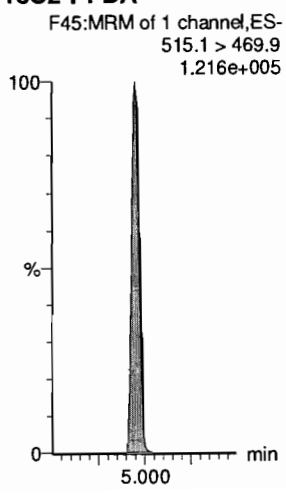


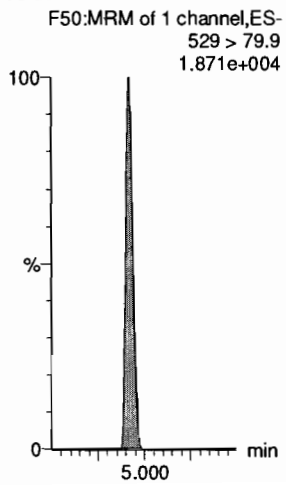
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

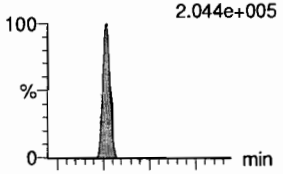


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

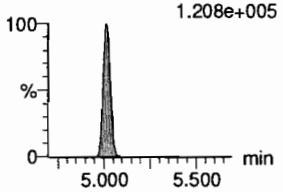
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

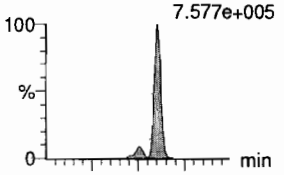
PFNS
F53:MRM of 2 channels,ES-
549.1 > 80.1
2.044e+005



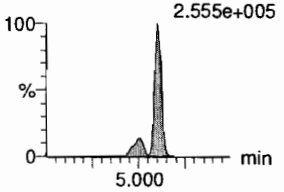
F53:MRM of 2 channels,ES-
549.1 > 99.1
1.208e+005



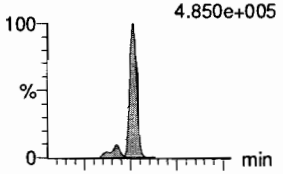
L-MeFOSAA
F56:MRM of 2 channels,ES-
570 > 419
7.577e+005



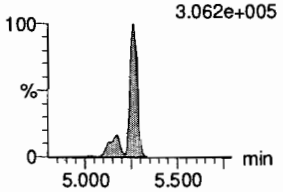
F56:MRM of 2 channels,ES-
570. > 512
2.555e+005



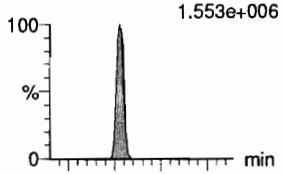
L-EtFOSAA
F59:MRM of 2 channels,ES-
584.1 > 419
4.850e+005



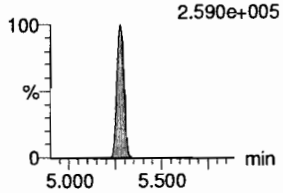
F59:MRM of 2 channels,ES-
584.1 > 526
3.062e+005



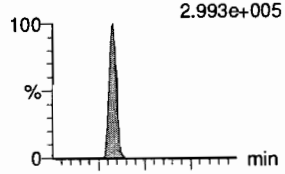
PFUdA
F54:MRM of 2 channels,ES-
563.0 > 518.9
1.553e+006



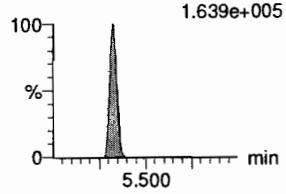
F54:MRM of 2 channels,ES-
563.0 > 269
2.590e+005



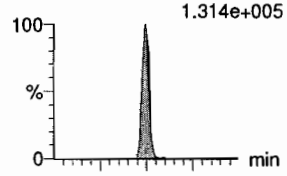
PFDS
F61:MRM of 2 channels,ES-
598.8 > 79.9
2.993e+005



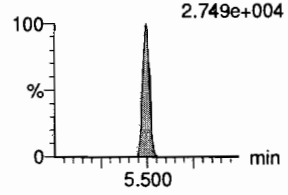
F61:MRM of 2 channels,ES-
598.8 > 98.9
1.639e+005



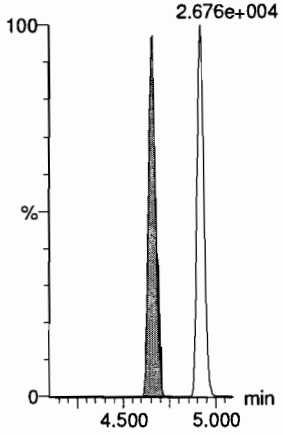
11Cl-PF30UdS
F68:MRM of 2 channels,ES-
632.6 > 452.7
1.314e+005



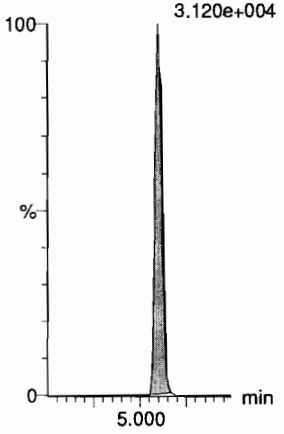
F68:MRM of 2 channels,ES-
632.6 > 450.7
2.749e+004



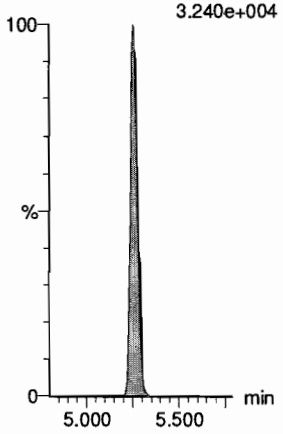
13C8-PFOS
F42:MRM of 1 channel,ES-
507.0 > 79.9
2.676e+004



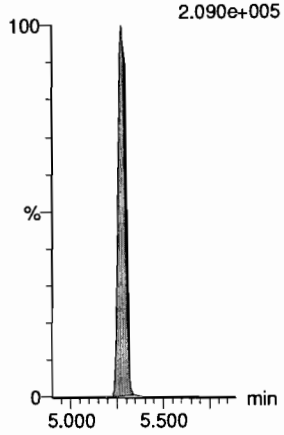
d3-N-MeFOSAA
F58:MRM of 1 channel,ES-
573.3 > 419
3.120e+004



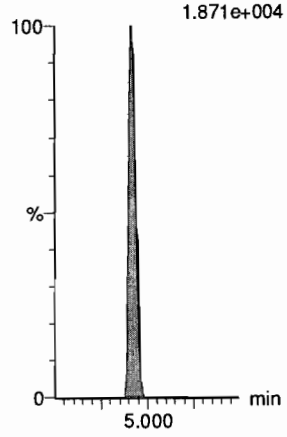
d5-N-EtFOSAA
F60:MRM of 1 channel,ES-
589.3 > 419
3.240e+004



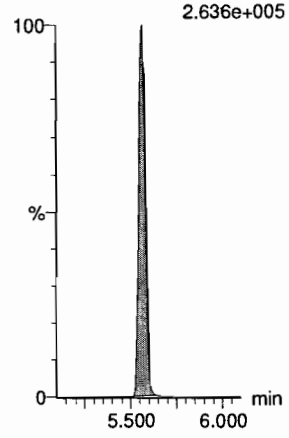
13C2-PFUdA
F55:MRM of 1 channel,ES-
565 > 519.8
2.090e+005



13C2-8:2 FTS
F50:MRM of 1 channel,ES-
529 > 79.9
1.871e+004



13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
2.636e+005

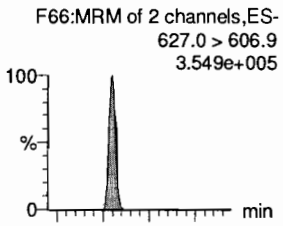


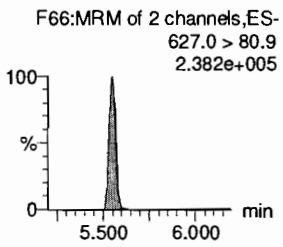
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

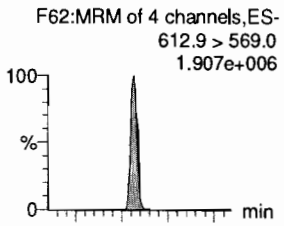
Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

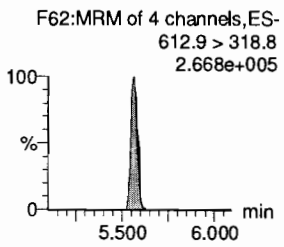
10:2 FTS



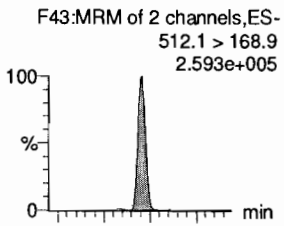


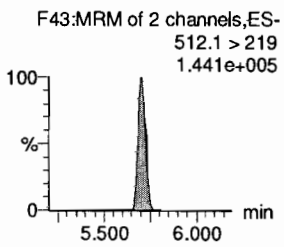
PFDoA



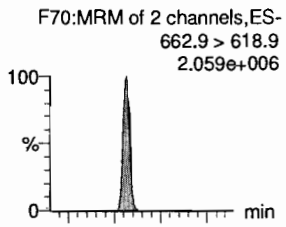


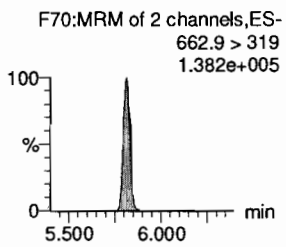
N-MeFOSA



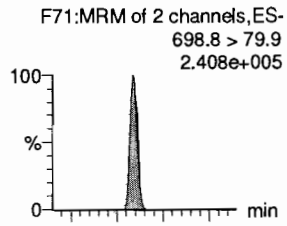


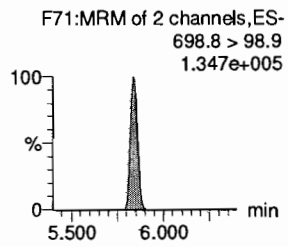
PFTrDA



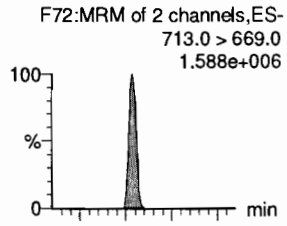


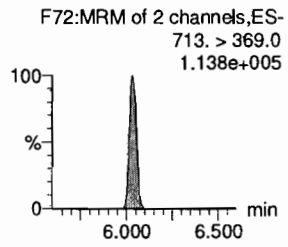
PFDoS



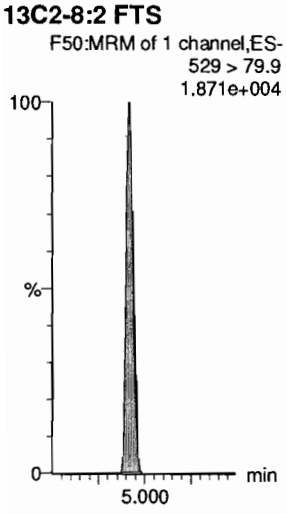


PFTeDA

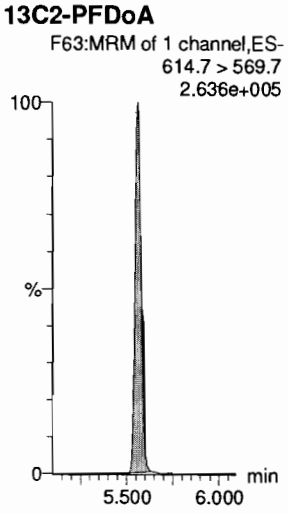




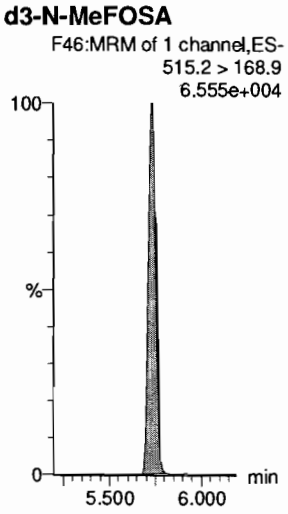
13C2-8:2 FTS



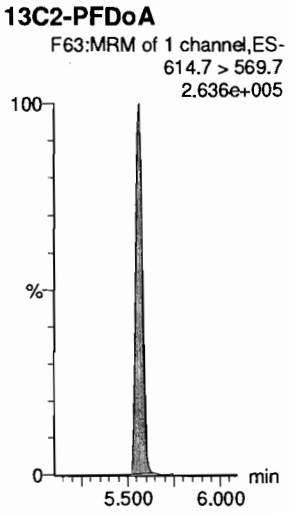
13C2-PFDoA



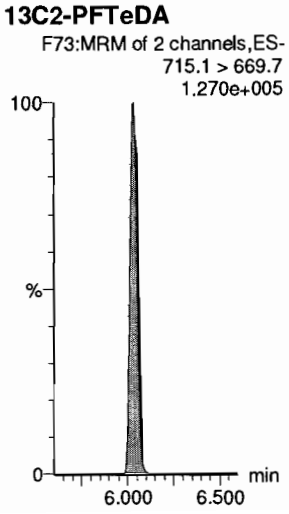
d3-N-MeFOSA



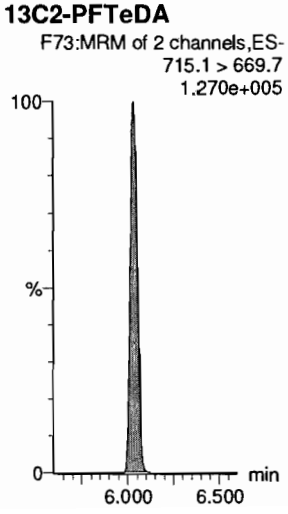
13C2-PFDoA



13C2-PFTeDA



13C2-PFTeDA

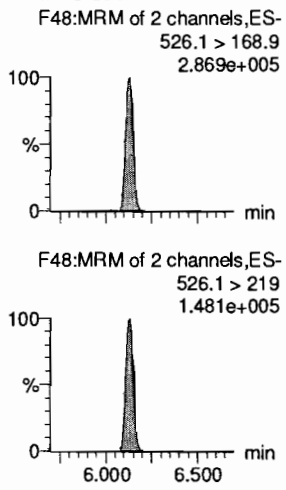


Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

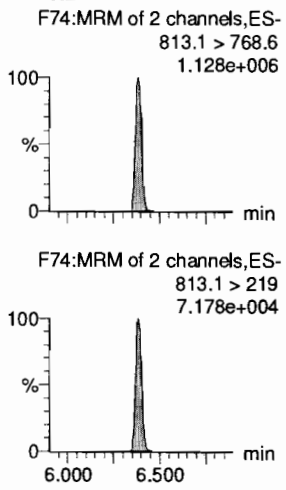
Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
Printed: Thursday, July 11, 2019 10:25:24 Pacific Daylight Time

Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

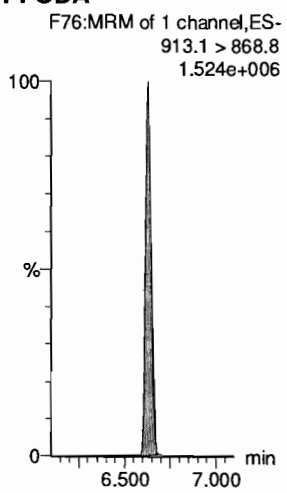
N-EtFOSA



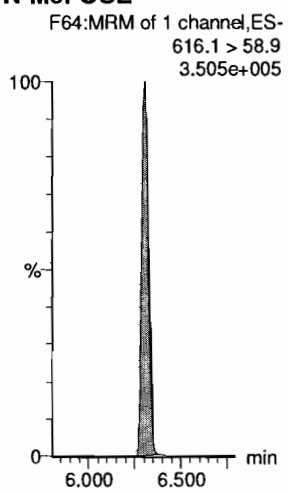
PFHxDA



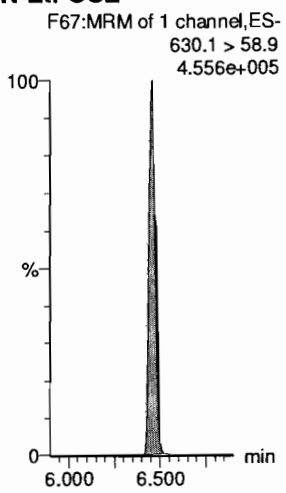
PFODA



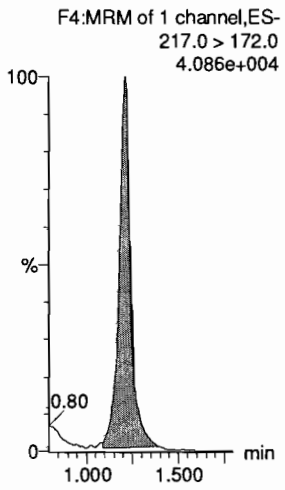
N-MeFOSE



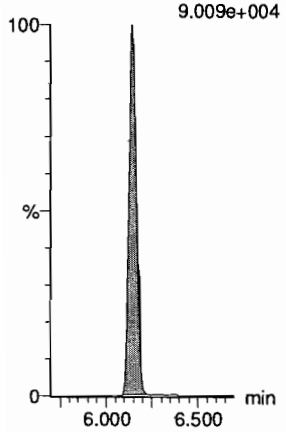
N-EtFOSE



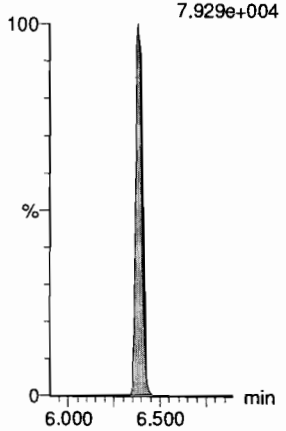
13C4-PFBA



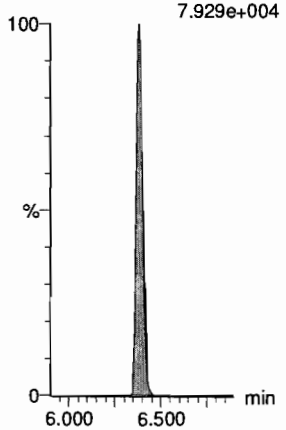
d5-N-ETFOSA



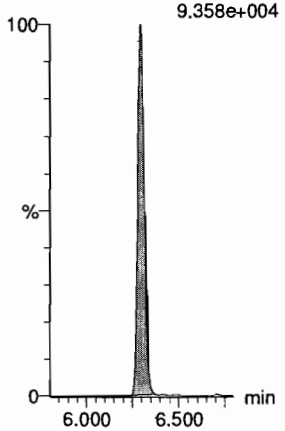
13C2-PFHxDA



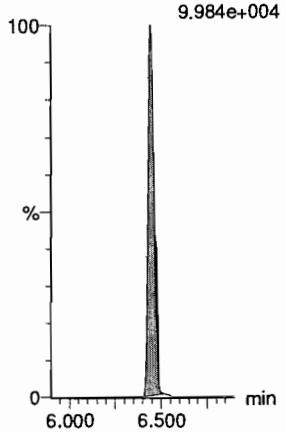
13C2-PFHxDA



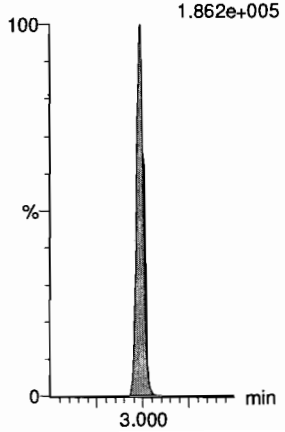
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-CRV.qld

Last Altered: Thursday, July 11, 2019 10:22:28 Pacific Daylight Time
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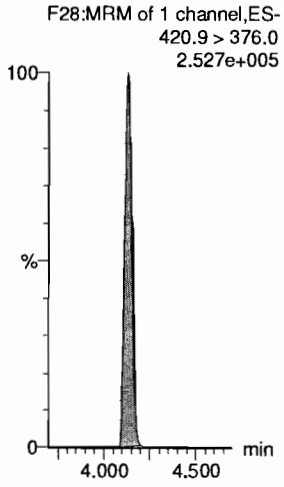
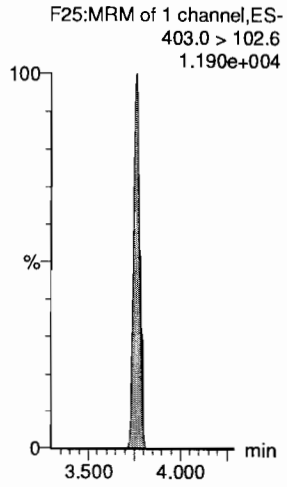
Name: 190710M2_13, Date: 10-Jul-2019, Time: 14:57:59, ID: ST190710M2-8 PFC CS5 19G0808, Description: PFC CS5 19G0808

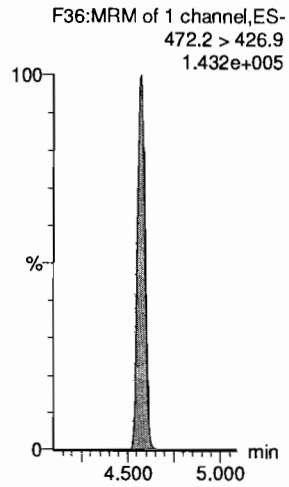
13C8-PFOA



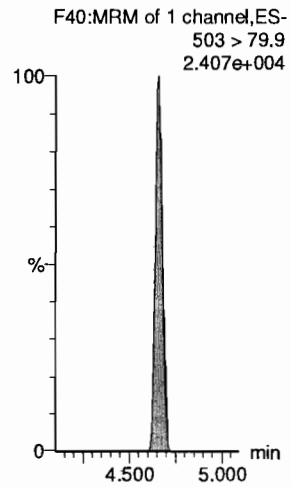
18O2-PFHxS



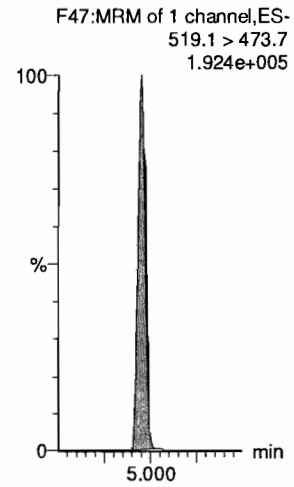
13C9-PFNA



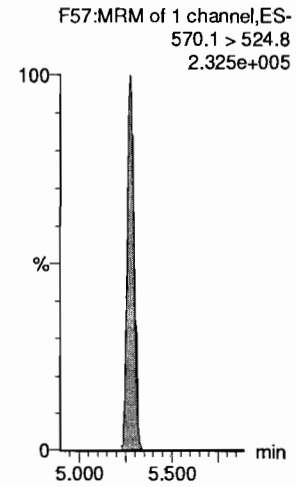
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

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6 Not in ICV. am 7/11/19

JK2 7/11/19

Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	1668.462	1979.732	1.00	1.22	10.535	7.4	74.3	NO		
2	2	PFPrS	248.9 > 79.9		594.434	1.00				(A)	NO		
3	3	3:3 FTCA	240.9 > 176.9		3999.152	1.00					NO		
4	4	PFPeA	263.1 > 218.9	2299.475	3999.152	1.00	2.20	7.187	7.6	75.6	NO		
5	5	PFBS	299.0 > 79.7	684.593	594.434	1.00	2.49	14.396	6.3	71.4	NO	3.133	NO
6	6	4:2 FTS	327.0 > 306.9	1799.142	1153.121	1.00	2.90	19.503	8.0	85.4	NO	1.947	NO
7	47	13C3-PFBA	216.1 > 171.8	1979.732	3078.759	1.00	1.21	8.038	12.4	98.9	NO		
8	49	13C3-PFBS	302.0 > 98.8	594.434	609.822	1.00	2.49	12.185	11.8	94.2	NO		
9	48	13C3-PFPeA	266.0 > 221.8	3999.152	9996.682	1.00	2.20	5.001	12.3	98.1	NO		
10	48	13C3-PFPeA	266.0 > 221.8	3999.152	9996.682	1.00	2.20	5.001	12.3	98.1	NO		
11	49	13C3-PFBS	302.0 > 98.8	594.434	609.822	1.00	2.49	12.185	11.8	94.2	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1153.121	609.822	1.00	2.90	23.636	10.6	84.5	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0	5535.548	3122.938	1.00	2.99	8.863	7.6	76.3	NO	13.636	NO
15	8	PFPeS	349.1>80.1	722.210	594.434	1.00	3.19	15.187	7.1	71.2	NO	1.614	NO
16	9	HFPO-DA	285.1 > 168.9		1267.019	1.00				(B)	NO		
17	10	5:3 FTCA	340.9 > 236.9		3749.774	1.00					NO		
18	11	PFHpA	363.0 > 318.9	2999.219	3749.774	1.00	3.61	9.998	8.2	81.5	NO	5.748	NO
19	12	ADONA	376.8 > 250.9		3749.774	1.00				(A)	NO		
20	52	13C2-PFHxA	315.0 > 270.0	3122.938	9996.682	1.00	2.99	3.905	4.9	98.6	NO		
21	49	13C3-PFBS	302.0 > 98.8	594.434	609.822	1.00	2.49	12.185	11.8	94.2	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1267.019	9996.682	1.00	3.20	1.584	5.2	103.4	NO		
23	53	13C4-PFHpA	367.2 > 321.8	3749.774	9996.682	1.00	3.61	4.689	12.0	95.9	NO		
24	53	13C4-PFHpA	367.2 > 321.8	3749.774	9996.682	1.00	3.61	4.689	12.0	95.9	NO		
25	53	13C4-PFHpA	367.2 > 321.8	3749.774	9996.682	1.00	3.61	4.689	12.0	95.9	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6	659.497	1329.815	1.00	3.76	6.199	7.5	81.7	NO	2.007	NO
28	15	6:2 FTS	427.0 > 406.9	1711.603	977.757	1.00	4.07	21.882	7.5	78.8	NO	2.088	NO
29	16	L-PFOA	412.8 > 368.9	8889.458	8278.422	1.00	4.13	13.423	7.2	72.4	NO	3.467	NO
30	18	PFecHS	460.8 > 381.0		8278.422	1.00				(6)	NO		
31	19	PFHpS	449.0 > 80.0	767.485	1319.405	1.00	4.25	7.271	8.4	87.7	NO	1.838	NO
32	20	7:3 FTCA	440.9 > 336.9		8161.165	1.00				(A)	NO		
33	54	13C3-PFHxS	401.8 > 79.9	1329.815	609.822	1.00	3.76	27.258	10.7	85.6	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	977.757	1316.567	1.00	4.07	9.283	12.6	100.9	NO		

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Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

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Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
35	58	13C2-PFOA	414.9 > 369.7	8278.422	13940.201	1.00	4.13	7.423	13.2	105.2	NO		
36	58	13C2-PFOA	414.9 > 369.7	8278.422	13940.201	1.00	4.13	7.423	13.2	105.2	NO		
37	59	13C8-PFOS	507.0 > 79.9	1319.405	1316.567	1.00	4.66	12.527	11.8	94.5	NO		
38	56	13C5-PFNA	468.2 > 422.9	8161.165	8020.511	1.00	4.57	12.719	12.9	103.5	NO		
39	-1												
40	21	PFNA	463.0 > 418.8	5668.871	8161.165	1.00	4.57	8.683	7.9	78.9	NO	2.991	NO
41	22	PFOSA	497.9 > 77.9	1183.944	1490.120	1.00	4.64	9.932	7.8	77.9	NO	47.923	YES
42	23	L-PFOS	498.9 > 79.9	1021.768	1319.405	1.00	4.66	9.680	7.8	84.0	NO	2.362	NO
43	25	9Cl-PF30NS	530.7 > 350.8		1319.405	1.00					NO		
44	26	PFDA	513 > 468.8	6402.301	6480.793	1.00	4.95	12.349	7.4	74.5	NO	4.349	NO
45	27	8:2 FTS	527.0 > 506.9	1172.854	885.406	1.00	4.92	16.558	7.4	76.6	NO	1.361	NO
46	56	13C5-PFNA	468.2 > 422.9	8161.165	8020.511	1.00	4.57	12.719	12.9	103.5	NO		
47	57	13C8-PFOSA	506.1 > 77.7	1490.120	12096.798	1.00	4.63	1.540	11.8	94.6	NO		
48	59	13C8-PFOS	507.0 > 79.9	1319.405	1316.567	1.00	4.66	12.527	11.8	94.5	NO		
49	59	13C8-PFOS	507.0 > 79.9	1319.405	1316.567	1.00	4.66	12.527	11.8	94.5	NO		
50	60	13C2-PFDA	515.1 > 469.9	6480.793	10100.407	1.00	4.95	8.020	12.1	96.9	NO		
51	61	13C2-8:2 FTS	529 > 79.9	885.406	1316.567	1.00	4.92	8.406	12.1	96.7	NO		
52	-1												
53	28	PFNS	549.1 > 80.1	768.594	1319.405	1.00	5.01	7.282	8.4	83.5	NO	1.839	NO
54	29	L-MeFOSAA	570 > 419	3409.469	1586.602	1.00	5.10	26.861	9.0	90.1	NO	3.233	NO
55	31	L-EtFOSAA	584.1 > 419	2583.433	1652.211	1.00	5.26	19.545	9.9	98.7	NO	1.462	NO
56	33	PFUdA	563.0 > 518.9	5771.112	10913.939	1.00	5.28	6.610	7.1	70.9	NO	5.946	NO
57	34	PFDS	598.8 > 79.9	966.503	885.406	1.00	5.32	13.645	6.8	70.5	NO	1.813	NO
58	35	11Cl-PF30UdS	632.6 > 452.7		12242.979	1.00					NO		
59	59	13C8-PFOS	507.0 > 79.9	1319.405	1316.567	1.00	4.66	12.527	11.8	94.5	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1586.602	12096.798	1.00	5.10	1.639	12.7	101.6	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1652.211	12096.798	1.00	5.26	1.707	11.6	92.7	NO		
62	63	13C2-PFUdA	565 > 519.8	10913.939	12096.798	1.00	5.28	11.278	13.2	105.3	NO		
63	61	13C2-8:2 FTS	529 > 79.9	885.406	1316.567	1.00	4.92	8.406	12.1	96.7	NO		
64	65	13C2-PFDoA	614.7 > 569.7	12242.979	10100.407	1.00	5.56	15.152	12.3	98.6	NO		
65	-1												
66	36	10:2 FTS	627.0 > 606.9		885.406	1.00					NO		
67	37	PFDoA	612.9 > 569.0	6942.080	12242.979	1.00	5.56	7.088	7.4	74.3	NO	6.841	NO
68	38	N-MeFOSA	512.1 > 168.9		2961.543	1.00					NO		

Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

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Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
69	39	PFTrDA	662.9 > 618.9	7759.583	12242.979	1.00	5.82	7.922	7.5	74.8	NO	13.911	NO
70	40	PFDoS	698.8 > 79.9		6413.826	1.00					NO		
71	41	PFTeDA	713.0 > 669.0	5451.753	6413.826	1.00	6.03	10.625	7.1	71.0	NO	14.504	NO
72	65	13C2-PFDoA	614.7 > 569.7	12242.979	10100.407	1.00	5.56	15.152	12.3	98.6	NO		
73	65	13C2-PFDoA	614.7 > 569.7	12242.979	10100.407	1.00	5.56	15.152	12.3	98.6	NO		
74	66	d3-N-MeFOSA	515.2 > 168.9	2961.543	12096.798	1.00	5.73	3.060	138.1	92.1	NO		
75	65	13C2-PFDoA	614.7 > 569.7	12242.979	10100.407	1.00	5.56	15.152	12.3	98.6	NO		
76	67	13C2-PFTeDA	715.1 > 669.7	6413.826	12096.798	1.00	6.03	6.628	13.0	103.7	NO		
77	67	13C2-PFTeDA	715.1 > 669.7	6413.826	12096.798	1.00	6.03	6.628	13.0	103.7	NO		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9		4532.070	1.00					NO		
80	43	PFHxDA	813.1 > 768.6		3496.733	1.00					NO		
81	44	PFODA	913.1 > 868.8		3496.733	1.00					NO		
82	45	N-MeFOSE	616.1 > 58.9		4091.928	1.00					NO		
83	46	N-EtFOSE	630.1 > 58.9		3846.295	1.00					NO		
84	72	13C4-PFBA	217.0 > 172.0	3078.759	3078.759	1.00	1.21	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9	4532.070	12096.798	1.00	6.15	4.683	150.3	100.2	NO		
86	69	13C2-PFHxDA	815 > 769.7	3496.733	12096.798	1.00	6.39	3.613	4.9	98.3	NO		
87	69	13C2-PFHxDA	815 > 769.7	3496.733	12096.798	1.00	6.39	3.613	4.9	98.3	NO		
88	70	d7-N-MeFOSE	623.1 > 58.9	4091.928	12096.798	1.00	6.30	4.228	151.3	100.8	NO		
89	71	d9-N-EtFOSE	639.2 > 58.8	3846.295	12096.798	1.00	6.45	3.974	144.5	96.3	NO		
90	73	13C5-PFHxA	318.0 > 272.9	9996.682	9996.682	1.00	2.99	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	13940.201	13940.201	1.00	4.13	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	609.822	609.822	1.00	3.76	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	8020.511	8020.511	1.00	4.57	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1316.567	1316.567	1.00	4.66	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	10100.407	10100.407	1.00	4.95	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	12096.798	12096.798	1.00	5.28	12.500	12.5	100.0	NO		

Vista Analytical Laboratory

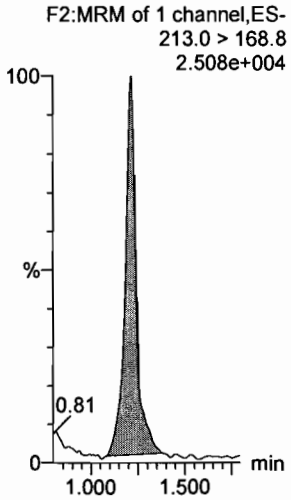
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:22:57 Pacific Daylight Time

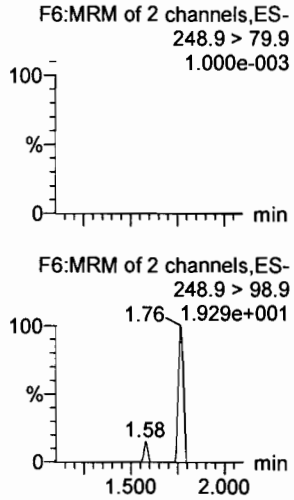
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019_ICV.mdb 11 Jul 2019 11:19:41
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

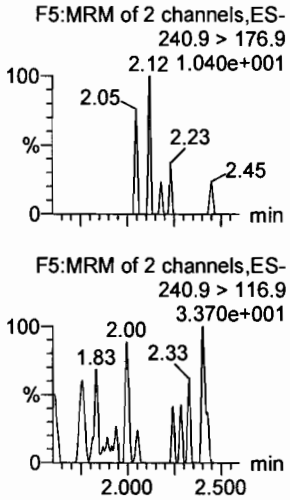
PFBA



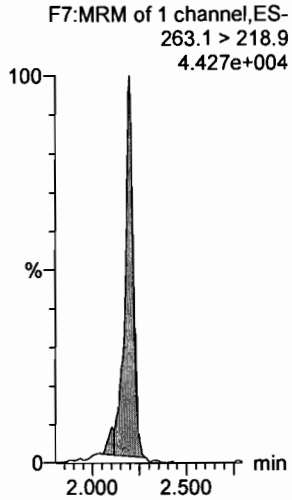
PFPrS



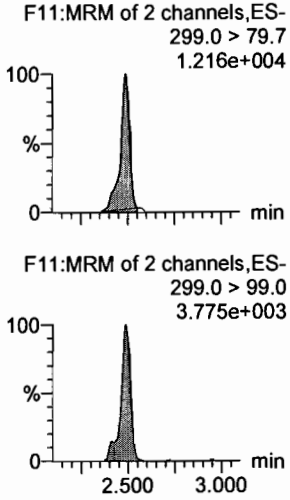
3:3 FTCA



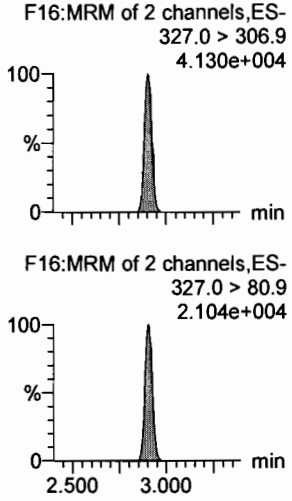
PFPeA



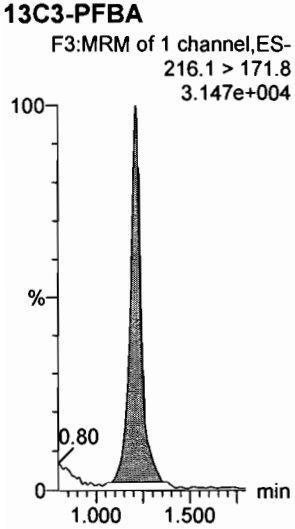
PFBS



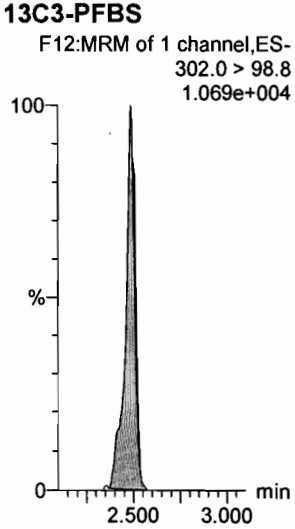
4:2 FTS



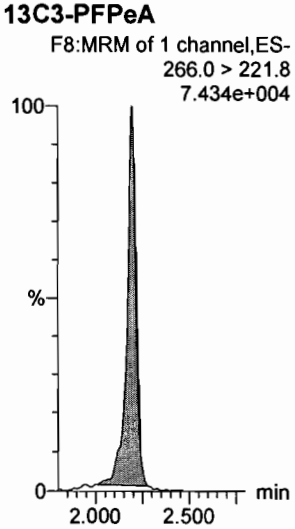
13C3-PFBA



13C3-PFBS



13C3-PFPeA



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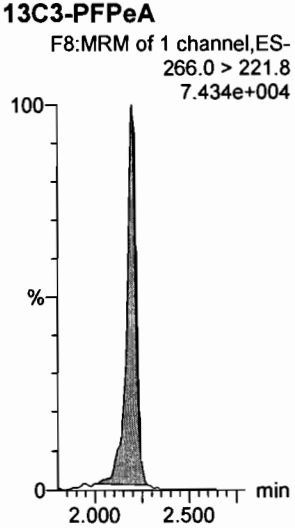
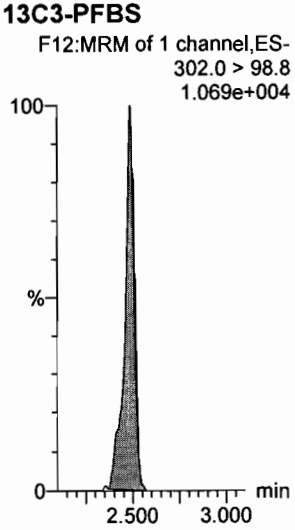
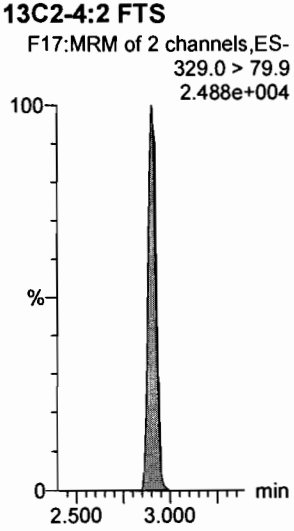


13C3-PFBS



13C2-4:2 FTS

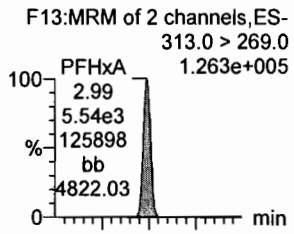


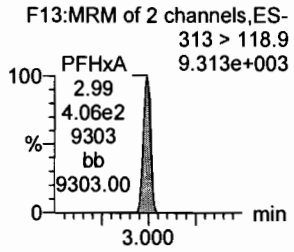
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:22:57 Pacific Daylight Time

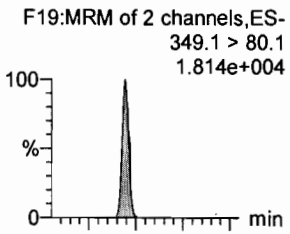
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

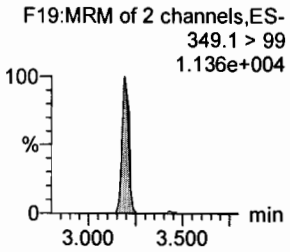
PFHxA



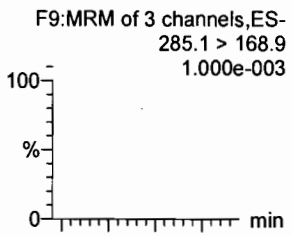


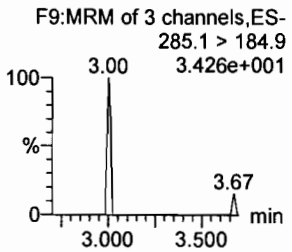
PFPeS



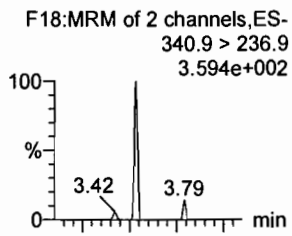


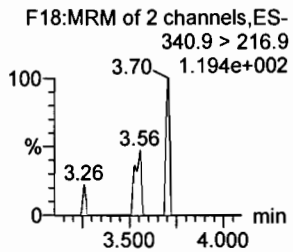
HFPO-DA



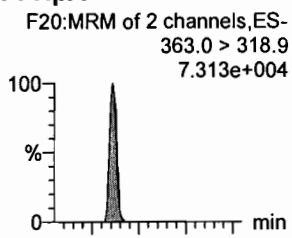


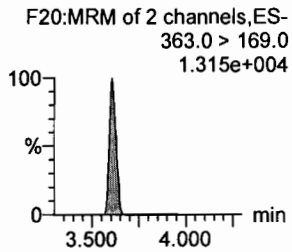
5:3 FTCA



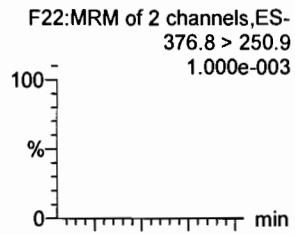


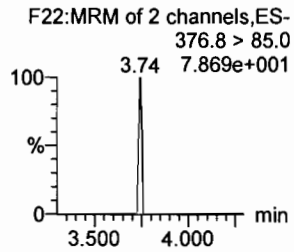
PFHpA



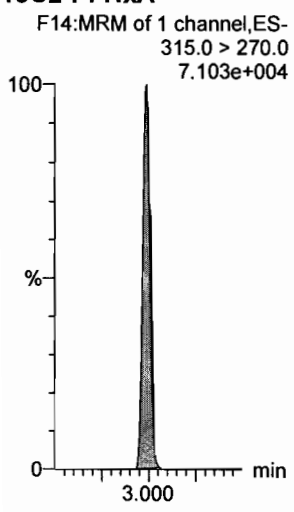


ADONA

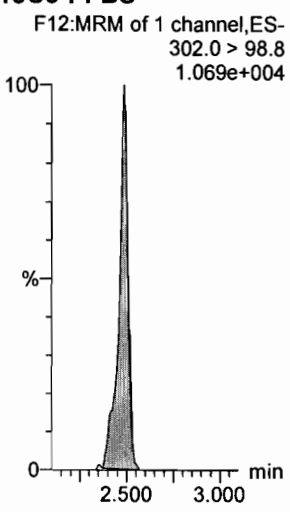




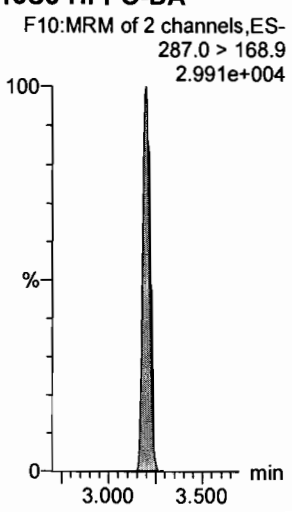
13C2-PFHxA



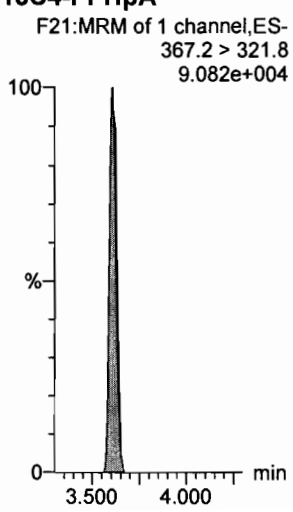
13C3-PFBS



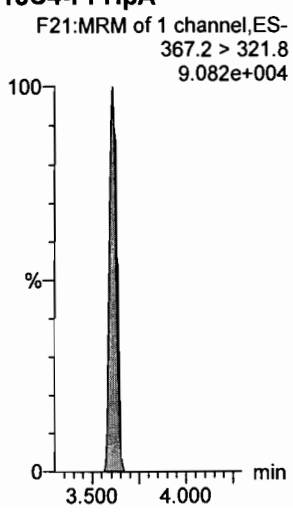
13C3-HFPO-DA



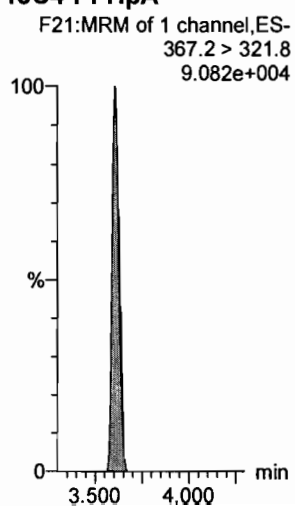
13C4-PFHpA



13C4-PFHpA



13C4-PFHpA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
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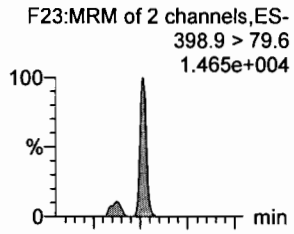
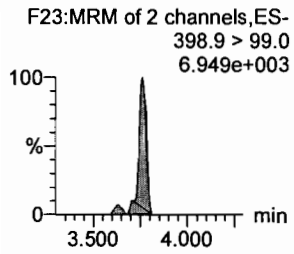
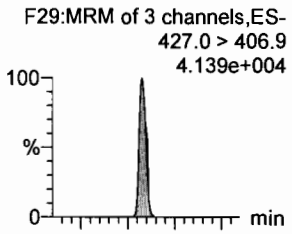
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

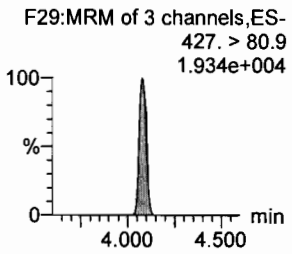
L-PFHxS



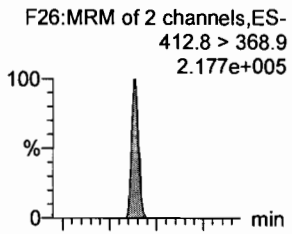


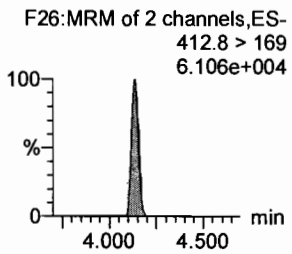
6:2 FTS



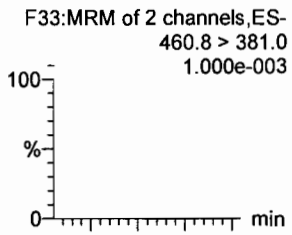


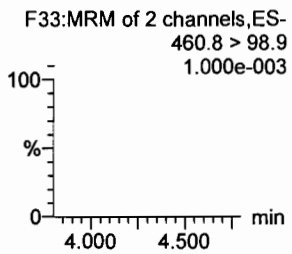
L-PFOA



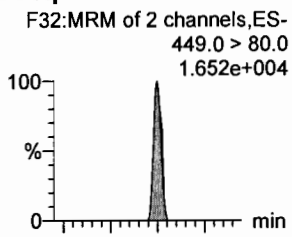


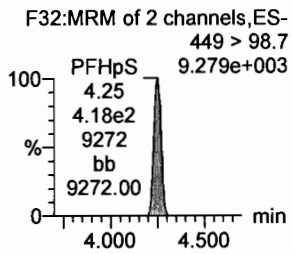
PFEChS



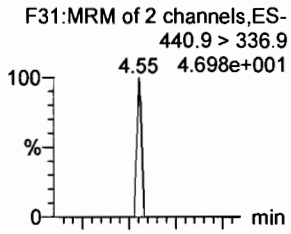


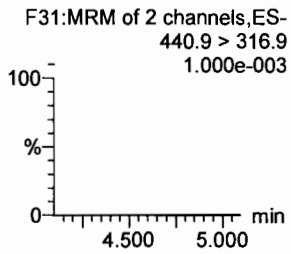
PFHpS



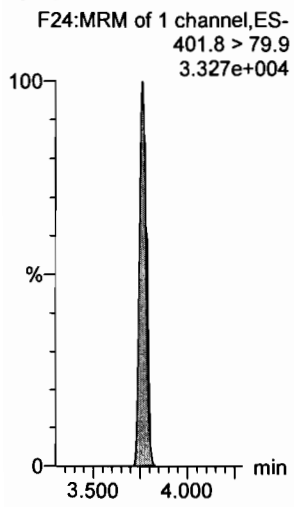


7:3 FTCA

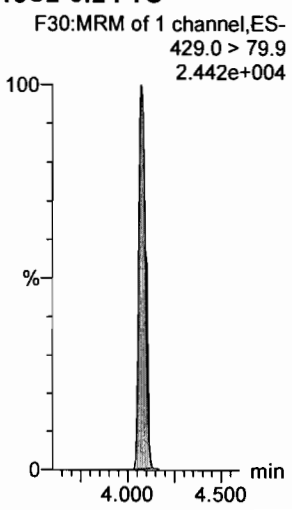




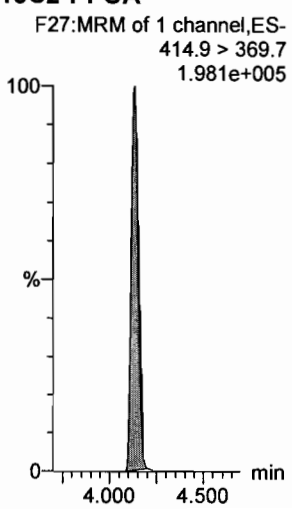
13C3-PFHxS



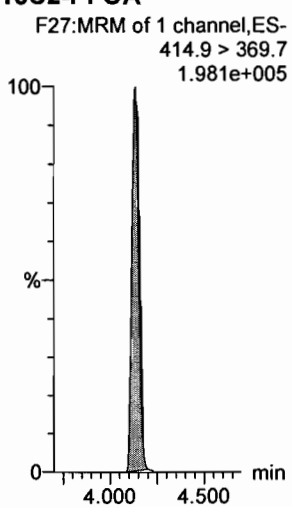
13C2-6:2 FTS



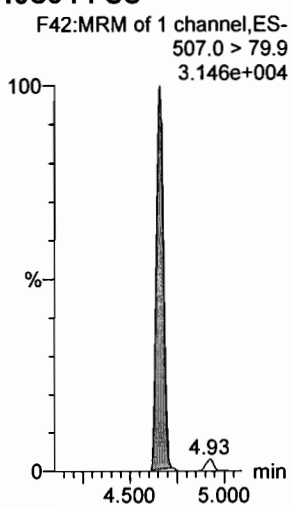
13C2-PFOA



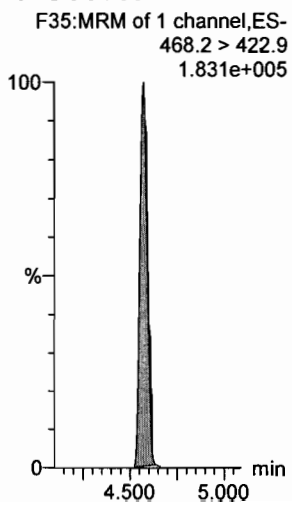
13C2-PFOA



13C8-PFOS



13C5-PFNA

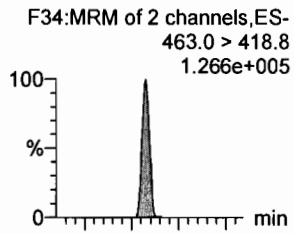


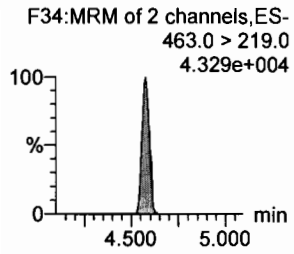
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:22:57 Pacific Daylight Time

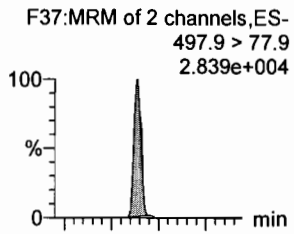
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

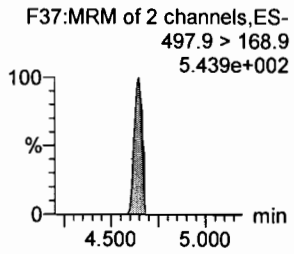
PFNA



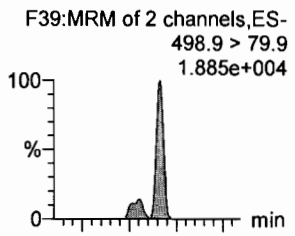


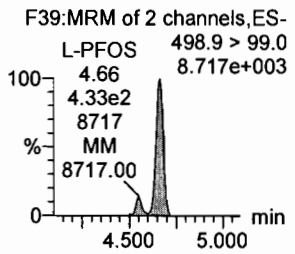
PFOSA



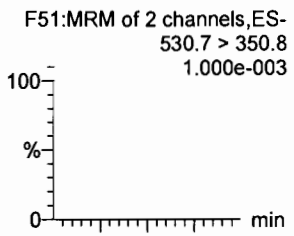


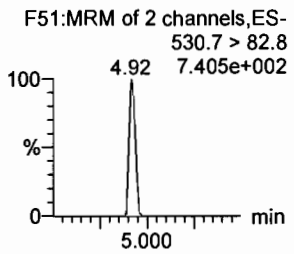
L-PFOS



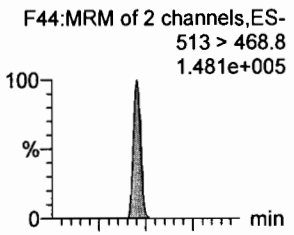


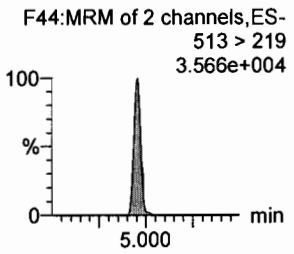
9Cl-PF30NS



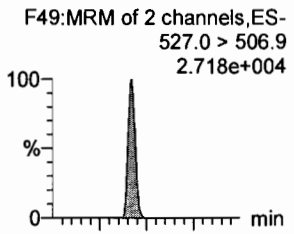


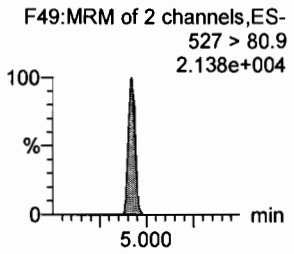
PFDA



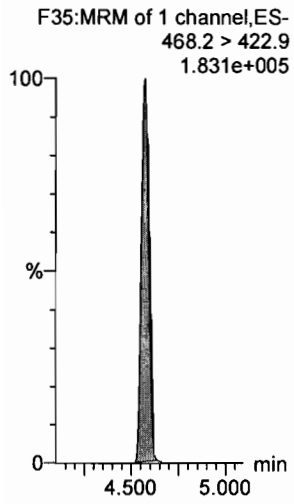


8:2 FTS

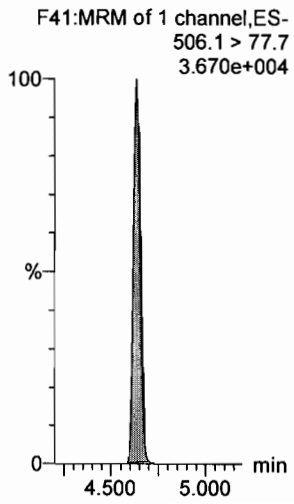




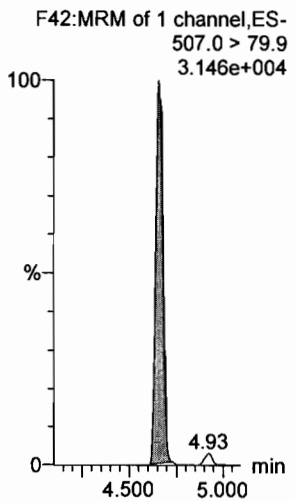
13C5-PFNA



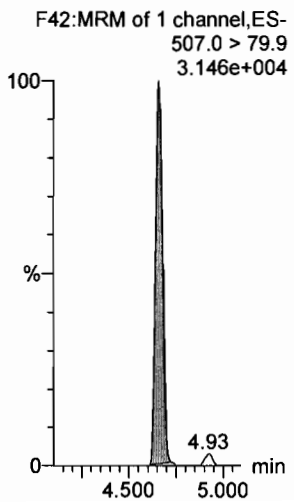
13C8-PFOSA



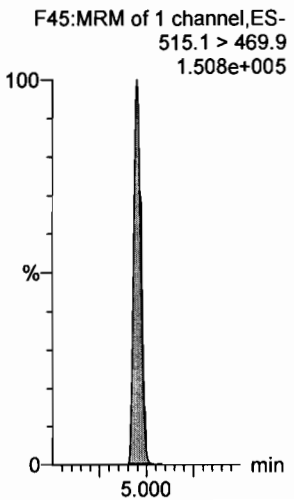
13C8-PFOS



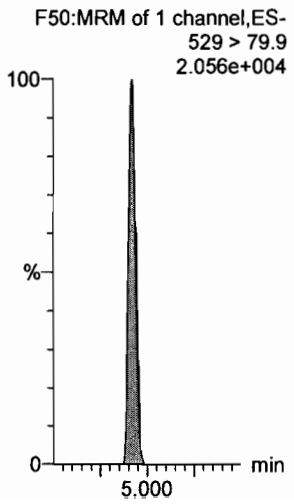
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

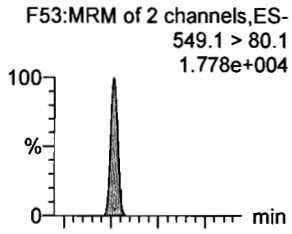


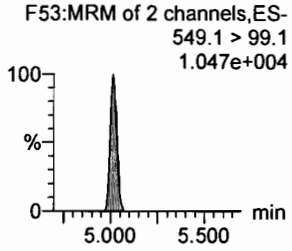
Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:22:57 Pacific Daylight Time

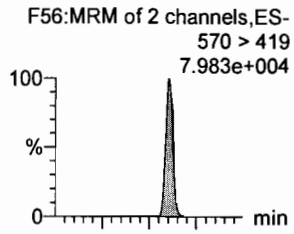
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

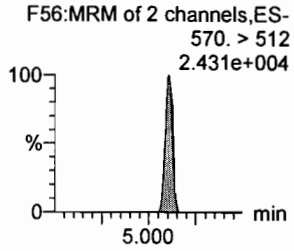
PFNS



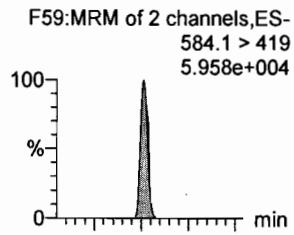


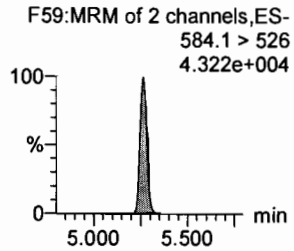
L-MeFOSAA



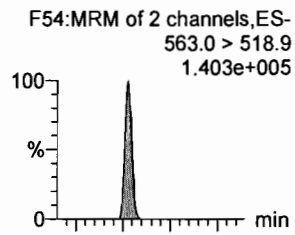


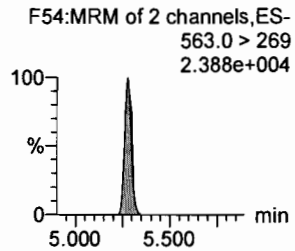
L-EtFOSAA



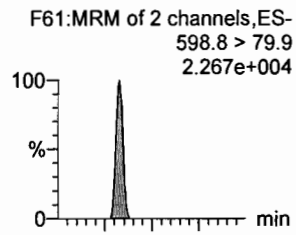


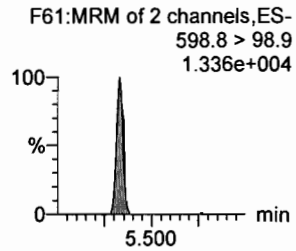
PFUdA



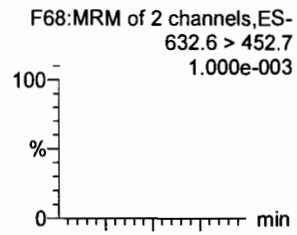


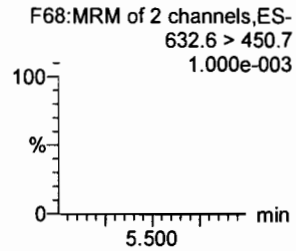
PFDS



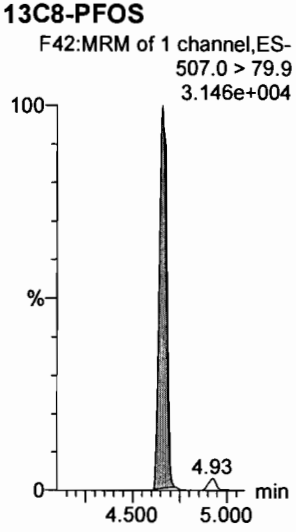


11Cl-PF30UdS

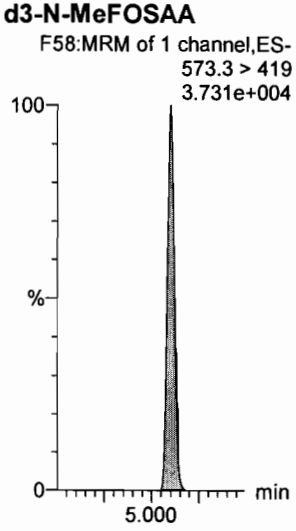




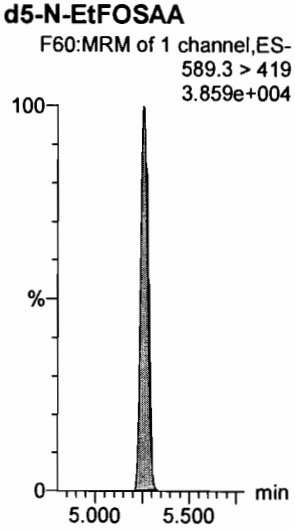
13C8-PFOS



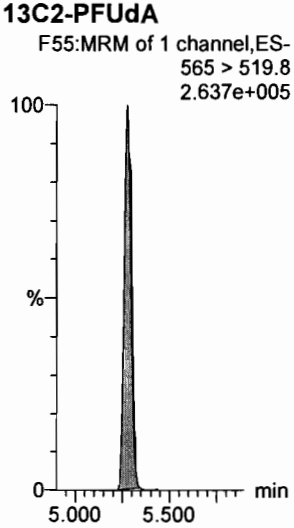
d3-N-MeFOSAA



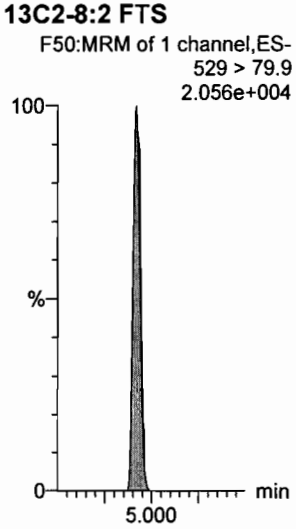
d5-N-EtFOSAA



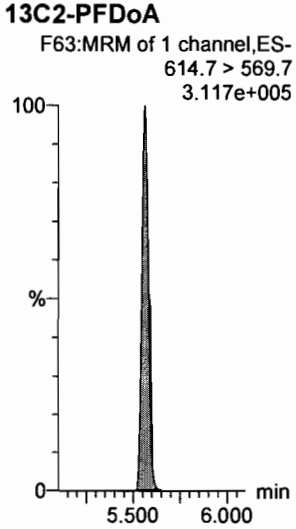
13C2-PFUdA



13C2-8:2 FTS



13C2-PFDoA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

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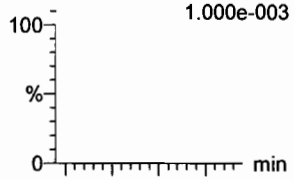
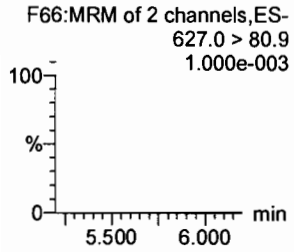
Printed: Thursday, July 11, 2019 11:22:57 Pacific Daylight Time

Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

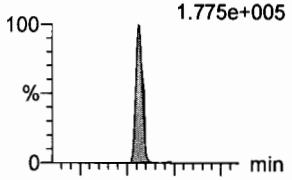
10:2 FTS
F66:MRM of 2 channels,ES-
627.0 > 606.9
1.000e-003



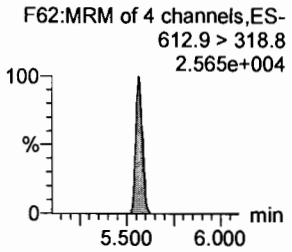
F66:MRM of 2 channels,ES-
627.0 > 80.9
1.000e-003



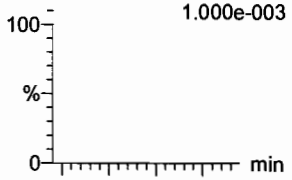
PFDoA
F62:MRM of 4 channels,ES-
612.9 > 569.0
1.775e+005



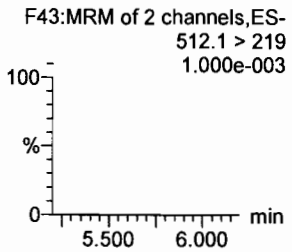
F62:MRM of 4 channels,ES-
612.9 > 318.8
2.565e+004



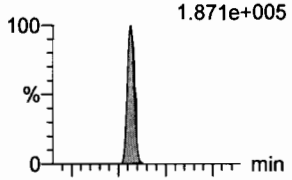
N-MeFOSA
F43:MRM of 2 channels,ES-
512.1 > 168.9
1.000e-003



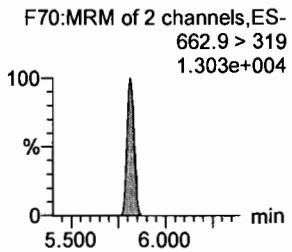
F43:MRM of 2 channels,ES-
512.1 > 219
1.000e-003



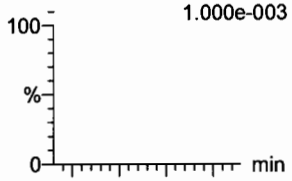
PFTrDA
F70:MRM of 2 channels,ES-
662.9 > 618.9
1.871e+005



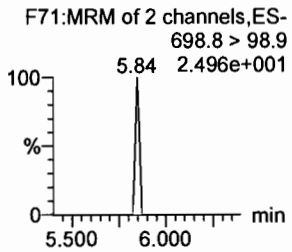
F70:MRM of 2 channels,ES-
662.9 > 319
1.303e+004



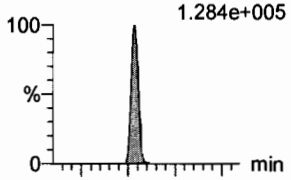
PFDoS
F71:MRM of 2 channels,ES-
698.8 > 79.9
1.000e-003



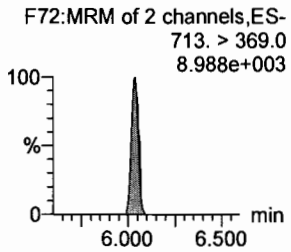
F71:MRM of 2 channels,ES-
698.8 > 98.9
5.84 2.496e+001



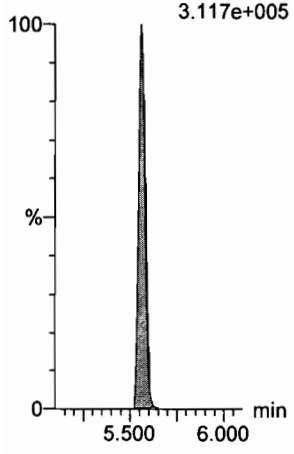
PFTeDA
F72:MRM of 2 channels,ES-
713.0 > 669.0
1.284e+005



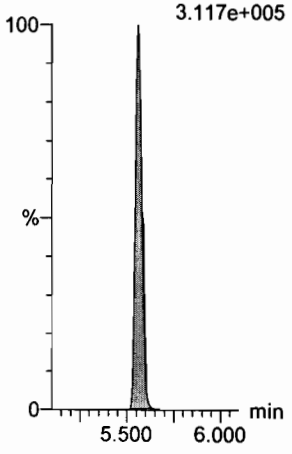
F72:MRM of 2 channels,ES-
713. > 369.0
8.988e+003



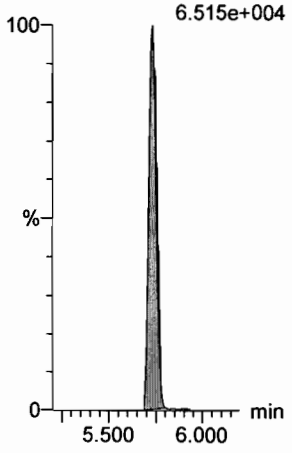
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.117e+005



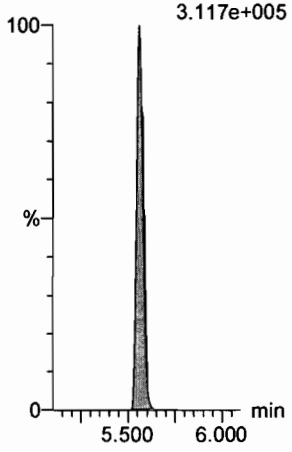
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.117e+005



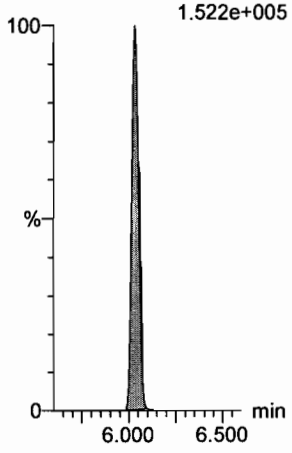
d3-N-MeFOSA
F46:MRM of 1 channel,ES-
515.2 > 168.9
6.515e+004



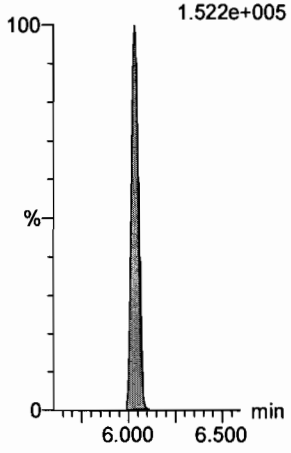
13C2-PFDoA
F63:MRM of 1 channel,ES-
614.7 > 569.7
3.117e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.522e+005



13C2-PFTeDA
F73:MRM of 2 channels,ES-
715.1 > 669.7
1.522e+005



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

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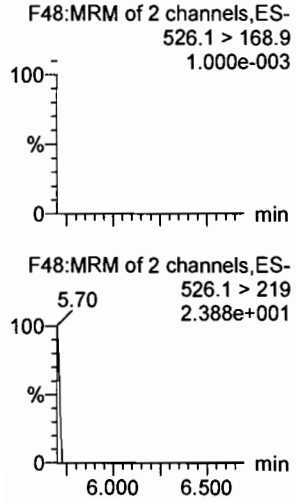
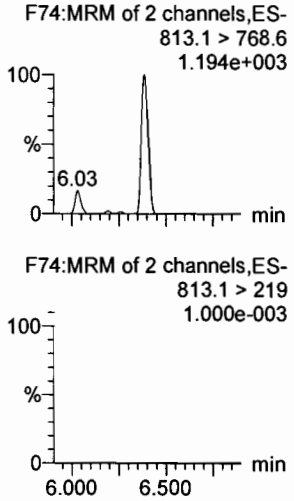
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

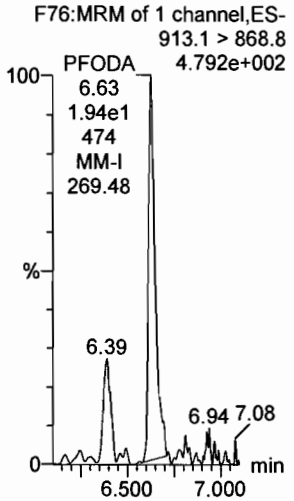
N-EtFOSA



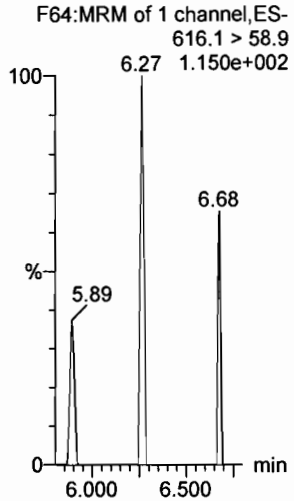
PFHxDA



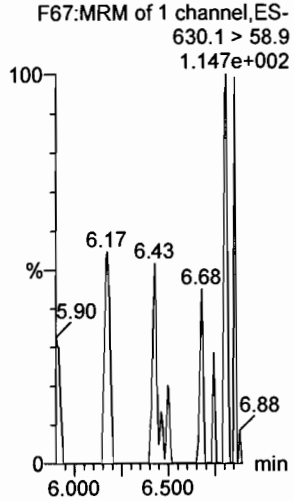
PFODA



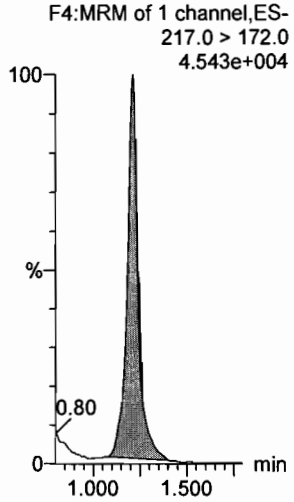
N-MeFOSE



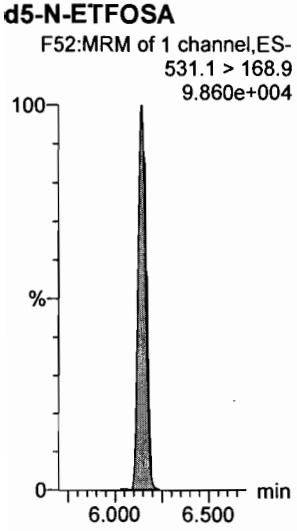
N-EtFOSE



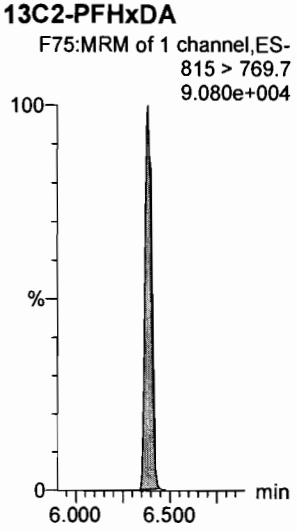
13C4-PFBA



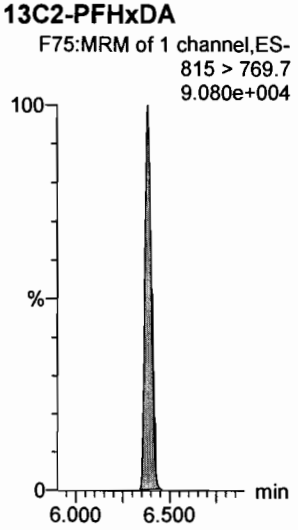
d5-N-ETFOSA



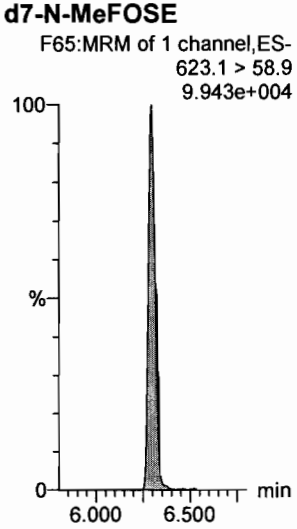
13C2-PFHxDA



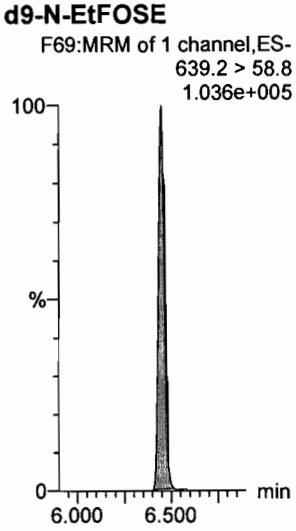
13C2-PFHxDA



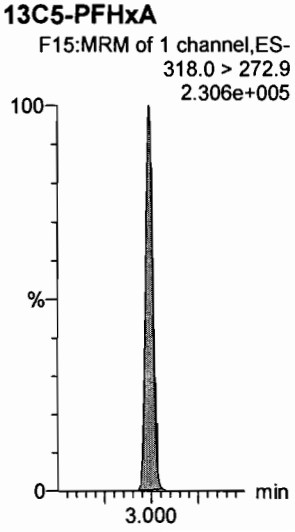
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA



Dataset: F:\Projects\PFAS.PRO\Results\190710M2\190710M2-ICV.qld

Last Altered: Thursday, July 11, 2019 11:22:53 Pacific Daylight Time
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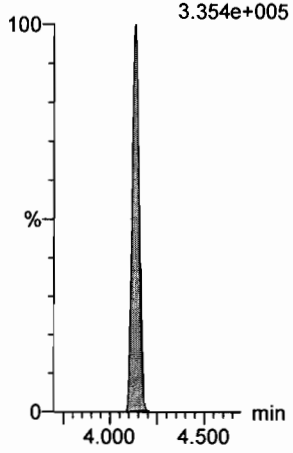
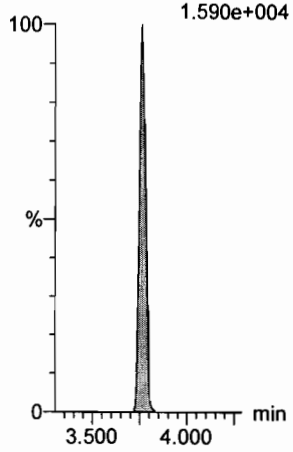
Name: 190710M2_17, Date: 10-Jul-2019, Time: 15:40:21, ID: ST190710M2-1 PFC ICV 19G0811, Description: PFC ICV 19G0811

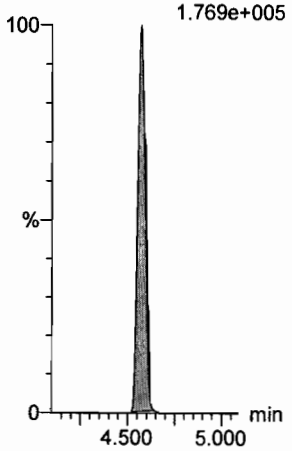
13C8-PFOA



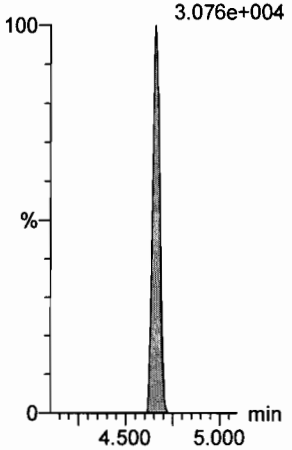
18O2-PFHxS



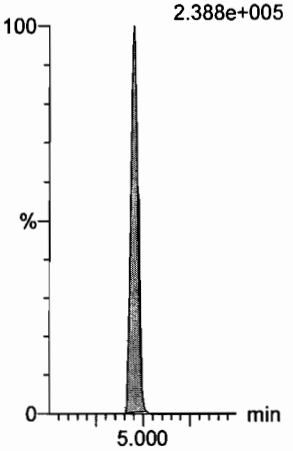
13C9-PFNA



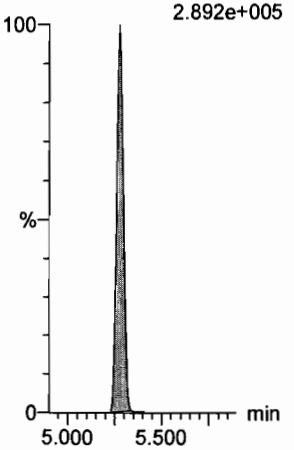
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8		3665.172	1.00					NO		
2	2	PFPrS	248.9 > 79.9		564.050	1.00					NO		
3	3	3:3 FTCA	240.9 > 176.9		4395.620	1.00					NO		
4	4	PFPeA	263.1 > 218.9		4395.620	1.00					NO		
5	5	PFBS	299.0 > 79.7		564.050	1.00					NO		
6	6	4:2 FTS	327.0 > 306.9		1123.940	1.00					NO		
7	47	13C3-PFBA	216.1 > 171.8	3665.172	5748.722	1.00	1.21	7.970	12.3	98.1	NO		
8	49	13C3-PFBS	302.0 > 98.8	564.050	553.194	1.00	2.49	12.745	12.3	98.5	NO		
9	48	13C3-PFPeA	266.0 > 221.8	4395.620	9796.685	1.00	2.20	5.609	13.8	110.1	NO		
10	48	13C3-PFPeA	266.0 > 221.8	4395.620	9796.685	1.00	2.20	5.609	13.8	110.1	NO		
11	49	13C3-PFBS	302.0 > 98.8	564.050	553.194	1.00	2.49	12.745	12.3	98.5	NO		
12	51	13C2-4:2 FTS	329.0 >79.9	1123.940	553.194	1.00	2.91	25.397	11.3	90.8	NO		
13	-1												
14	7	PFHxA	313.0 > 269.0	7.800	3103.105	1.00	2.86	0.013	0.0		NO		
15	8	PFPeS	349.1>80.1		564.050	1.00					NO		
16	9	HFPO-DA	285.1 > 168.9		1212.091	1.00					NO		
17	10	5:3 FTCA	340.9 > 236.9		3834.397	1.00					NO		
18	11	PFHpA	363.0 > 318.9		3834.397	1.00					NO		
19	12	ADONA	376.8 > 250.9		3834.397	1.00					NO		
20	52	13C2-PFHxA	315.0 > 270.0	3103.105	9796.685	1.00	2.99	3.959	5.0	99.9	NO		
21	49	13C3-PFBS	302.0 > 98.8	564.050	553.194	1.00	2.49	12.745	12.3	98.5	NO		
22	50	13C3-HFPO-DA	287.0 > 168.9	1212.091	9796.685	1.00	3.20	1.547	5.0	100.9	NO		
23	53	13C4-PFHpA	367.2 > 321.8	3834.397	9796.685	1.00	3.61	4.892	12.5	100.1	NO		
24	53	13C4-PFHpA	367.2 > 321.8	3834.397	9796.685	1.00	3.61	4.892	12.5	100.1	NO		
25	53	13C4-PFHpA	367.2 > 321.8	3834.397	9796.685	1.00	3.61	4.892	12.5	100.1	NO		
26	-1												
27	13	L-PFHxS	398.9 > 79.6		1448.751	1.00					NO		
28	15	6:2 FTS	427.0 > 406.9		1044.706	1.00					NO		
29	16	L-PFOA	412.8 > 368.9	37.351	8031.595	1.00	4.14	0.058	0.0		NO	4.911	NO
30	18	PFecHS	460.8 > 381.0		8031.595	1.00					NO		
31	19	PFHpS	449.0 > 80.0		1410.610	1.00					NO		
32	20	7:3 FTCA	440.9 > 336.9		7616.705	1.00					NO		
33	54	13C3-PFHxS	401.8 > 79.9	1448.751	553.194	1.00	3.76	32.736	12.9	102.8	NO		
34	55	13C2-6:2 FTS	429.0 >79.9	1044.706	1293.104	1.00	4.08	10.099	13.7	109.7	NO		
35	58	13C2-PFOA	414.9 > 369.7	8031.595	13655.097	1.00	4.13	7.352	13.0	104.2	NO		
36	58	13C2-PFOA	414.9 > 369.7	8031.595	13655.097	1.00	4.13	7.352	13.0	104.2	NO		

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Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	59	13C8-PFOS	507.0 > 79.9	1410.610	1293.104	1.00	4.66	13.636	12.9	102.9	NO		
38	56	13C5-PFNA	468.2 > 422.9	7616.705	8145.557	1.00	4.57	11.688	11.9	95.2	NO		
39	-1												
40	21	PFNA	463.0 > 418.8	8.783	7616.705	1.00	4.56	0.014			NO		
41	22	PFOSA	497.9 > 77.9		549.882	1.00					NO		
42	23	L-PFOS	498.9 > 79.9		1410.610	1.00					NO		
43	25	9Cl-PF30NS	530.7 > 350.8		1410.610	1.00					NO		
44	26	PFDA	513 > 468.8		6263.837	1.00					NO		
45	27	8:2 FTS	527.0 > 506.9		946.606	1.00					NO		
46	56	13C5-PFNA	468.2 > 422.9	7616.705	8145.557	1.00	4.57	11.688	11.9	95.2	NO		
47	57	13C8-PFOSA	506.1 > 77.7	549.882	8175.738	1.00	4.63	0.841	6.5	51.6	NO		
48	59	13C8-PFOS	507.0 > 79.9	1410.610	1293.104	1.00	4.66	13.636	12.9	102.9	NO		
49	59	13C8-PFOS	507.0 > 79.9	1410.610	1293.104	1.00	4.66	13.636	12.9	102.9	NO		
50	60	13C2-PFDA	515.1 > 469.9	6263.837	9421.503	1.00	4.95	8.311	12.6	100.4	NO		
51	61	13C2-8:2 FTS	529 > 79.9	946.606	1293.104	1.00	4.92	9.151	13.2	105.3	NO		
52	-1												
53	28	PFNS	549.1 > 80.1		1410.610	1.00					NO		
54	29	L-MeFOSAA	570 > 419		1235.898	1.00					NO		
55	31	L-EtFOSAA	584.1 > 419		1426.384	1.00					NO		
56	33	PFUdA	563.0 > 518.9	16.167	7494.523	1.00	5.27	0.027	0.0		NO		
57	34	PFDS	598.8 > 79.9		946.606	1.00					NO		
58	35	11Cl-PF30UdS	632.6 > 452.7		3698.353	1.00					NO		
59	59	13C8-PFOS	507.0 > 79.9	1410.610	1293.104	1.00	4.66	13.636	12.9	102.9	NO		
60	62	d3-N-MeFOSAA	573.3 > 419	1235.898	8175.738	1.00	5.10	1.890	14.6	117.1	NO		
61	64	d5-N-EtFOSAA	589.3 > 419	1426.384	8175.738	1.00	5.26	2.181	14.8	118.4	NO		
62	63	13C2-PFUdA	565 > 519.8	7494.523	8175.738	1.00	5.28	11.458	13.4	107.0	NO		
63	61	13C2-8:2 FTS	529 > 79.9	946.606	1293.104	1.00	4.92	9.151	13.2	105.3	NO		
64	65	13C2-PFDoA	614.7 > 569.7	3698.353	9421.503	1.00	5.56	4.907	4.0	31.9	YES		
65	-1												
66	36	10:2 FTS	627.0 > 606.9		946.606	1.00					NO		
67	37	PFDoA	612.9 > 569.0		3698.353	1.00					NO		
68	38	N-MeFOSA	512.1 > 168.9			1.00					NO		
69	39	PFTrDA	662.9 > 618.9	6.069	3698.353	1.00	5.89	0.021	0.1		NO		
70	40	PFDoS	698.8 > 79.9		362.476	1.00					NO		
71	41	PFTeDA	713.0 > 669.0		362.476	1.00					NO		
72	65	13C2-PFDoA	614.7 > 569.7	3698.353	9421.503	1.00	5.56	4.907	4.0	31.9	YES		

Vista Analytical Laboratory

Dataset: Untitled

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Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	65	13C2-PFDoA	614.7 > 569.7	3698.353	9421.503	1.00	5.56	4.907	4.0	31.9	YES		
74	66	d3-N-MeFOSA	515.2 > 168.9		8175.738	1.00					NO		
75	65	13C2-PFDoA	614.7 > 569.7	3698.353	9421.503	1.00	5.56	4.907	4.0	31.9	YES		
76	67	13C2-PFTeDA	715.1 > 669.7	362.476	8175.738	1.00	6.04	0.554	1.1	8.7	YES		
77	67	13C2-PFTeDA	715.1 > 669.7	362.476	8175.738	1.00	6.04	0.554	1.1	8.7	YES		
78	-1												
79	42	N-EtFOSA	526.1 > 168.9			1.00					NO		
80	43	PFHxDA	813.1 > 768.6	12.580	384.845	1.00	6.40	0.163	0.1		NO		
81	44	PFODA	913.1 > 868.8	20.252	384.845	1.00	6.63	0.263	0.3		NO		
82	45	N-MeFOSE	616.1 > 58.9		287.485	1.00					NO		
83	46	N-EtFOSE	630.1 > 58.9	9.122	214.581	1.00	6.56	6.377	4.7		NO		
84	72	13C4-PFBA	217.0 > 172.0	5748.722	5748.722	1.00	1.21	12.500	12.5	100.0	NO		
85	68	d5-N-ETFOSA	531.1 > 168.9		8175.738	1.00					NO		
86	69	13C2-PFHxDA	815 > 769.7	384.845	8175.738	1.00	6.39	0.588	0.8	16.0	YES		
87	69	13C2-PFHxDA	815 > 769.7	384.845	8175.738	1.00	6.39	0.588	0.8	16.0	YES		
88	70	d7-N-MeFOSE	623.1 > 58.9	287.485	8175.738	1.00	6.30	0.440	15.7	10.5	YES		
89	71	d9-N-EtFOSE	639.2 > 58.8	214.581	8175.738	1.00	6.45	0.328	11.9	8.0	YES		
90	73	13C5-PFHxA	318.0 > 272.9	9796.685	9796.685	1.00	2.99	12.500	12.5	100.0	NO		
91	-1												
92	75	13C8-PFOA	420.9 > 376.0	13655.097	13655.097	1.00	4.13	12.500	12.5	100.0	NO		
93	74	18O2-PFHxS	403.0 > 102.6	553.194	553.194	1.00	3.76	12.500	12.5	100.0	NO		
94	76	13C9-PFNA	472.2 > 426.9	8145.557	8145.557	1.00	4.57	12.500	12.5	100.0	NO		
95	77	13C4-PFOS	503 > 79.9	1293.104	1293.104	1.00	4.66	12.500	12.5	100.0	NO		
96	78	13C6-PFDA	519.1 > 473.7	9421.503	9421.503	1.00	4.95	12.500	12.5	100.0	NO		
97	79	13C7-PFUdA	570.1 > 524.8	8175.738	8175.738	1.00	5.27	12.500	12.5	100.0	NO		

(GM 7/11/2019

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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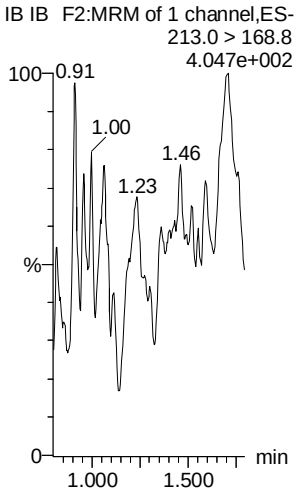
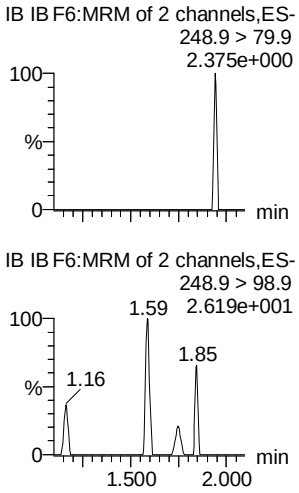
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_071019.mdb 11 Jul 2019 10:07:19
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_07-10-19.cdb 11 Jul 2019 10:56:26

Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

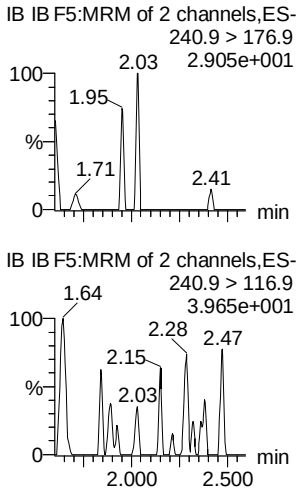
PFBA



PFPrS



3:3 FTCA



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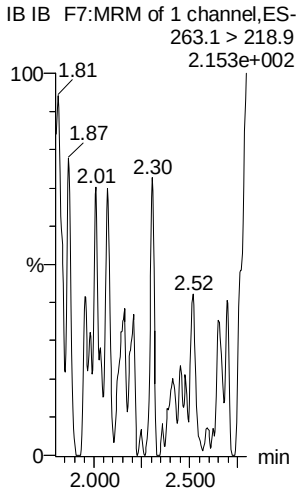

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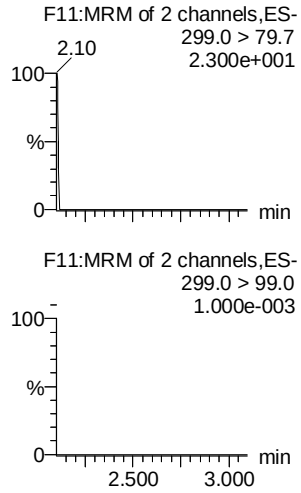
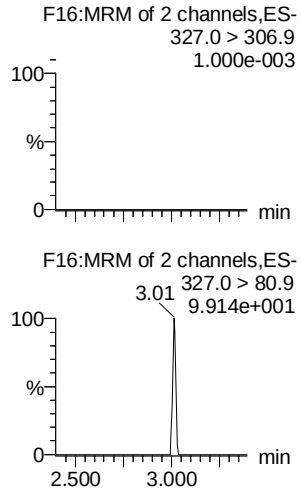
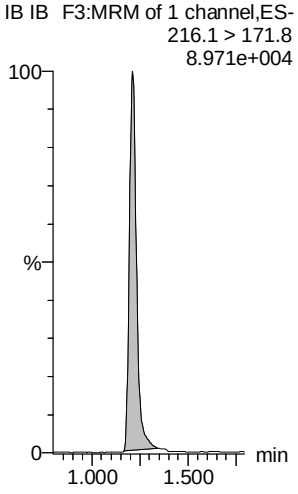


4:2 FTS



13C3-PFBA



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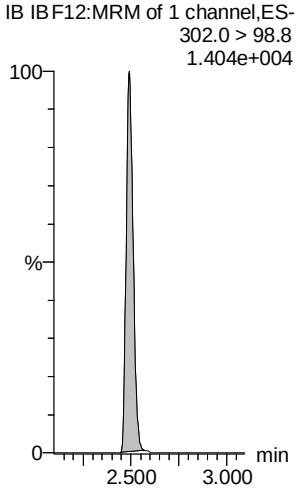

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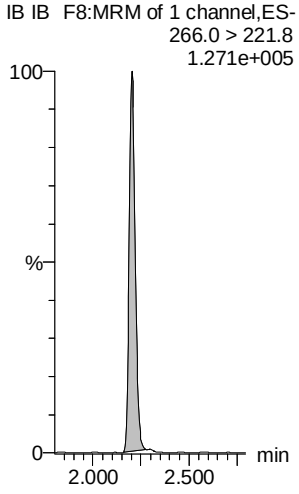

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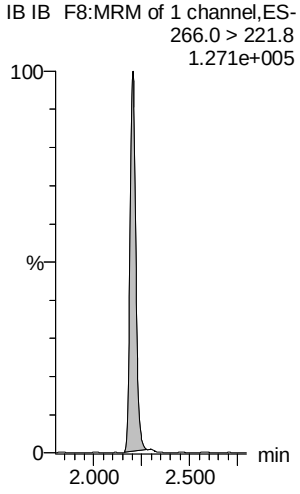

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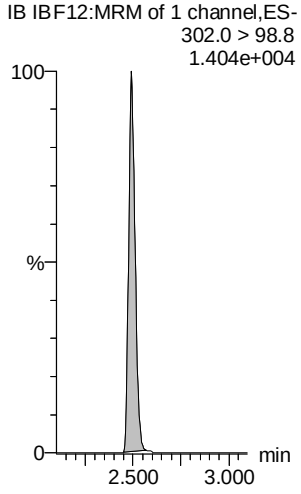
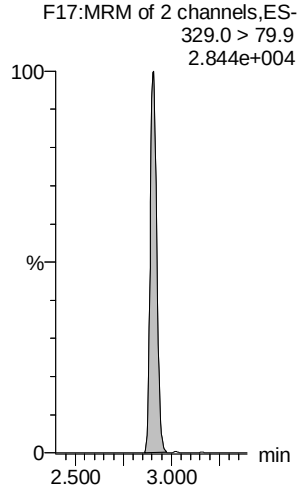


13C2-4:2 FTS



Vista Analytical Laboratory

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Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

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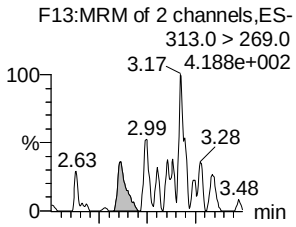
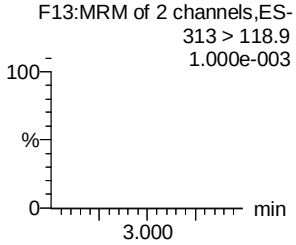
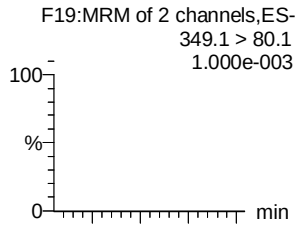
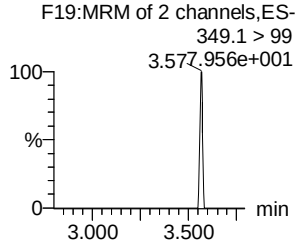


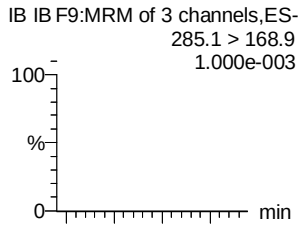


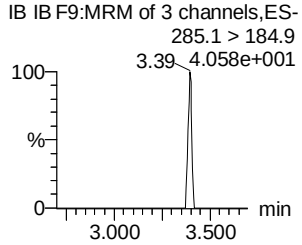
PFPeS



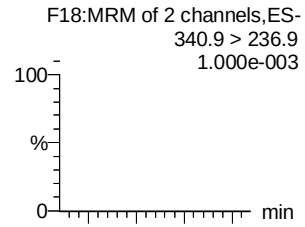


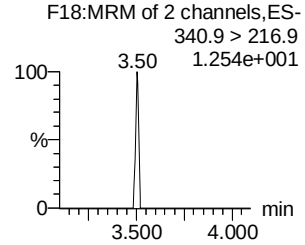
HFPO-DA





5:3 FTCA





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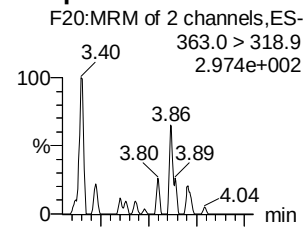

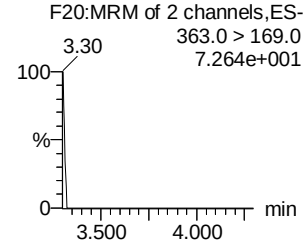

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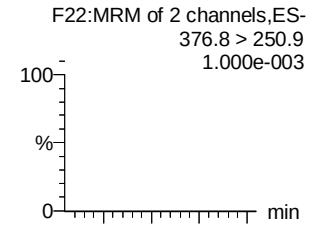

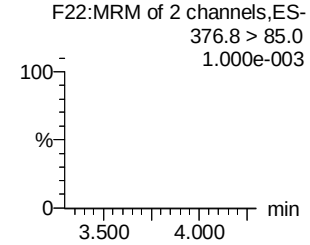

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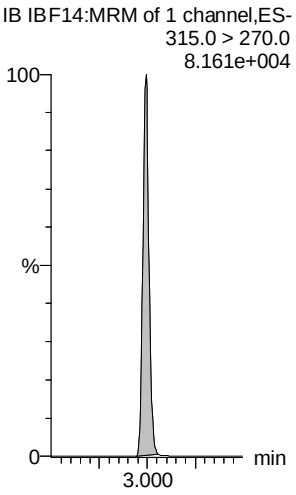
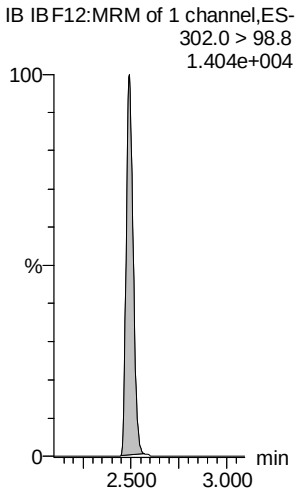
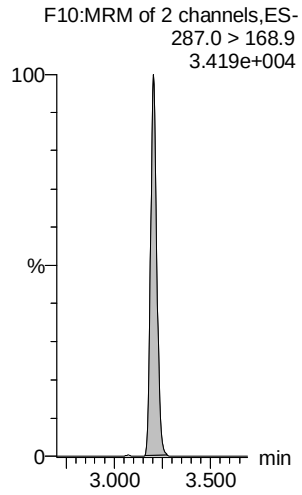


13C3-PFBS



13C3-HFPO-DA



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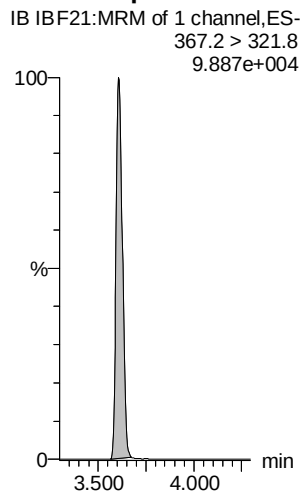

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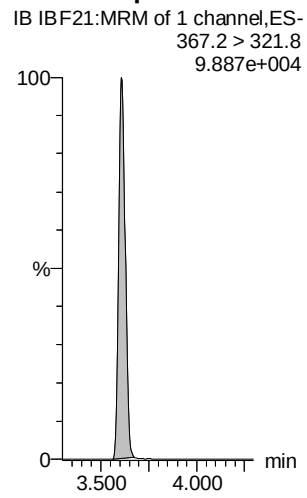

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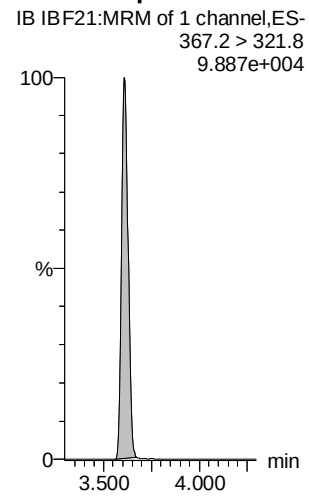

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Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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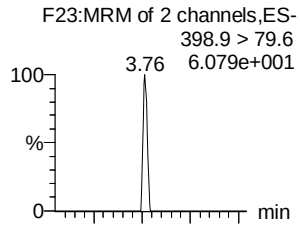
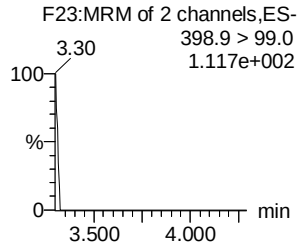
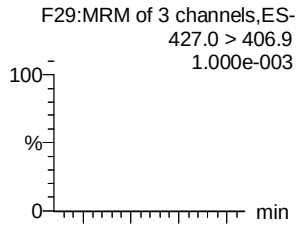
Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

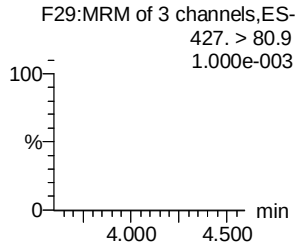
L-PFHxS



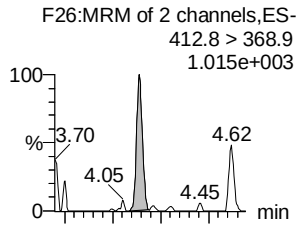


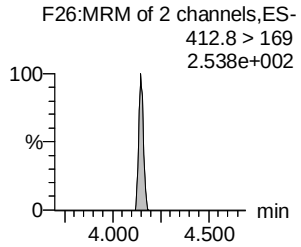
6:2 FTS





L-PFOA





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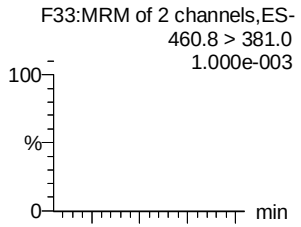

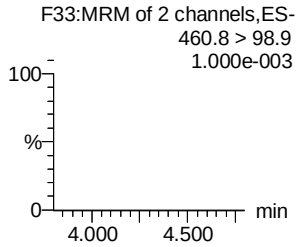

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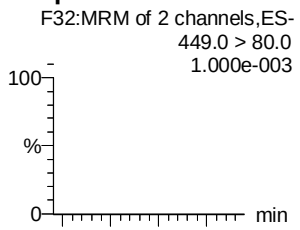
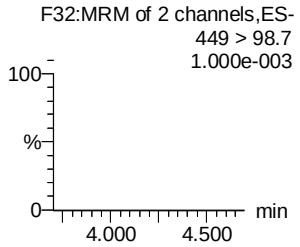
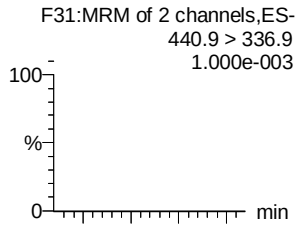
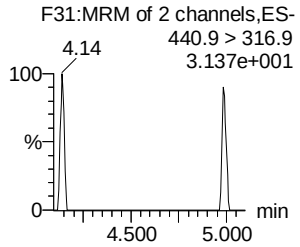




7:3 FTCA





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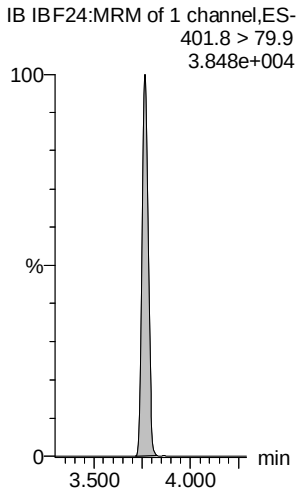

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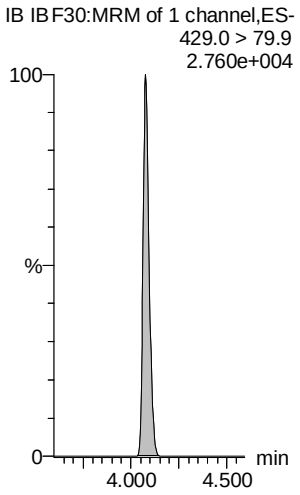

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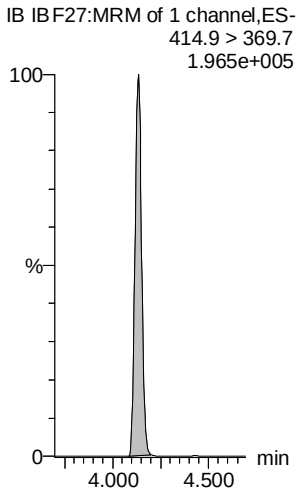

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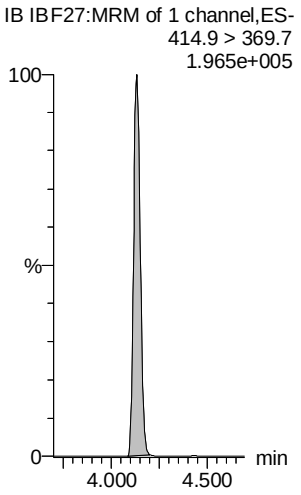

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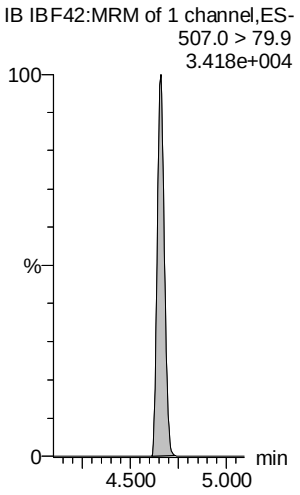

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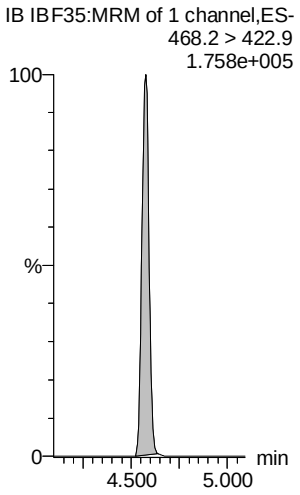

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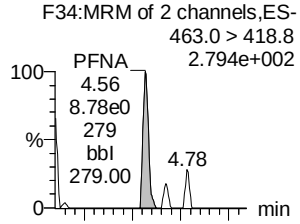
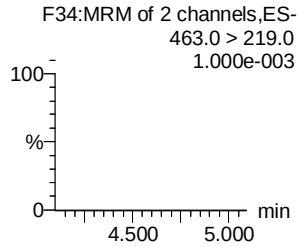
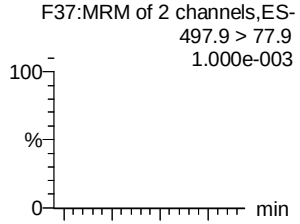
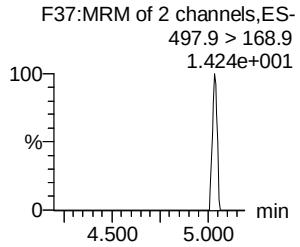
PFNA





PFOSA





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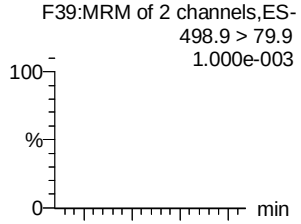

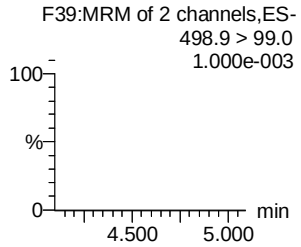

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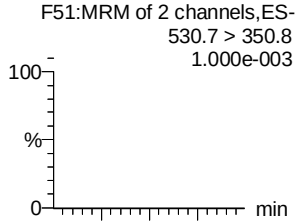

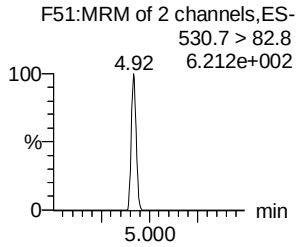

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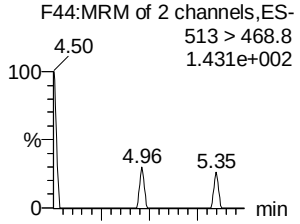

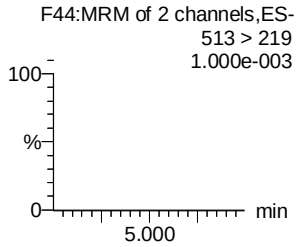

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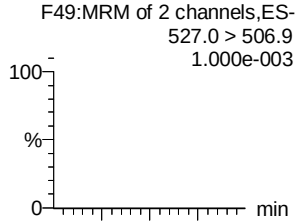

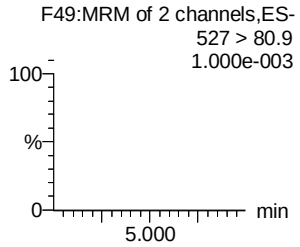

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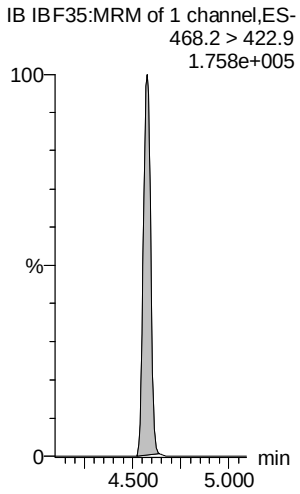

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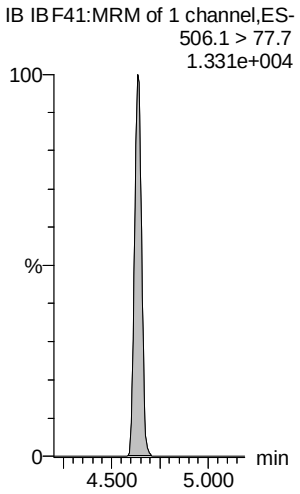

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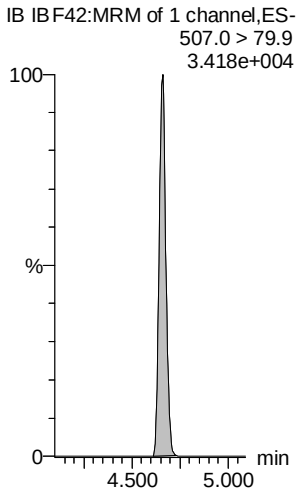

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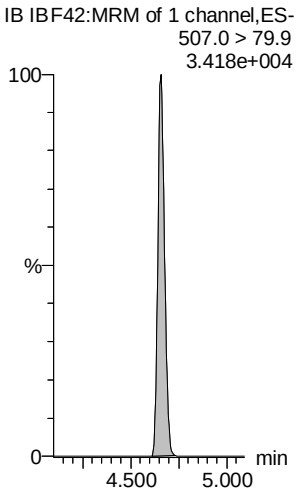

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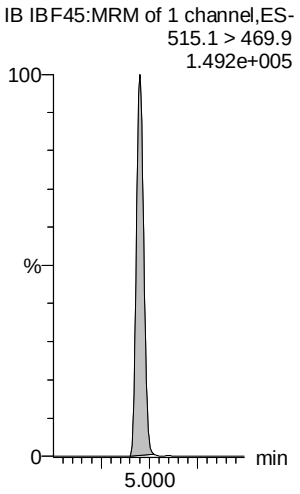
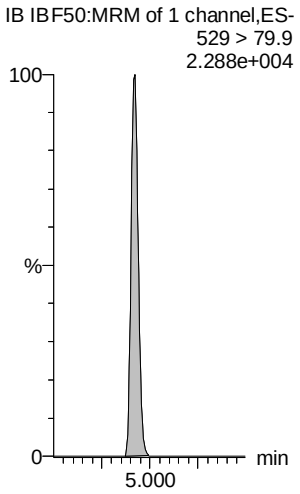


13C2-8:2 FTS



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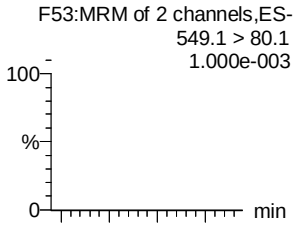

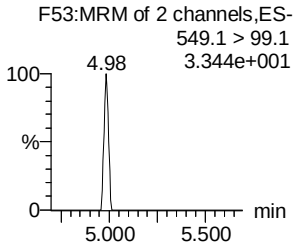

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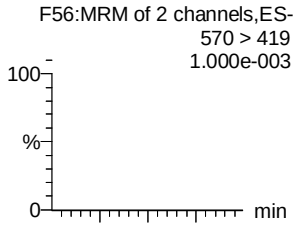

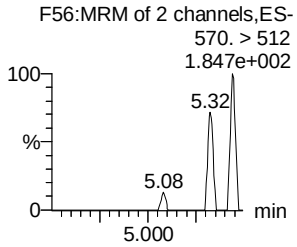

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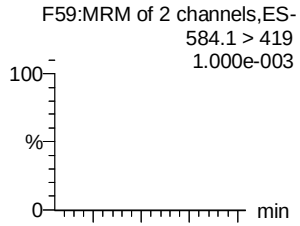

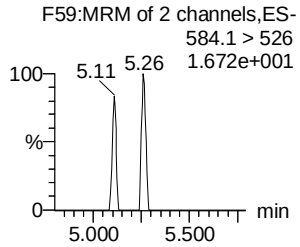

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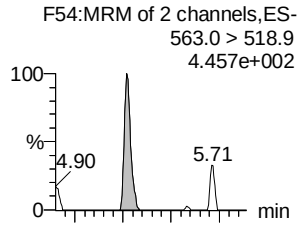

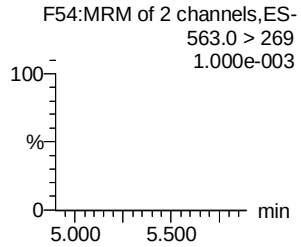

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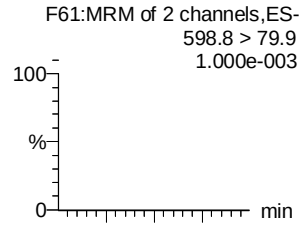

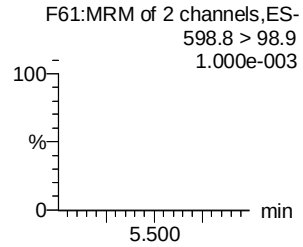

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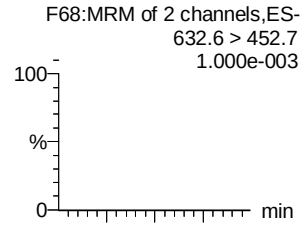

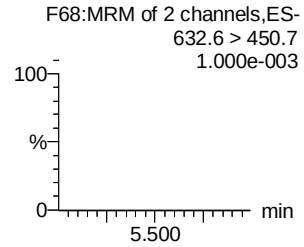

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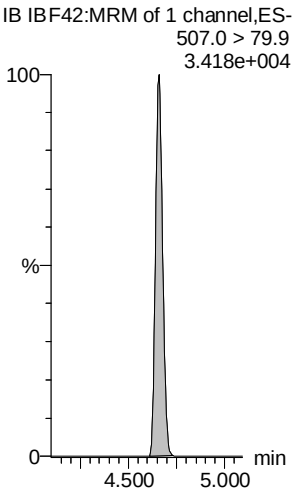

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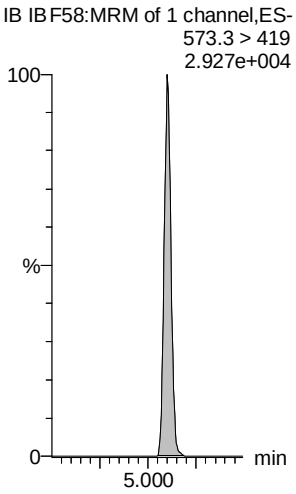

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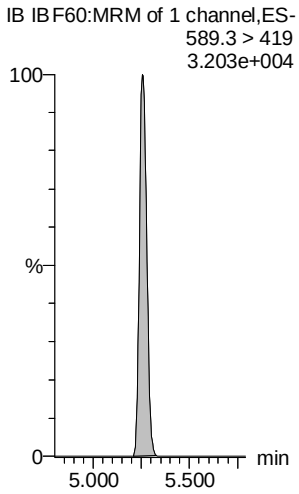

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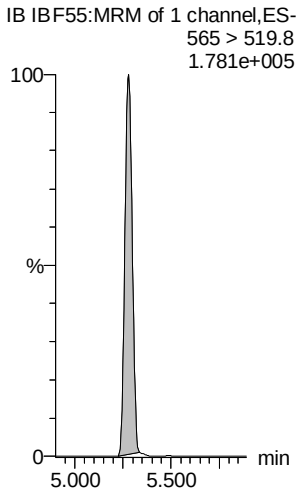
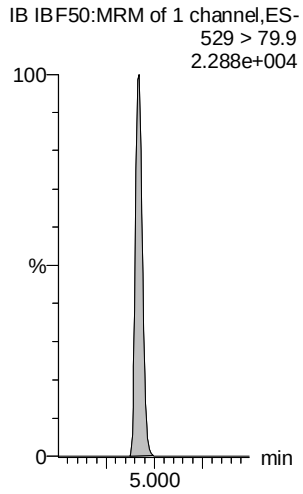


13C2-8:2 FTS



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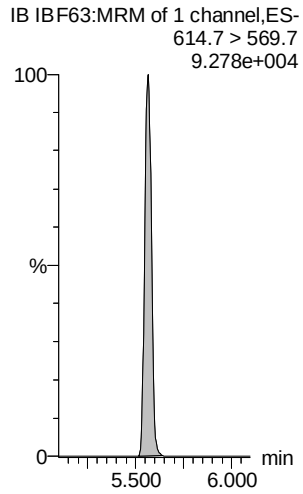

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Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
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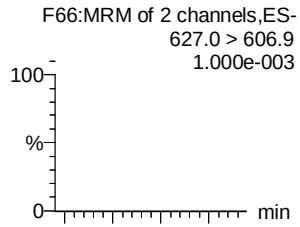
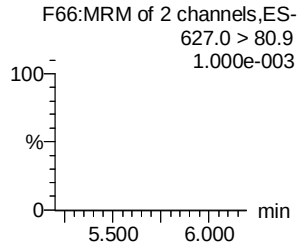
10:2 FTS





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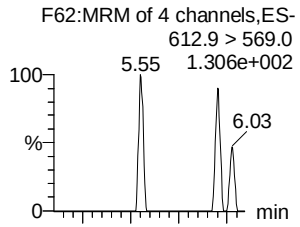

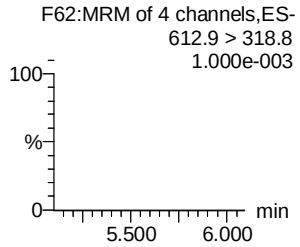

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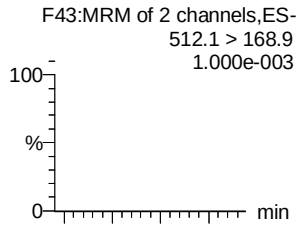

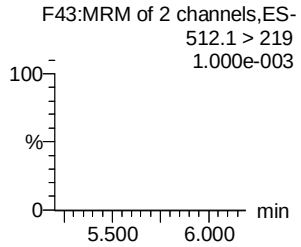

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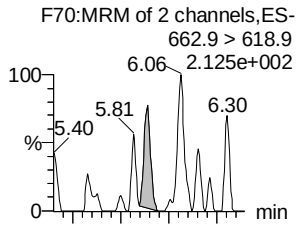

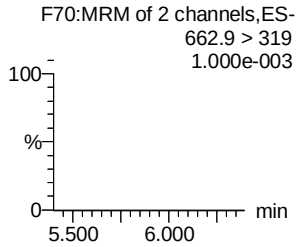

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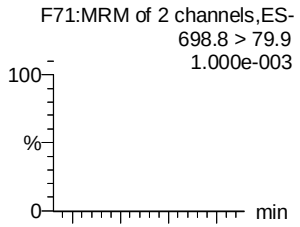

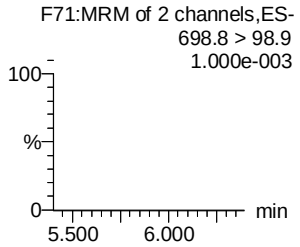

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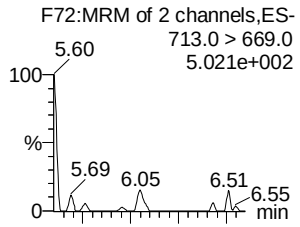

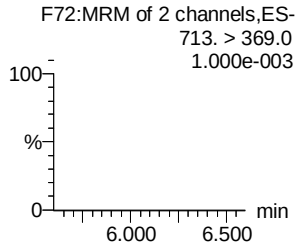

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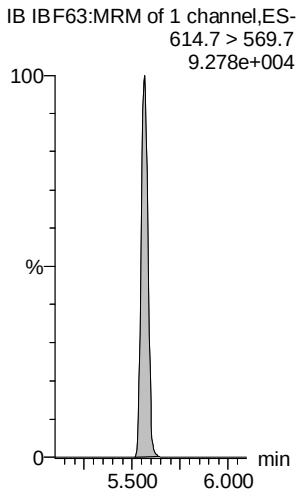

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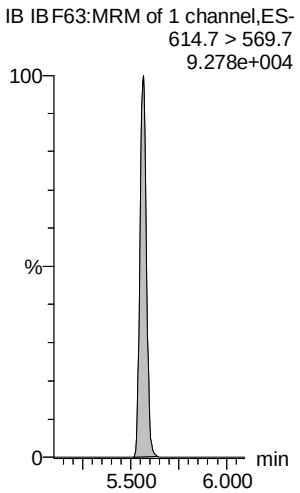

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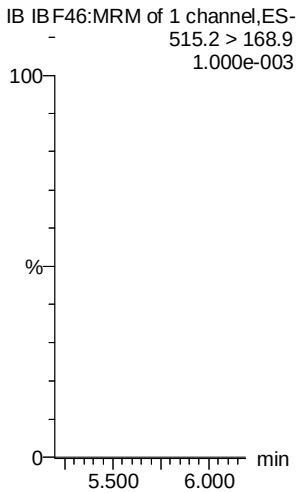

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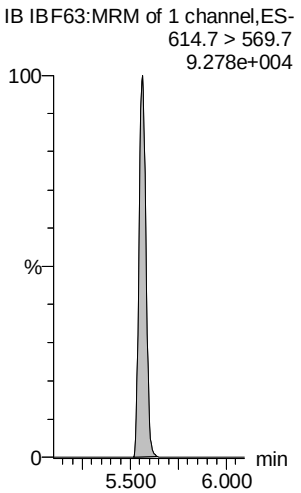

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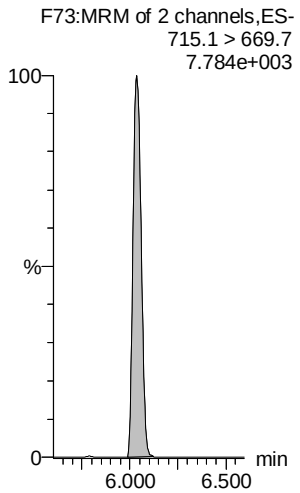

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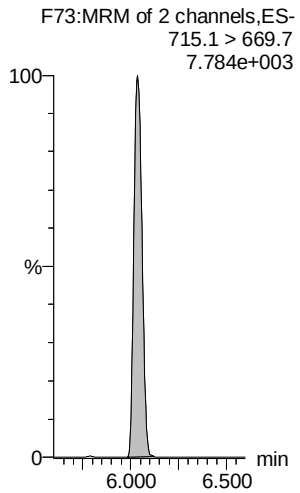

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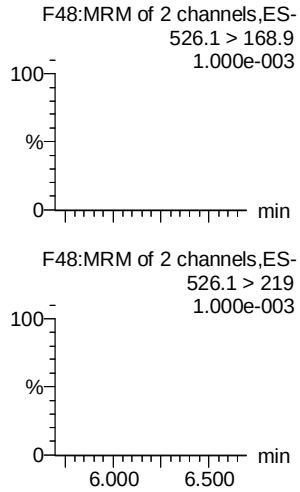
N-EtFOSA



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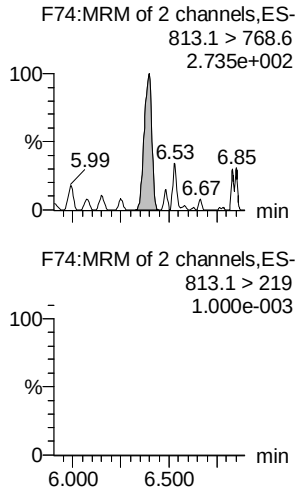
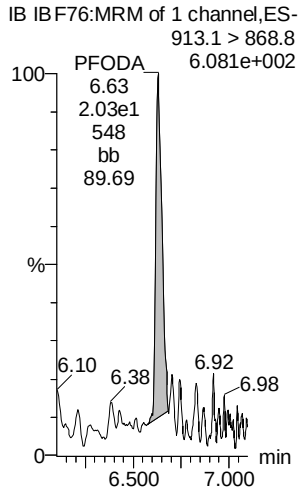
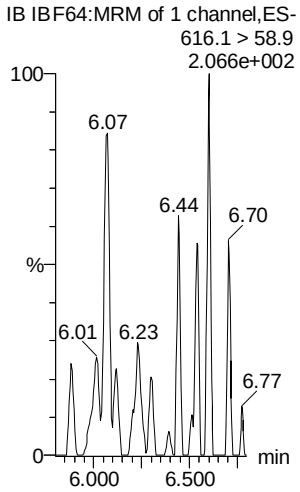


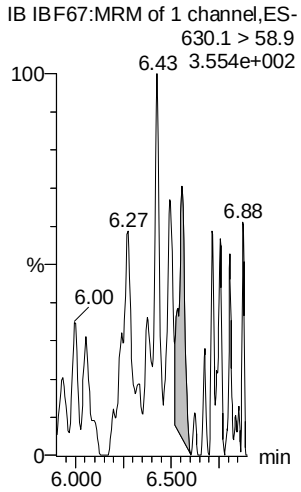
PFODA



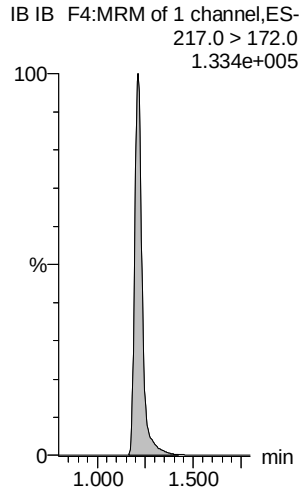
N-MeFOSE



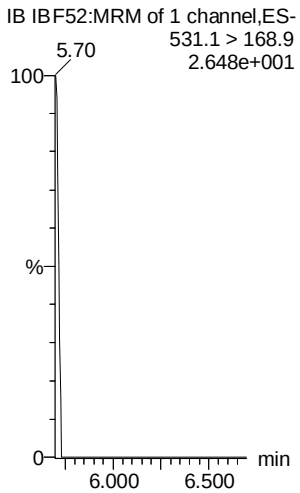
N-EtFOSE



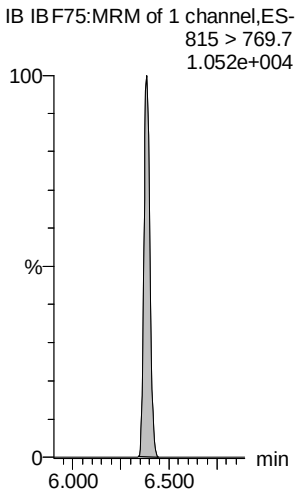
13C4-PFBA



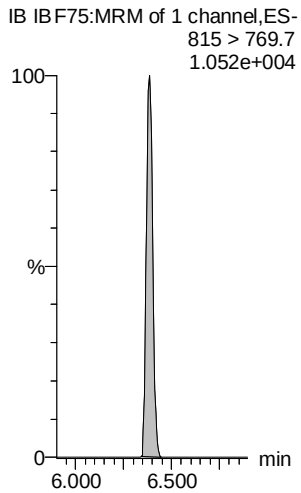
d5-N-ETFOSA



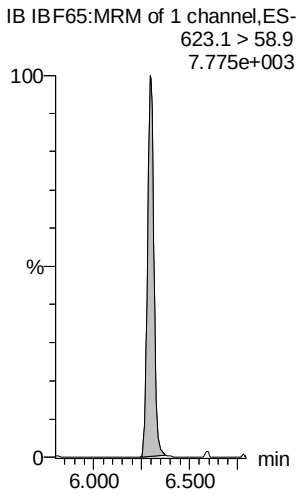
13C2-PFHxDA



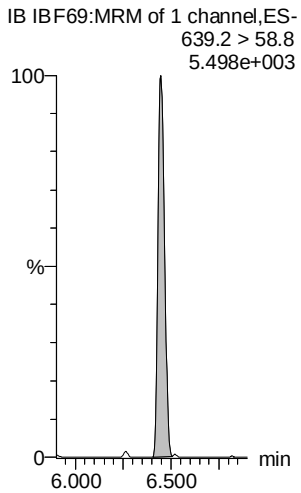
13C2-PFHxDA



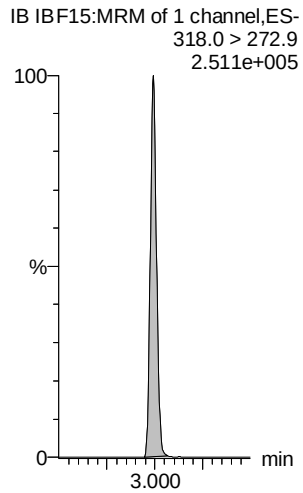
d7-N-MeFOSE



d9-N-EtFOSE



13C5-PFHxA

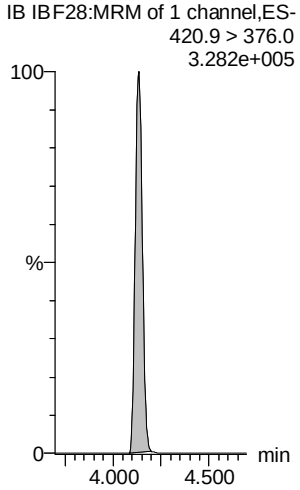


Dataset: Untitled

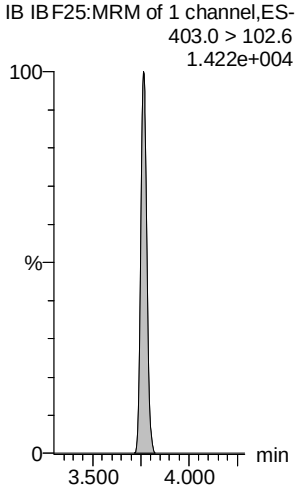
Last Altered: Thursday, July 11, 2019 11:00:15 Pacific Daylight Time
Printed: Thursday, July 11, 2019 11:00:25 Pacific Daylight Time

Name: 190710M2_16, Date: 10-Jul-2019, Time: 15:29:49, ID: IB, Description: IB

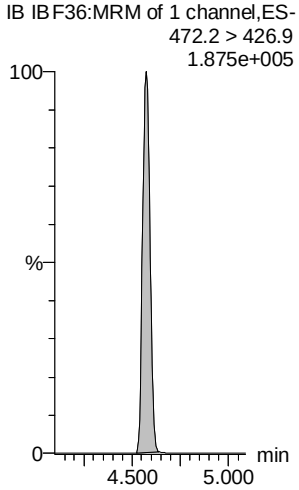
13C8-PFOA



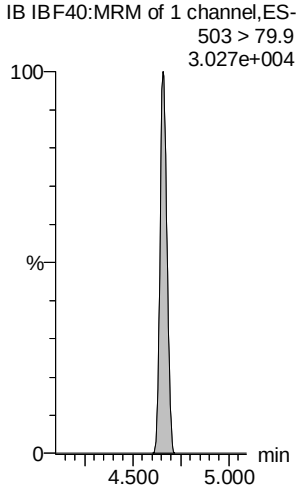
18O2-PFHxS



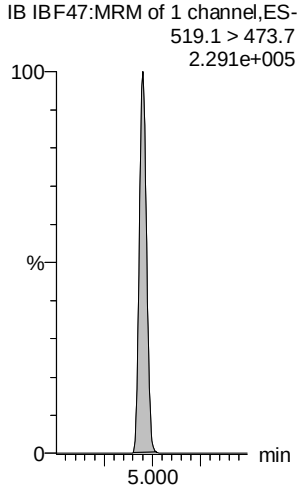
13C9-PFNA



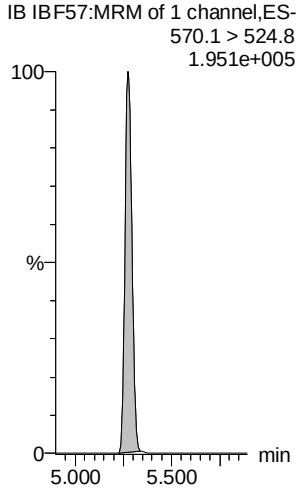
13C4-PFOS



13C6-PFDA



13C7-PFUdA



TUNE CHECKS

Q4(M) 07-10-19

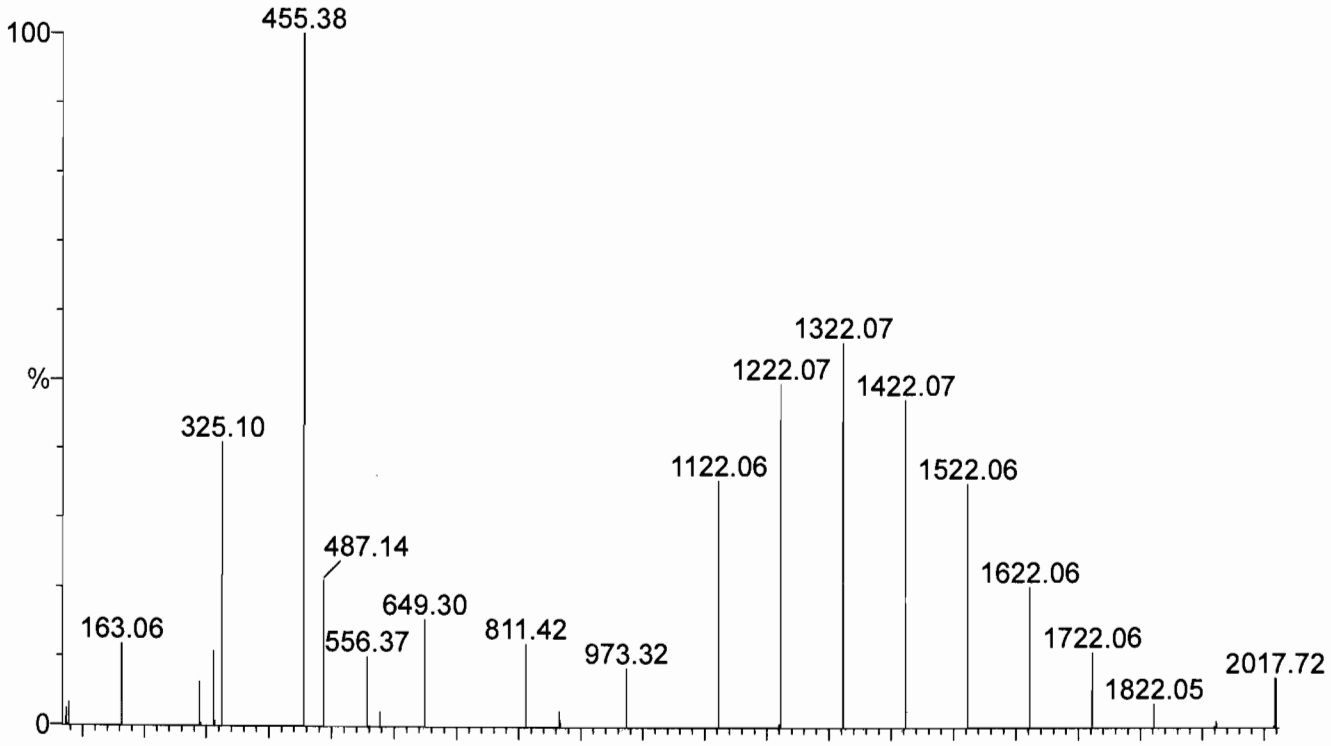
07/03/19 Calt 7/10/19

Calibration Verification Report - MS1 Static

Printed: **Wed Jul 10 07:44:01 2019**

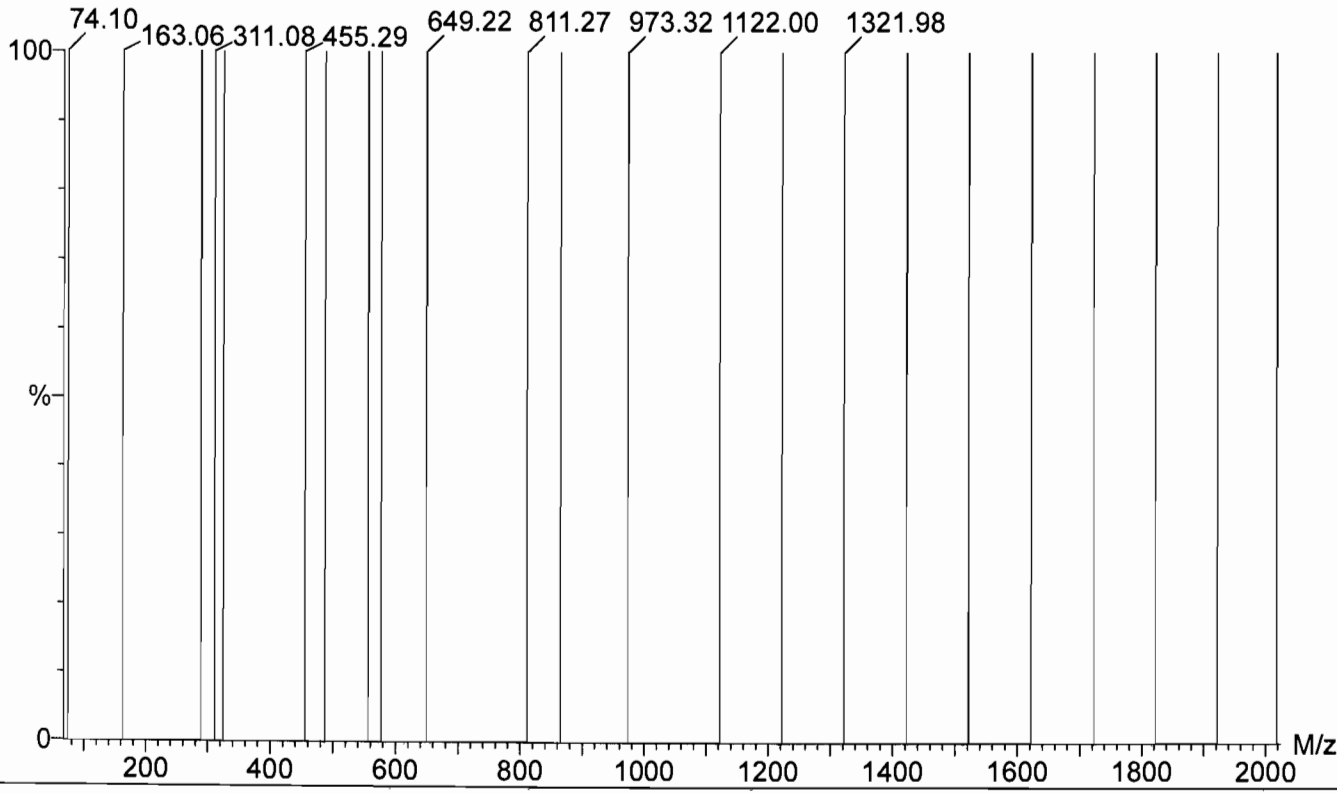
Data file: STATMS1V - Calibrated

23 matches of 23 tested references

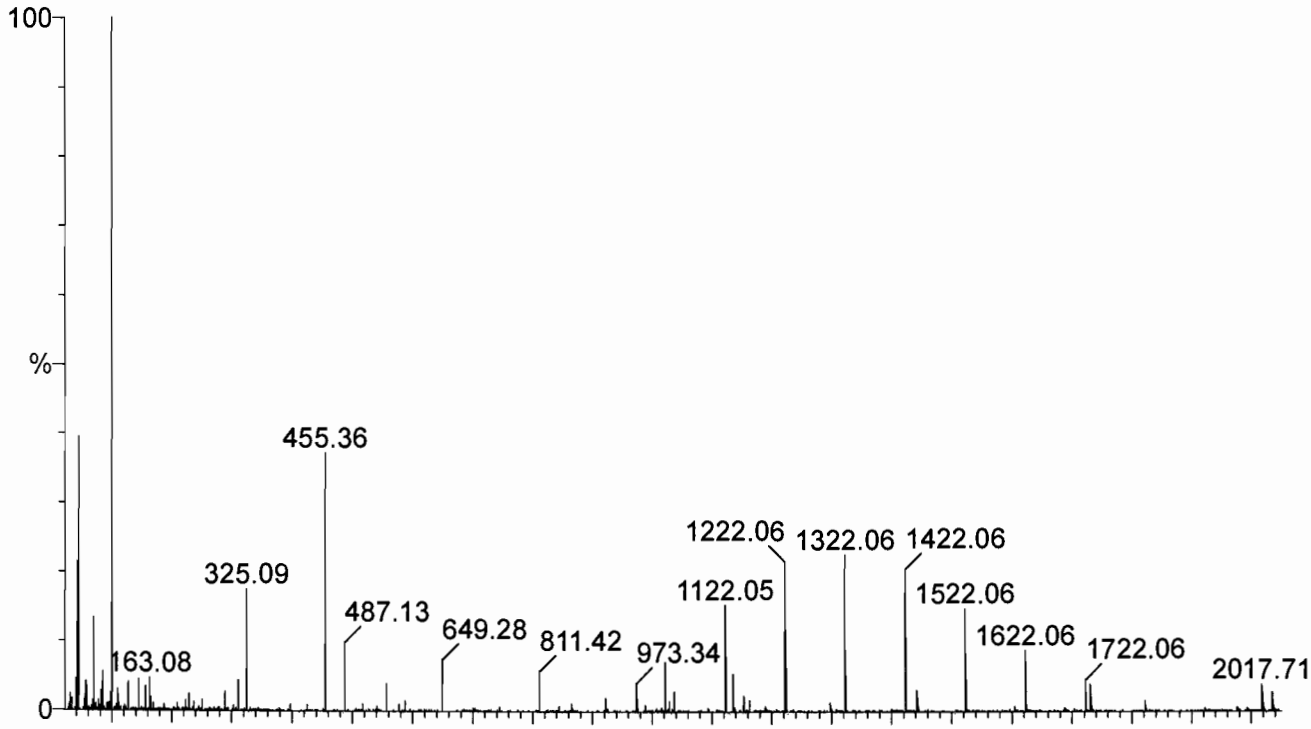


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref

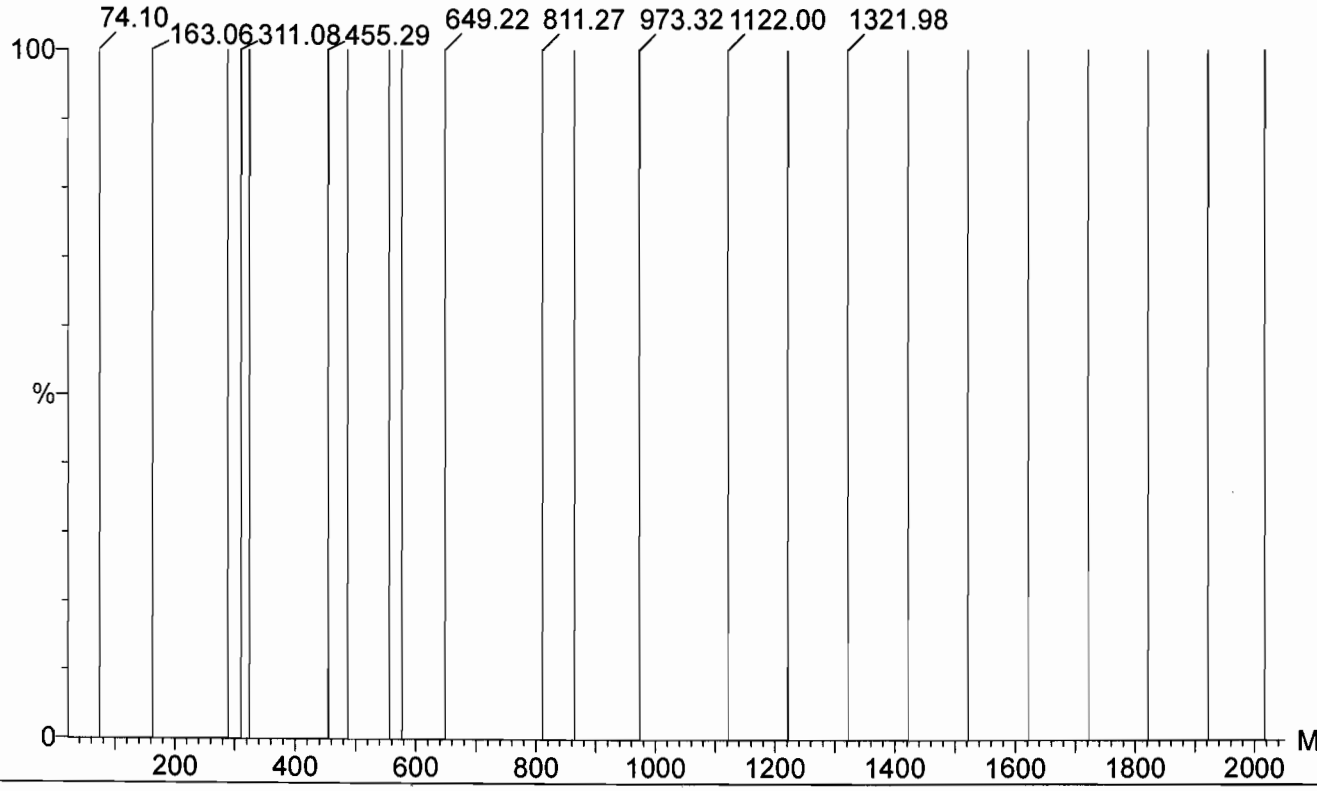
Mean residual = 0.0661 amu



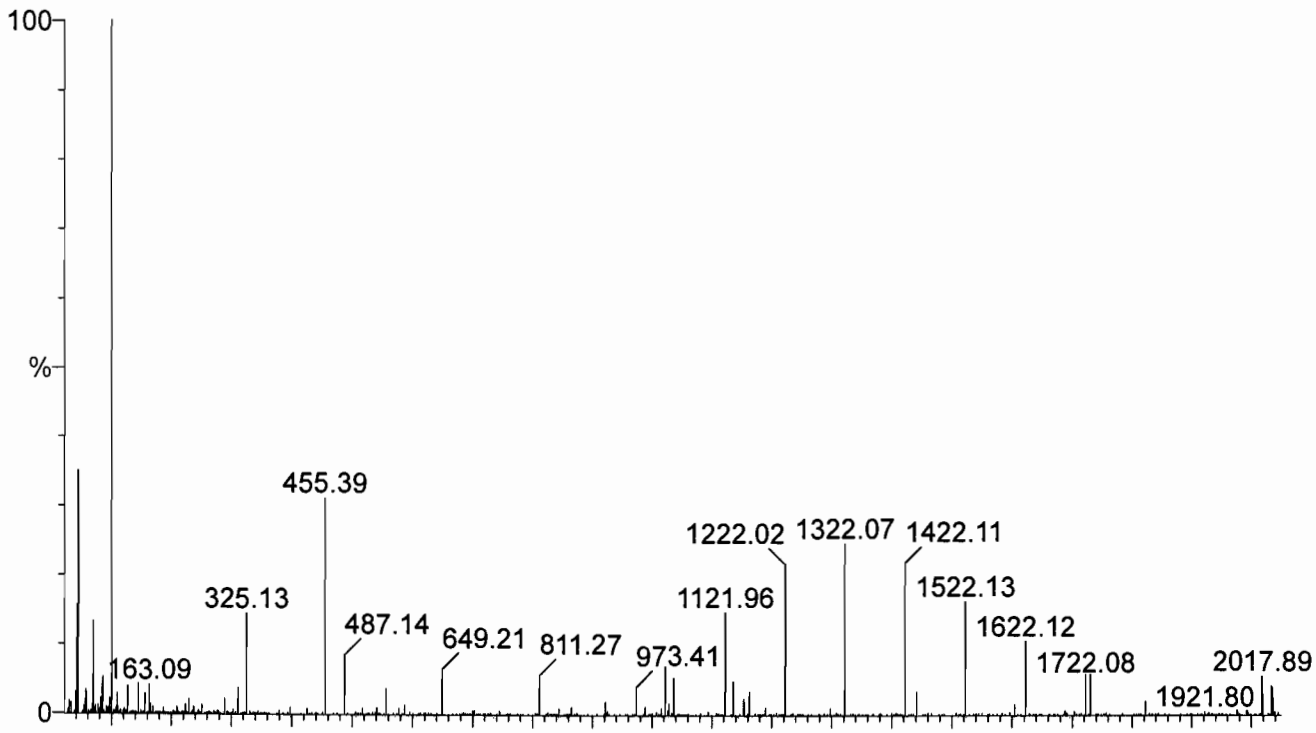
Data file: SCNMS1V - Calibrated 23 matches of 23 tested references



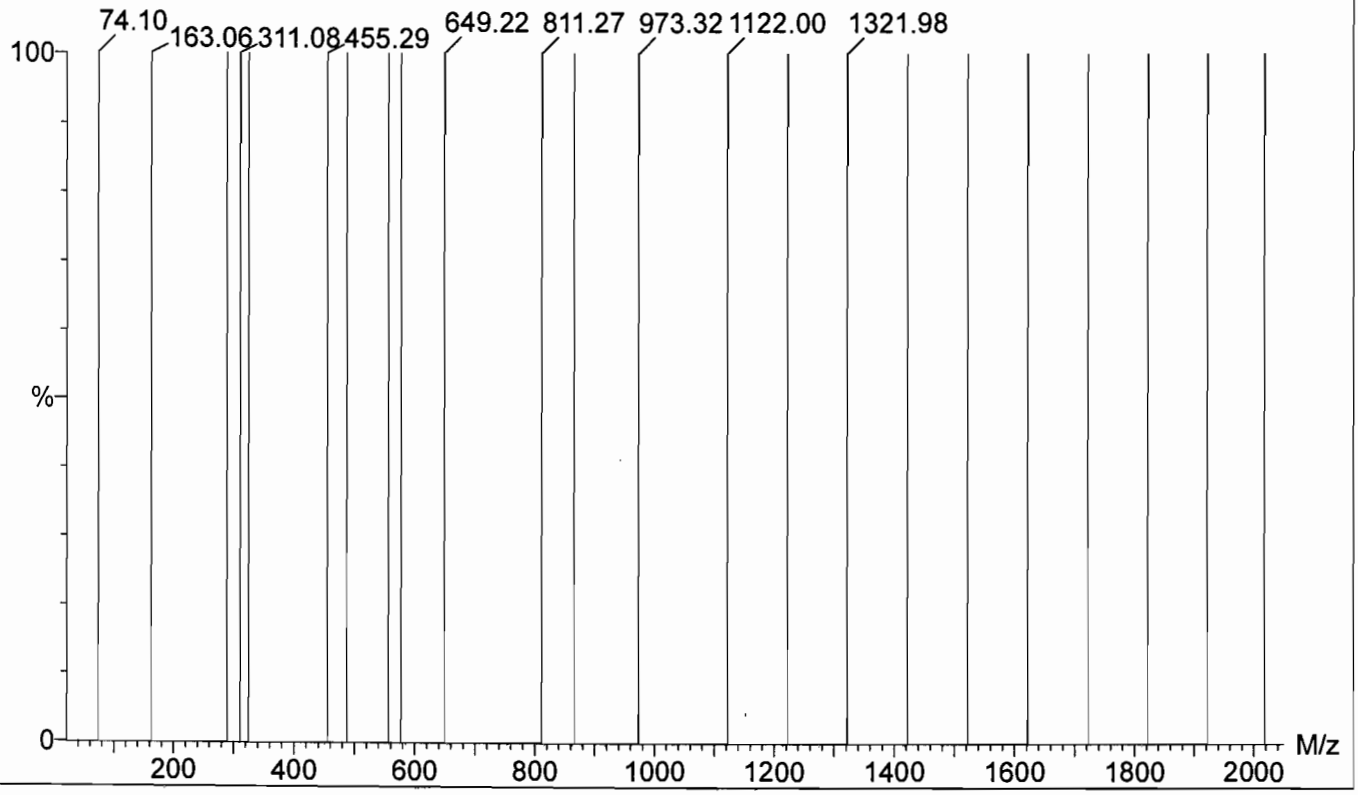
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0656 amu



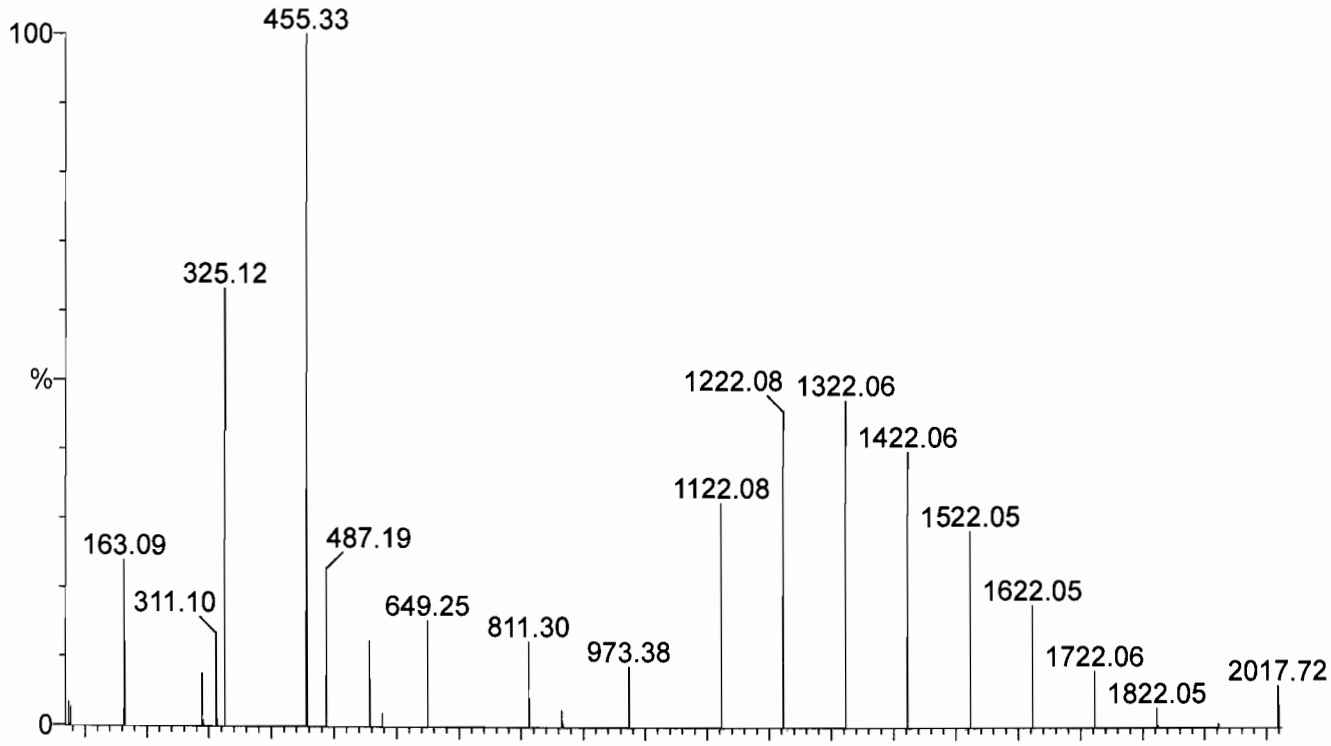
Data file: FASTMS1V - Calibrated 23 matches of 23 tested references



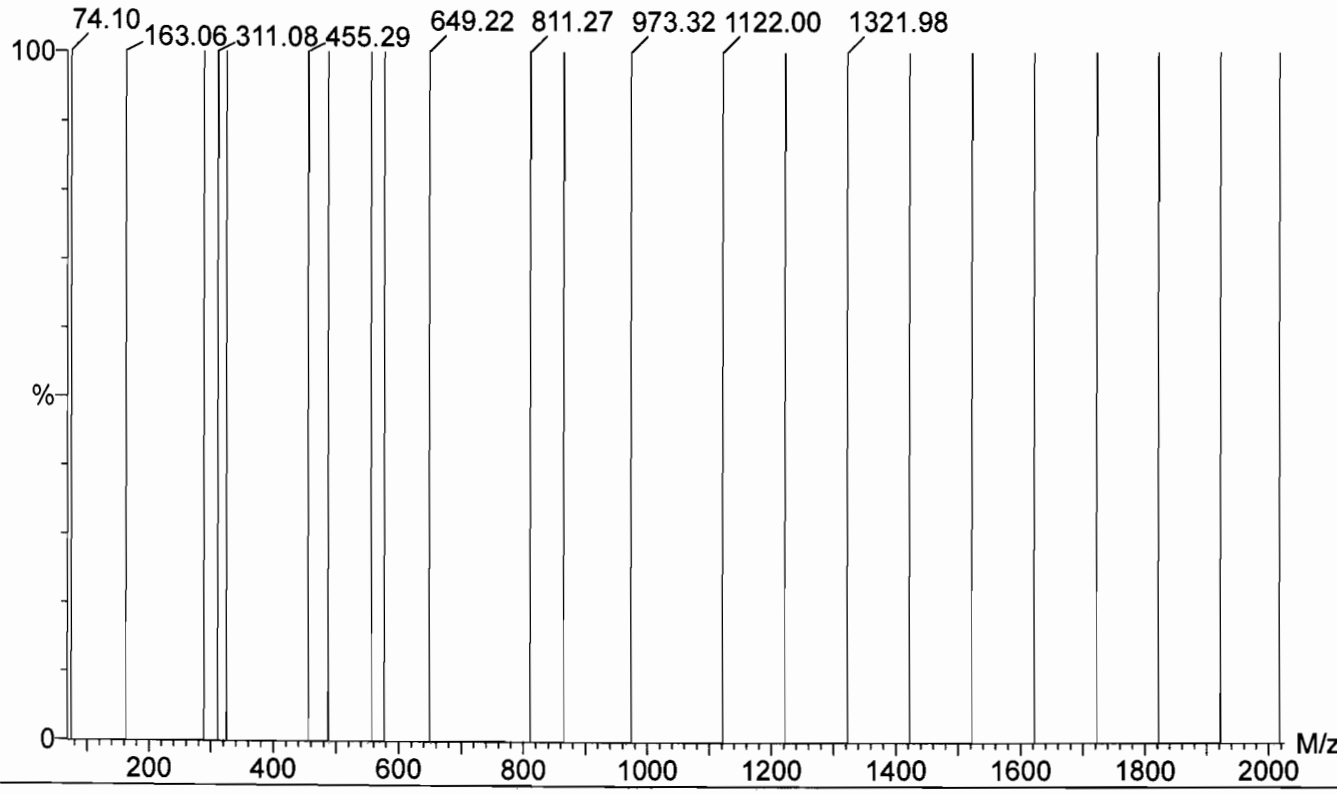
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0675 amu



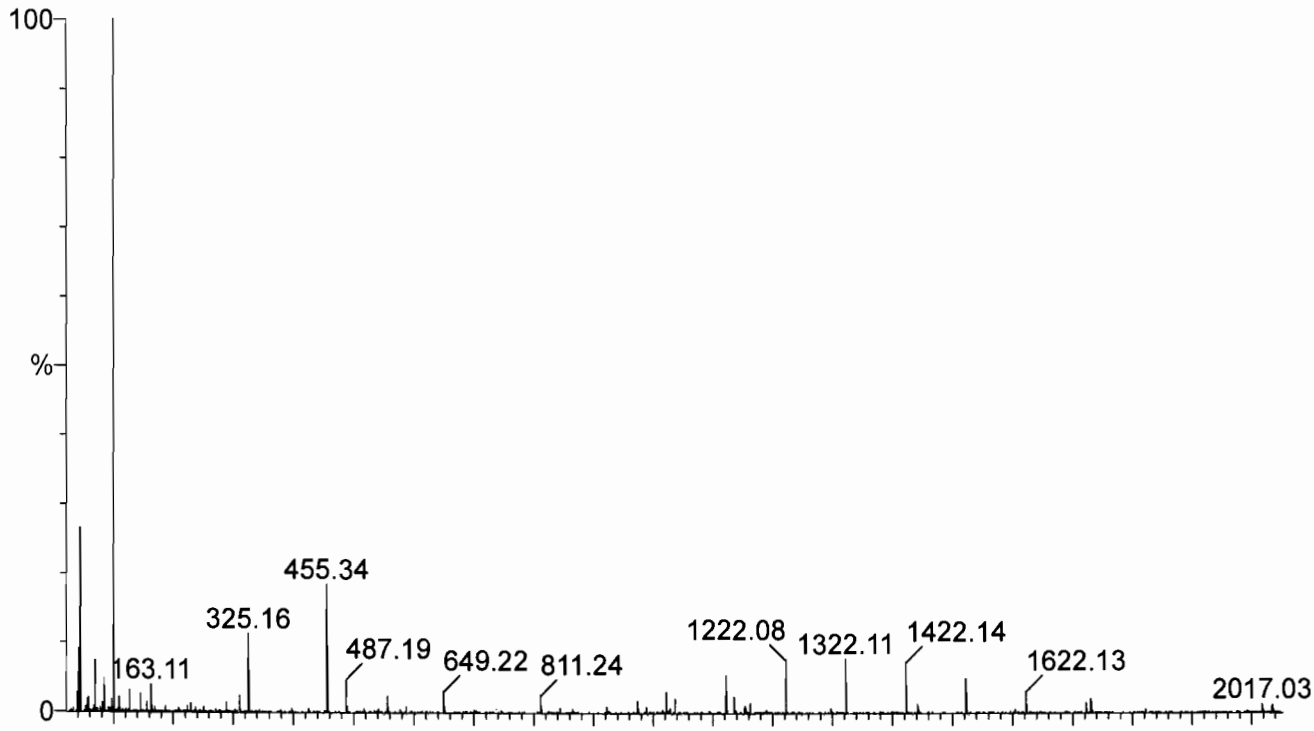
Data file: STATMS2V - Calibrated 23 matches of 23 tested references



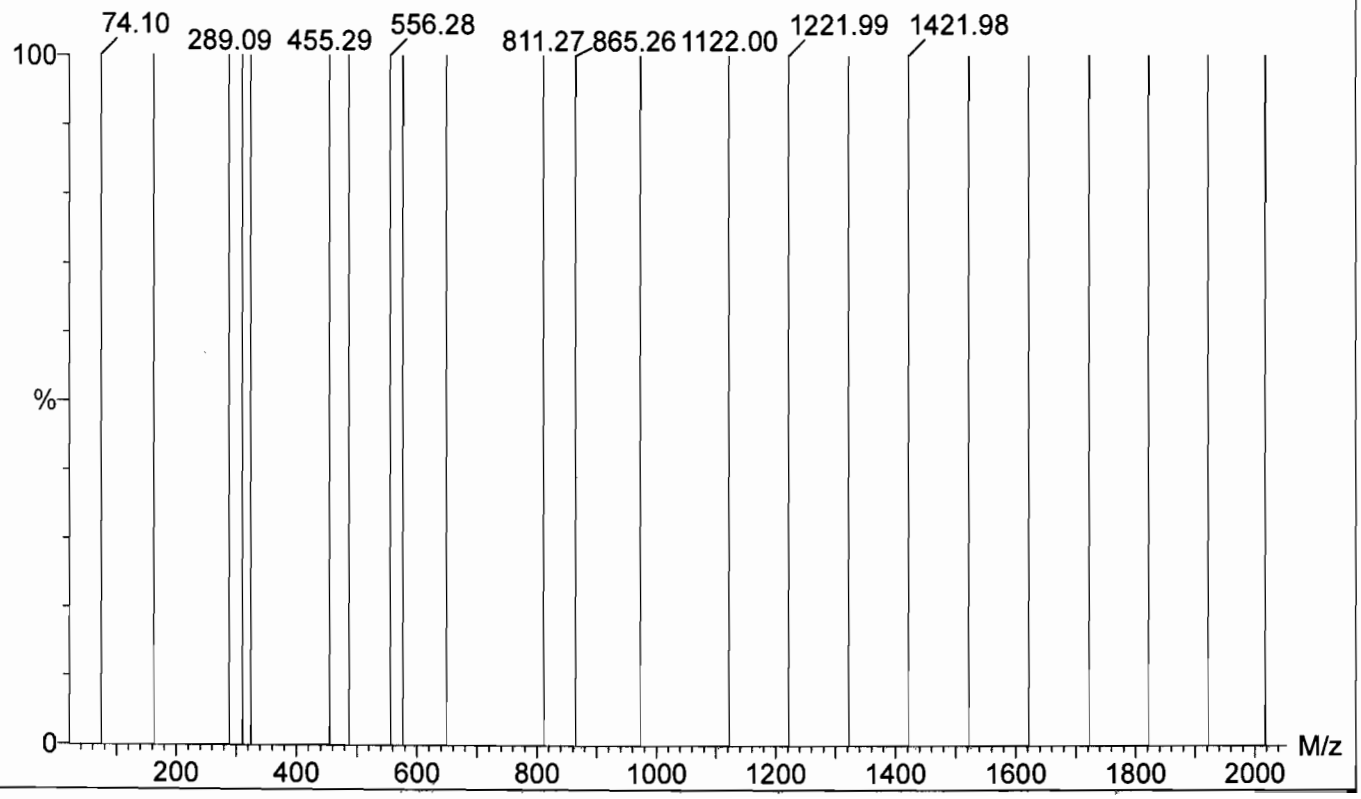
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0542 amu



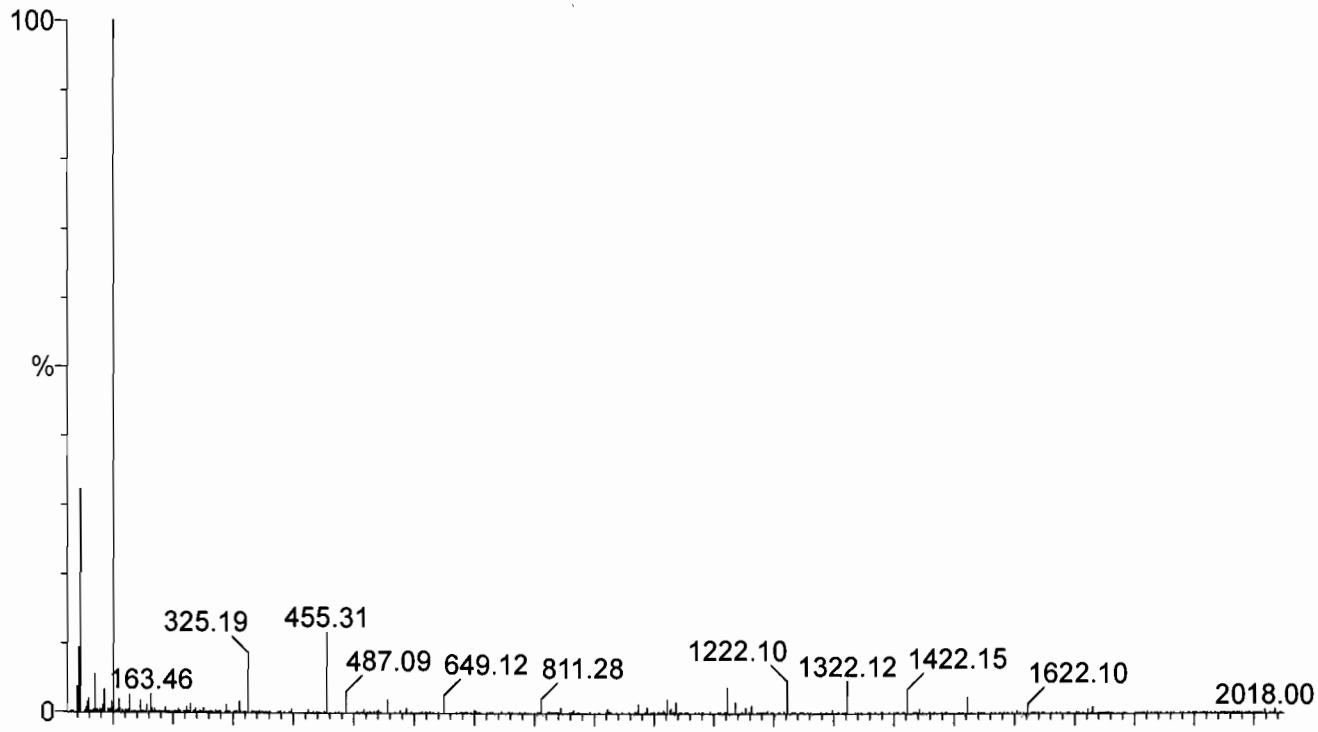
Data file: SCNMS2V - Calibrated 23 matches of 23 tested references



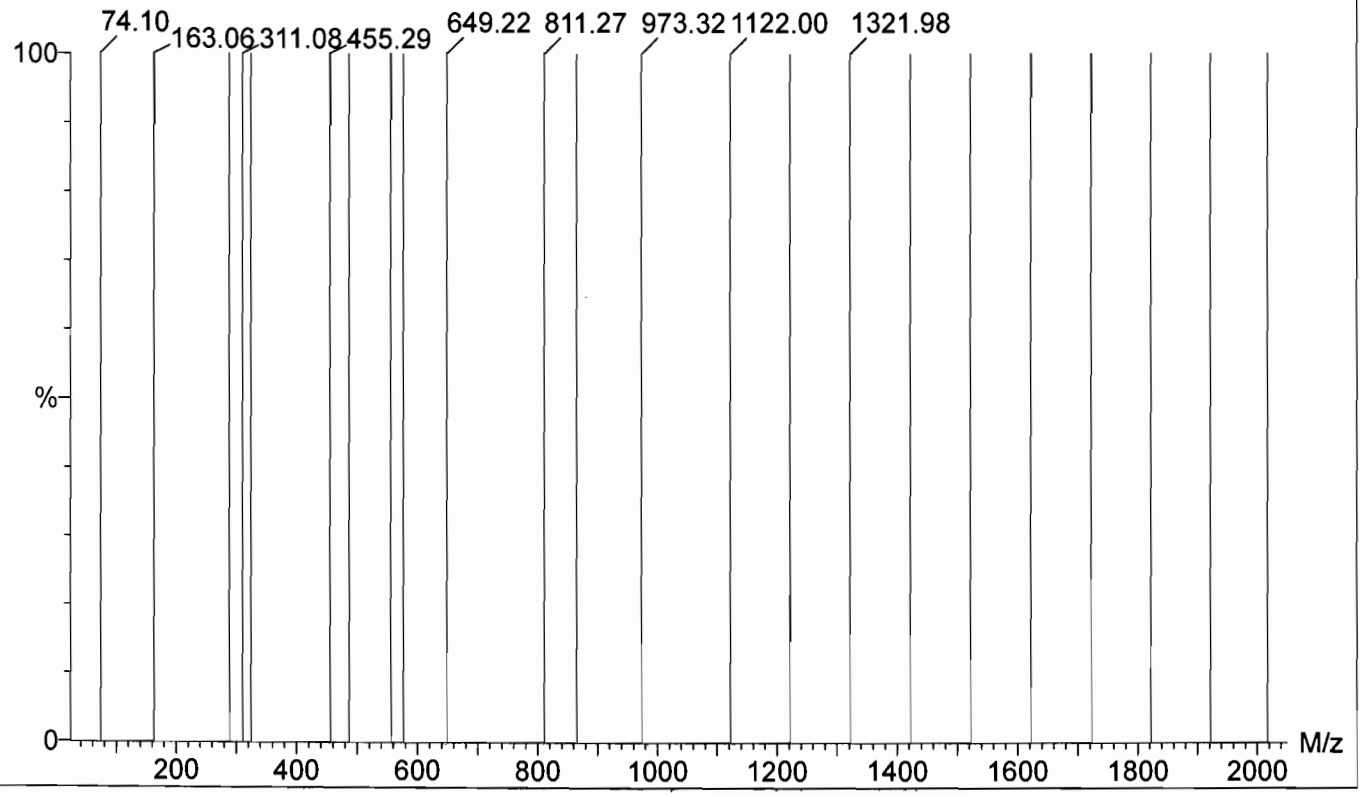
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0969 amu



Data file: FASTMS2V - Calibrated 23 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.121 amu



Q4(M) 07-11-19

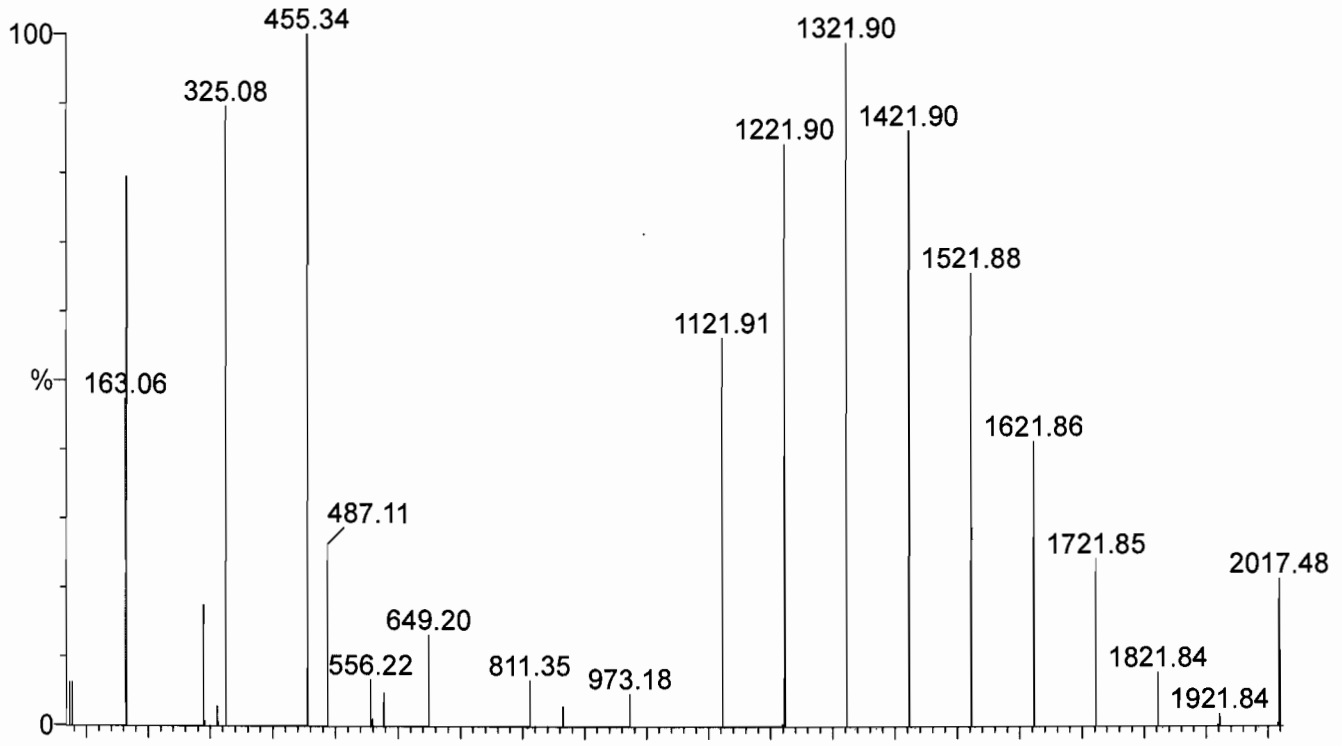
07/03/19 Calt 7/11/19

Calibration Verification Report - MS1 Static

Printed: **Thu Jul 11 09:16:11 2019**

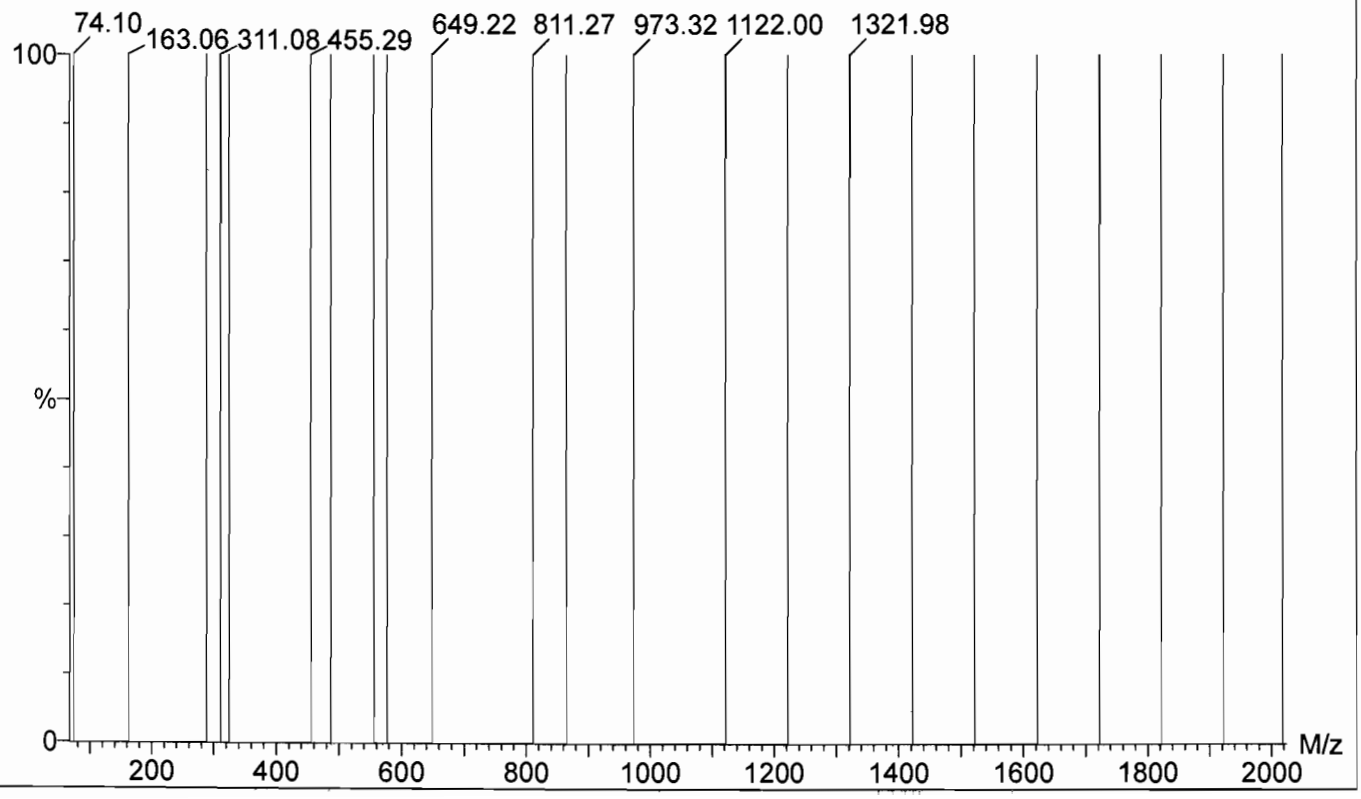
Data file: STATMS1V - Calibrated

23 matches of 23 tested references

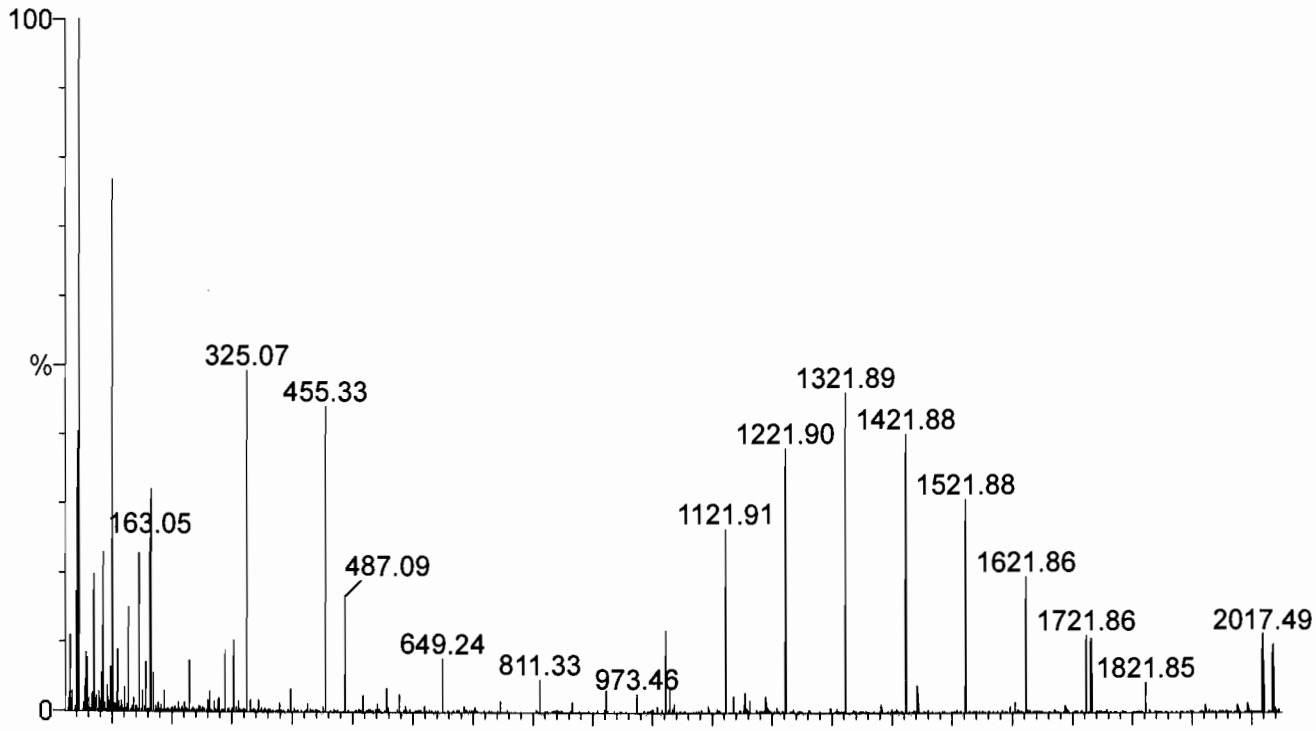


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref

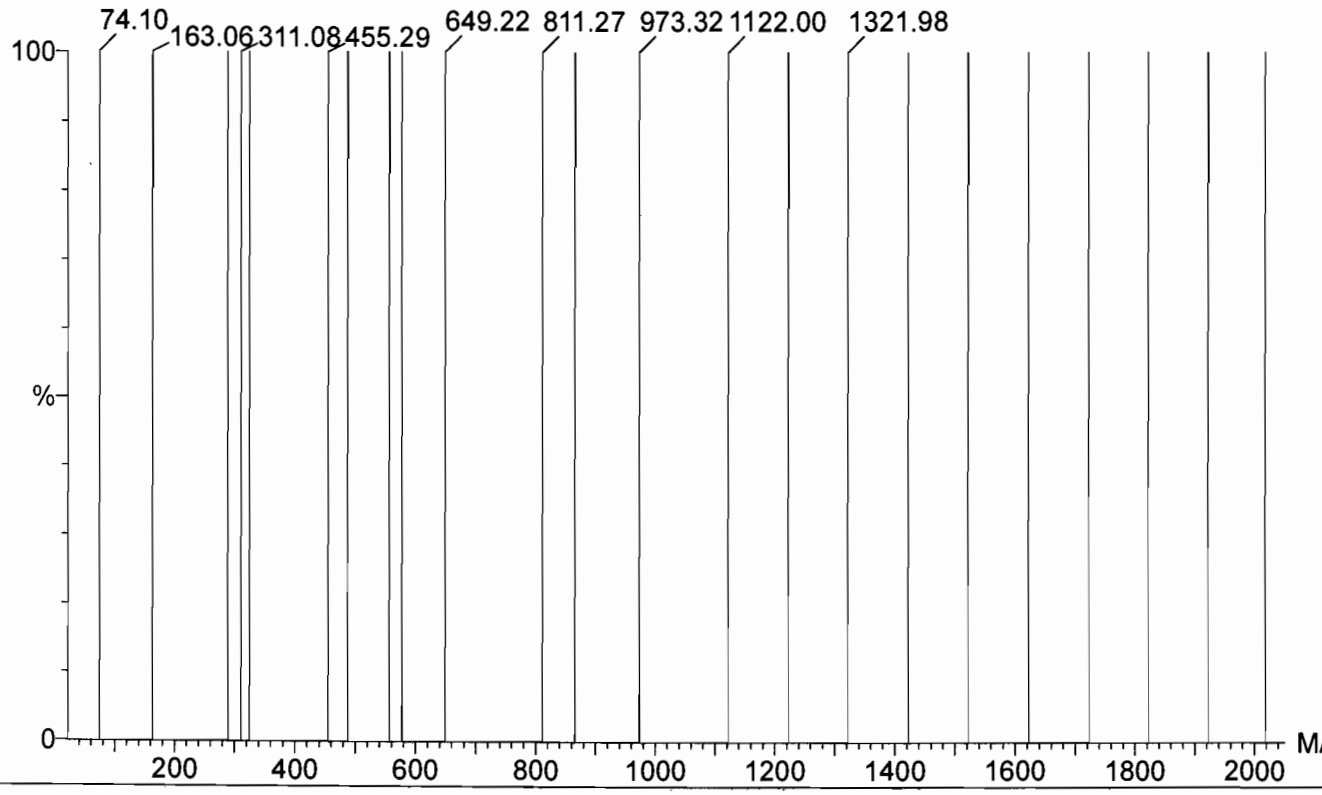
Mean residual = 0.0721 amu



Data file: SCNMS1V - Calibrated 23 matches of 23 tested references

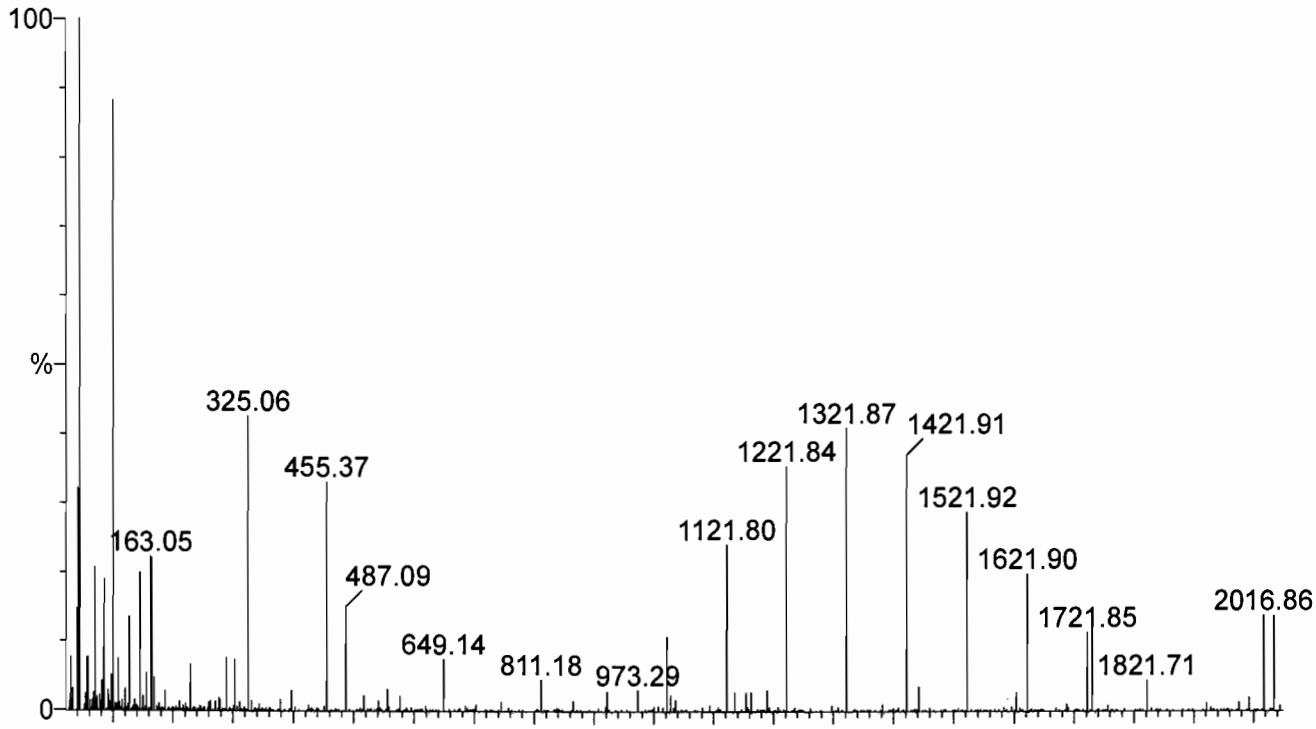


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0717 amu



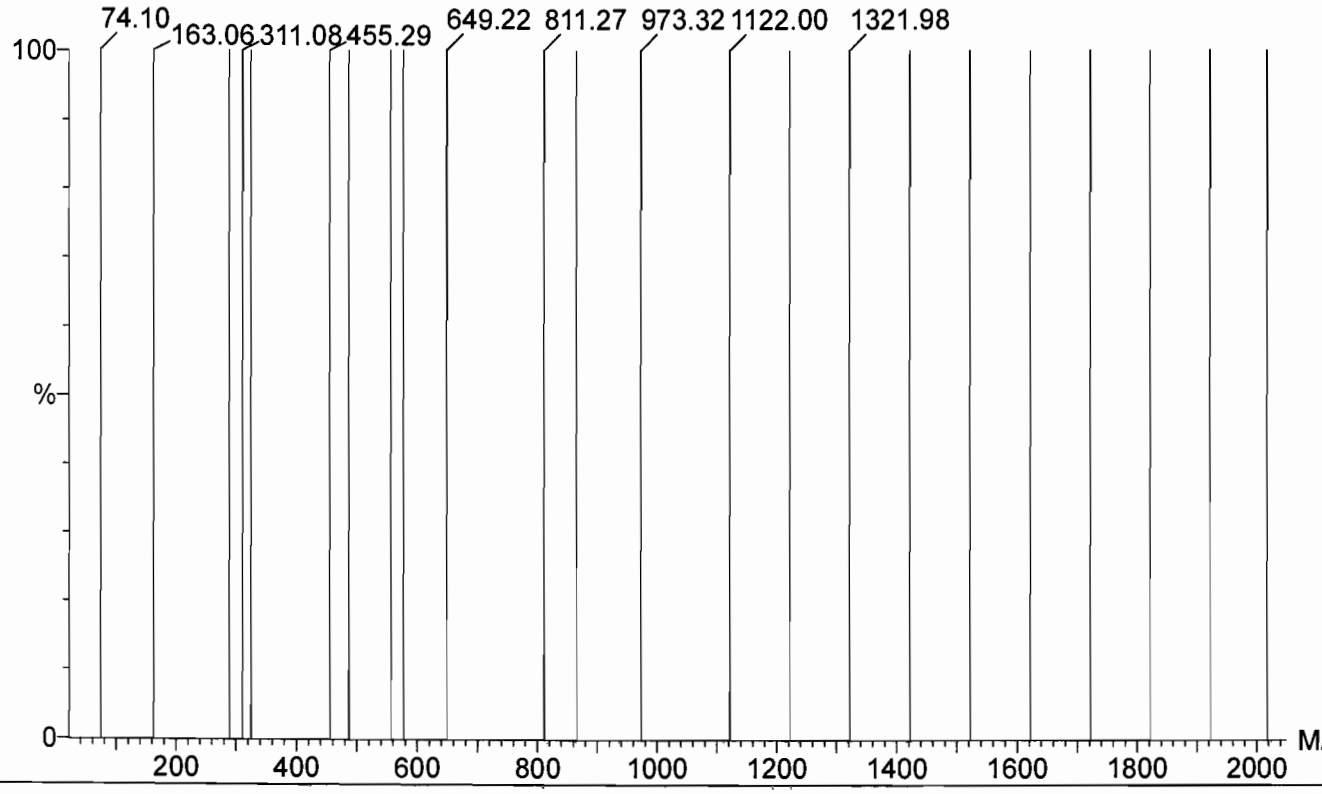
Data file: FASTMS1V - Calibrated

23 matches of 23 tested references

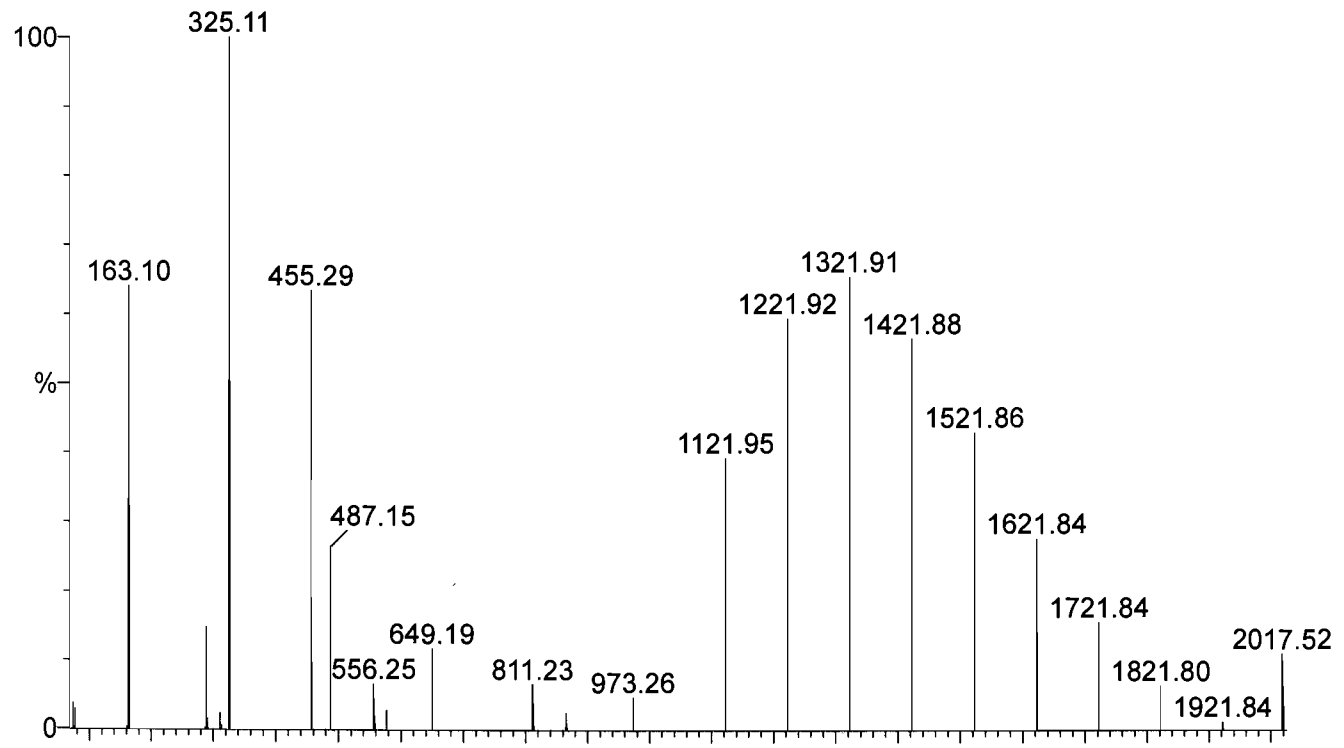


Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref

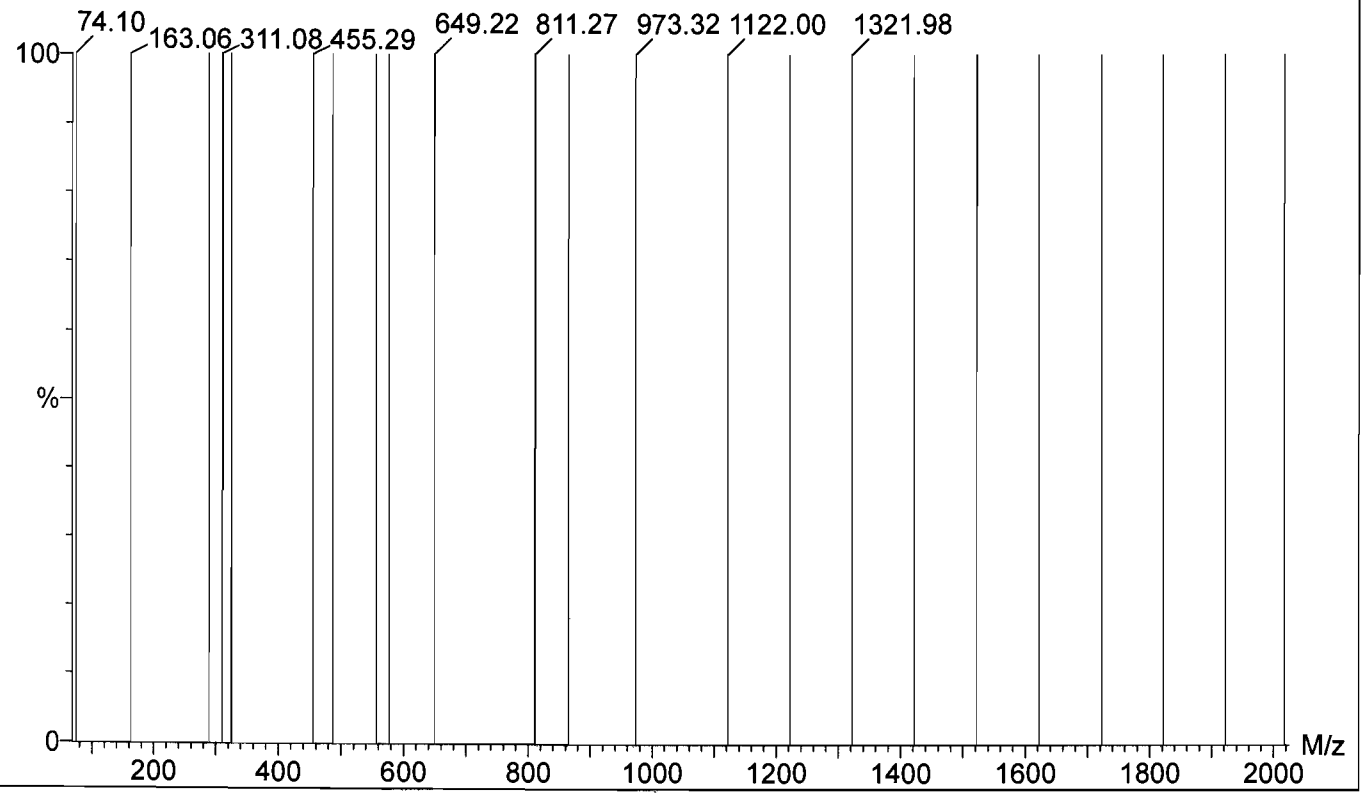
Mean residual = 0.13 amu



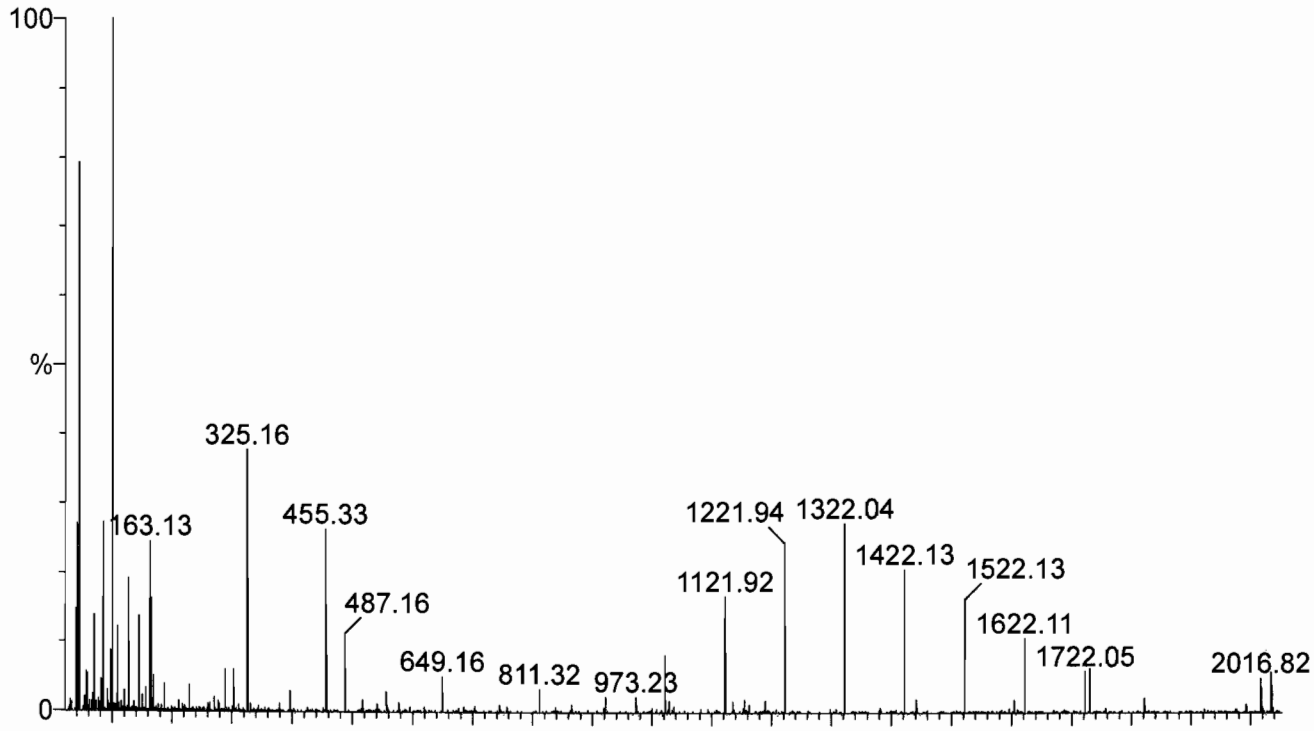
Data file: STATMS2V - Calibrated 23 matches of 23 tested references



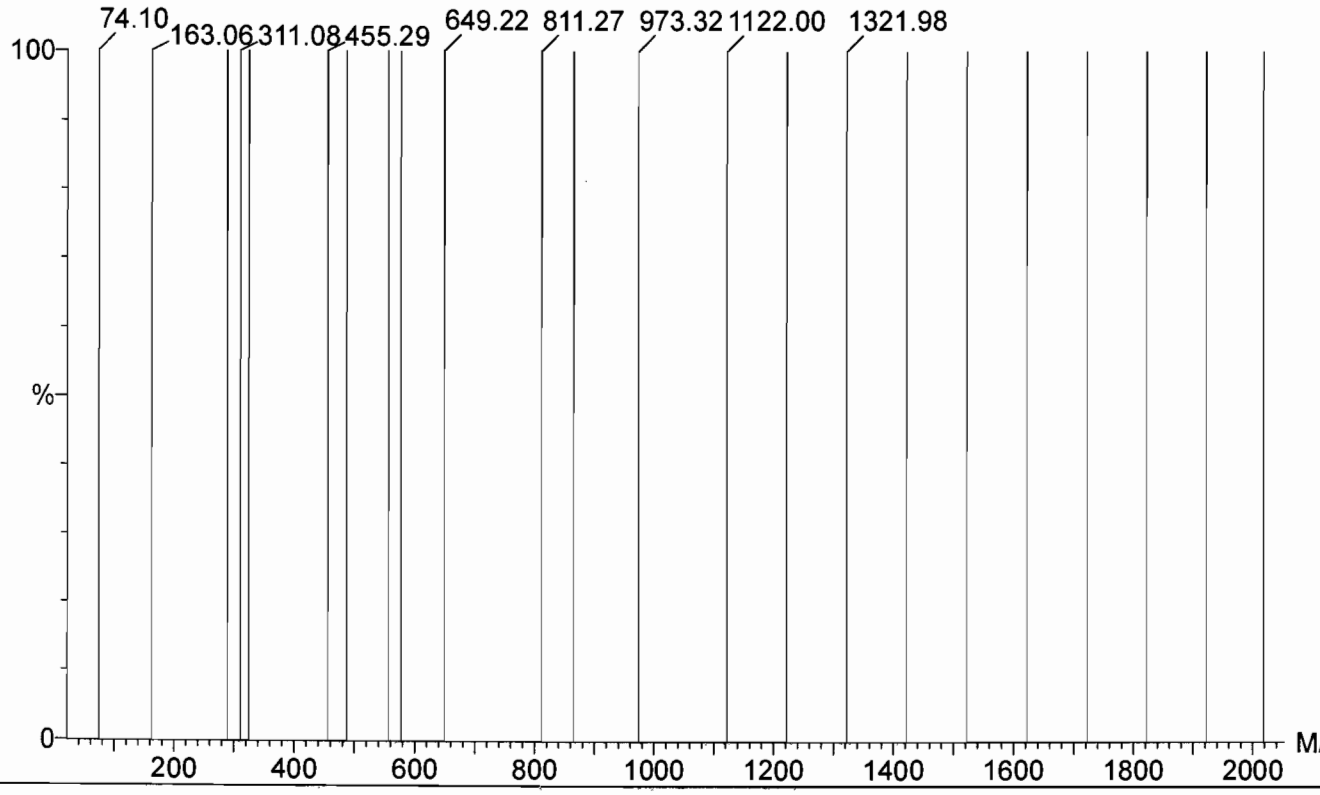
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0609 amu



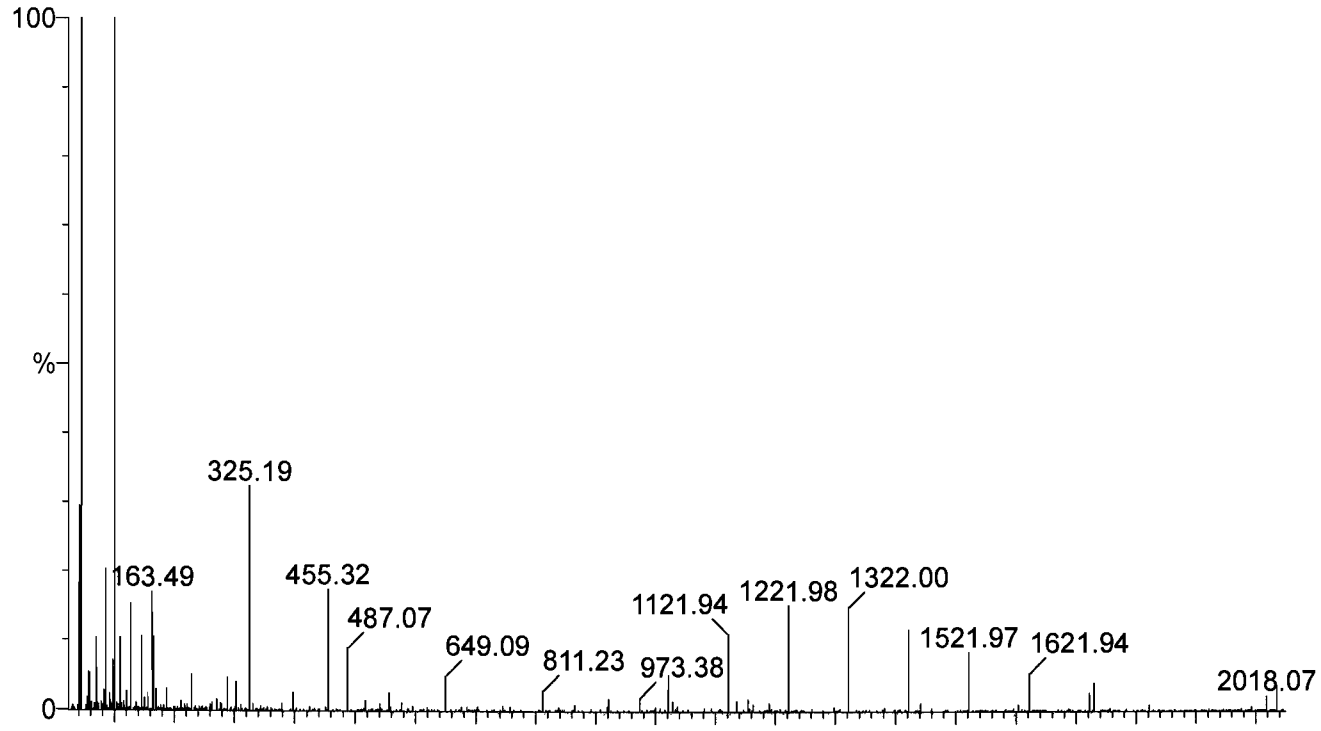
Data file: SCNMS2V - Calibrated 23 matches of 23 tested references



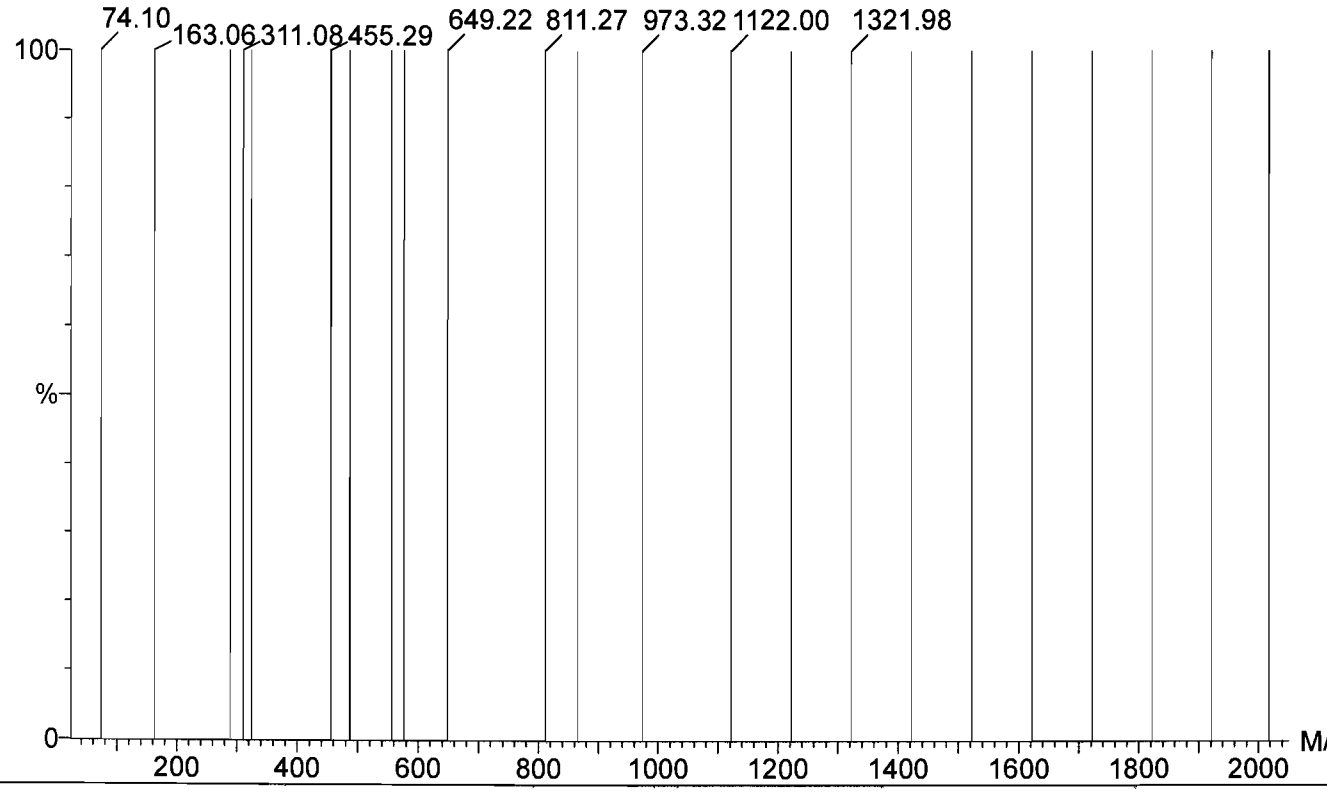
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.127 amu



Data file: FASTMS2V - Calibrated 23 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.127 amu



STANDARDS

Analytical Standard Record

Vista Analytical Laboratory

19E2201

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18L2001	13C2-4:2 FTS	20-Dec-18	** Vendor **	01-Sep-22	1.07
18L2002	13C2-6:2 FTS	20-Dec-18	** Vendor **	22-Nov-23	1.05
18L2003	13C2-8:2 FTS	20-Dec-18	** Vendor **	24-Jan-23	1.04
18L2004	13C3-PFBA	20-Dec-18	** Vendor **	14-Dec-22	1
18L2005	13C2-PFDA	20-Dec-18	** Vendor **	06-Dec-23	1
18L2006	13C2-PFUdA	20-Dec-18	** Vendor **	11-May-23	1
18L2007	13C2-PFTeDA	20-Dec-18	** Vendor **	30-Nov-22	1
18L2008	13C5-PFNA	20-Dec-18	** Vendor **	14-Dec-22	1
18L2009	13C2-PFDoA	20-Dec-18	** Vendor **	16-Feb-23	1
18L2010	13C4-PFHpA	20-Dec-18	** Vendor **	06-Jul-23	1
18L2011	13C2-PFOA	20-Dec-18	** Vendor **	10-Oct-23	1
18L2012	13C3-PFPeA	20-Dec-18	** Vendor **	20-Apr-22	1
18L2013	13C8-FOSA-I	20-Dec-18	** Vendor **	10-Oct-23	1
18L2014	d3-N-Me-FOSAA	20-Dec-18	** Vendor **	23-Aug-23	1
18L2015	d5-N-EtFOSAA	20-Dec-18	** Vendor **	23-Aug-23	1
18L2016	13C3-PFBS	20-Dec-18	** Vendor **	10-Dec-23	1.075
18L2017	13C8-PFOS	20-Dec-18	** Vendor **	20-Sep-23	1.045
18L2019	13C2-PFHxA	20-Dec-18	** Vendor **	22-May-23	0.4
18L2020	13C2-PFHxDA	20-Dec-18	** Vendor **	11-Oct-23	0.4
18L2027	13C3-PFHxS	20-Dec-18	** Vendor **	20-Jun-23	1.06
18L2077	13C3-HFPO-DA	20-Dec-18	** Vendor **	24-Oct-21	1

Description:	PFC - IS	Expires:	28-May-21
Standard Type:	Reagent	Prepared:	28-May-19
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	28-May-19 09:02 by GRB

Analyte	CAS Number	Concentration	Units
13C3-PFBA		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		0.5	ug/mL
13C2-PFHxDA		0.5	ug/mL
13C2-PFOA		1.25	ug/mL
13C2-PFTeDA		1.25	ug/mL
13C2-4:2 FTS		1.25	ug/mL
13C3-HFPO-DA		1.25	ug/mL
d5-EtFOSAA		1.25	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

19E2201

Description:	PFC - IS	Expires:	28-May-21
Standard Type:	Reagent	Prepared:	28-May-19
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	28-May-19 09:02 by GRB

Analyte	CAS Number	Concentration	Units
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-PFUnA		1.25	ug/mL

18L2001

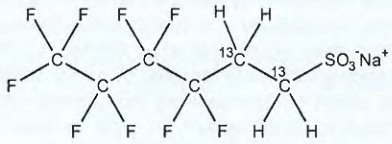
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-4:2FTS **LOT NUMBER:** M242FTS0817

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)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
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.
- 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).

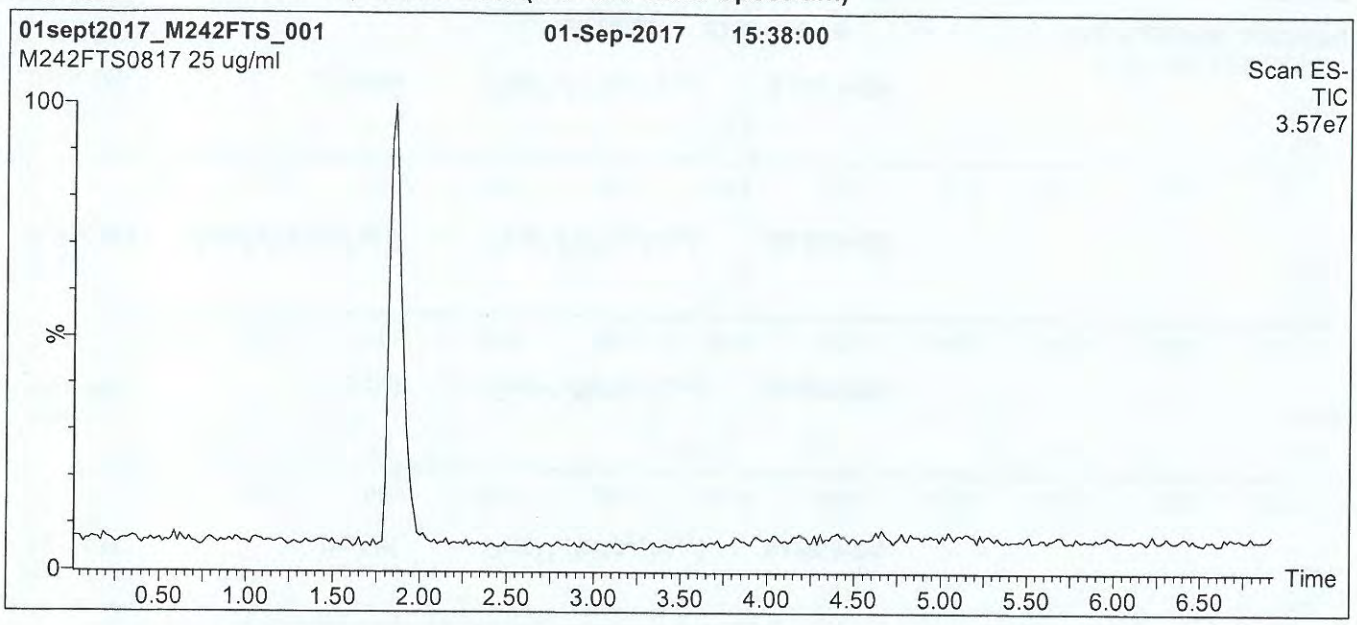
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

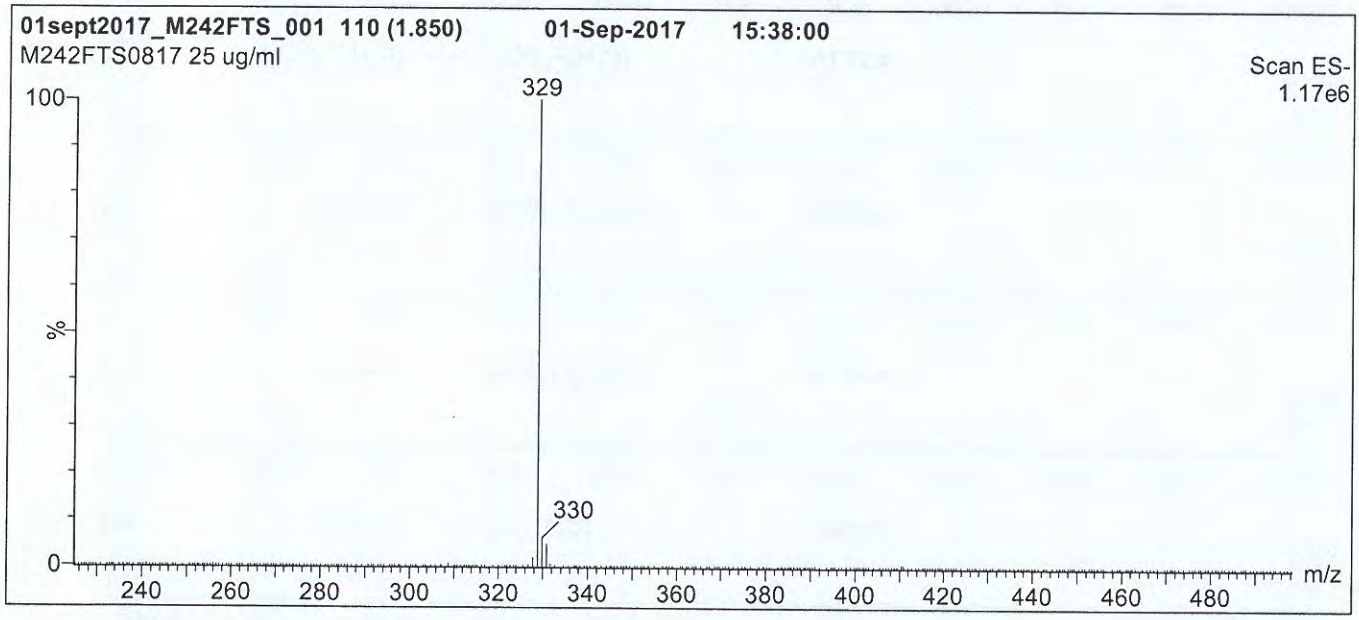
Certified By: _____ **Date:** 09/29/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18L2001

Figure 1: **M2-4:2FTS; 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: 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 1 min before returning
to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18L2001

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).

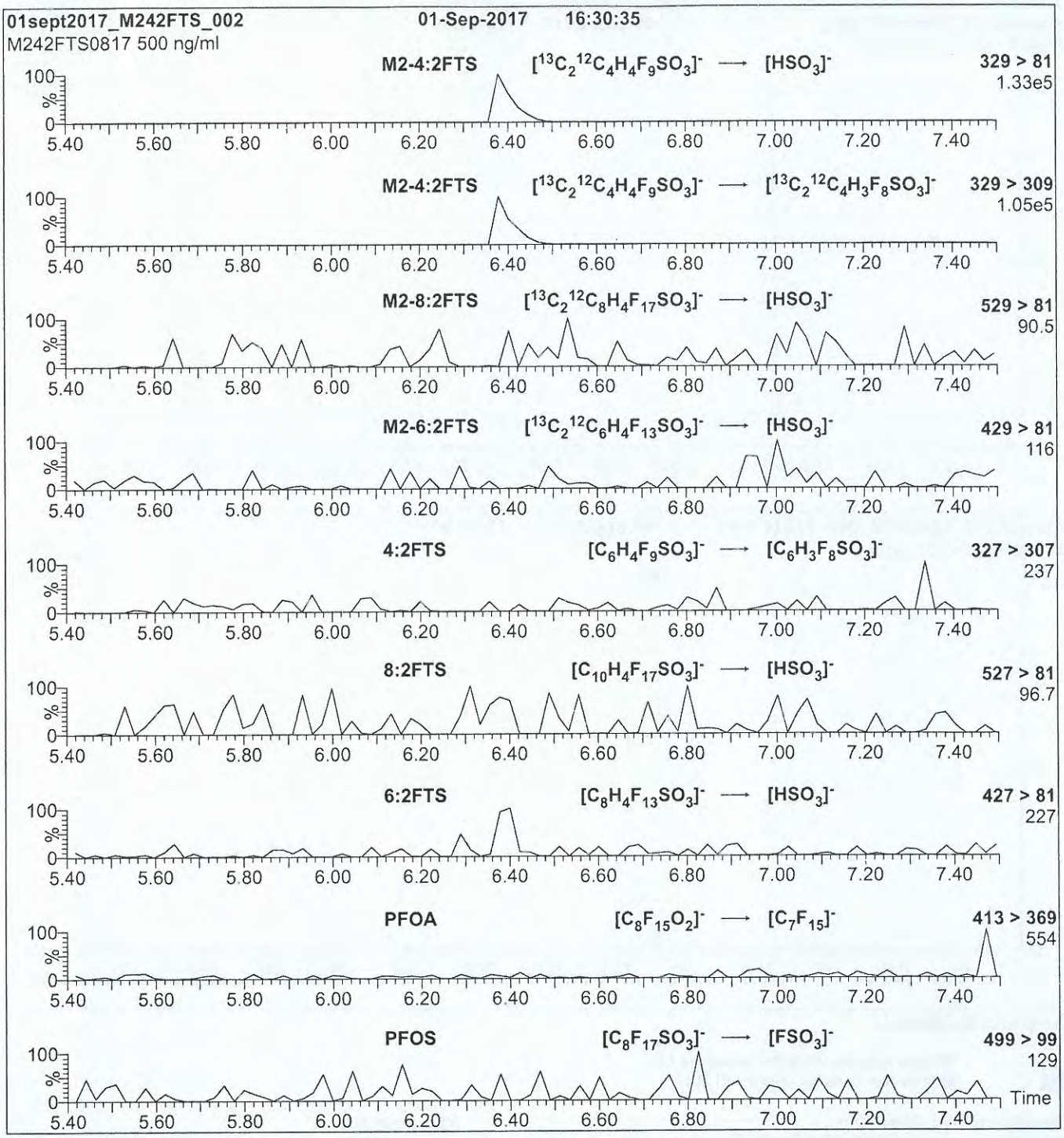
CALA Testing Accreditation No. A 1226

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

1812001

Figure 2: **M2-4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-4:2FTS)

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) = 3.28e-3
Collision Energy (eV) = 25

18L2002

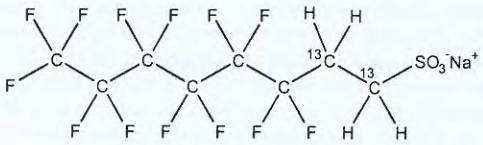
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS1118

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)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/22/2018		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2023		
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:** 11/26/2018 (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

18L2002

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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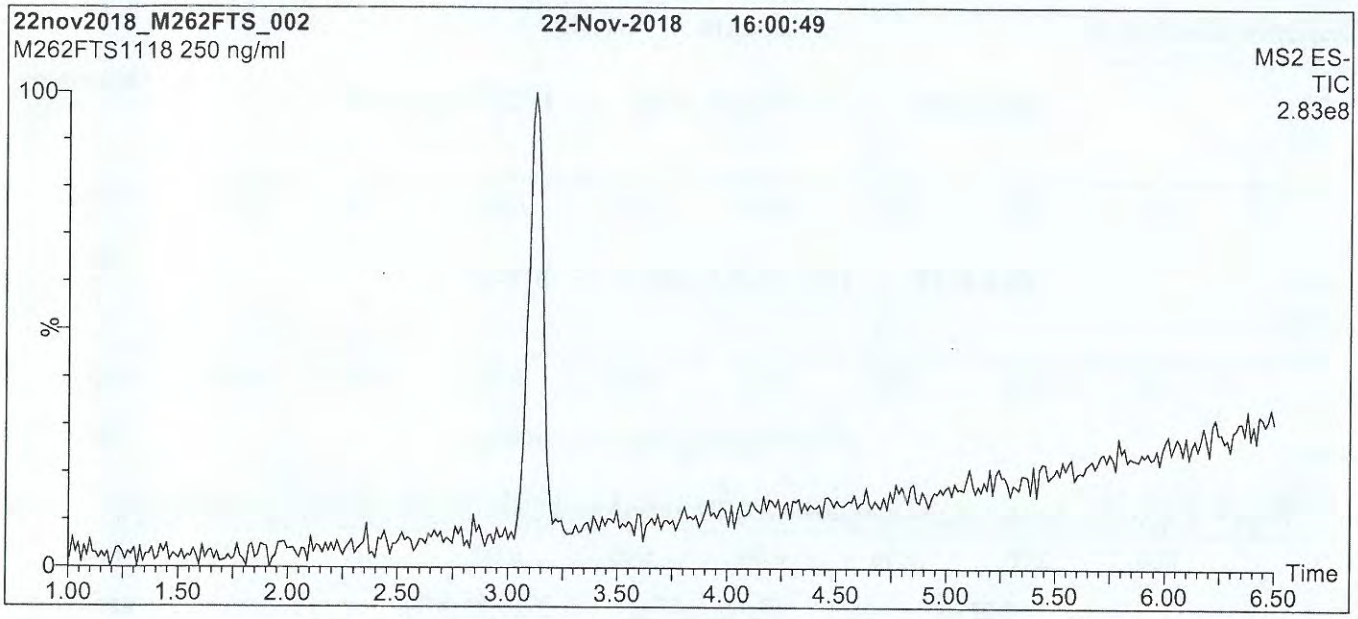
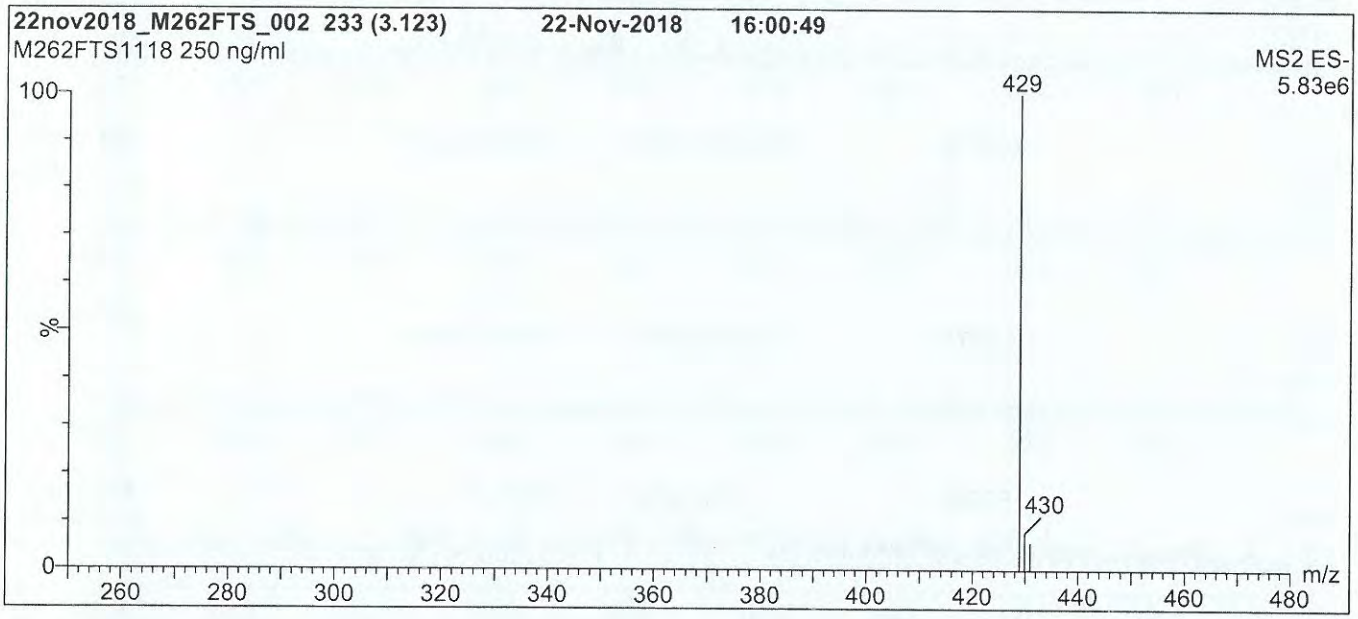
18L2002

Figure 1: **M2-6:2FTS; 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: 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

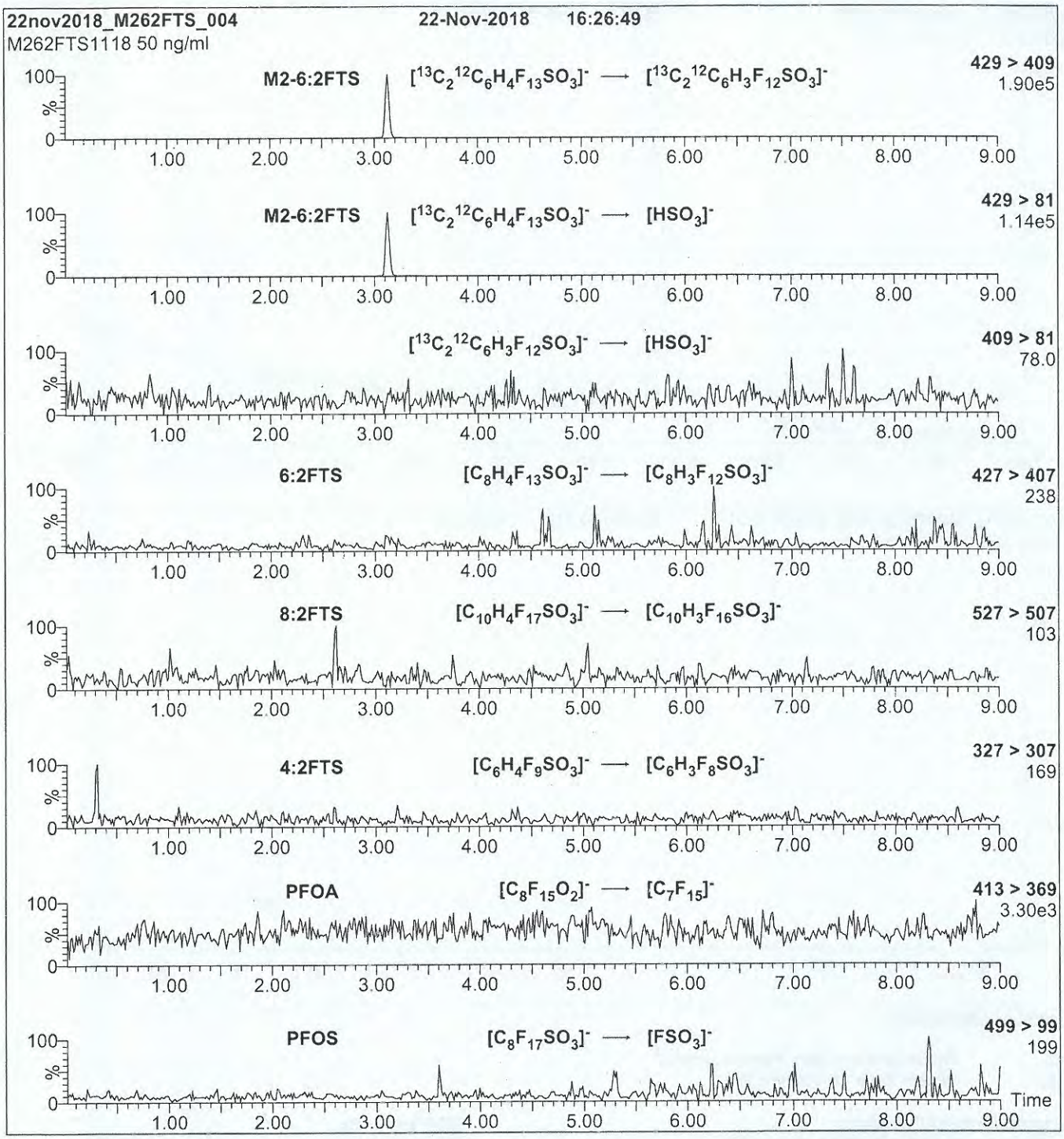
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812002

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) = 2.97e-3
Collision Energy (eV) = 20

18L2003

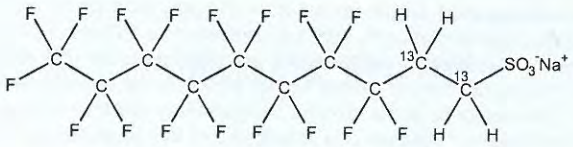
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

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)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/24/2018		
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023		
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 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:** 01/26/2018 (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

Form#:27, Issued 2004-11-10
Revision#:5, Revised 2018-01-22

18L2003

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

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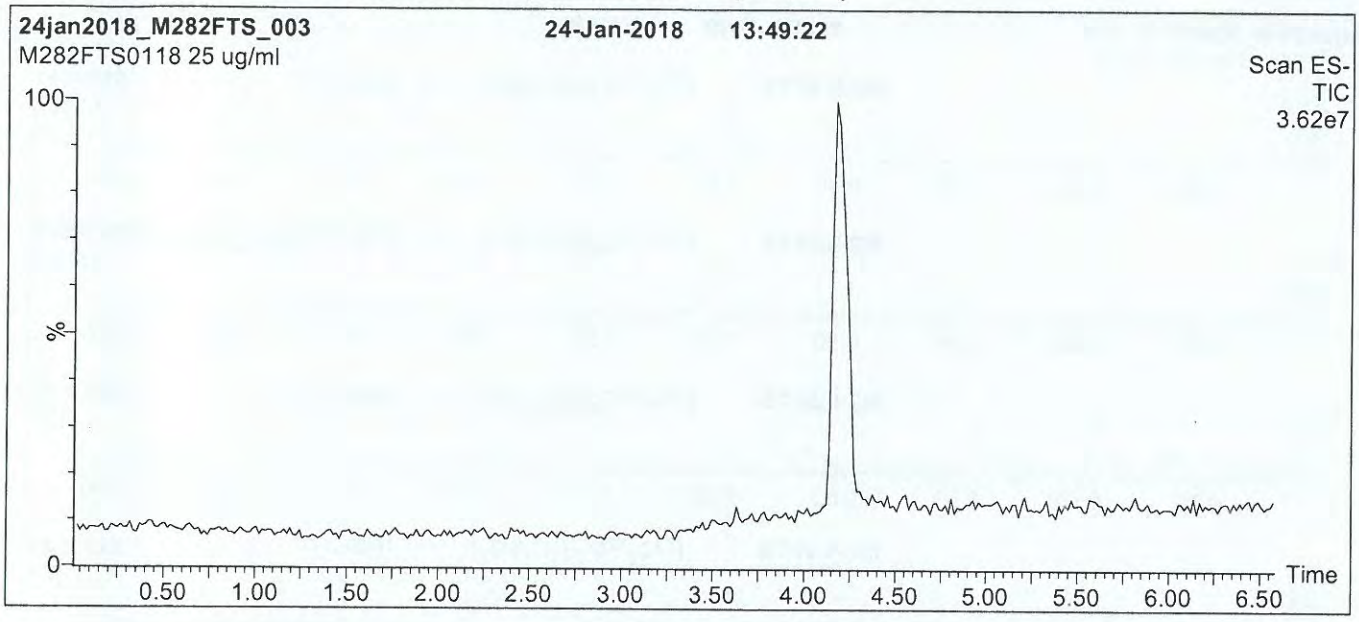
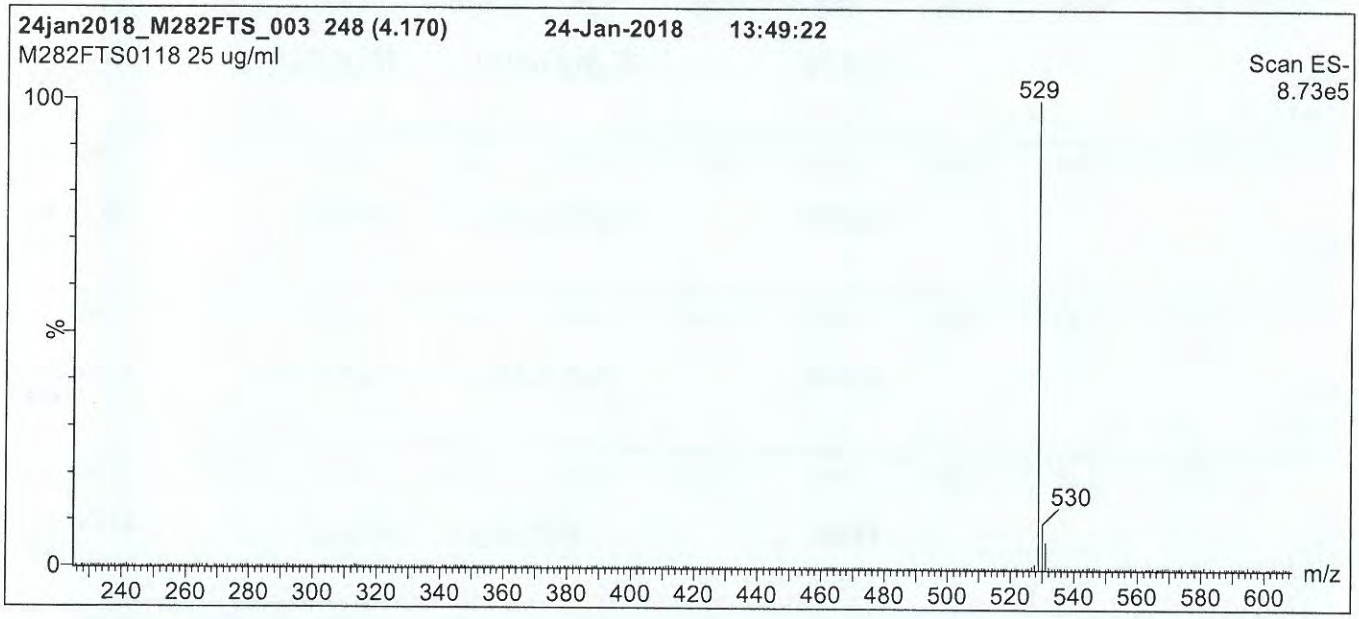
1812003

Figure 1: **M2-8:2FTS; 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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

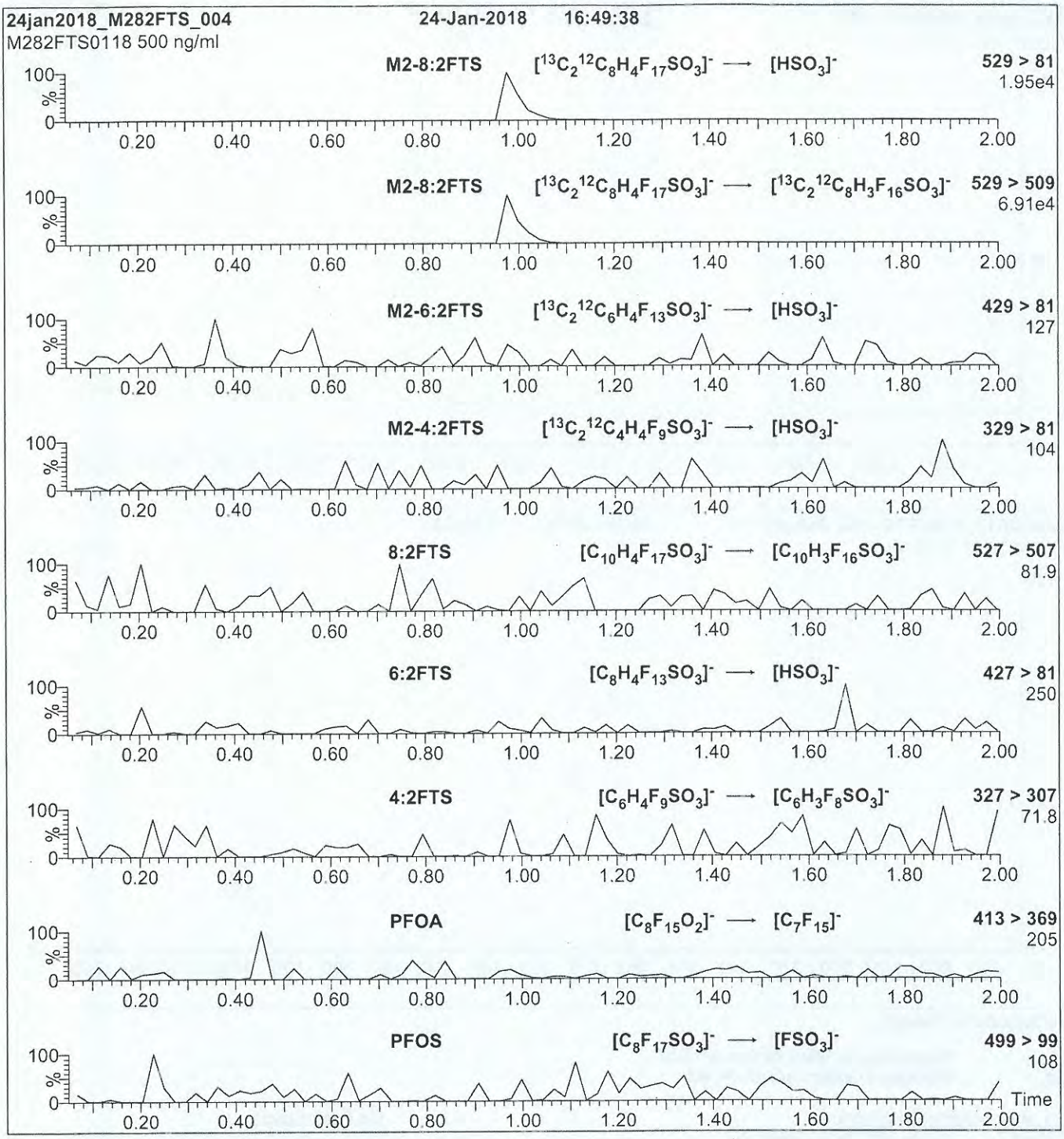
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

1812003

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

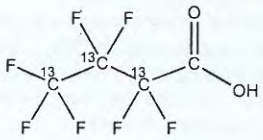
Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

18L2004

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

18L2004

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).

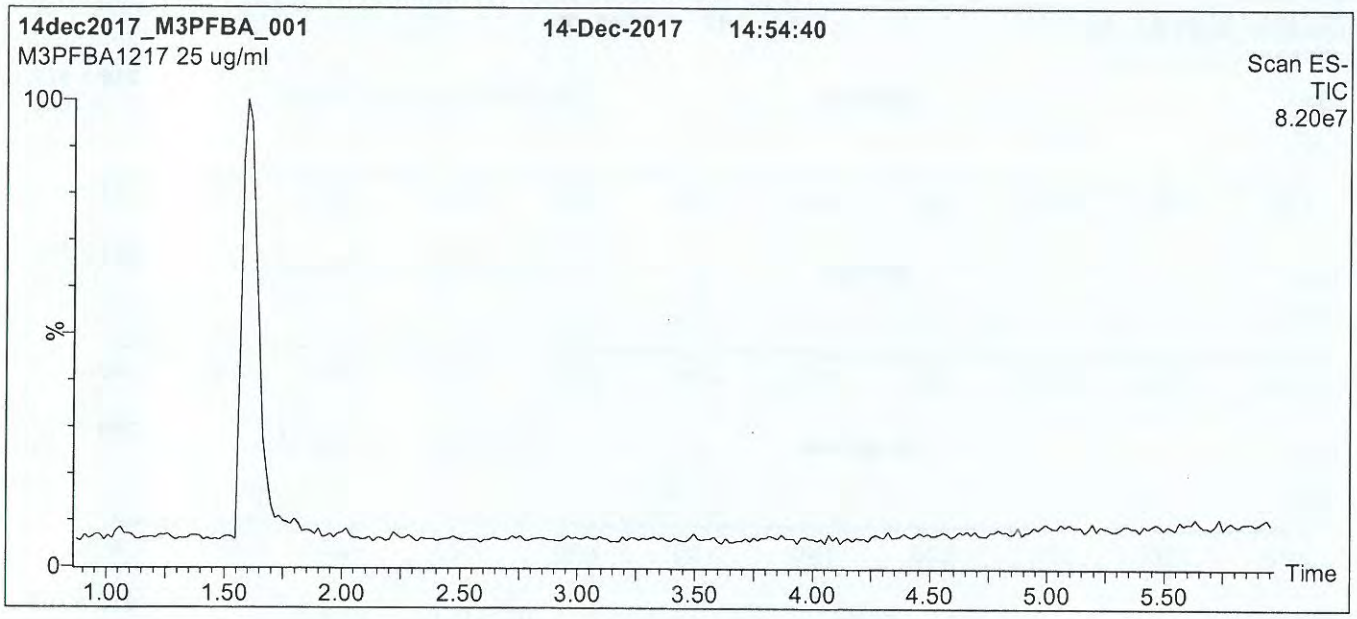
CALA Testing Accreditation No. A 1226

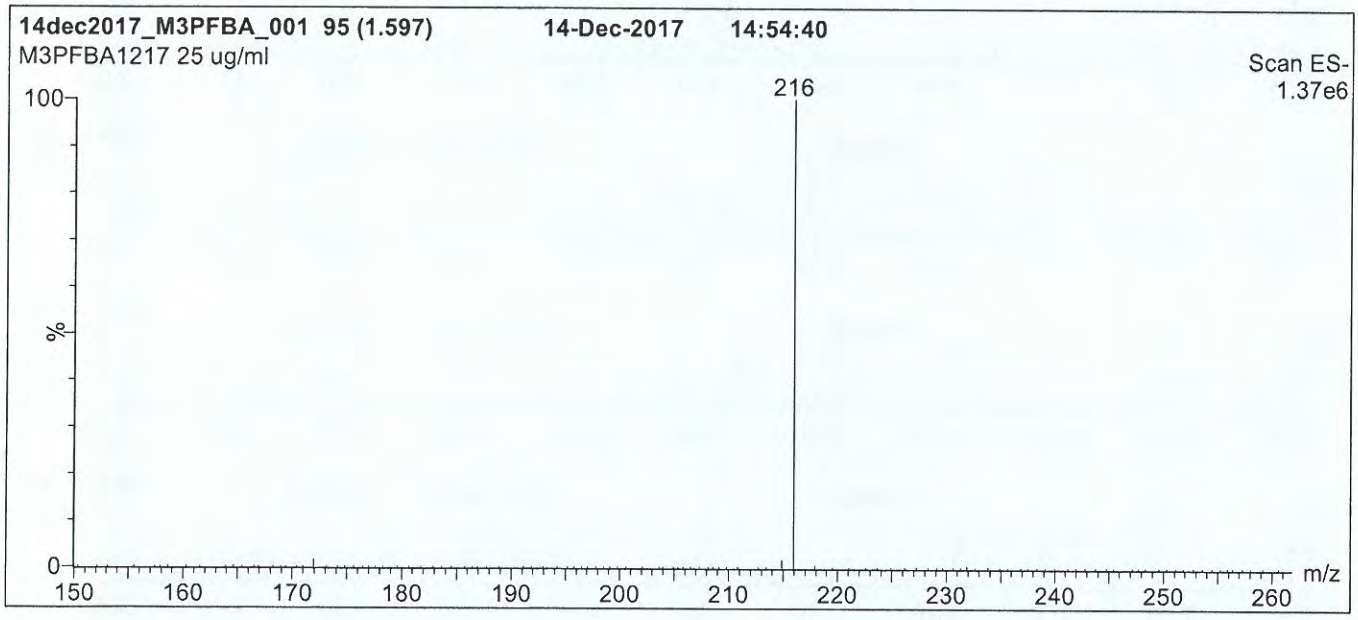
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

1812004

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

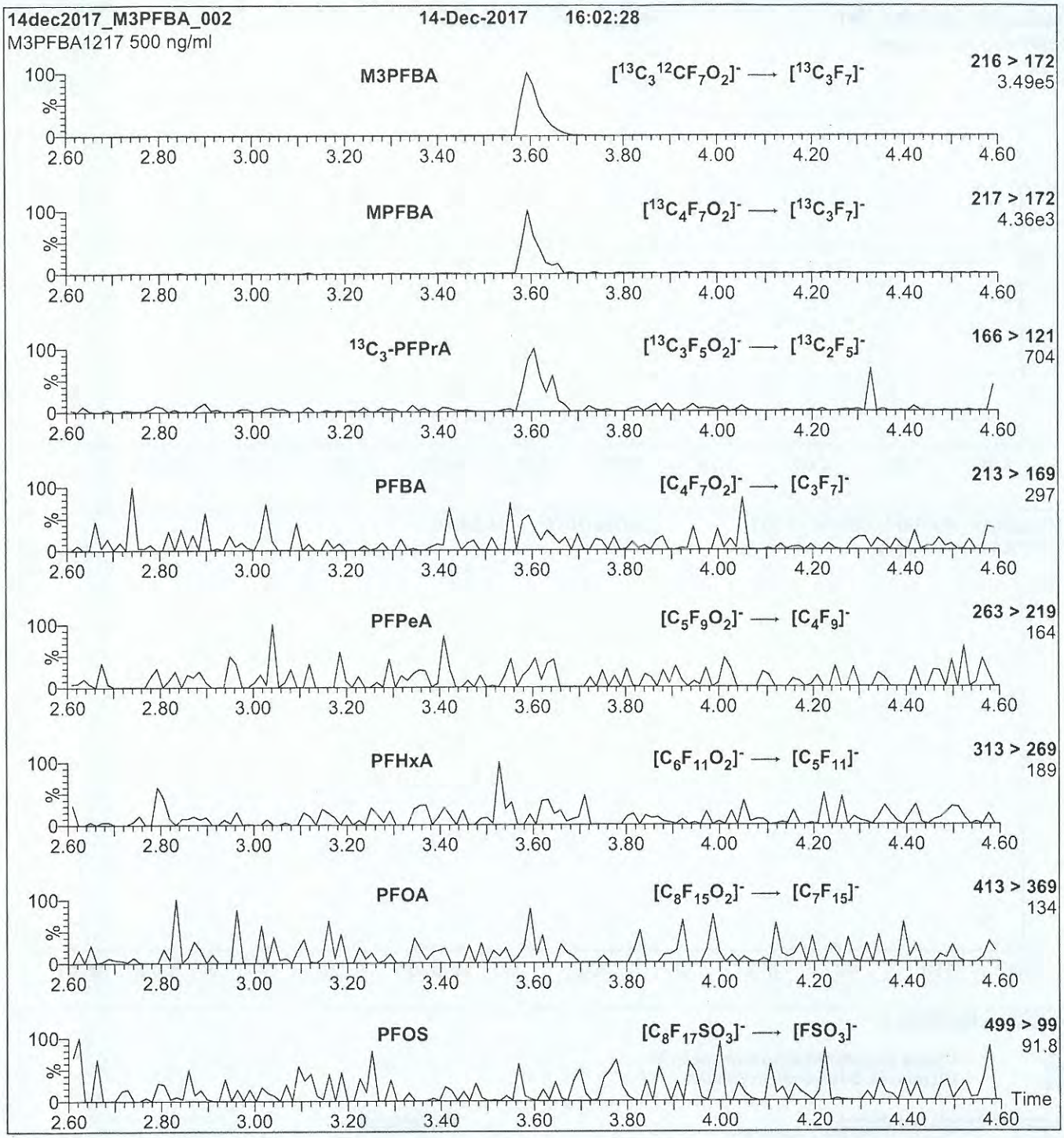
MS Parameters

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

18L2004

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

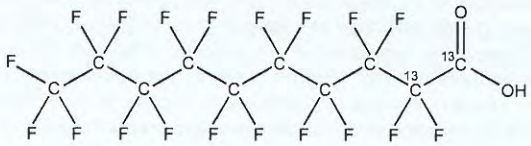
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

18L2005

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA1218
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-$^{13}C_2$)
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 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

1812005

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).

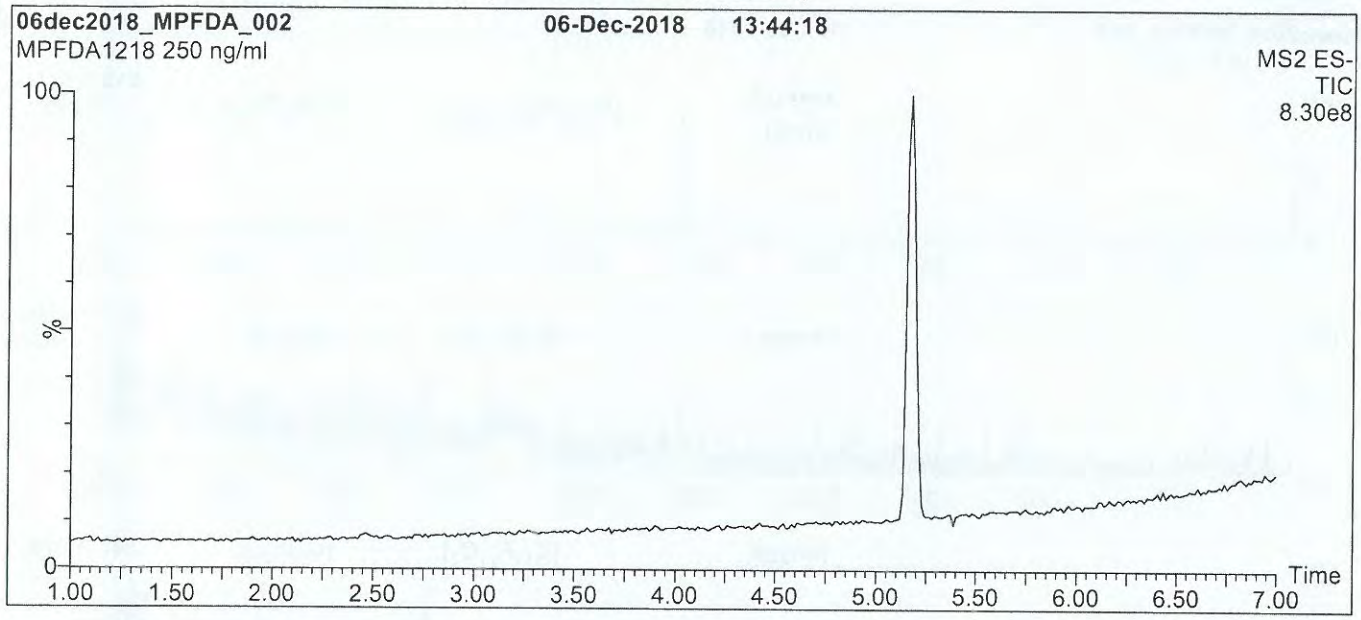
CALA Testing Accreditation No. A 1226

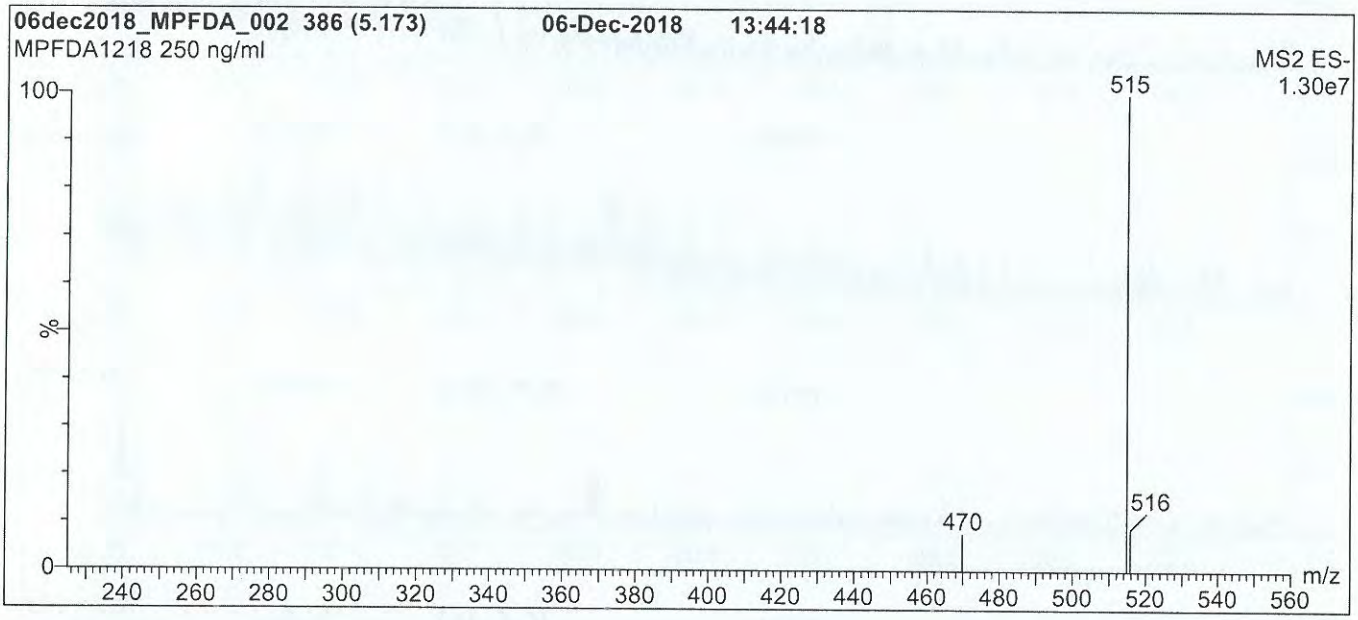
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812005

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: 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

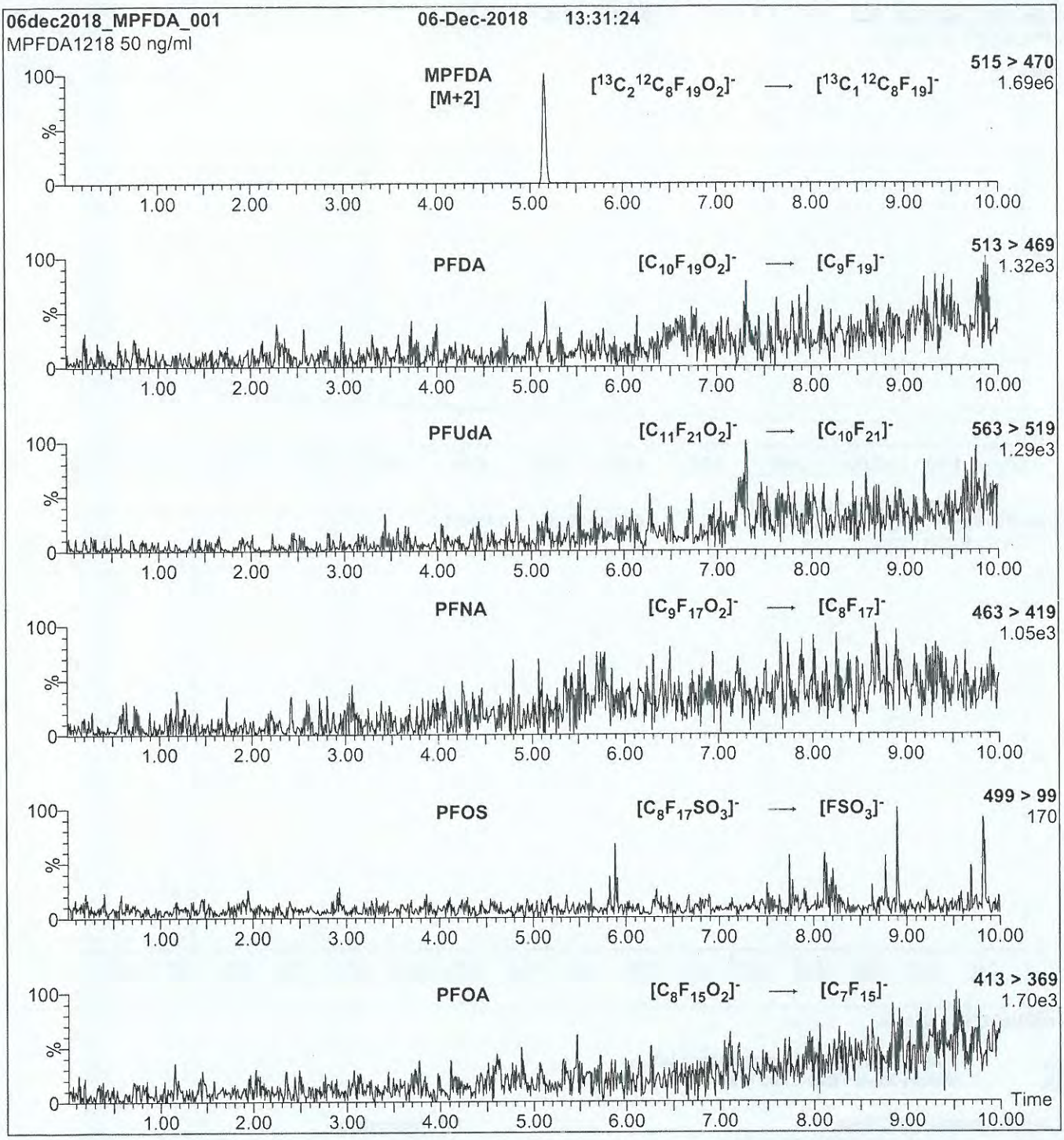
MS Parameters

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

1812005

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

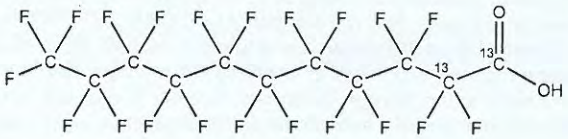
Collision Gas (mbar) = 3.27e-3
Collision Energy (eV) = 10

18L2006

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA0518
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)	05/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/11/2023		
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.
- 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:** 05/25/2018 (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

1812006

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:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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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.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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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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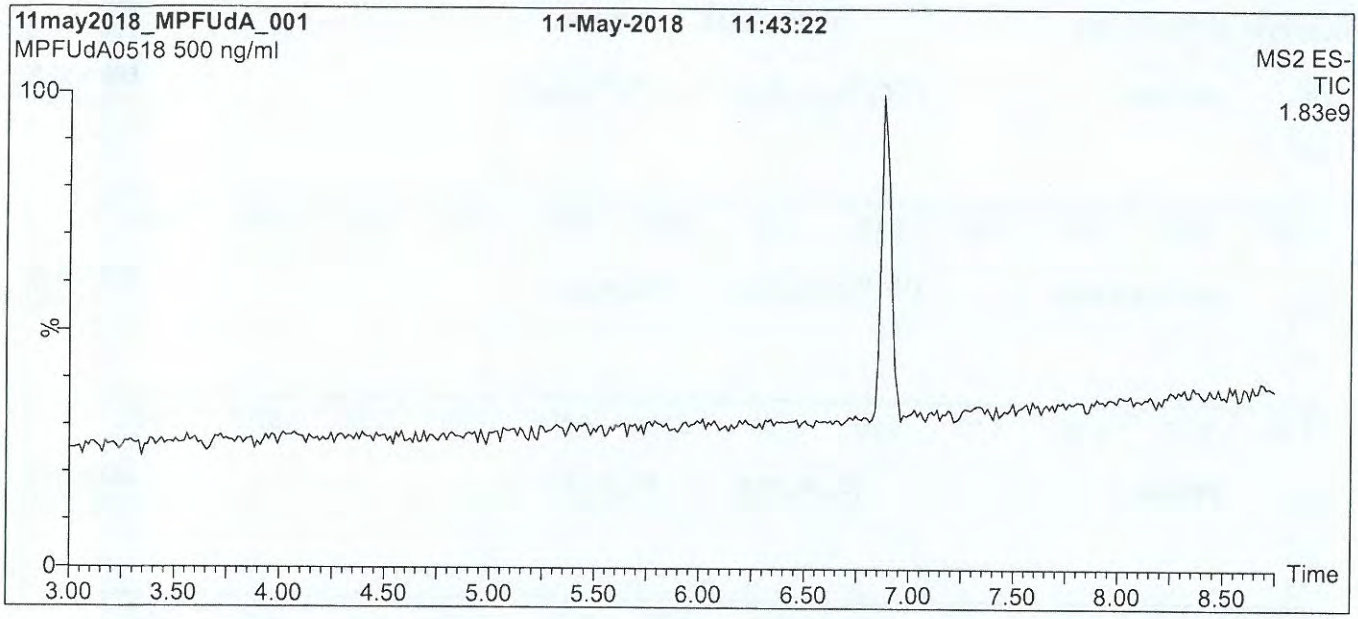
CALA Testing Accreditation No. A 1226

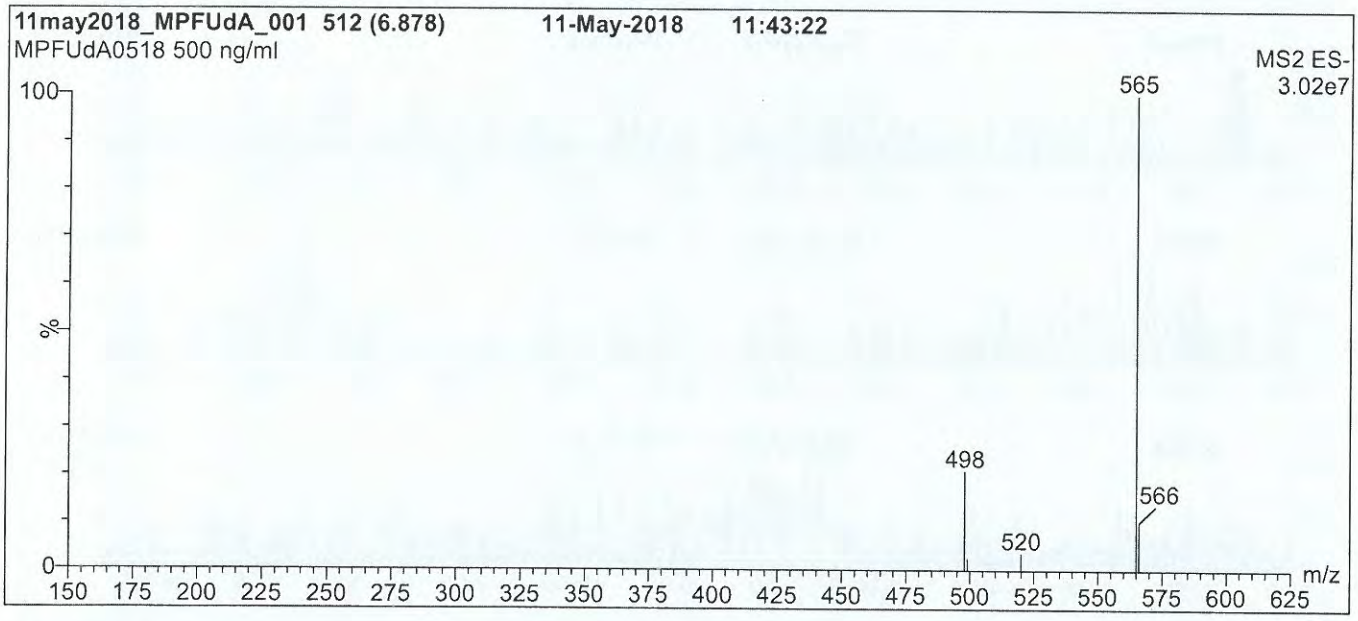
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2006

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: 50% (80:20 MeOH:ACN) / 50% 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

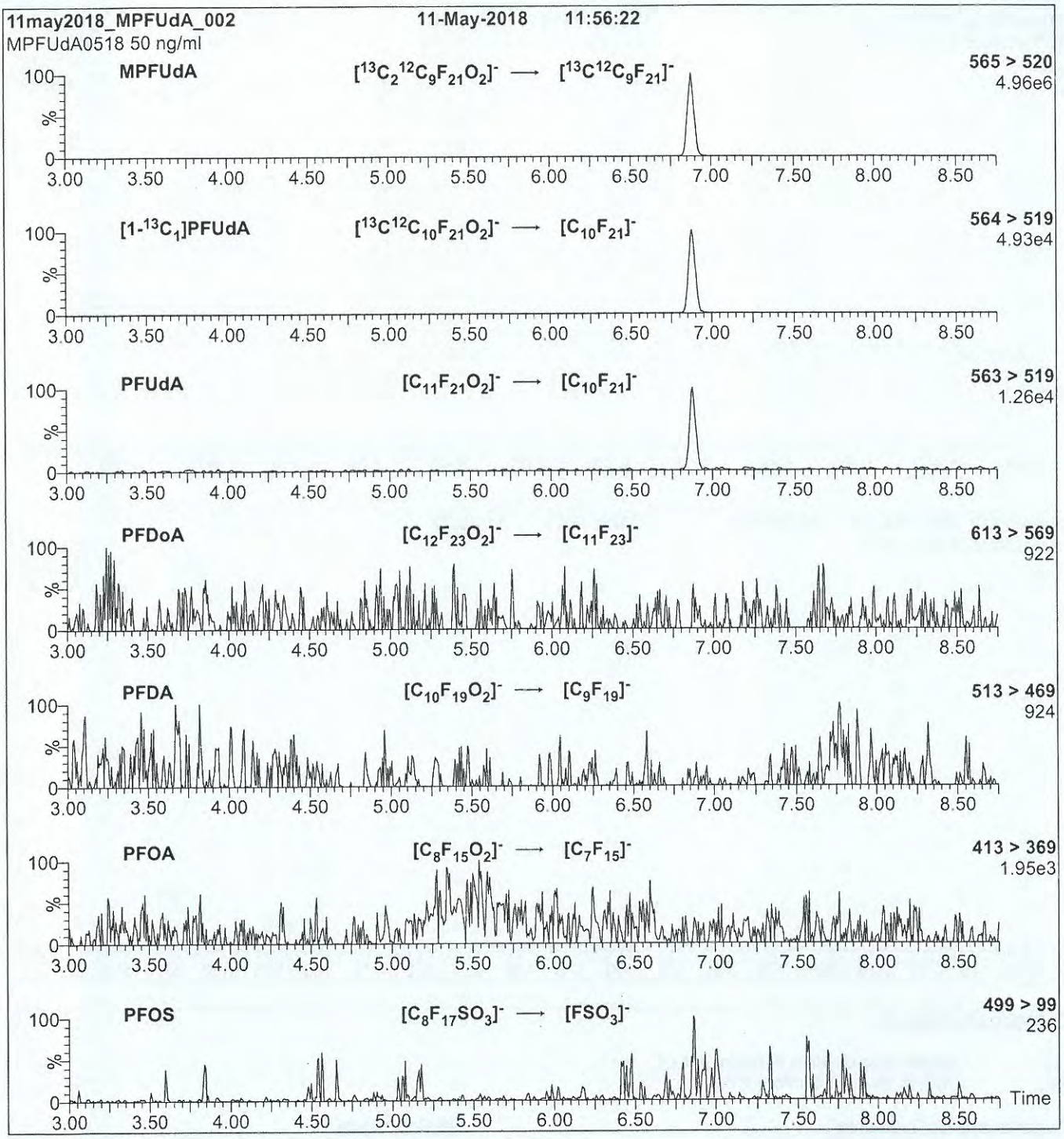
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18L2006

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

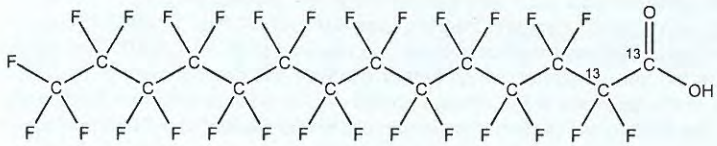
Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 12

18L2007

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1117
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)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/01/2017 (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

1812007

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).

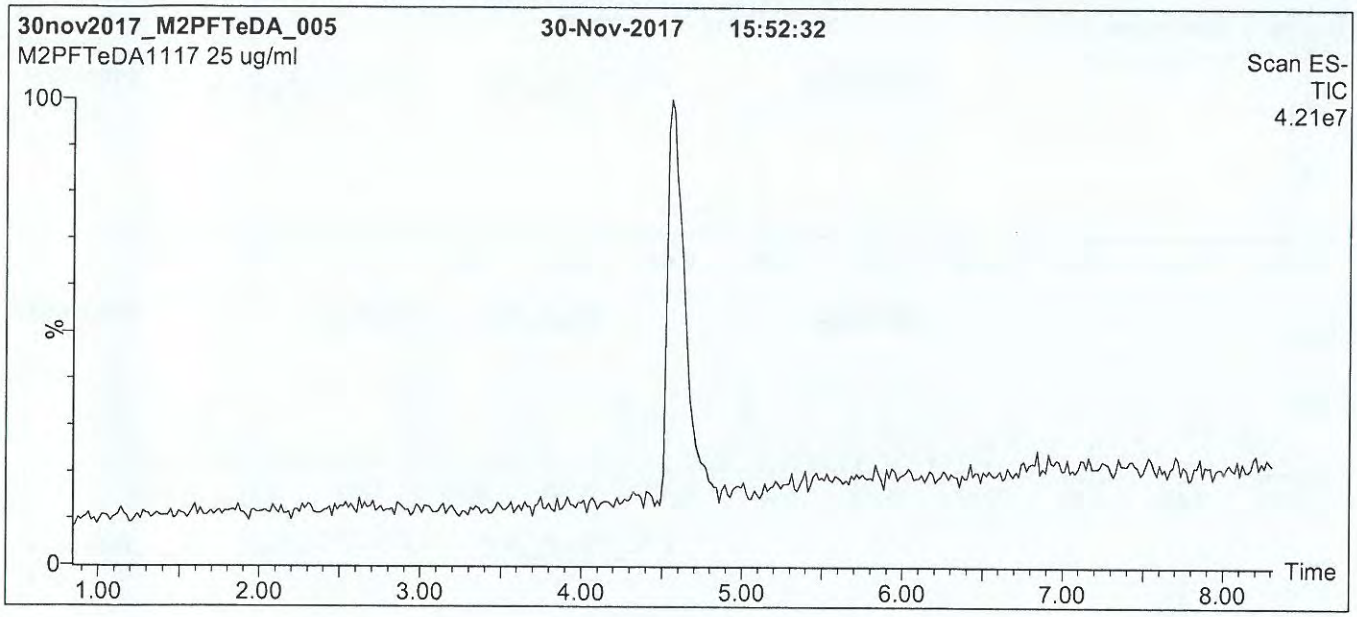
CALA Testing Accreditation No. A1226

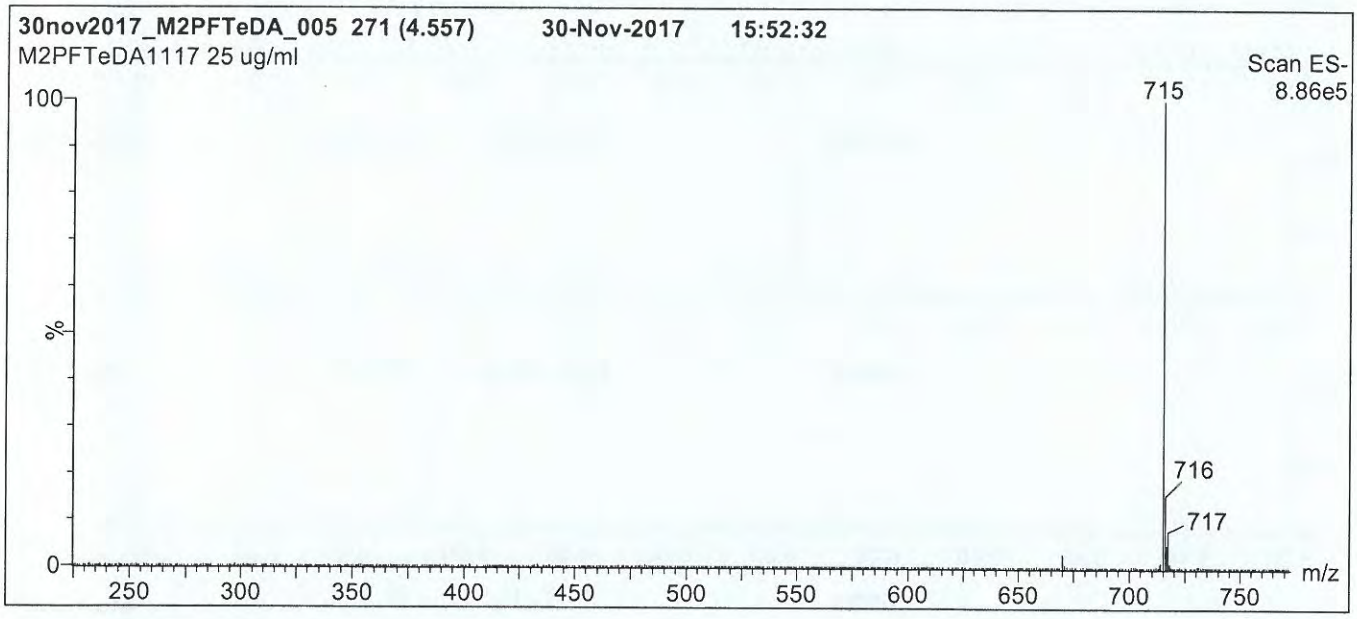
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

1862007

Figure 1: **M2PFTeDA; 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: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

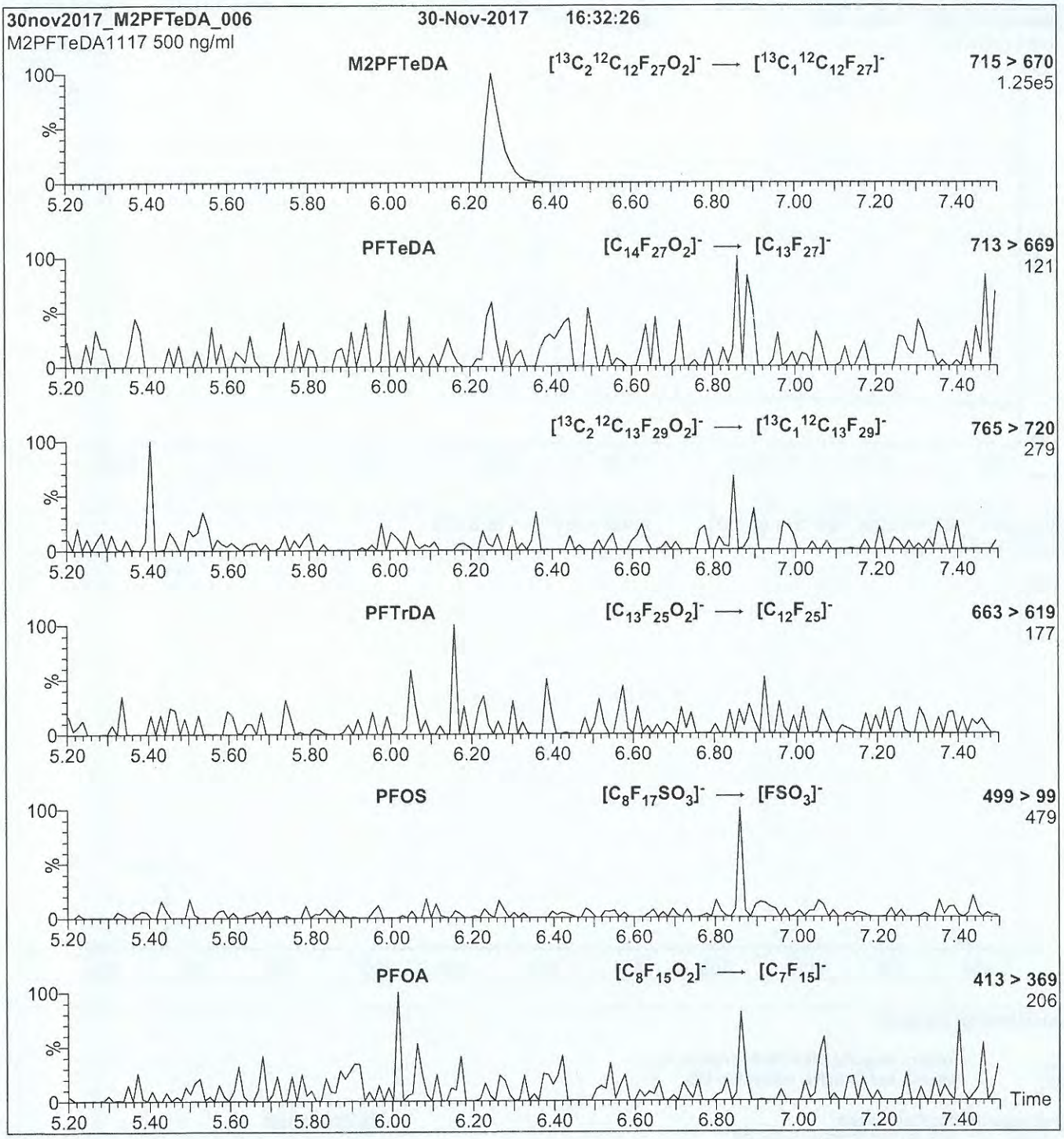
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18L2007

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

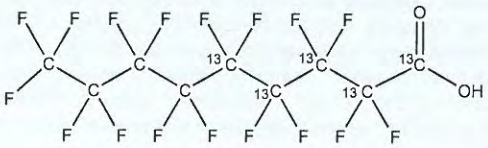
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

1812008

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA1217
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)	12/14/2017		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/19/2017 (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

1812008

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:

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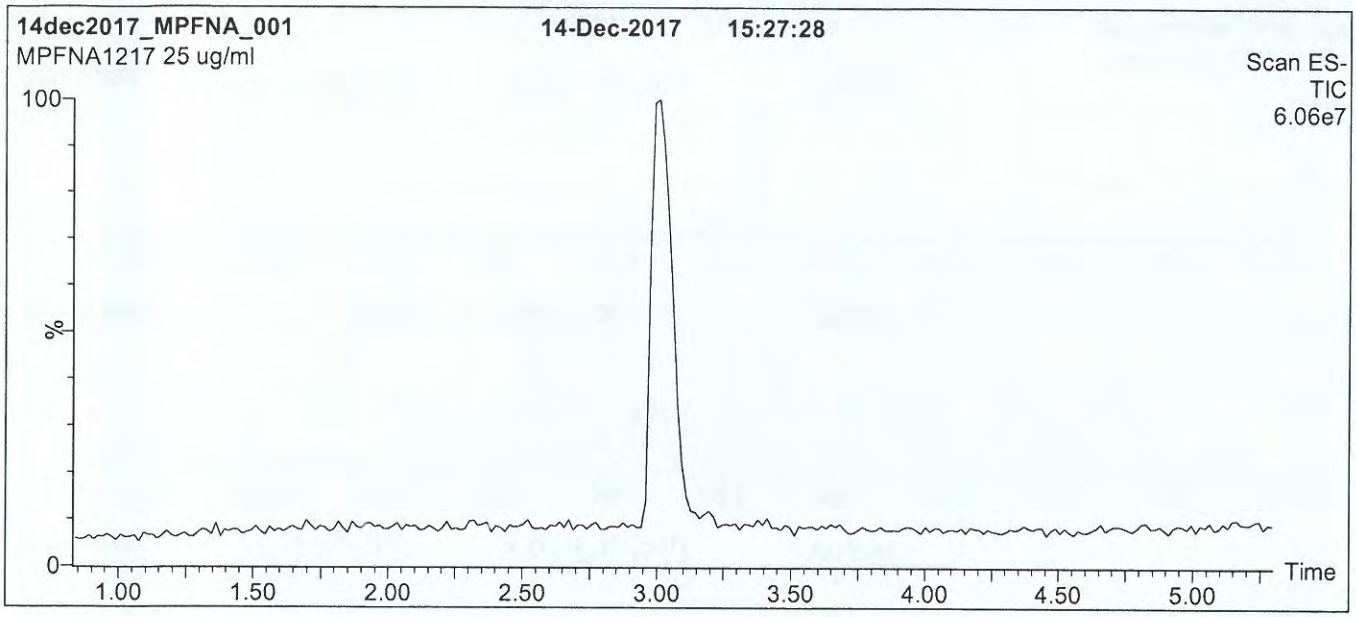
CALA Testing Accreditation No. A 1226

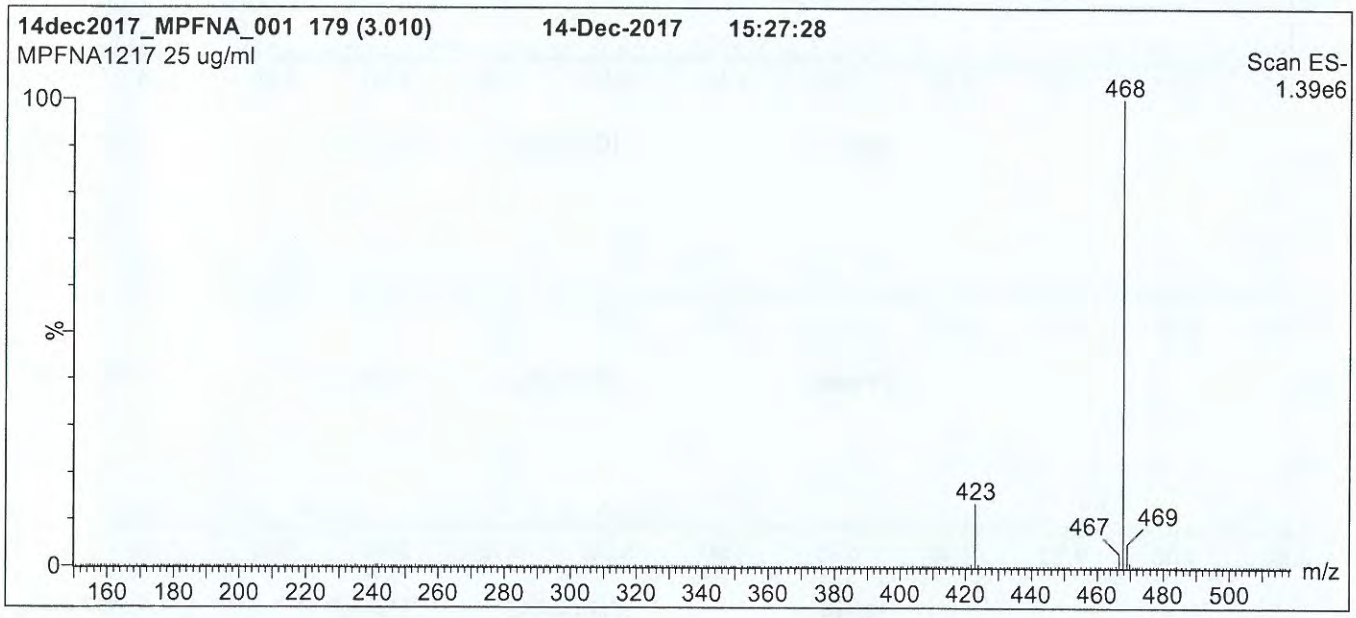
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812008

Figure 1: **MPFNA; 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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

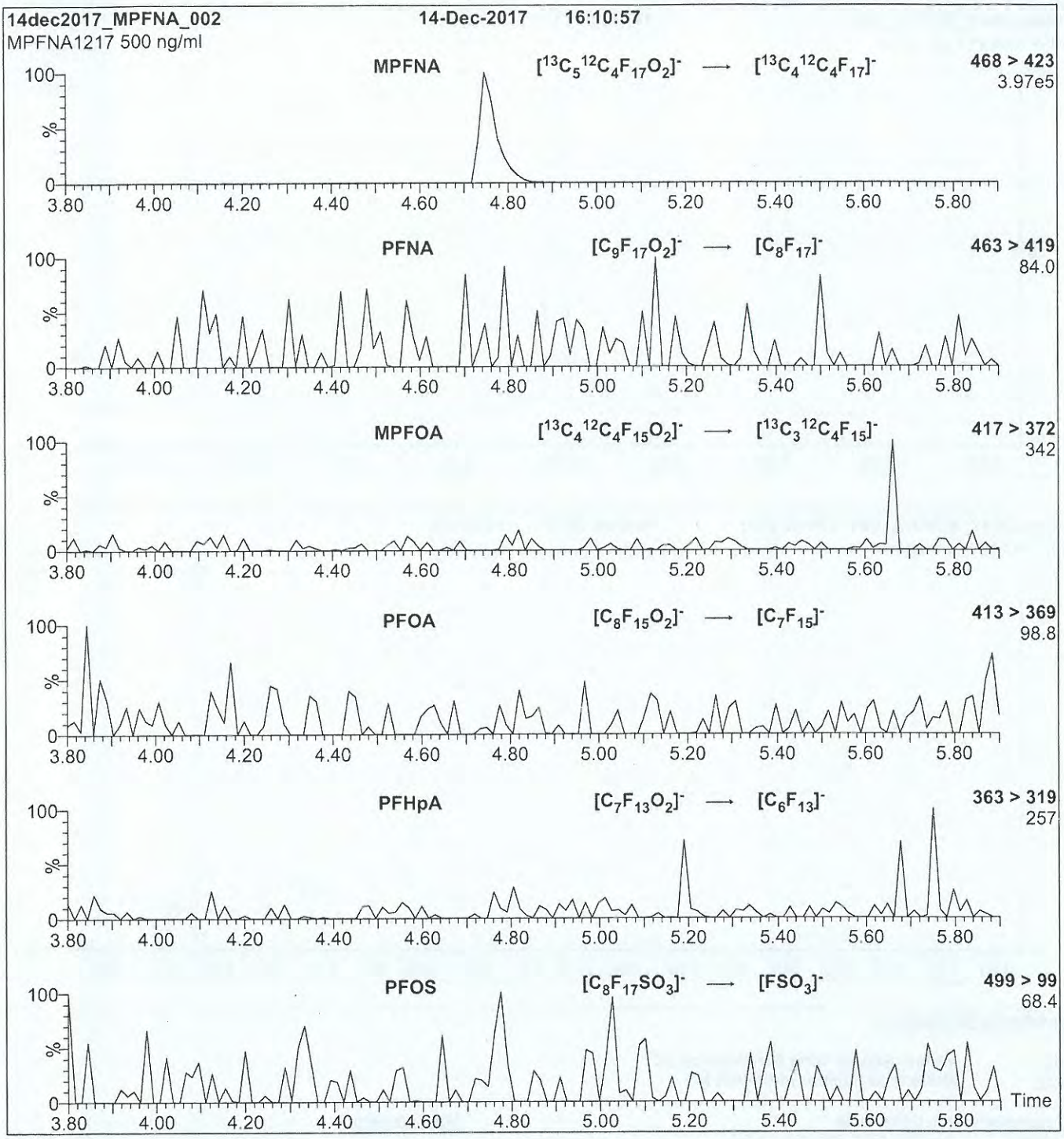
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18L2008

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

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) = 11

18L2009

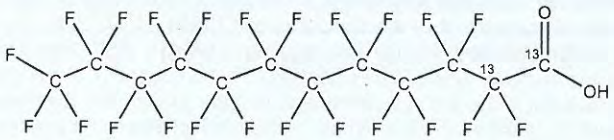
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0218
CAS #: Not available

STRUCTURE:



MOLECULAR FORMULA: $^{13}C_2\,^{12}C_{10}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 616.08
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

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:** 02/23/2018 (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

18L2009

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:

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SYNTHESIS / CHARACTERIZATION:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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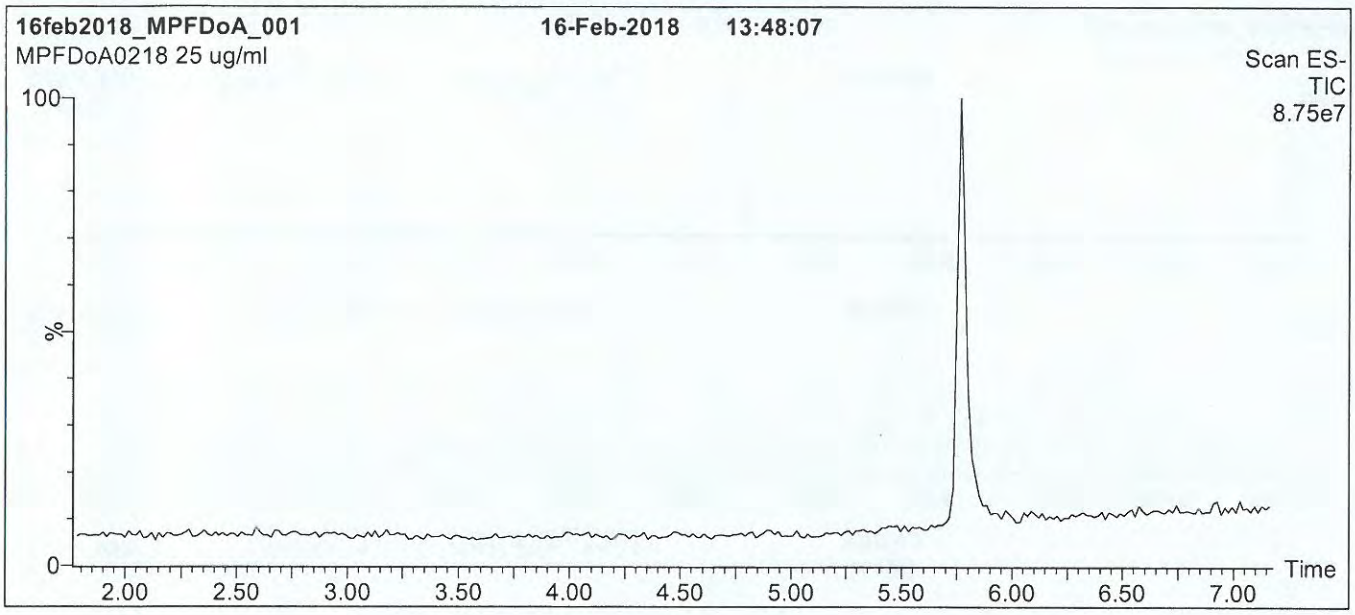
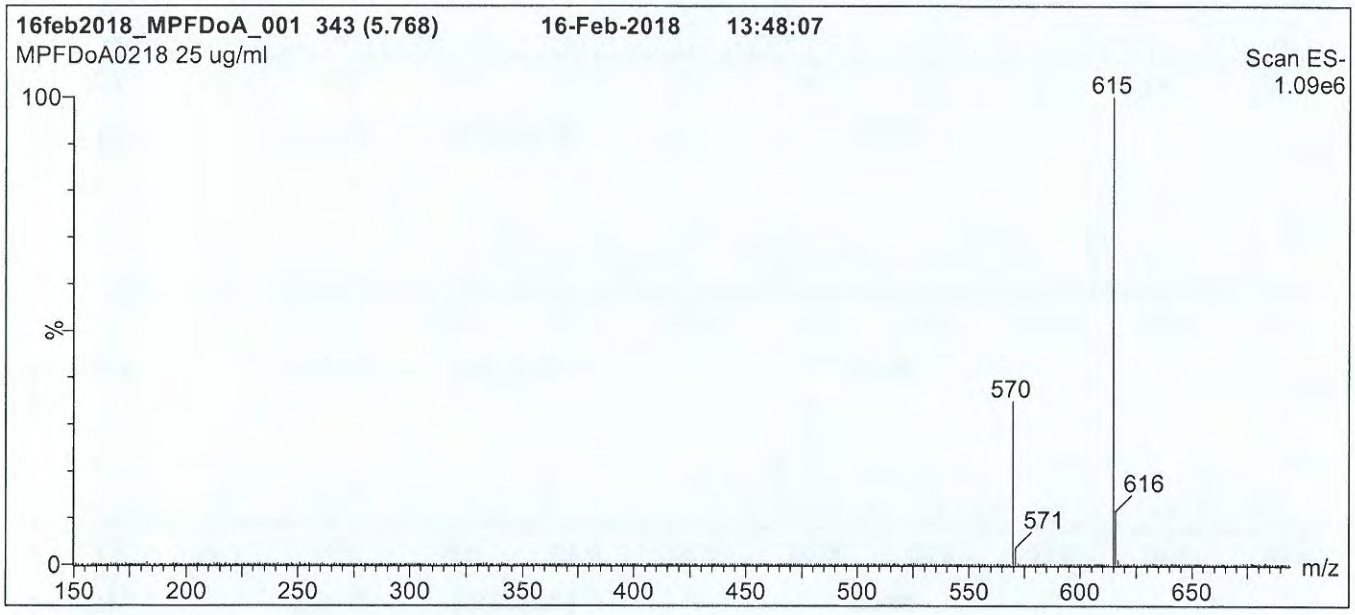
1862009

Figure 1: **MPFDoA; 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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

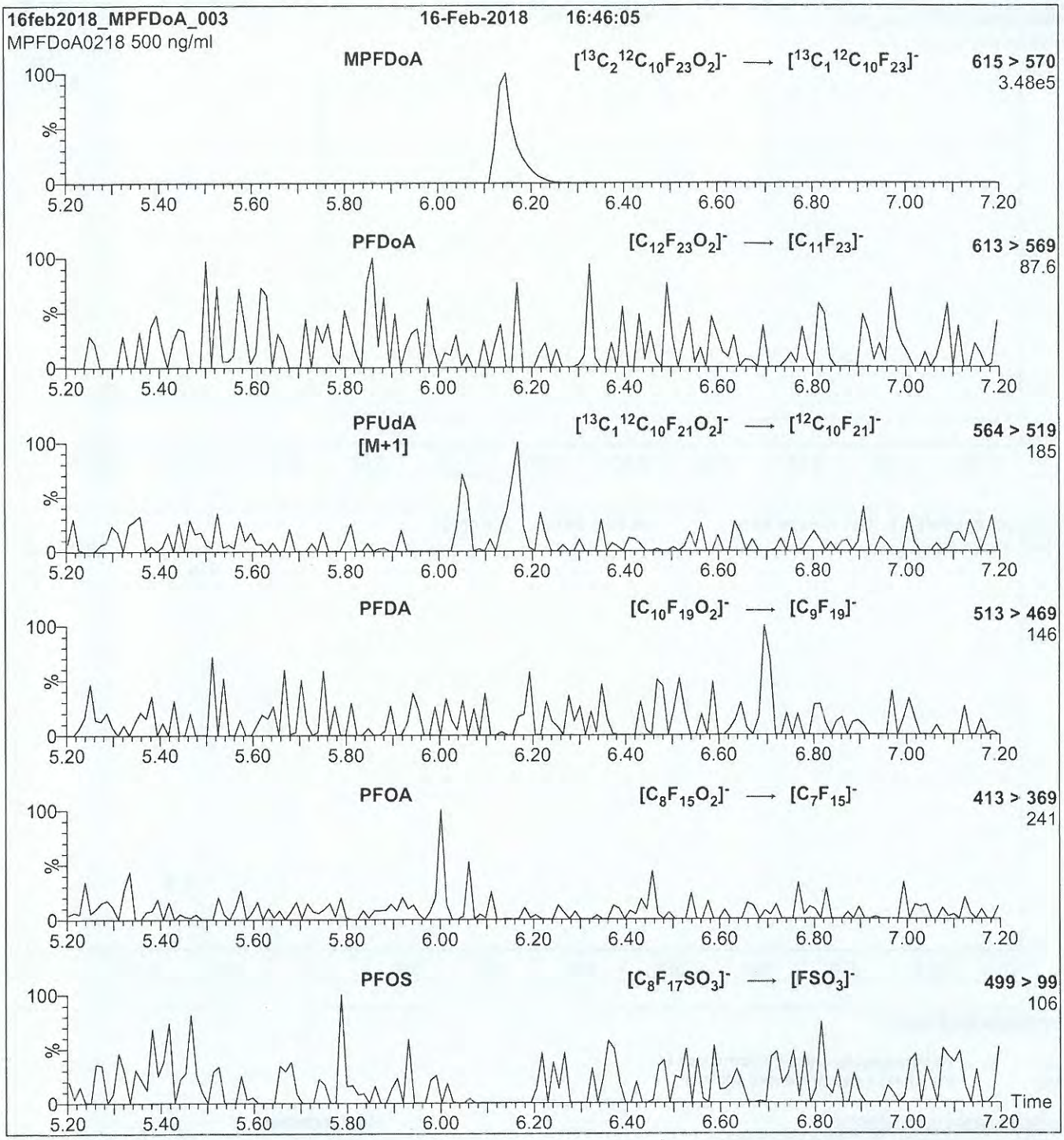
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18L2009

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

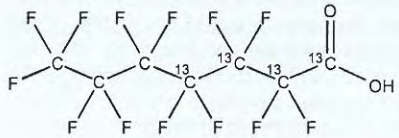
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

18L2010

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0618
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 ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	07/06/2018		
EXPIRY DATE: (mm/dd/yyyy)	07/06/2023		
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 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.04% of perfluoro-n-heptanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/09/2018 (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

18L2010

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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).

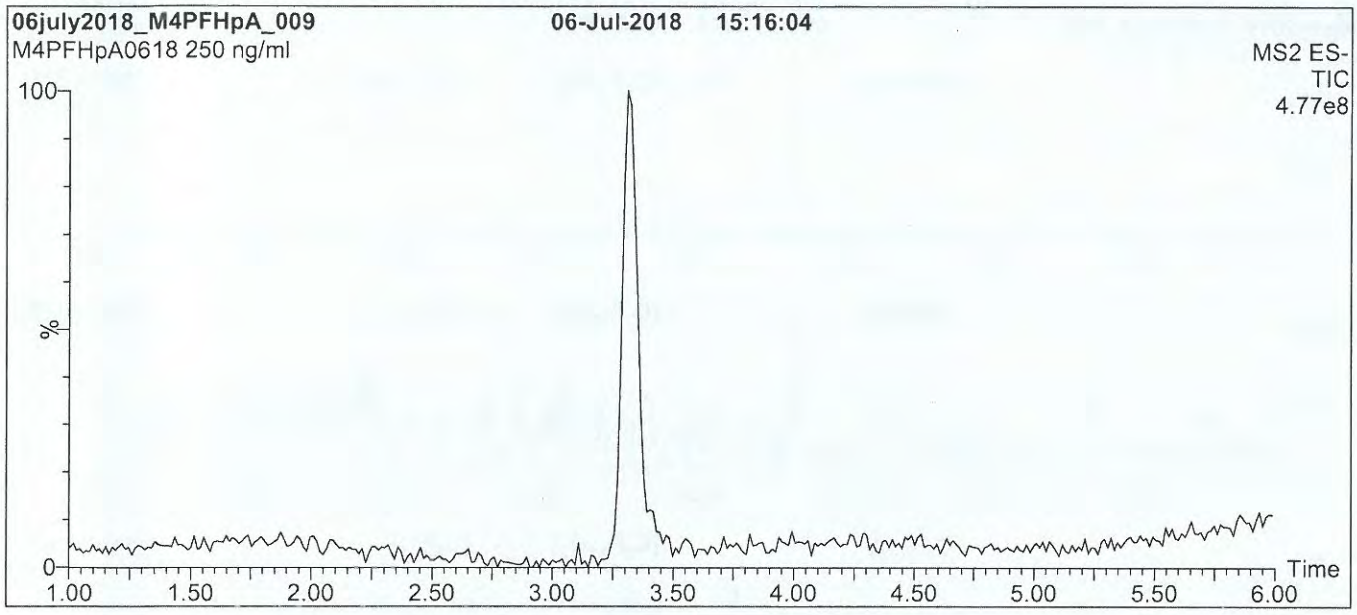
CALA Testing Accreditation No. A 1226

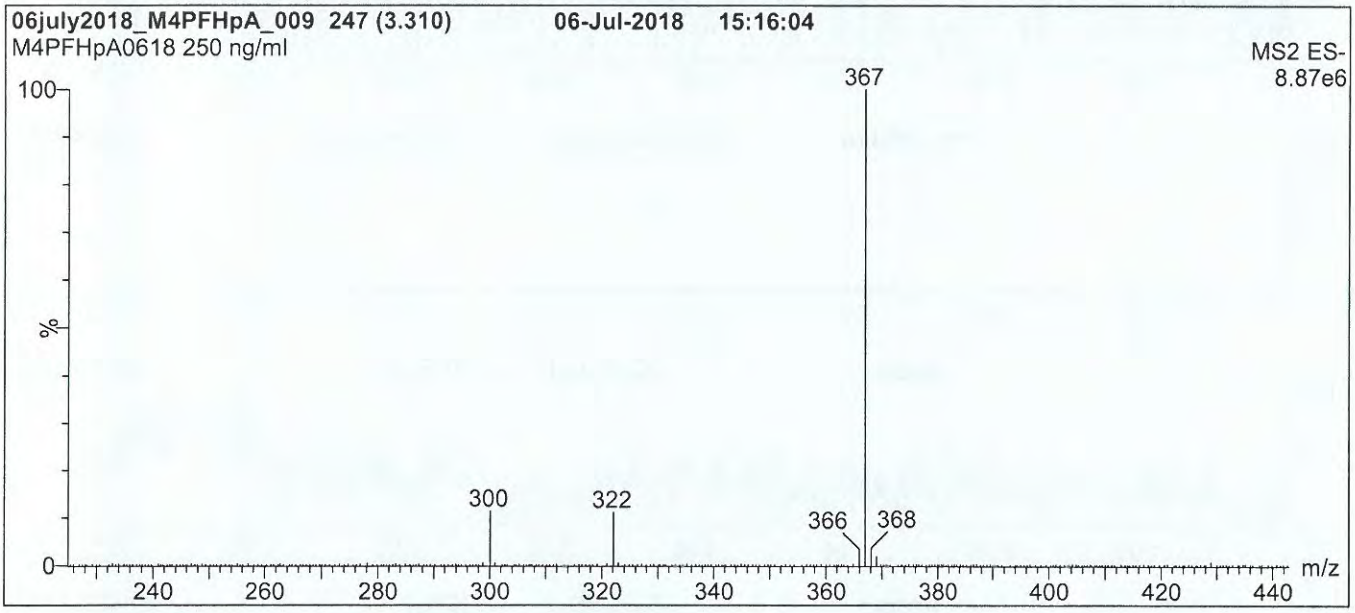
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1/8/2010

Figure 1: **M4PFHpA; 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 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

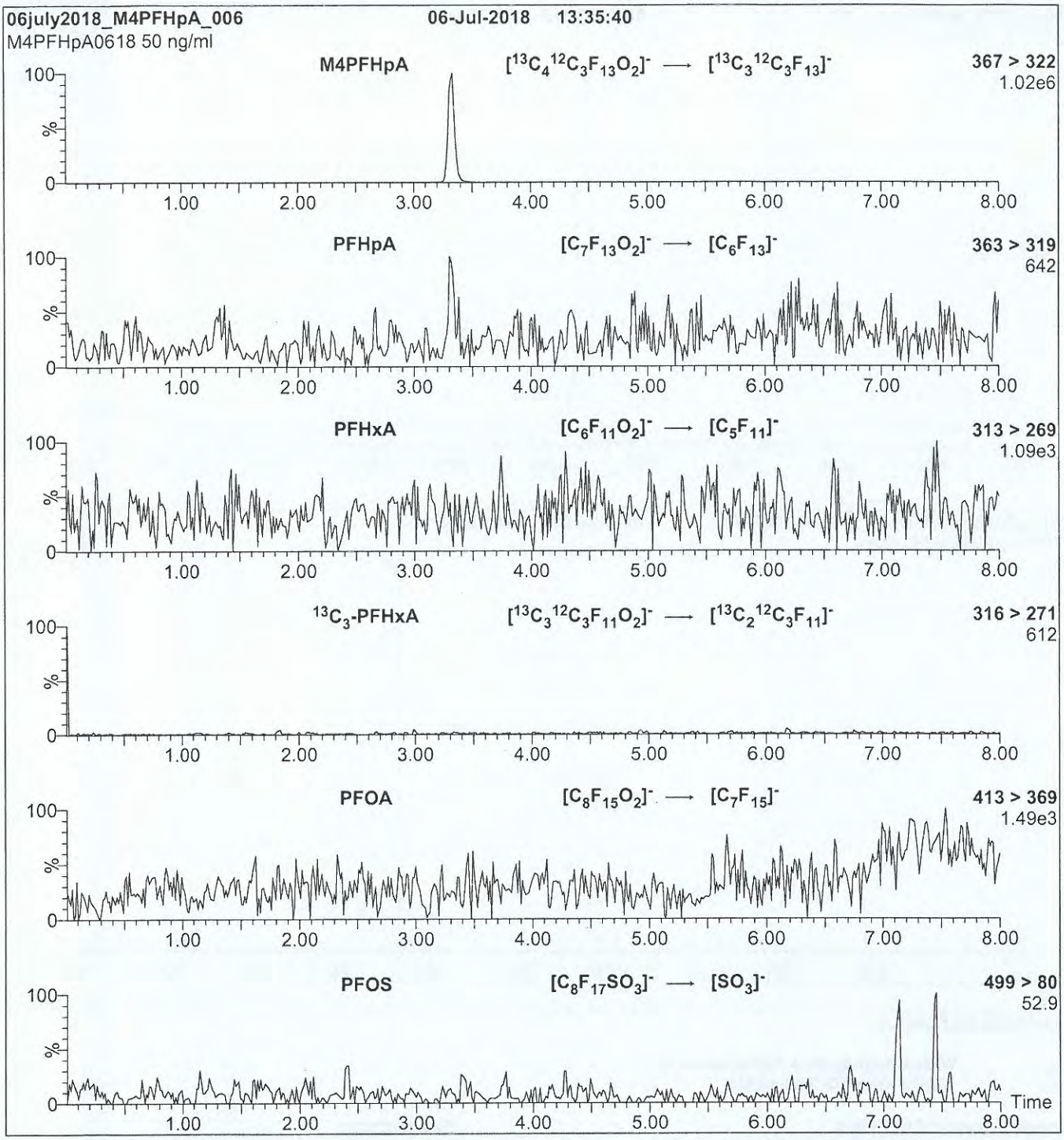
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1862010

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

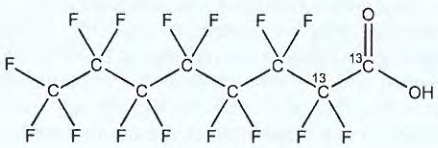
Collision Gas (mbar) = 3.89e-3
Collision Energy (eV) = 8

18L2011

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA1018
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 ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/10/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/10/2023		
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 < 0.1% 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:** 10/17/2018 (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

18L2011

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:

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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).

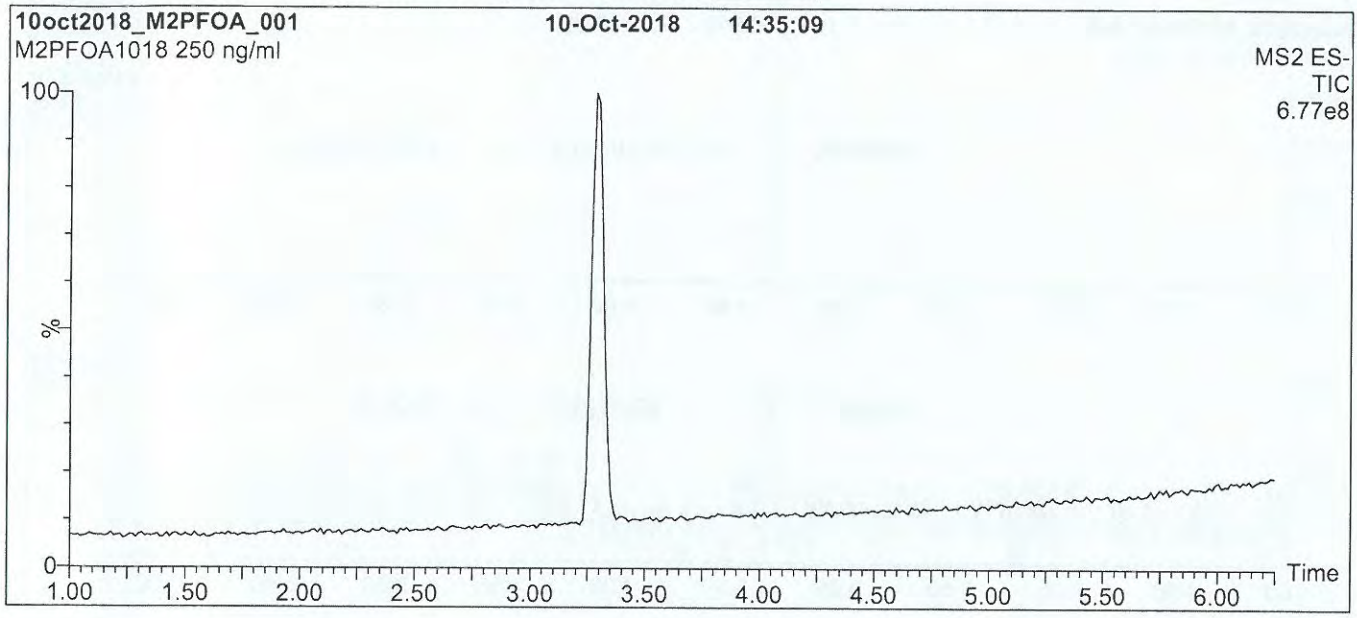
CALA Testing Accreditation No. A1226

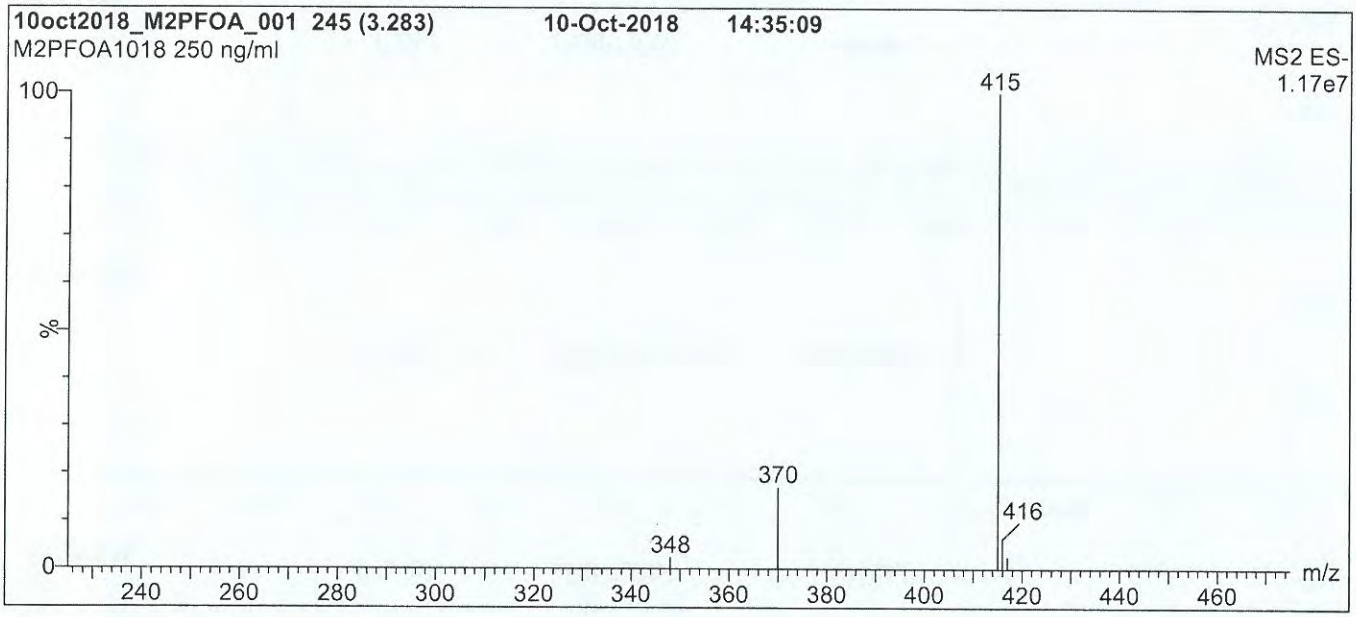
ANAB ACCREDITED ISO17034 REFERENCE MATERIAL PRODUCER

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

18L2011

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: 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

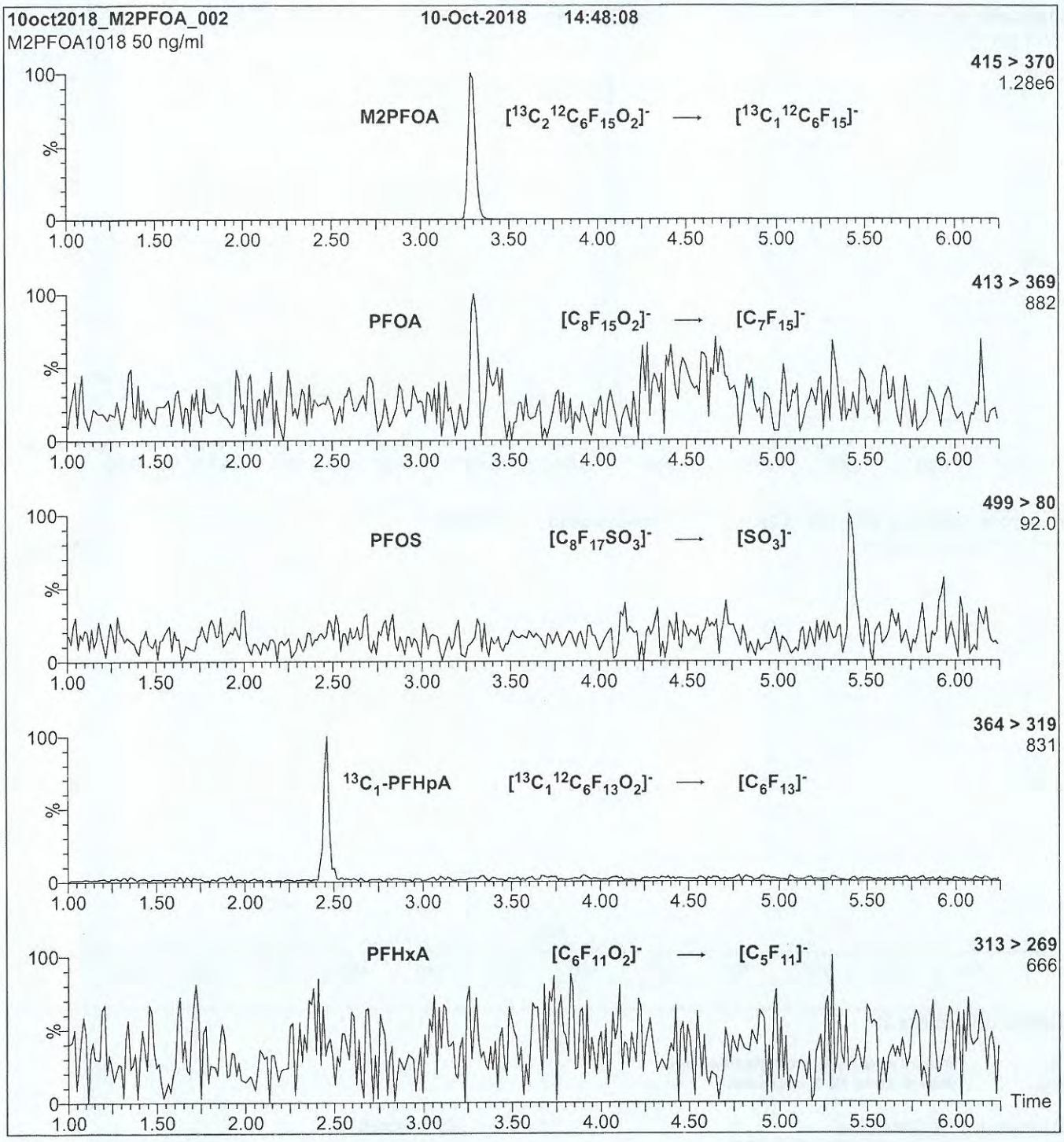
MS Parameters

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

18L2011

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

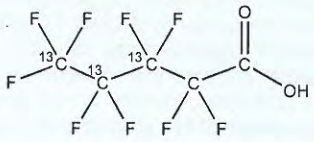
Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 8

1812012

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFPeA	**LOT NUMBER:**	M3PFPeA0417
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)	04/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/20/2022		
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 ~ 0.95% 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:** 04/24/2017 (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

18L2012

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. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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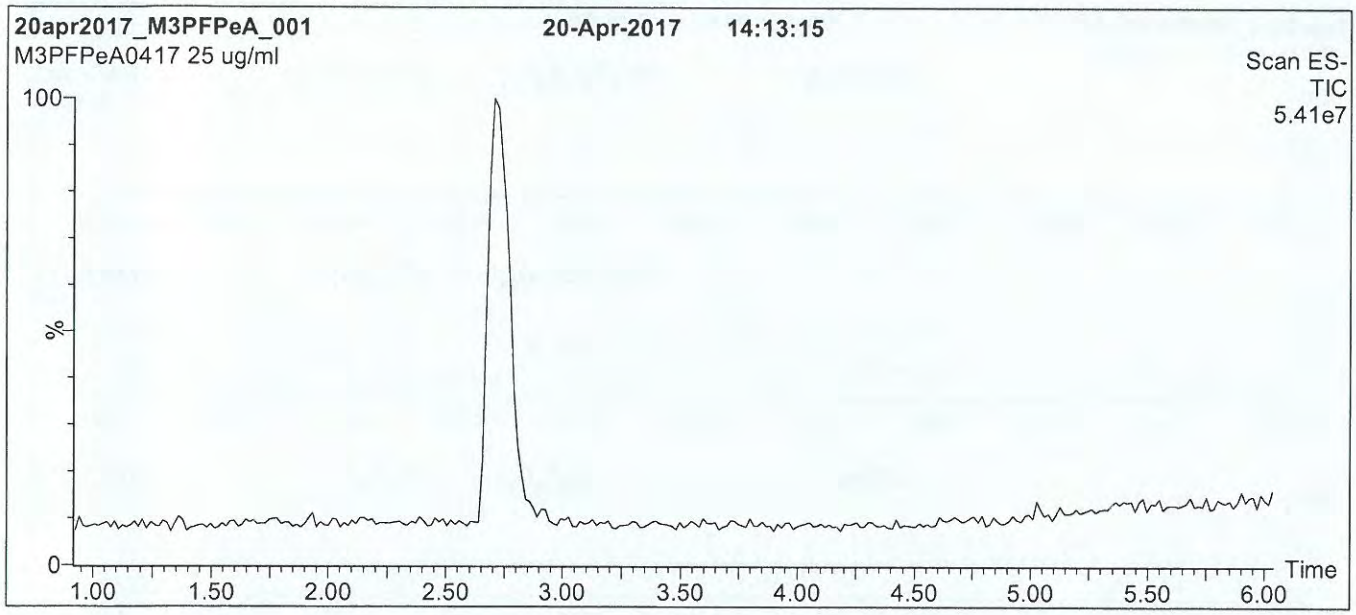
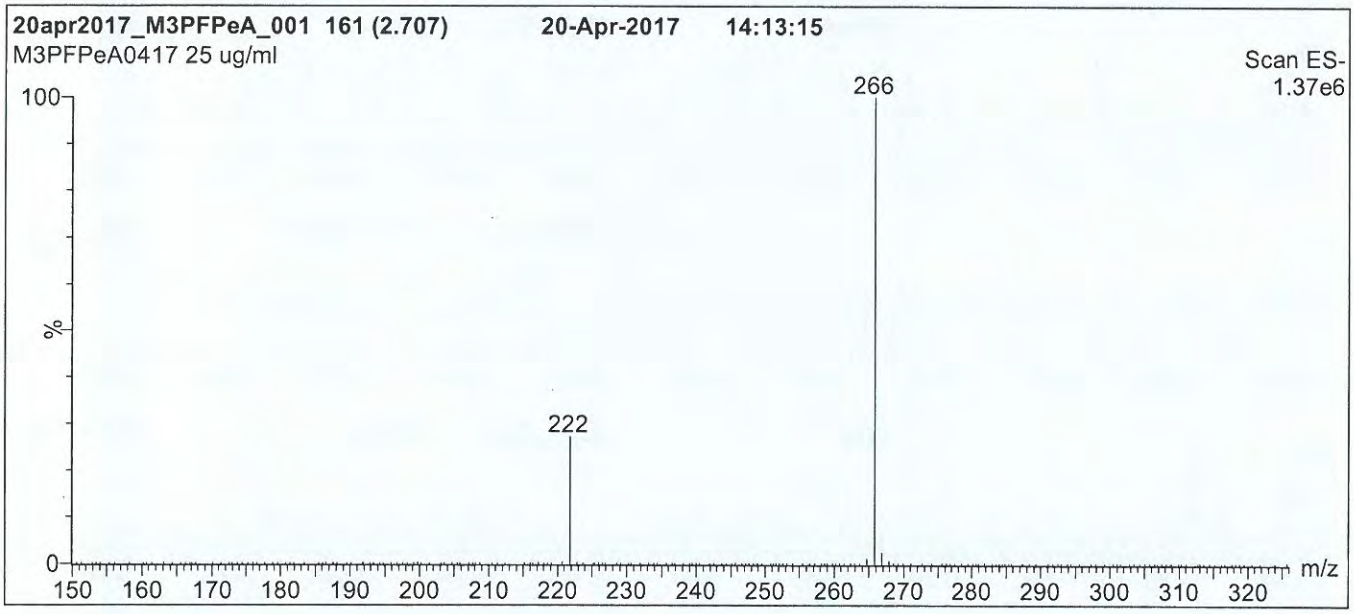
18L2012

Figure 1: **M3PFPeA; 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: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

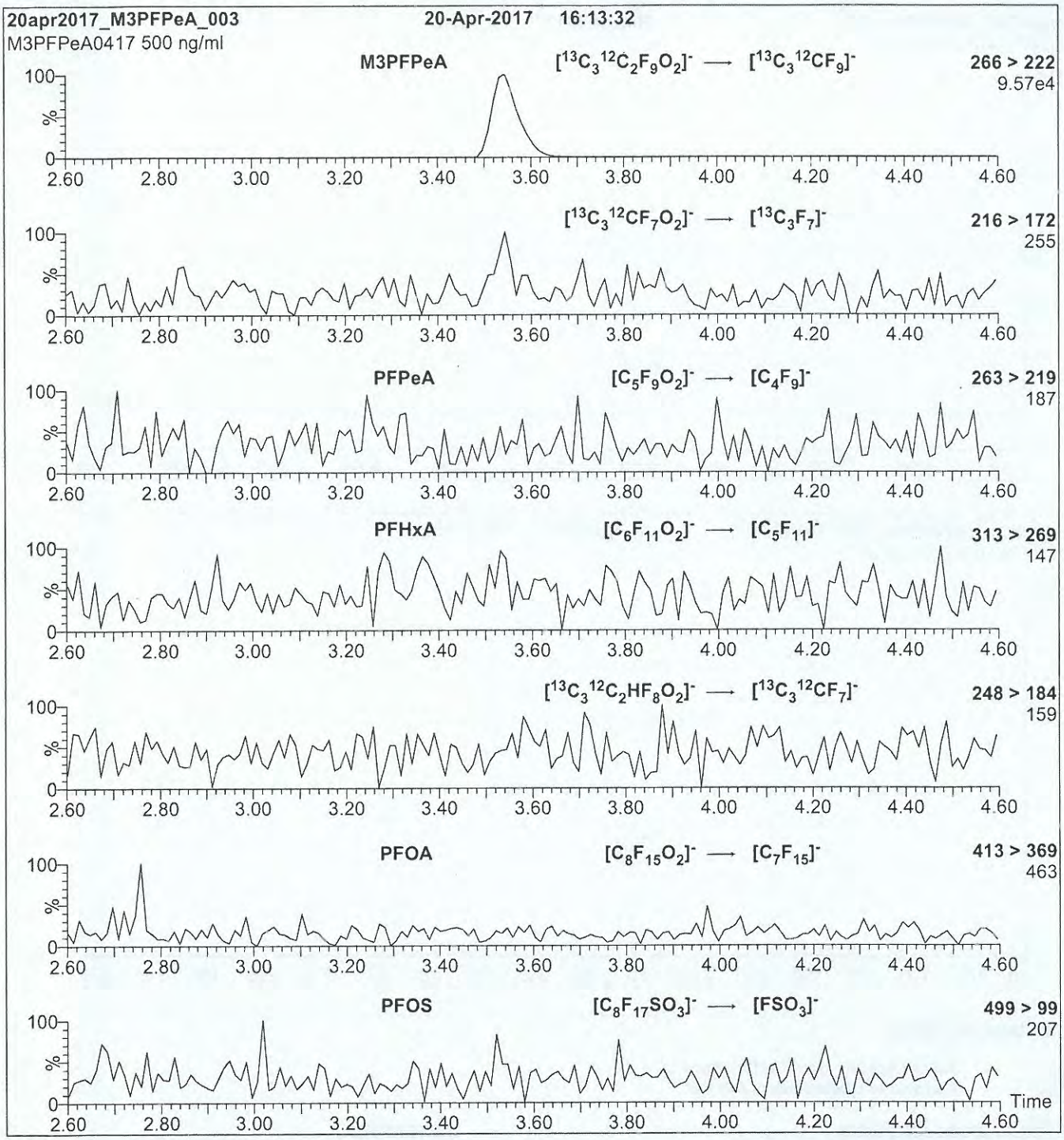
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18L2012

Figure 2: **M3PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

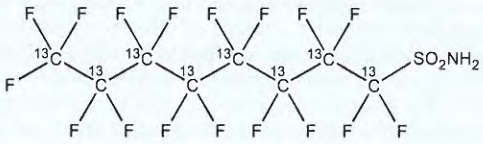
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 9

18L2013

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1018I
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)	10/10/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/10/2023		
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 ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide, ~ 0.5% of perfluoro-n-[$^{13}C_8$]octanoic acid (M8PFOA), and ~ 0.02% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/15/2018 (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

18L2013

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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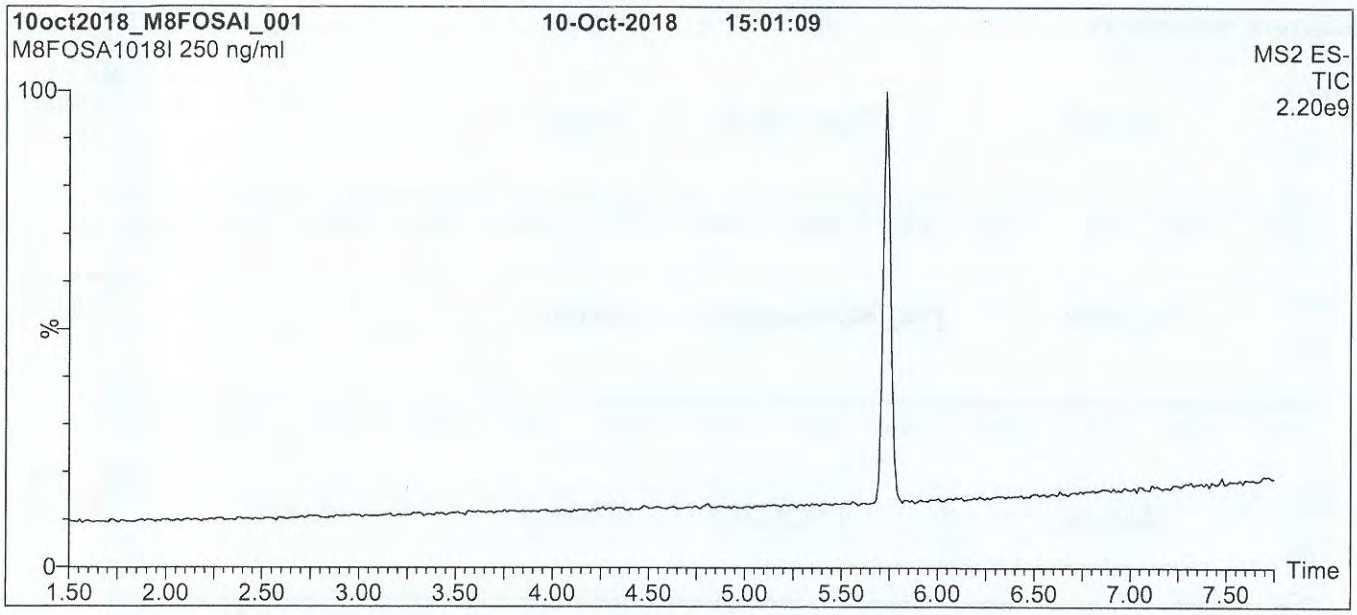
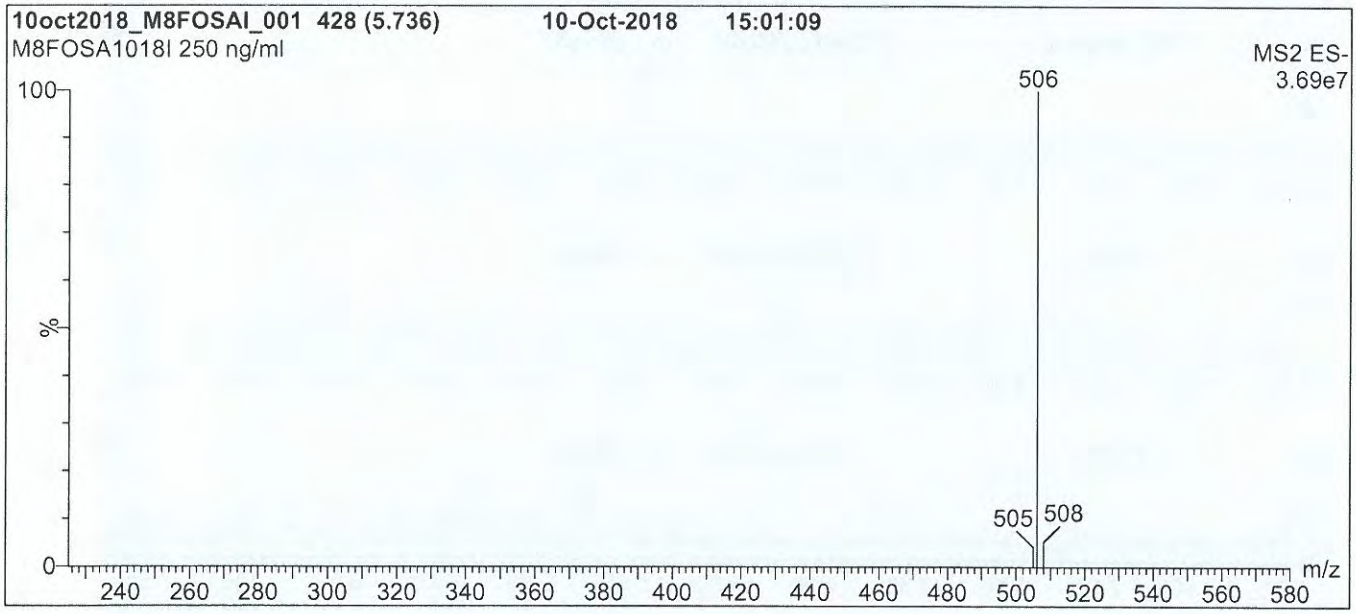
18L2013

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

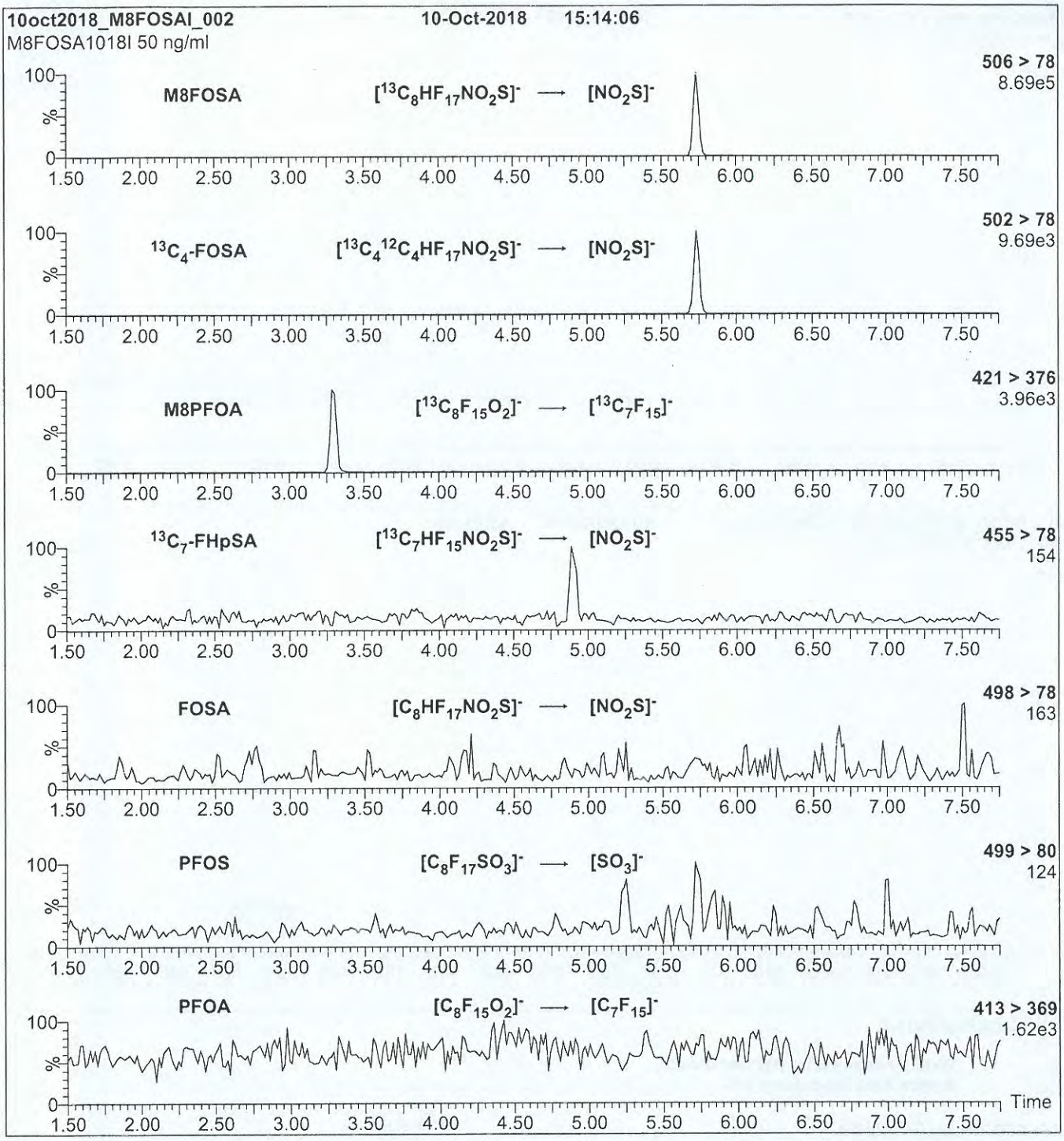
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2013

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) = 2.97e-3
Collision Energy (eV) = 30

18L2014

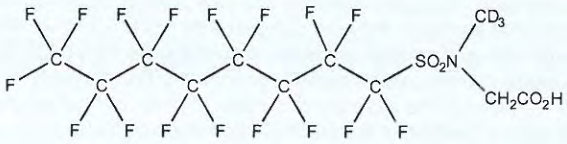
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0818

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



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)	08/23/2018		
EXPIRY DATE: (mm/dd/yyyy)	08/23/2023		
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:** 08/24/2018 (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

18L2014

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:

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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where x is expressed as a relative standard uncertainty of the individual parameter.

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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:

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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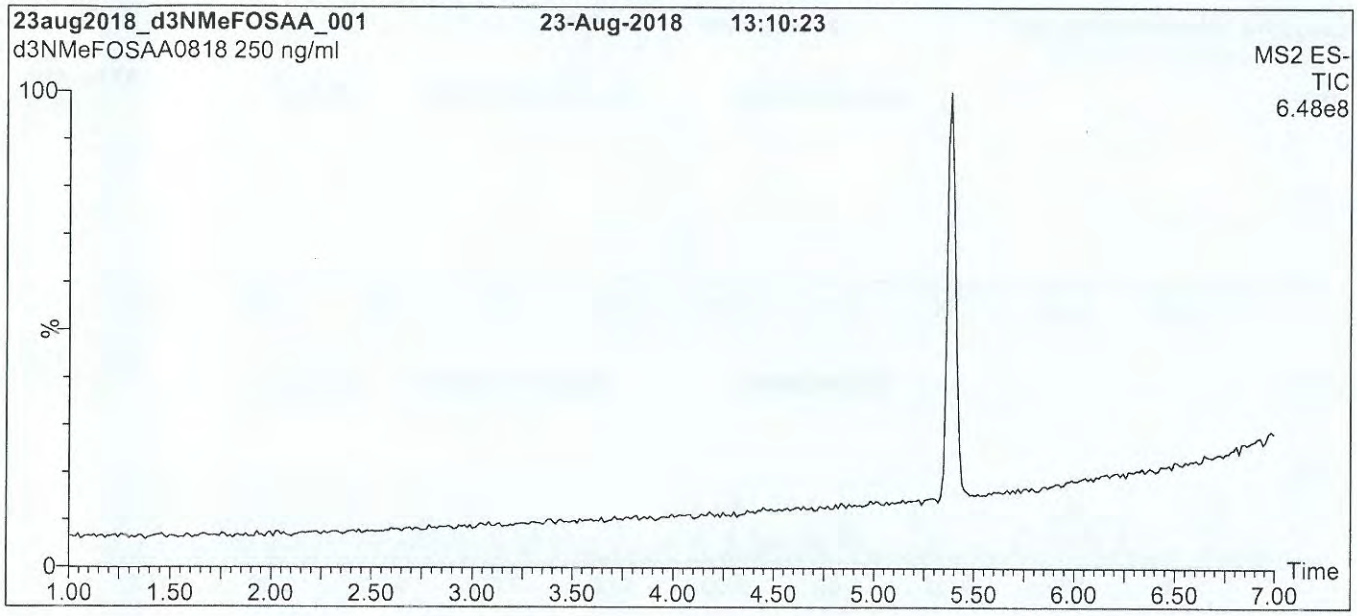
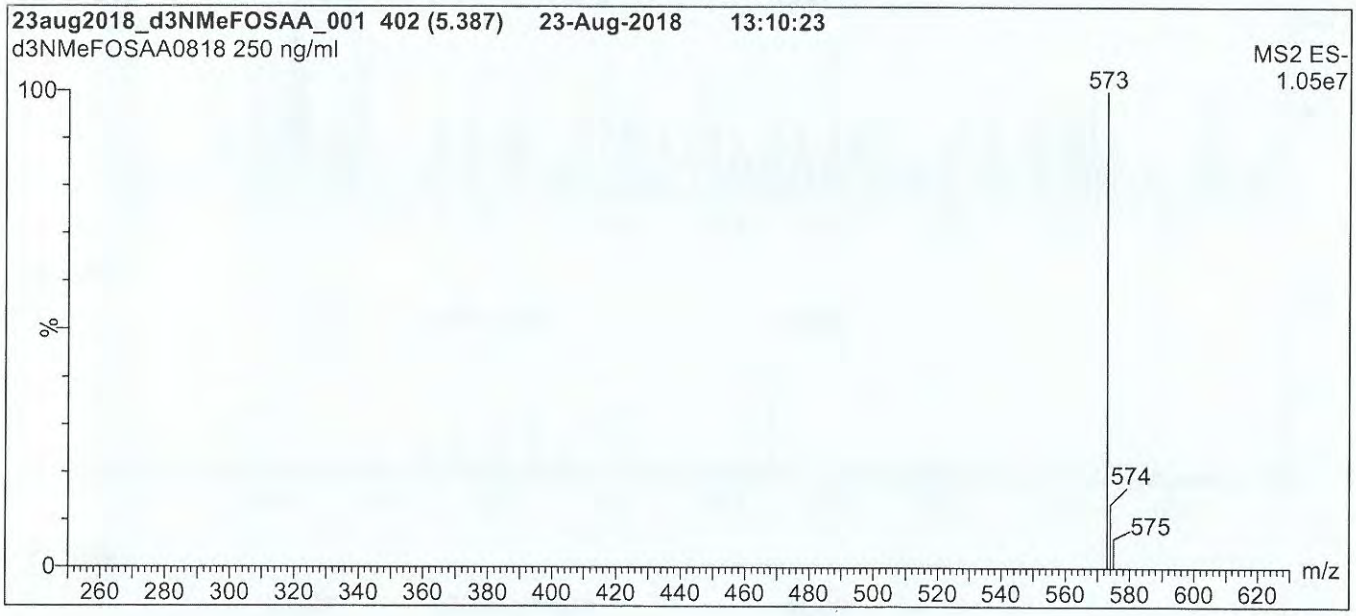
18L2014

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: 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

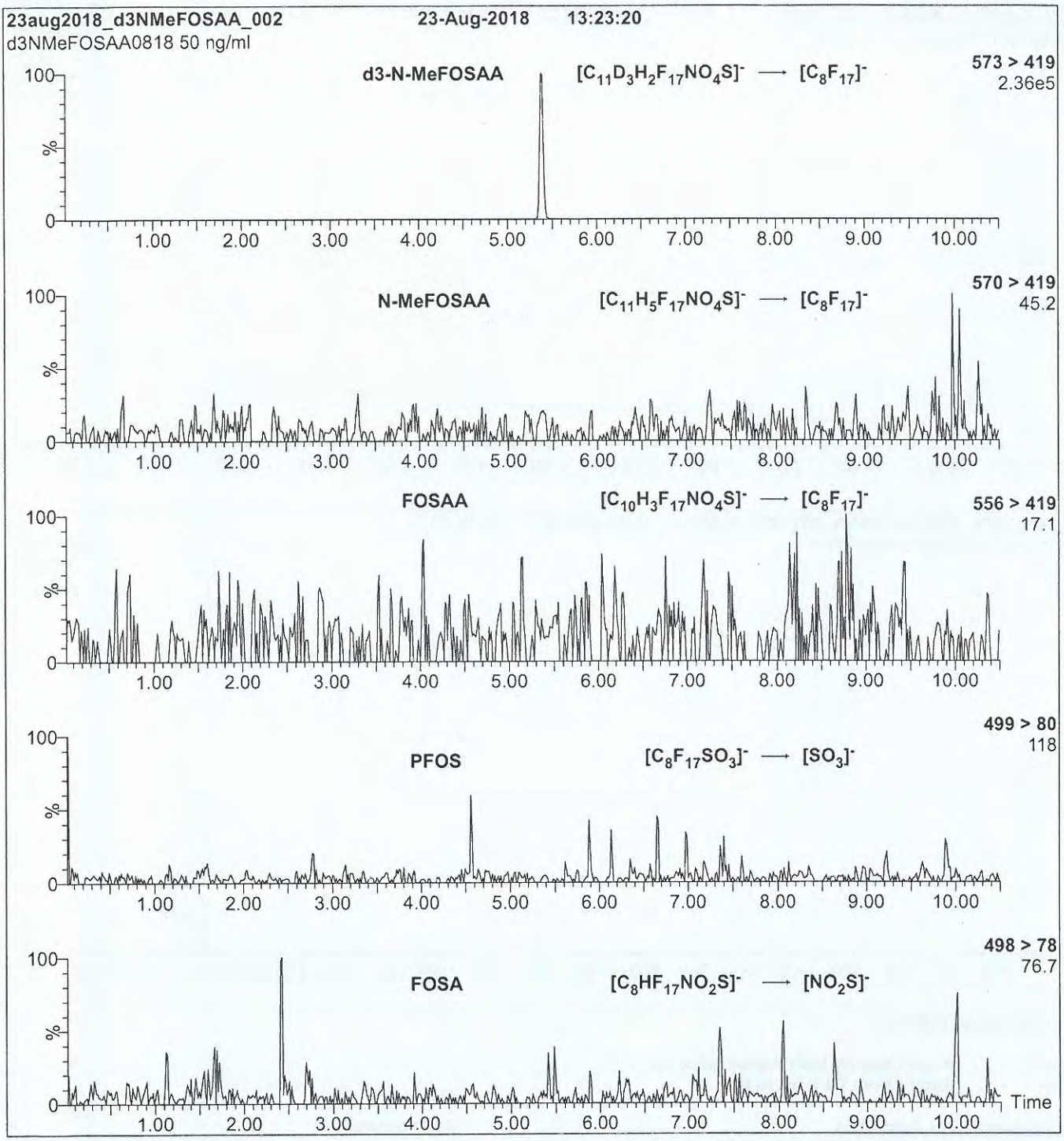
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2014

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) = 3.43e-3
Collision Energy (eV) = 18

18L2015

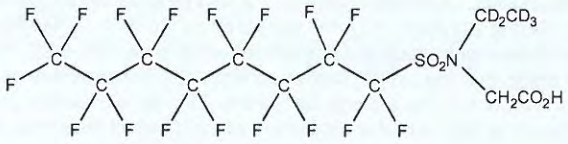
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA0818

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)	08/23/2018		
EXPIRY DATE: (mm/dd/yyyy)	08/23/2023		
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:** 08/28/2018 (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

18L2015

INTENDED USE:

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HANDLING:

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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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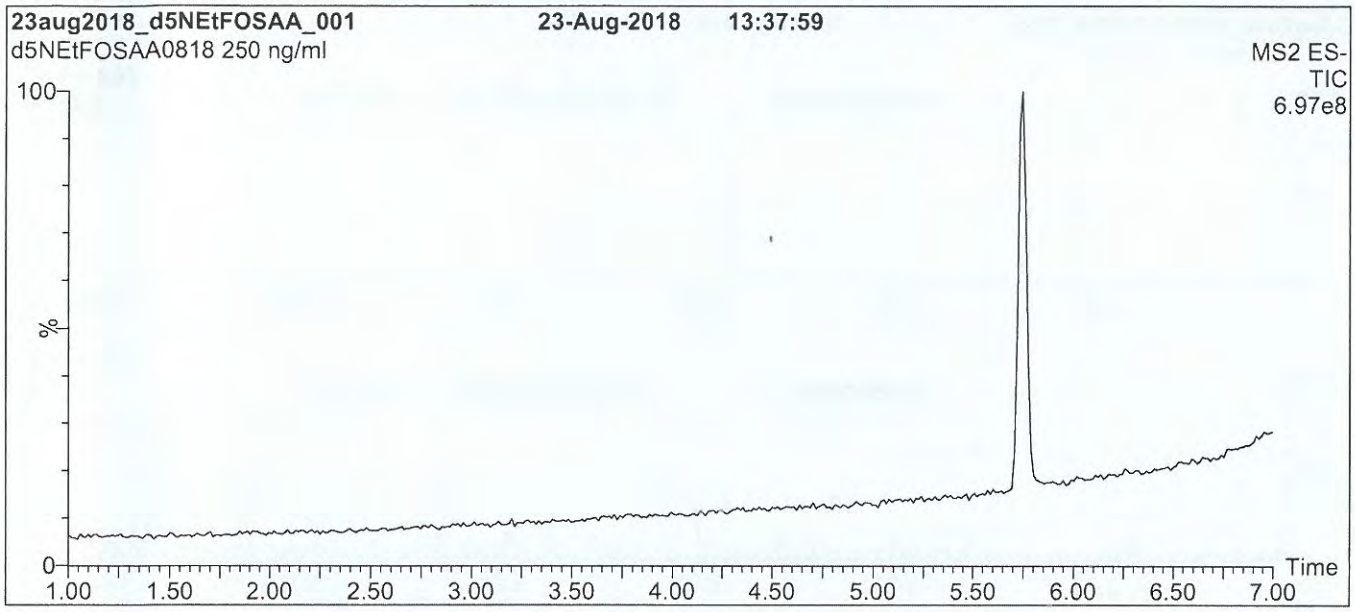
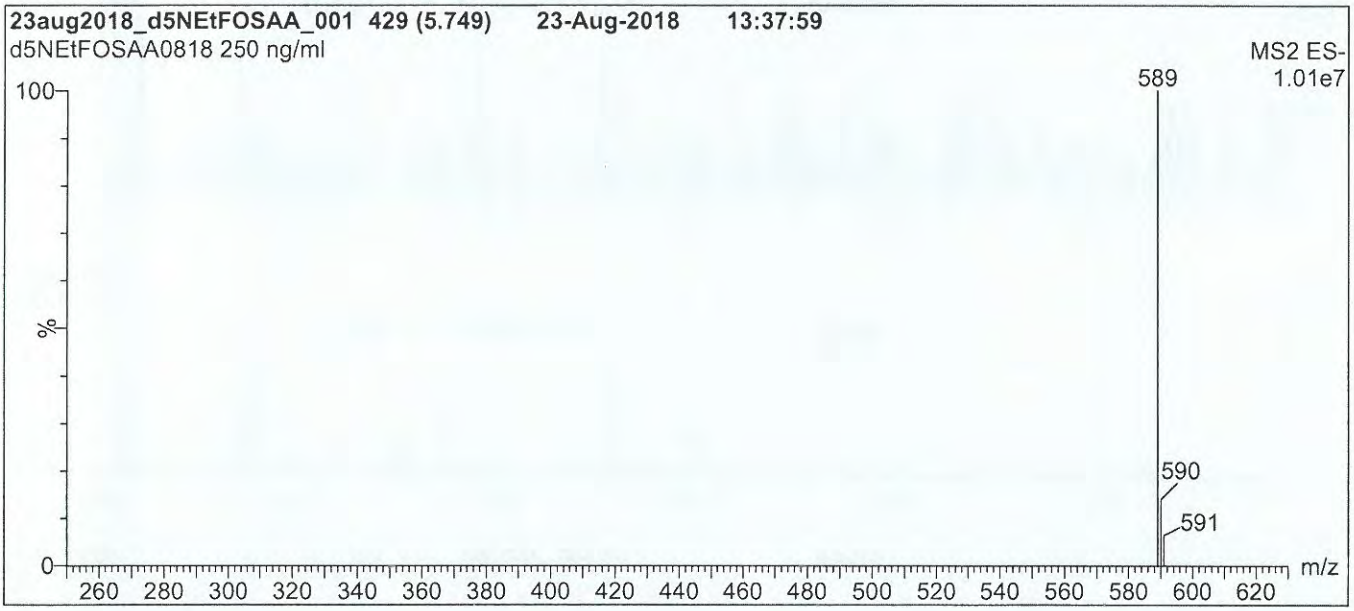
1822015

Figure 1: **d5-N-EtFOSAA; 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

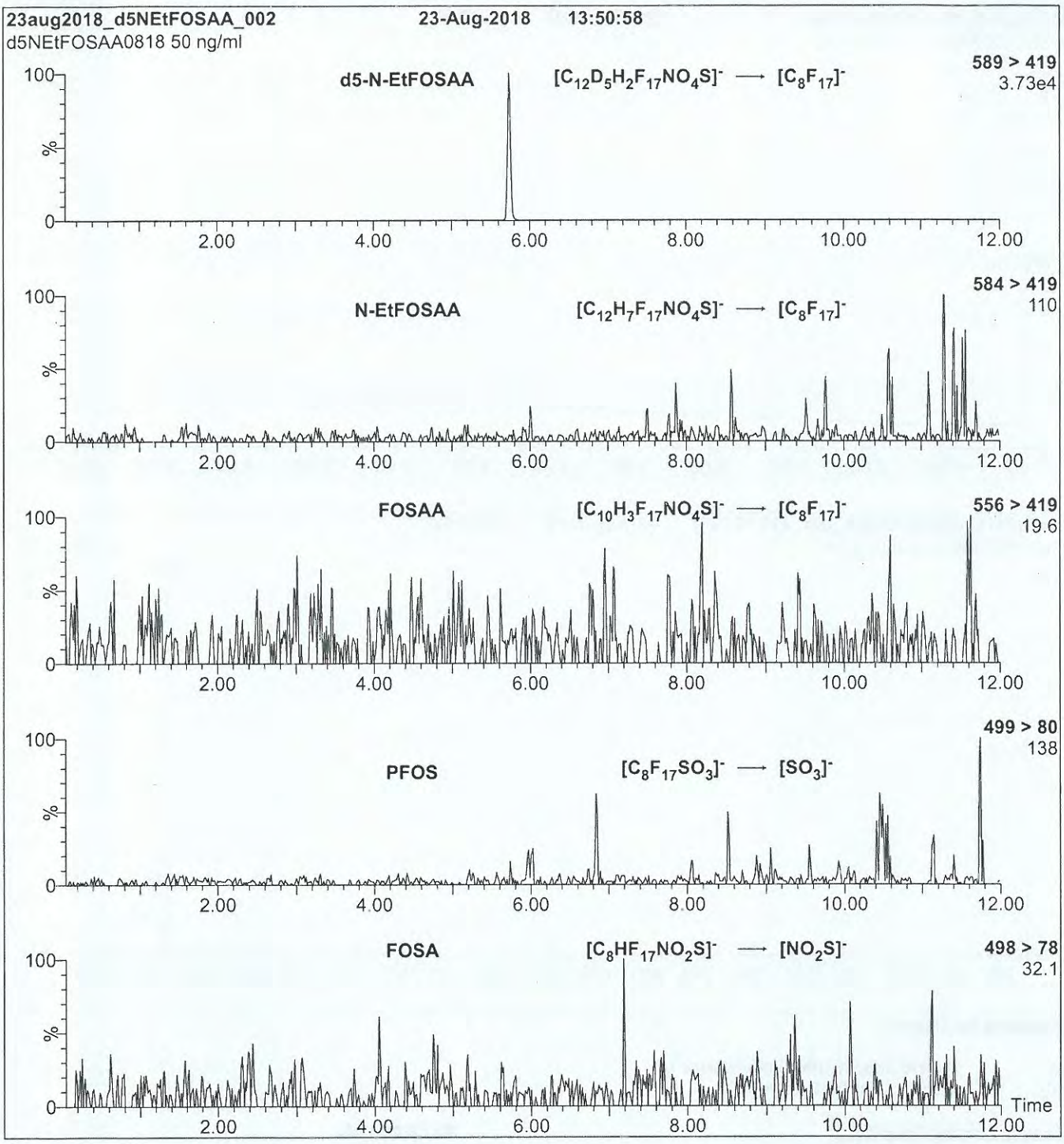
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2015

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) = 3.43e-3
Collision Energy (eV) = 18

18L2016

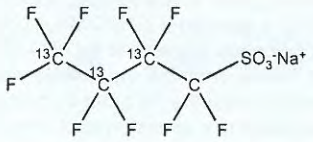
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS1218

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)	12/10/2018		
EXPIRY DATE: (mm/dd/yyyy)	12/10/2023		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2018 (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

18L2016

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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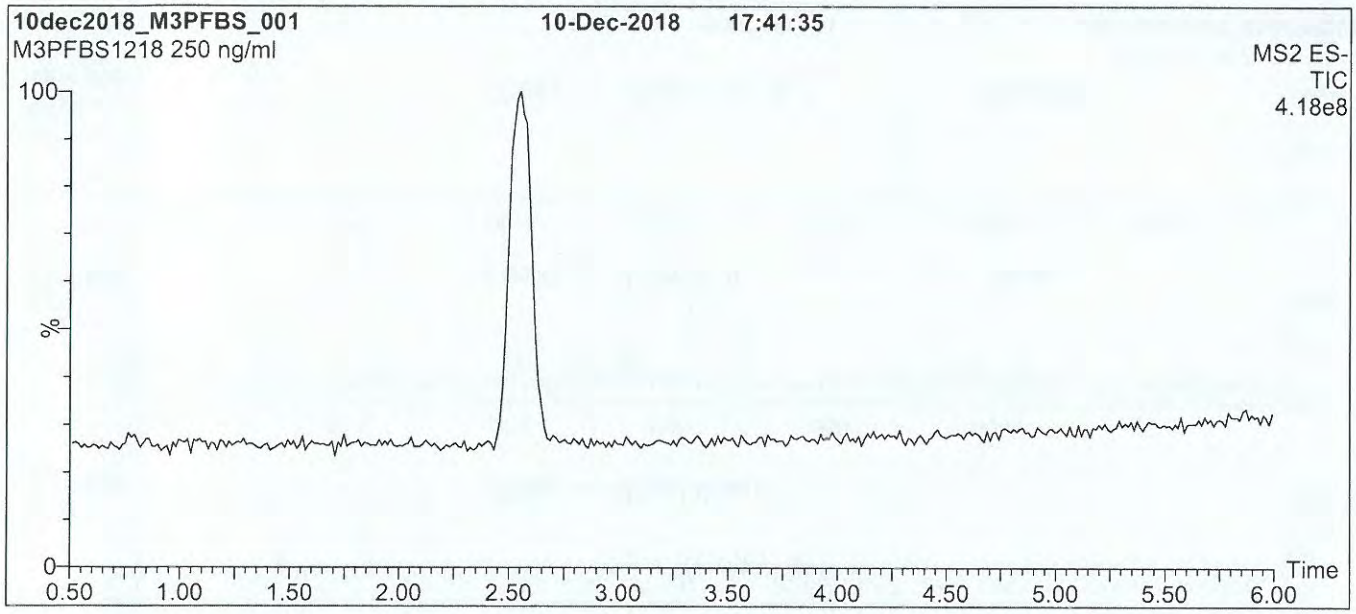
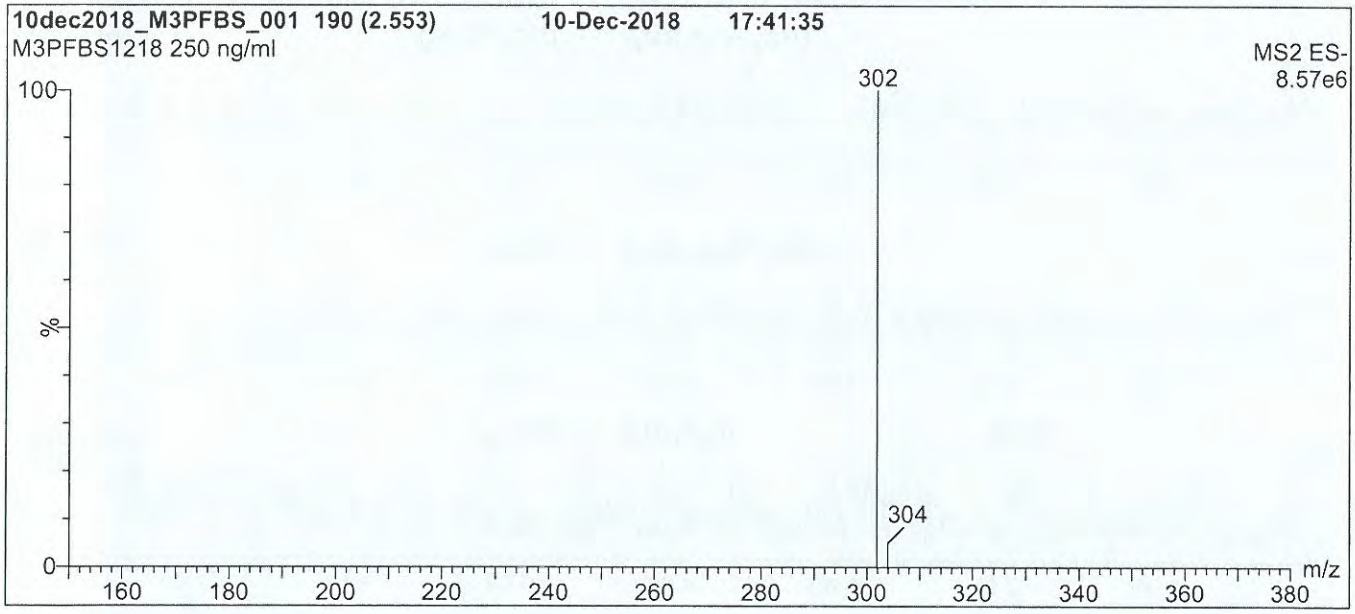
18L2016

Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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1.7 µm, 2.1 x 100 mm

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(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

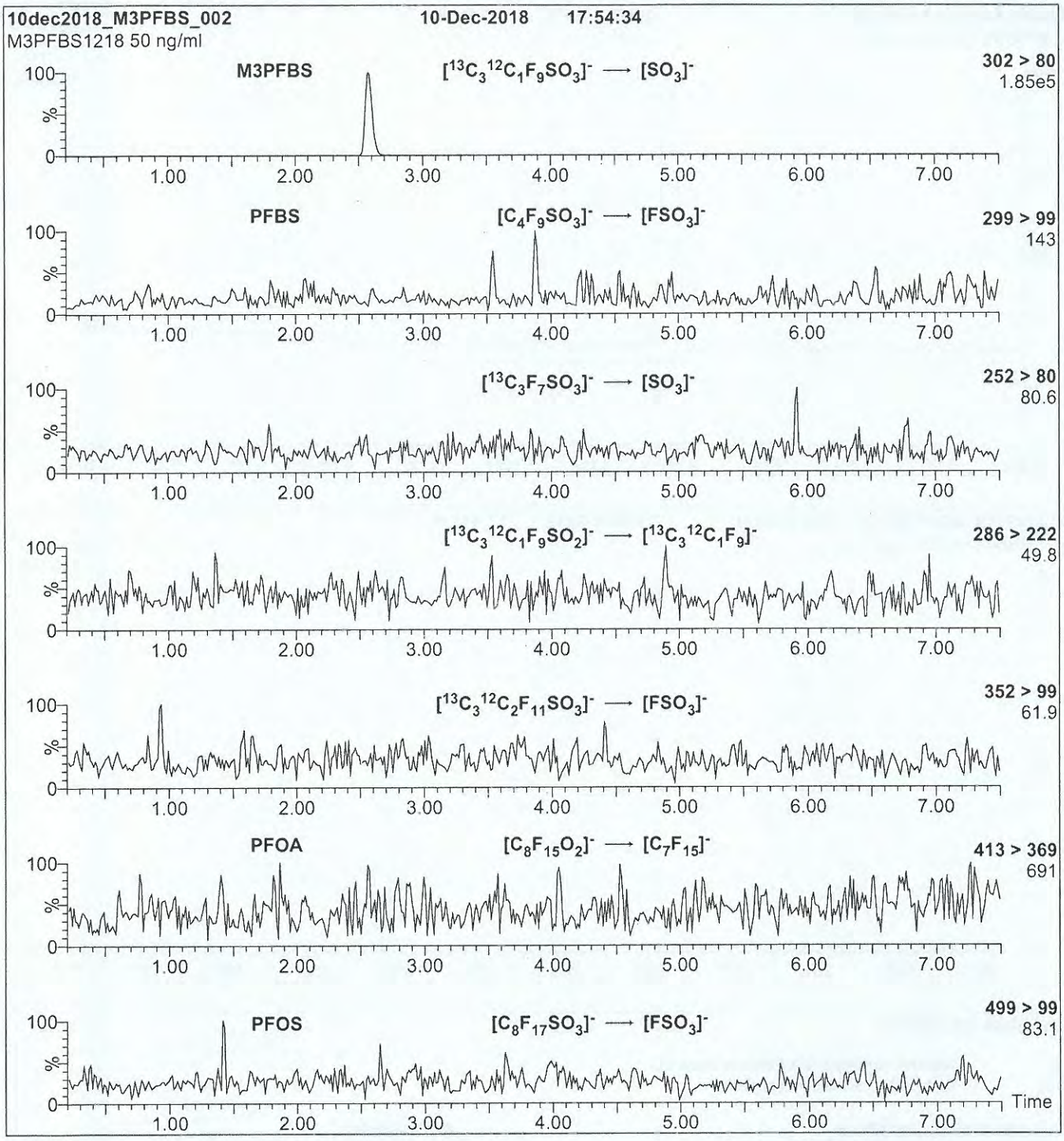
MS Parameters

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

18L2016

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

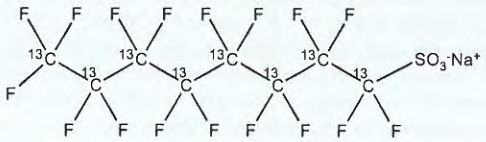
Collision Gas (mbar) = 2.90e-3
Collision Energy (eV) = 30

1812017

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOS	**LOT NUMBER:**	M8PFOS0918
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)	09/20/2018		
EXPIRY DATE: (mm/dd/yyyy)	09/20/2023		
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 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:** 09/24/2018 (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

18L2017

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).

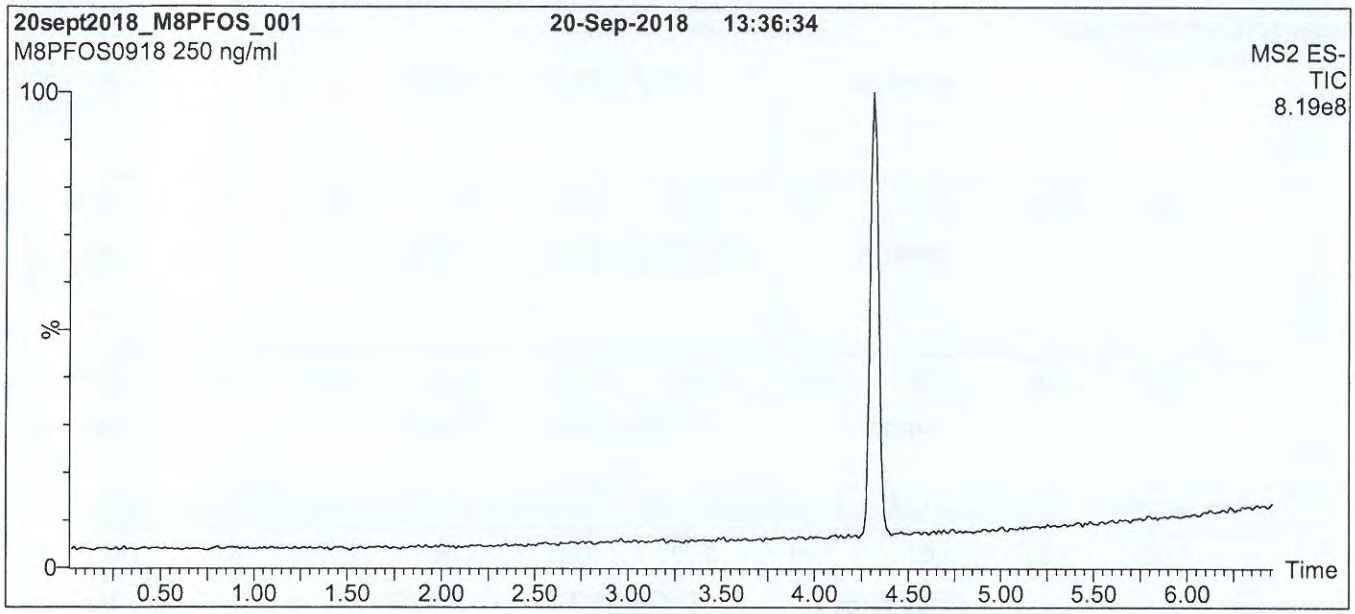
CALA Testing Accreditation No. A 1226

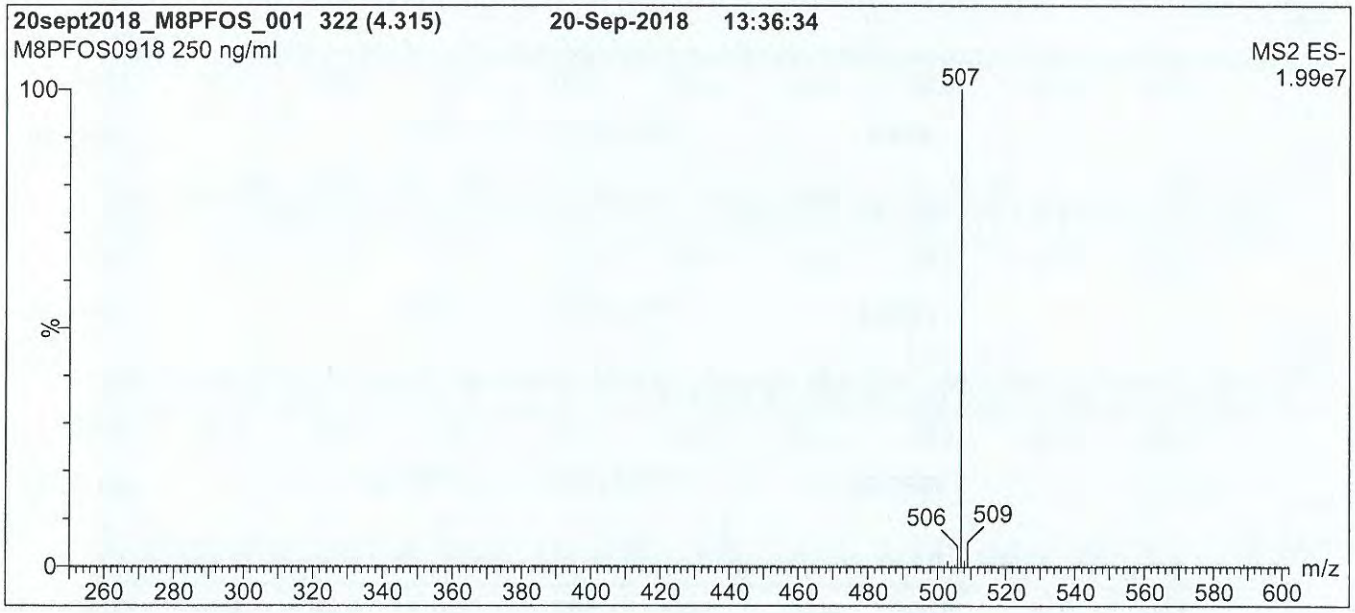
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2017

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: 12 min

Flow: 300 µl/min

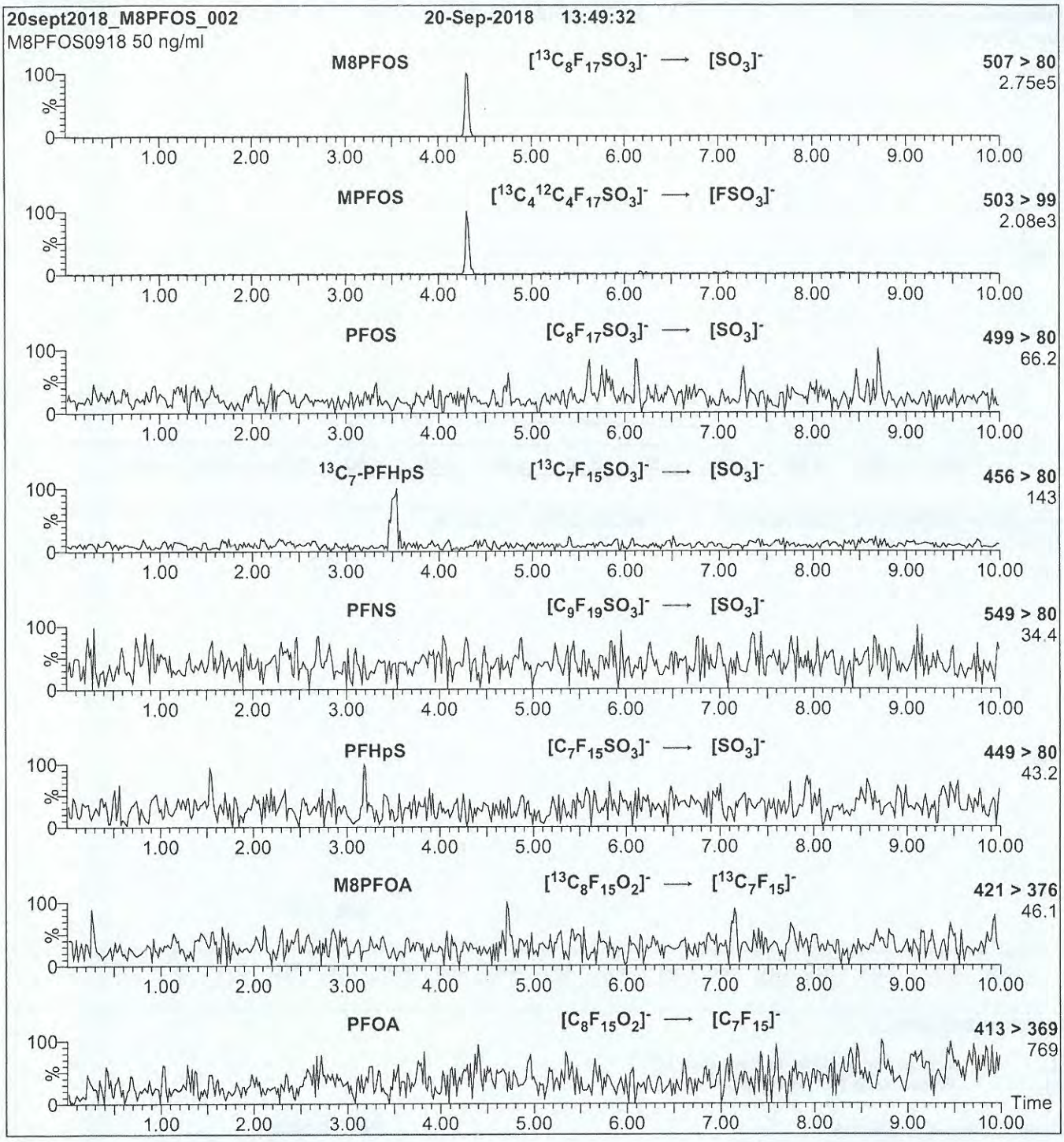
MS Parameters

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

18L2017

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

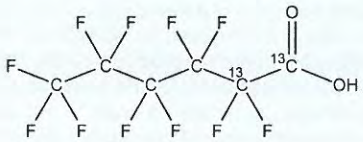
Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 42

18L2019

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA0518
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)	05/22/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2023		
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 < 0.1% of perfluoro-n-hexanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2018 (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

18L2019

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).

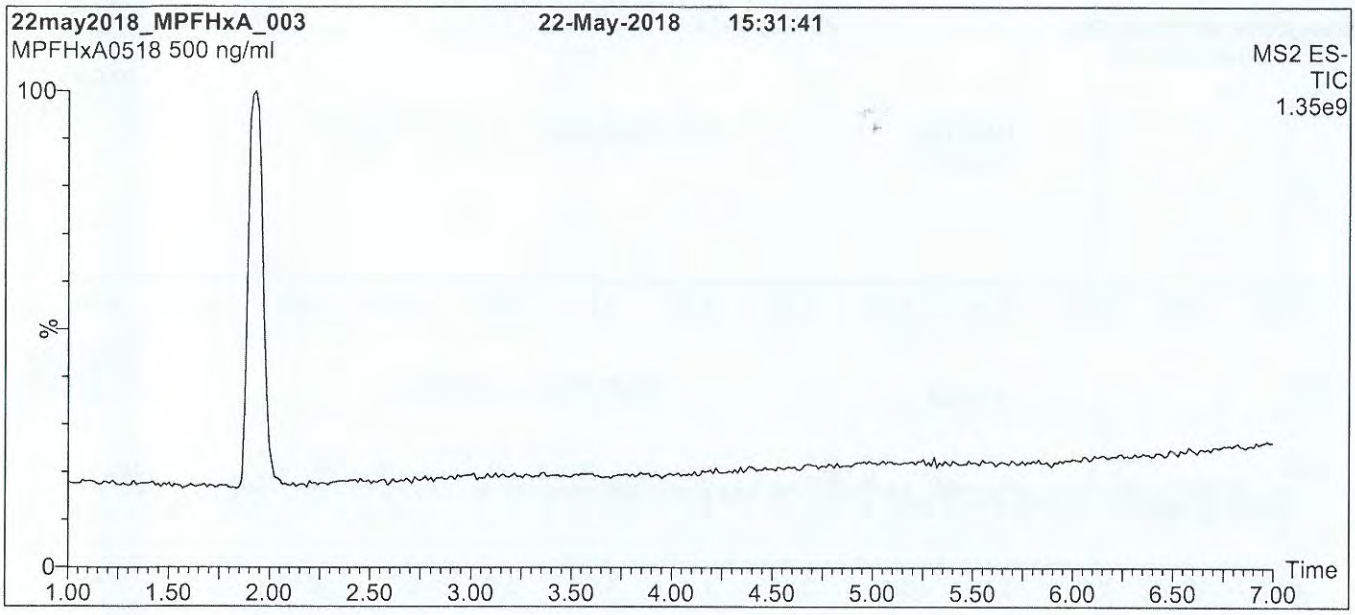
CALA Testing Accreditation No. A 1226

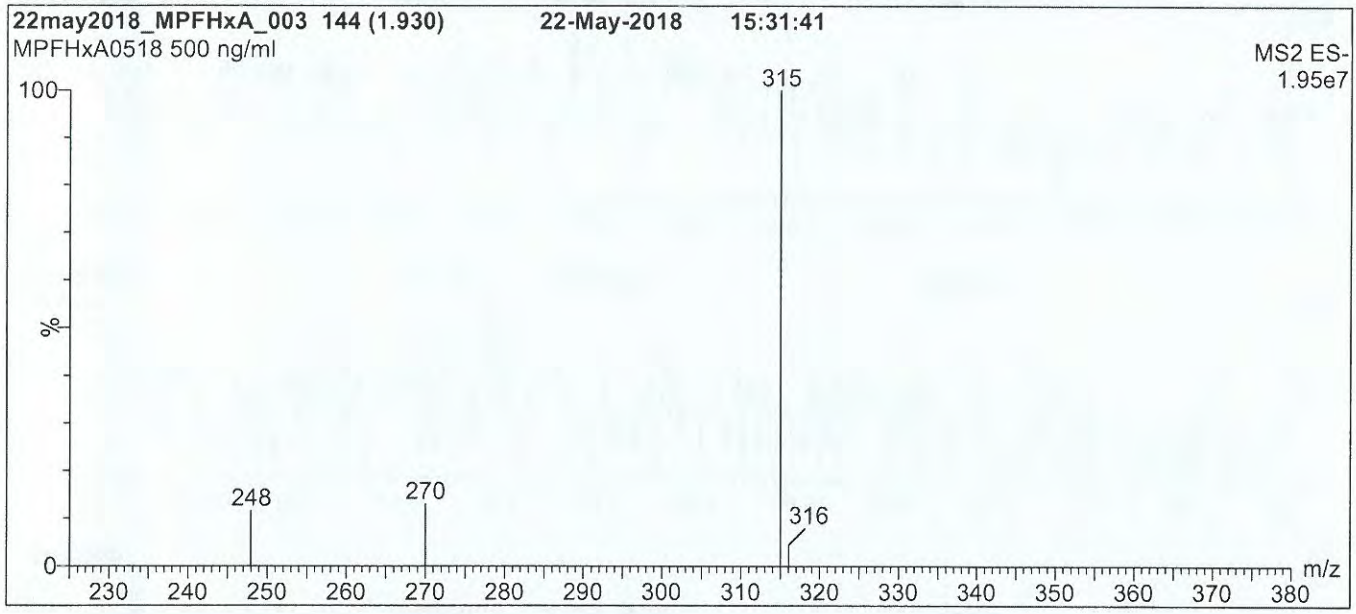
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2019

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 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

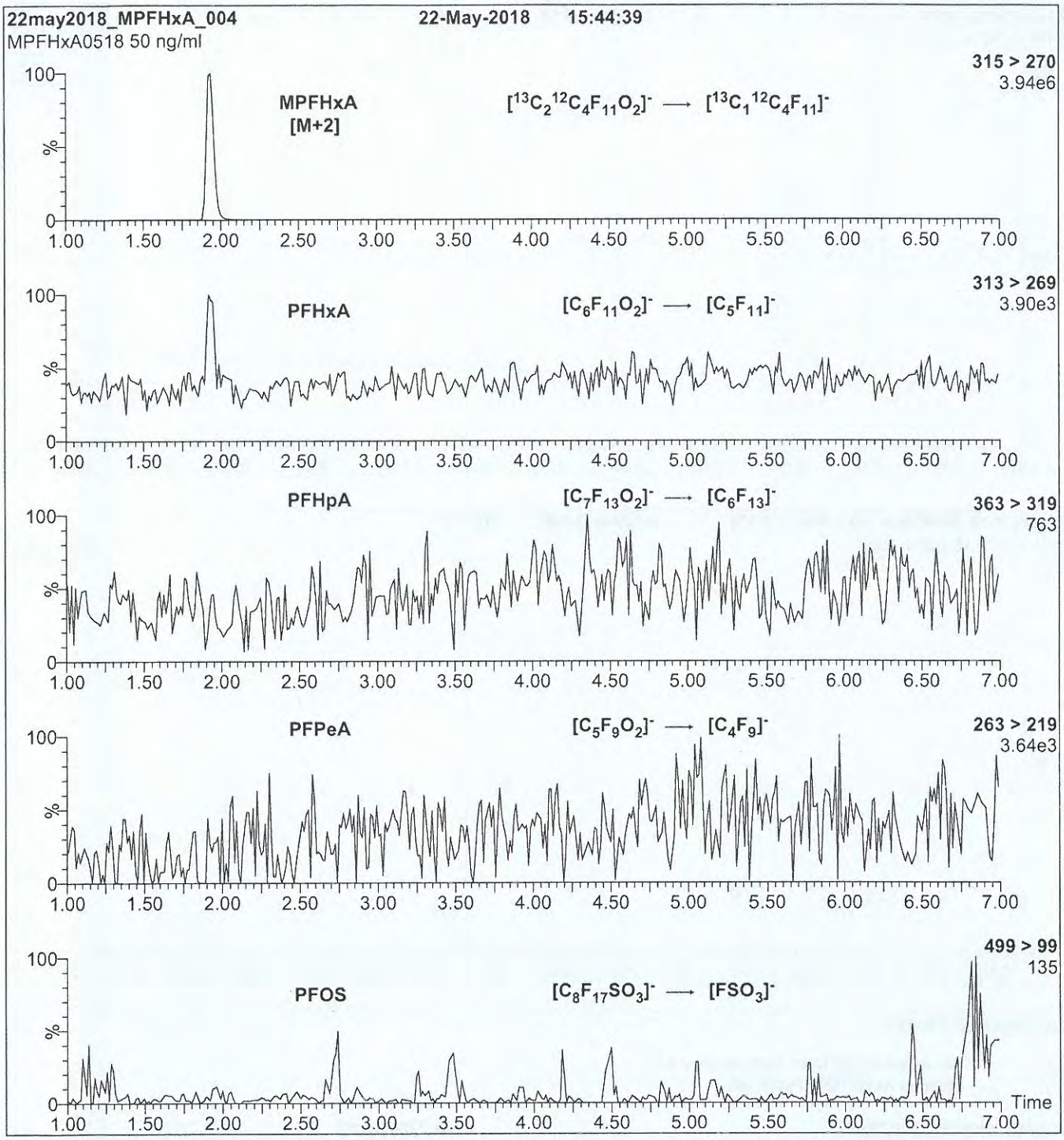
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18L2019

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

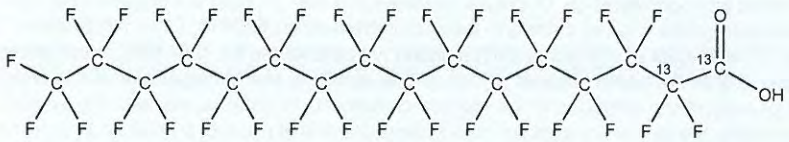
Collision Gas (mbar) = 3.55e-3
Collision Energy (eV) = 8

1812020

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

18L2020

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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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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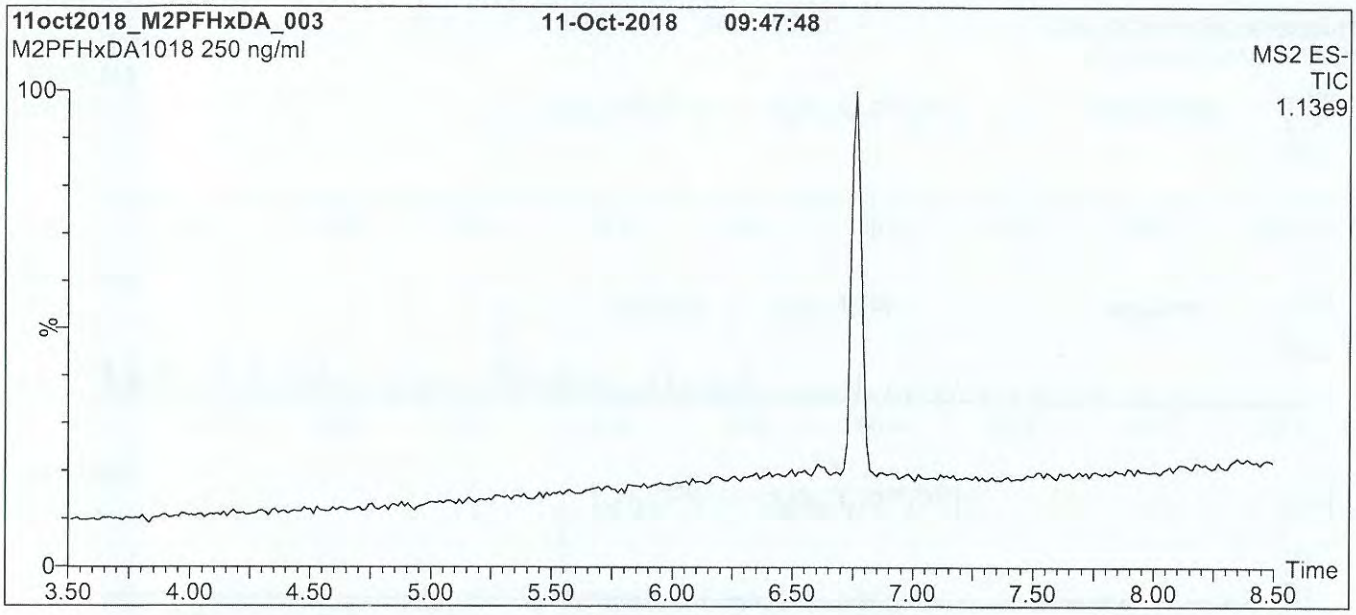
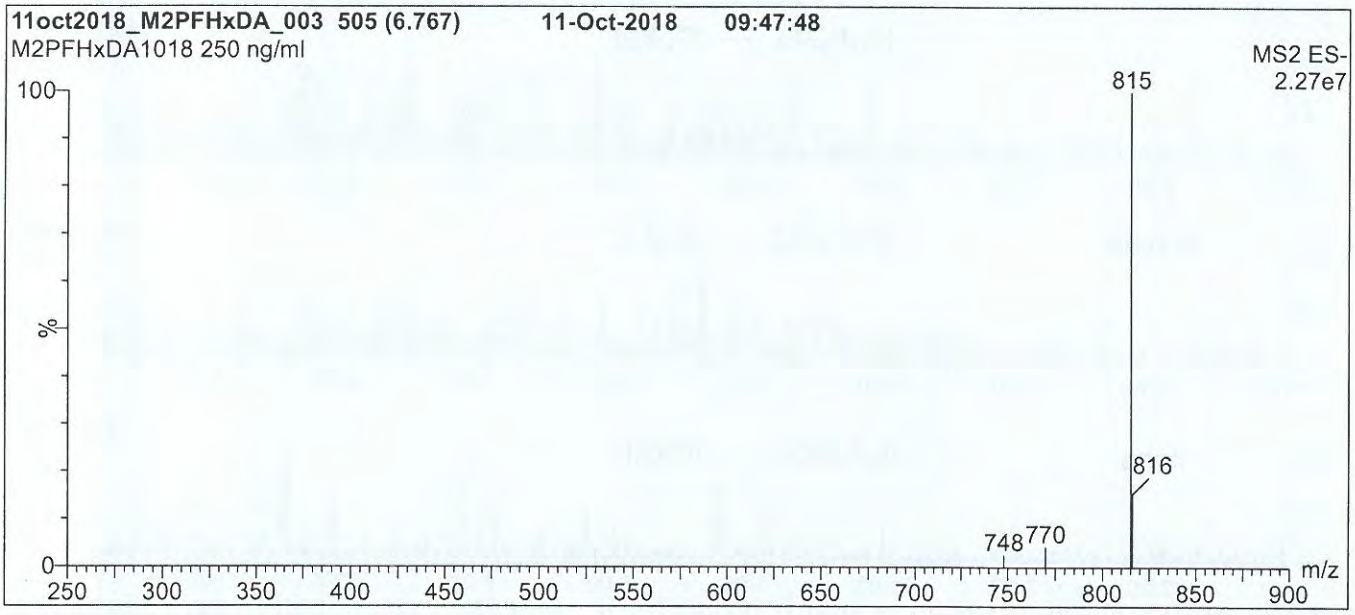
18L2020

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

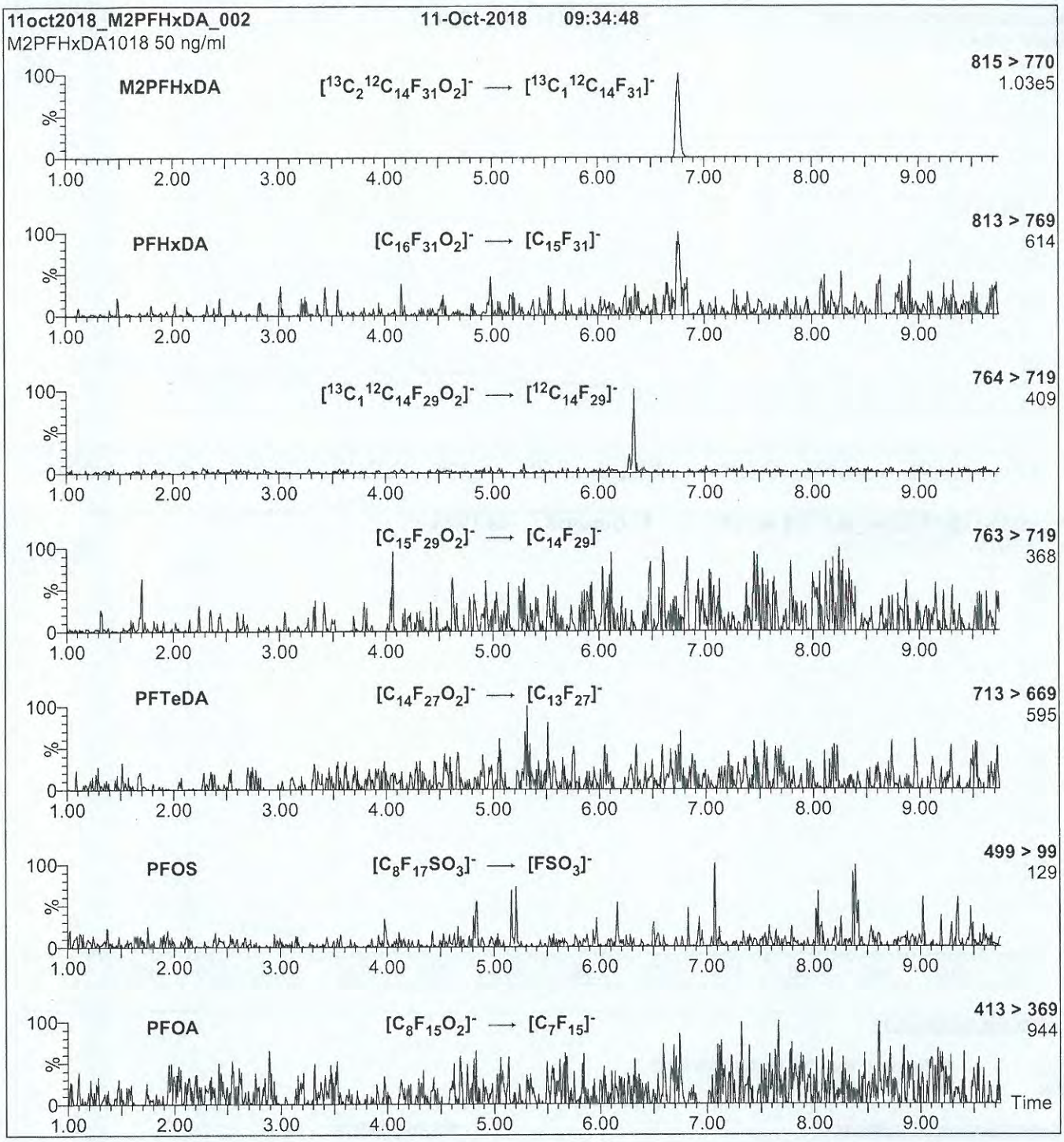
MS Parameters

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

18L2020

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

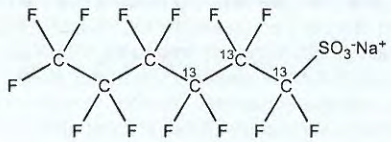
Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 15

1812027

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFHxS	**LOT NUMBER:**	M3PFHxS0618
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)	06/20/2018		
EXPIRY DATE: (mm/dd/yyyy)	06/20/2023		
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 ~ 0.1% 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:** 06/29/2018 (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

1812027

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).

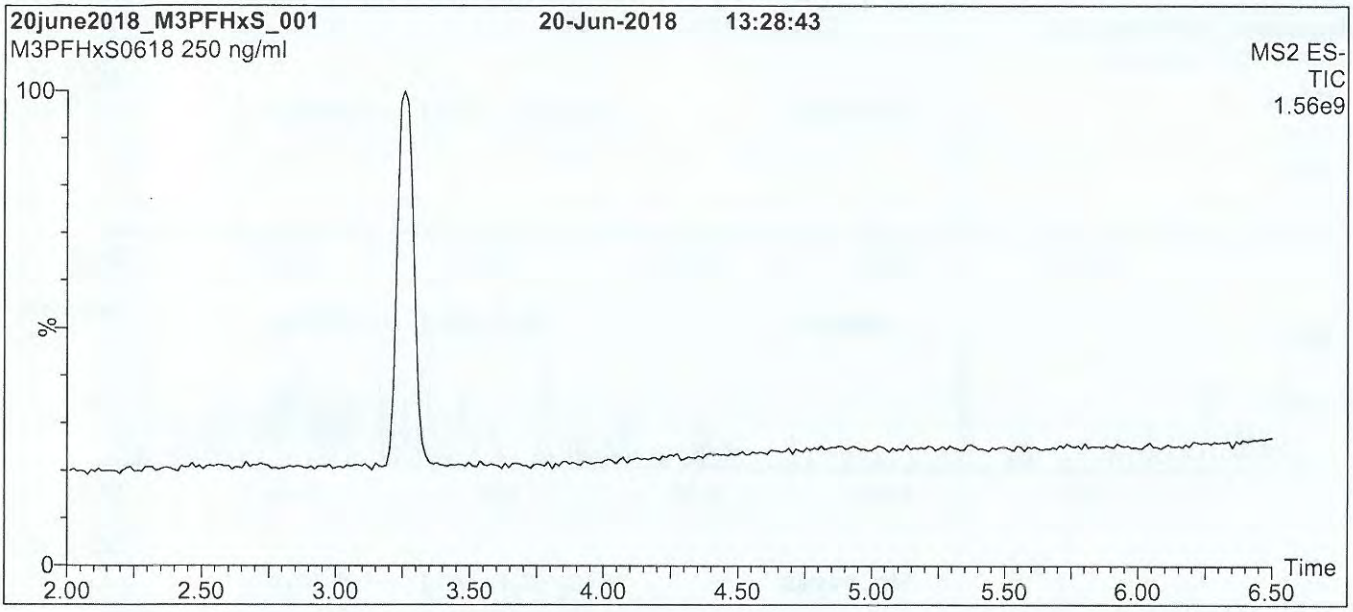
CALA Testing Accreditation No. A 1226

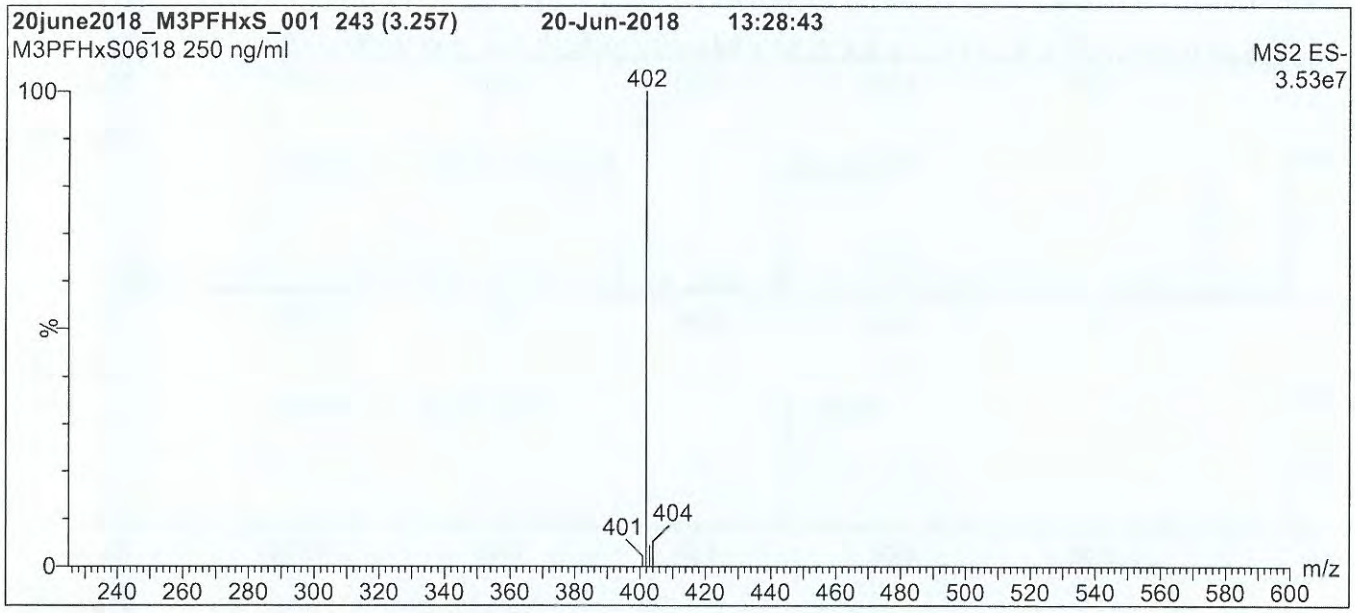
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812027

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: 50% (80:20 MeOH:ACN) / 50% 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

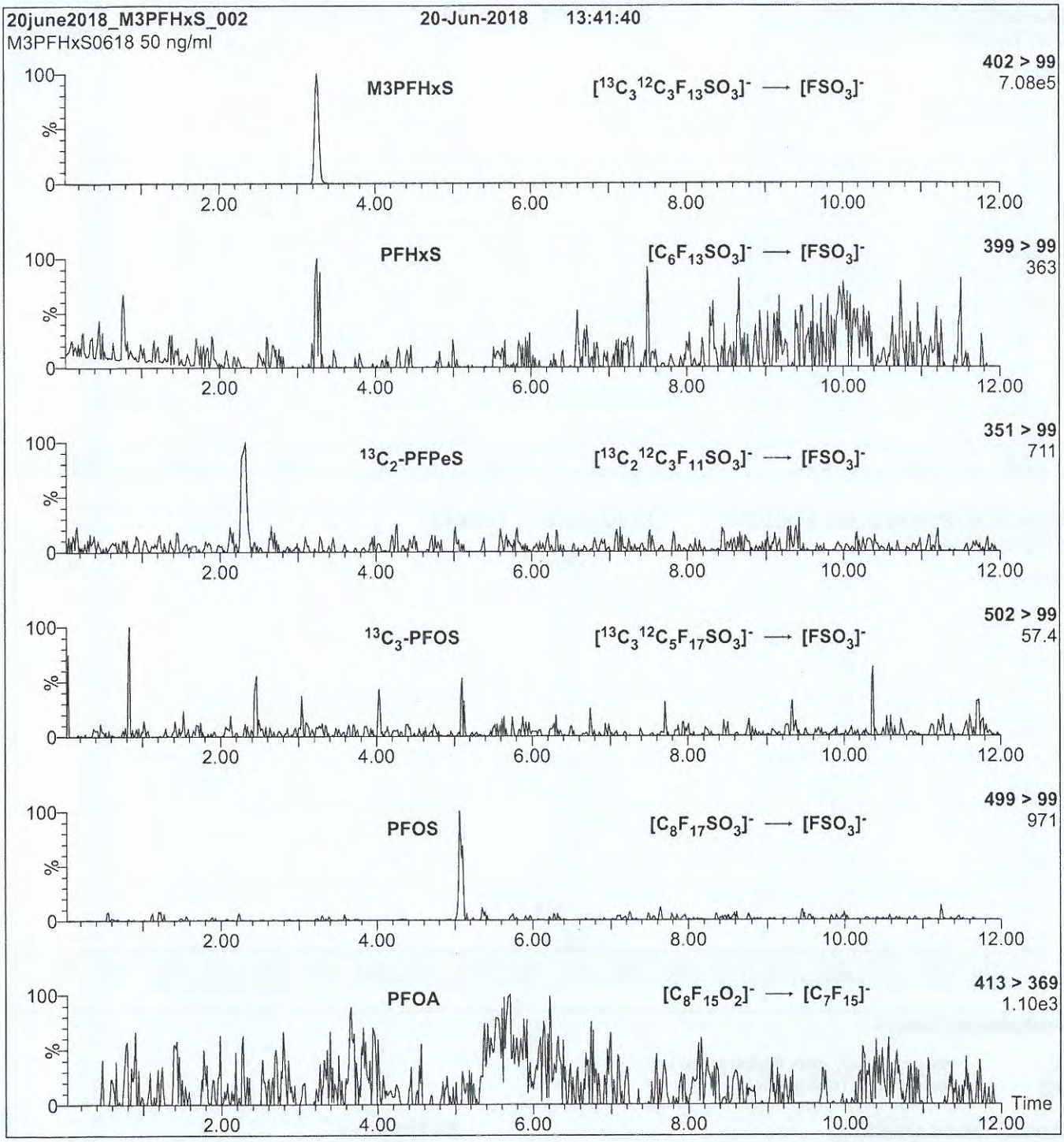
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18L2027

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) = 3.43e-3
Collision Energy (eV) = 36

1812077

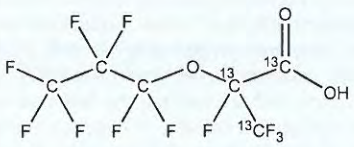
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA1018

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)	10/24/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/24/2021		
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 ~ 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:** 10/31/2018 (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

18L2077

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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18L2077

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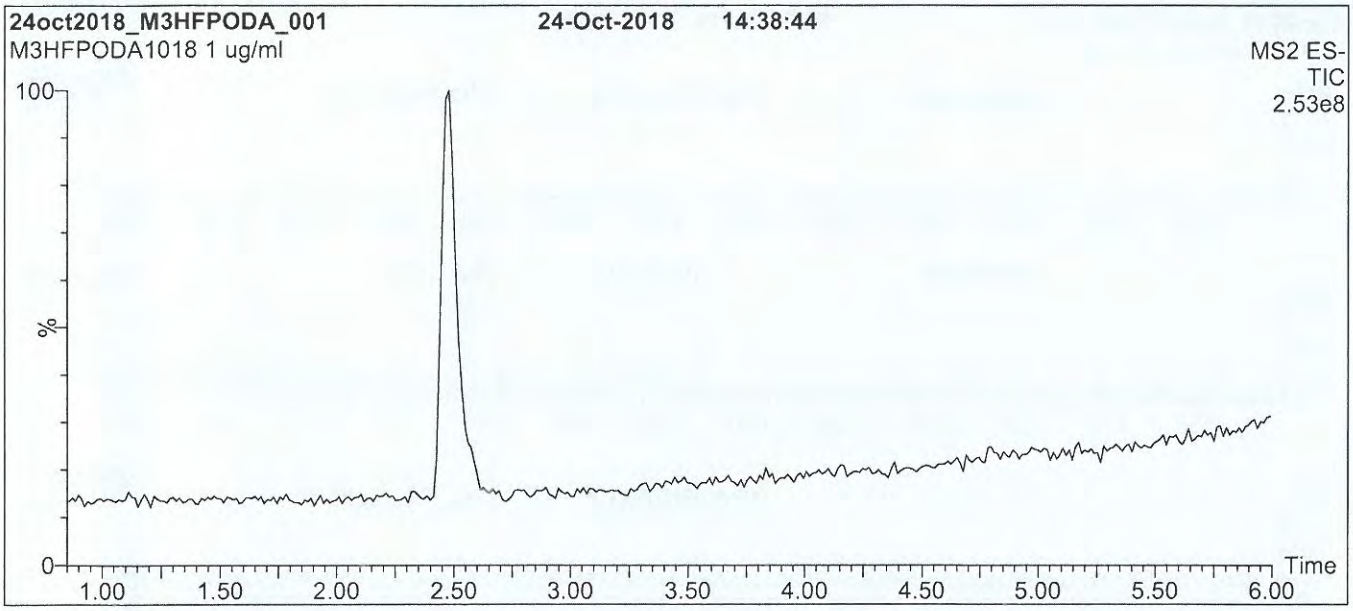

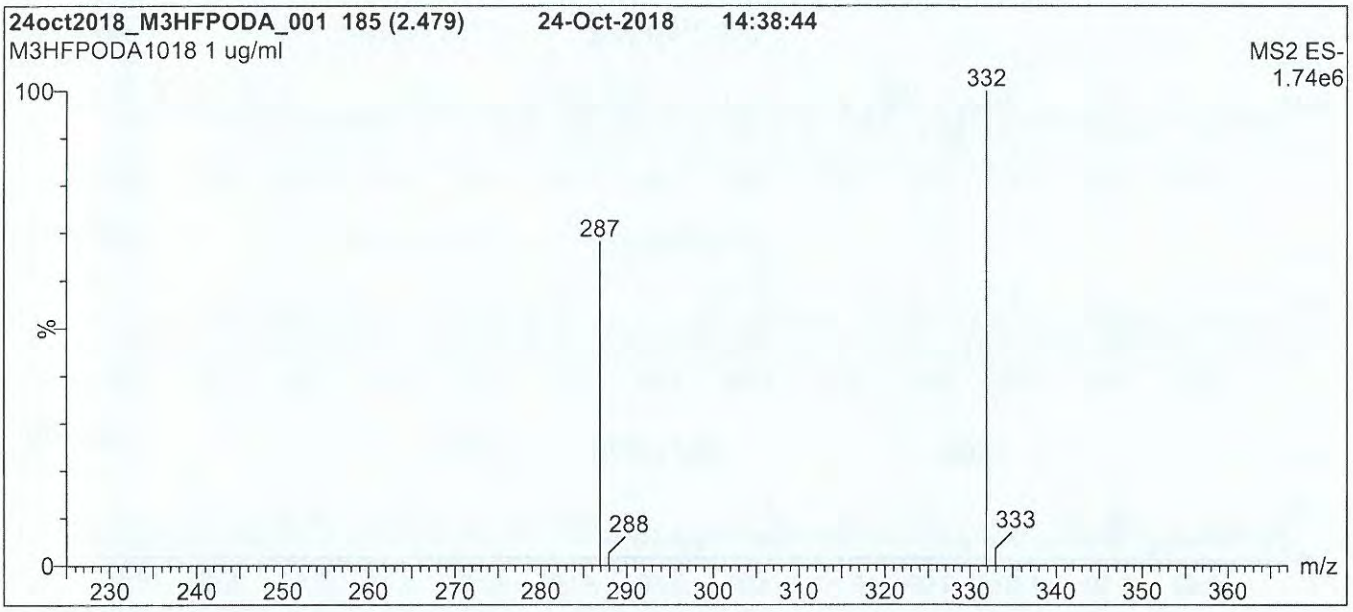

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(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

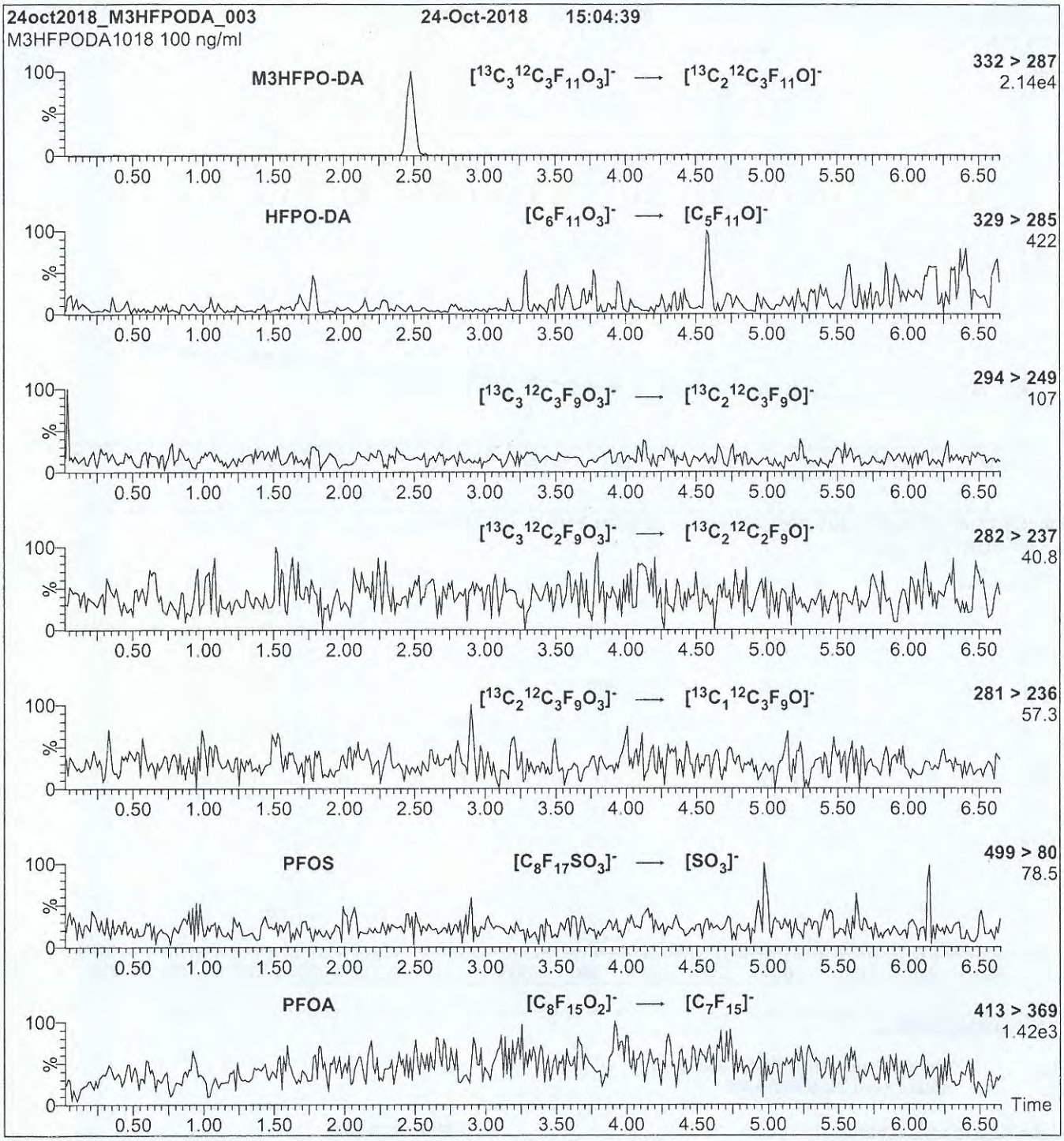
MS Parameters

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

1812077

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) = 3.02e-3
Collision Energy (eV) = 6

Analytical Standard Record

Vista Analytical Laboratory

19E2204

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18C0911	PFECHS	09-Mar-18	** Vendor **	20-Feb-22	0.435
18L2034	PFDoA	20-Dec-18	** Vendor **	18-Apr-23	0.4
18L2035	PFBA	20-Dec-18	** Vendor **	28-Nov-23	0.4
18L2036	PFPeA	20-Dec-18	** Vendor **	16-Feb-23	0.4
18L2037	PFHxA	20-Dec-18	** Vendor **	18-May-23	0.4
18L2038	PFDA	20-Dec-18	** Vendor **	12-Nov-23	0.4
18L2039	PFUdA	20-Dec-18	** Vendor **	23-Aug-23	0.4
18L2040	PFTrDA	20-Dec-18	** Vendor **	16-Feb-23	0.4
18L2041	PFHpA	20-Dec-18	** Vendor **	12-Jul-23	0.4
18L2042	PFOA	20-Dec-18	** Vendor **	23-Aug-23	0.4
18L2043	PFNA	20-Dec-18	** Vendor **	16-Feb-23	0.4
18L2044	PFTeDA	20-Dec-18	** Vendor **	23-Aug-23	0.4
18L2045	PFHxDA	20-Dec-18	** Vendor **	13-Jul-22	0.4
18L2046	PFODA	20-Dec-18	** Vendor **	13-Jul-22	0.4
18L2047	L-PFBS	20-Dec-18	** Vendor **	04-May-23	0.454
18L2048	L-PFPeS	20-Dec-18	** Vendor **	12-Jul-23	0.428
18L2049	L-PFHpS	20-Dec-18	** Vendor **	04-May-23	0.42
18L2050	L-PFNS	20-Dec-18	** Vendor **	13-Jul-23	0.418
18L2051	L-PFDS	20-Dec-18	** Vendor **	05-Oct-23	0.415
18L2052	br-PFHxSK	20-Dec-18	** Vendor **	02-Oct-23	0.44
18L2053	br-PFOSK anion	20-Dec-18	** Vendor **	18-Apr-23	0.431
18L2054	4:2 FTS	20-Dec-18	** Vendor **	03-Jul-23	0.43
18L2055	6:2FTS	20-Dec-18	** Vendor **	03-Apr-23	0.422
18L2056	8:2FTS	20-Dec-18	** Vendor **	28-Nov-23	0.418
18L2057	FOSA-I	20-Dec-18	** Vendor **	20-Jun-23	0.4
18L2058	br-NMeFOSAA	20-Dec-18	** Vendor **	17-Jan-23	0.4
18L2059	br-NEtFOSAA	20-Dec-18	** Vendor **	26-Jul-23	0.4
18L2060	N-MeFOSA-M	20-Dec-18	** Vendor **	31-May-23	2
18L2061	N-EtFOSA-M	20-Dec-18	** Vendor **	31-May-23	2
18L2062	N-MeFOSE-M	20-Dec-18	** Vendor **	17-May-23	2
18L2063	N-EtFOSE-M	20-Dec-18	** Vendor **	04-Jun-23	2
18L2071	HFPO-DA	20-Dec-18	** Vendor **	24-Oct-21	0.4
18L2072	11Cl-PF3OUdS	20-Dec-18	** Vendor **	23-Nov-23	0.425
18L2073	9Cl-PF3ONS	20-Dec-18	** Vendor **	22-Nov-23	0.43
18L2074	NaDONA	20-Dec-18	** Vendor **	26-Mar-23	0.4
18L2076	L-PFPrS	20-Dec-18	** Vendor **	14-Dec-22	0.438
18L2078	10:2FTS	20-Dec-18	** Vendor **	13-Jul-21	0.415
19B0712	L-PFDoS	07-Feb-19	** Vendor **	30-Sep-21	0.415

Analytical Standard Record

Vista Analytical Laboratory

19E2204

Description:	PFC NS Stock	Expires:	29-May-21
Standard Type:	Analyte Spike	Prepared:	29-May-19
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	28-May-19 09:03 by GRB

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
EtFOSAA	2991-50-6	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
ADONA	919005-14-4	1	ug/mL
Br-EtFOSAA		0.224	ug/mL
Br-MeFOSAA		0.24	ug/mL
Br-PFHxS	3871-99-6	0.189	ug/mL
Br-PFOS	2795-39-3	0.211	ug/mL
L-EtFOSE	1691-99-2	5	ug/mL
EtFOSA	4151-50-2	5	ug/mL
L-PFPeA		1	ug/mL
EtFOSE	1691-99-2	5	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

19E2204

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Standard Type:	Analyte Spike	Prepared:	29-May-19
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	28-May-19 09:03 by GRB

Analyte	CAS Number	Concentration	Units
F-53B Major (9Cl-PF3ONS)	756426-58-1	1	ug/mL
F-53B Minor (11Cl-PF3OUdS)	763051-92-9	1	ug/mL
F-53B Total		2	ug/mL
HFPO-DA (GenX)	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
cis-PFECHS		0.668	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

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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

18C0911

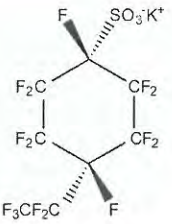
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

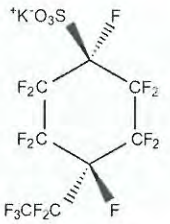
PRODUCT CODE: PFECHS **LOT NUMBER:** PFECHS0217

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)	02/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/20/2022		
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 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:** 08/15/2017 (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

18C0911

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).

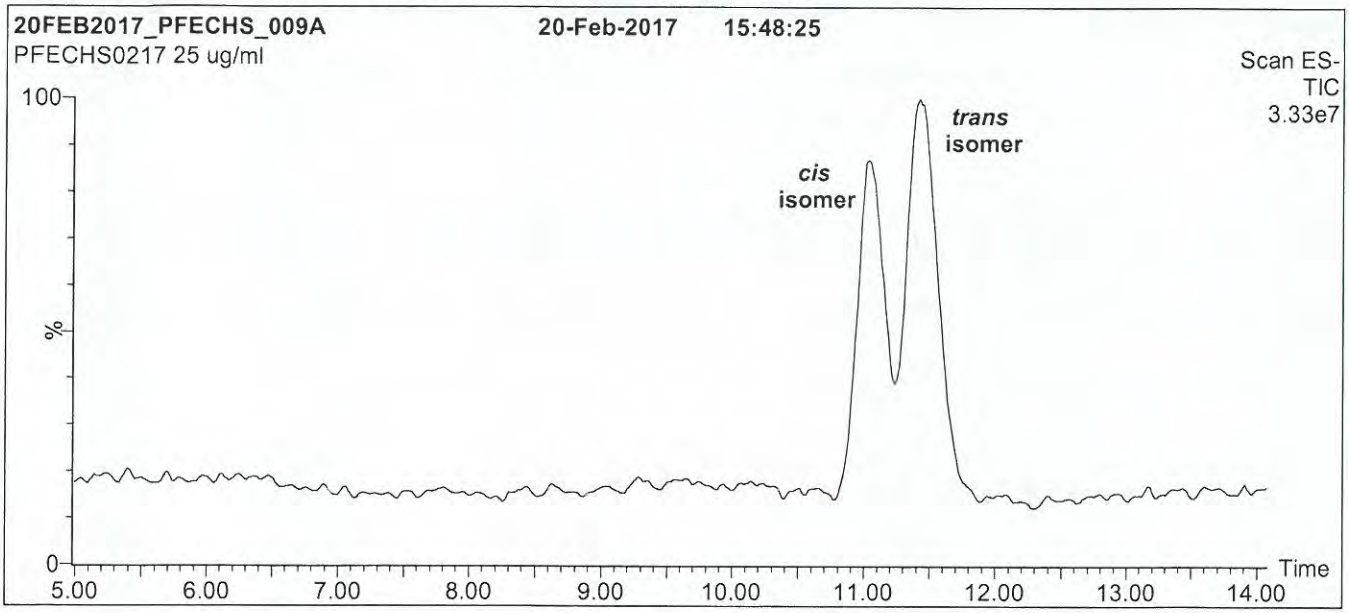
CALA

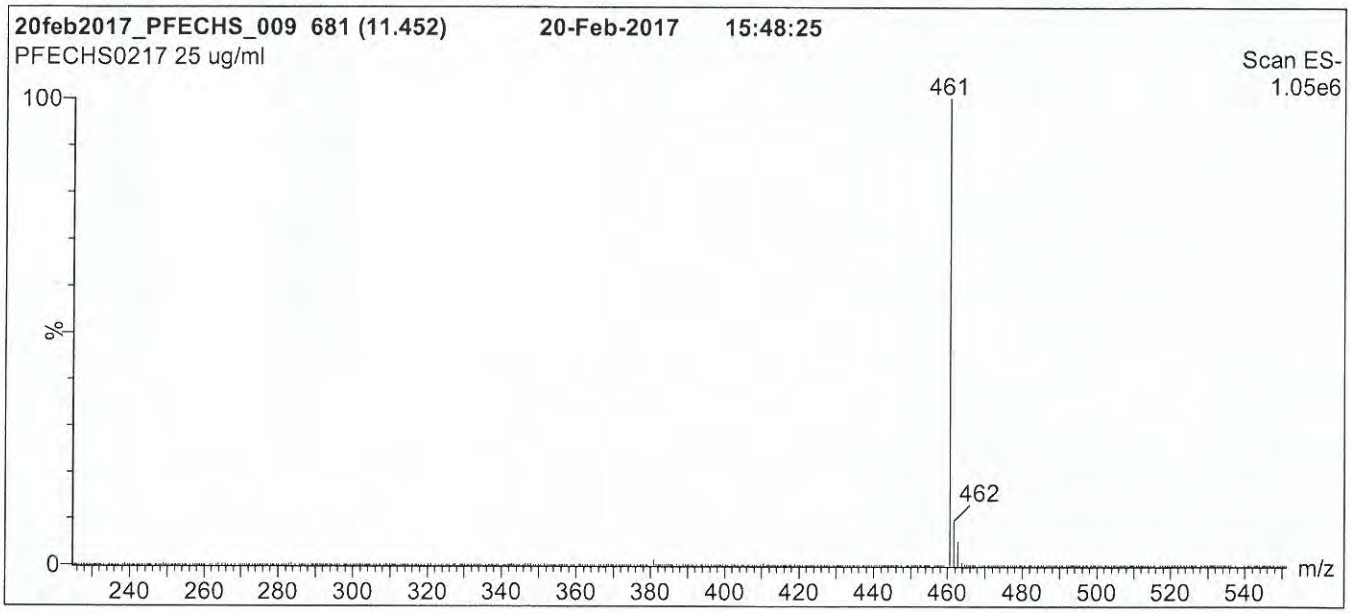
ANAB ACCREDITED

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

1801911

Figure 1: **PFECHS; 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 CSH Fluoro-Phenyl
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 35% (80:20 MeOH:ACN) / 65% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 13 min. Ramp to 50% organic over 1.5 min and hold for 2.5 min. Ramp to 80% organic over 1 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 20 min

Flow: 300 µl/min

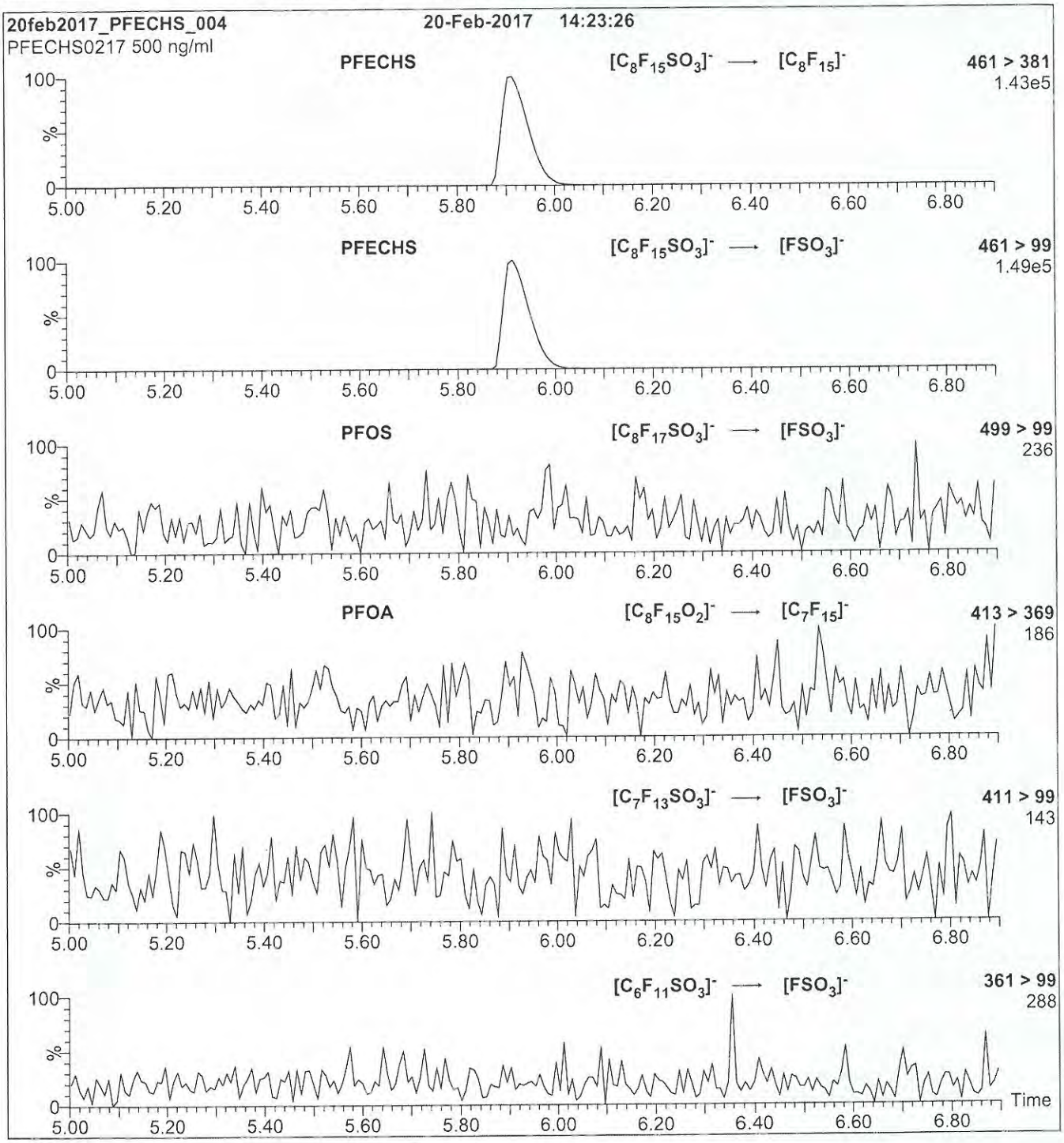
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.50
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18C0911

Figure 2: **PFECHS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFECHS)

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) = 3.50e-3
Collision Energy (eV) = 25

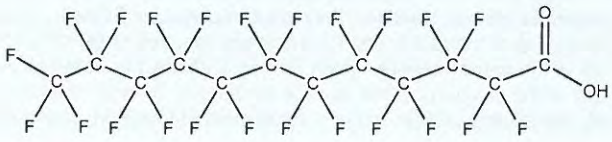
18L2034

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid
LOT NUMBER: PFDoA0418

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) 04/18/2018
EXPIRY DATE: (mm/dd/yyyy) 04/18/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS Data (Mass Spectrum)
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 carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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1812034

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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

18L2034

Figure 1: **PFDoA; LC/MS Data (SIR)**

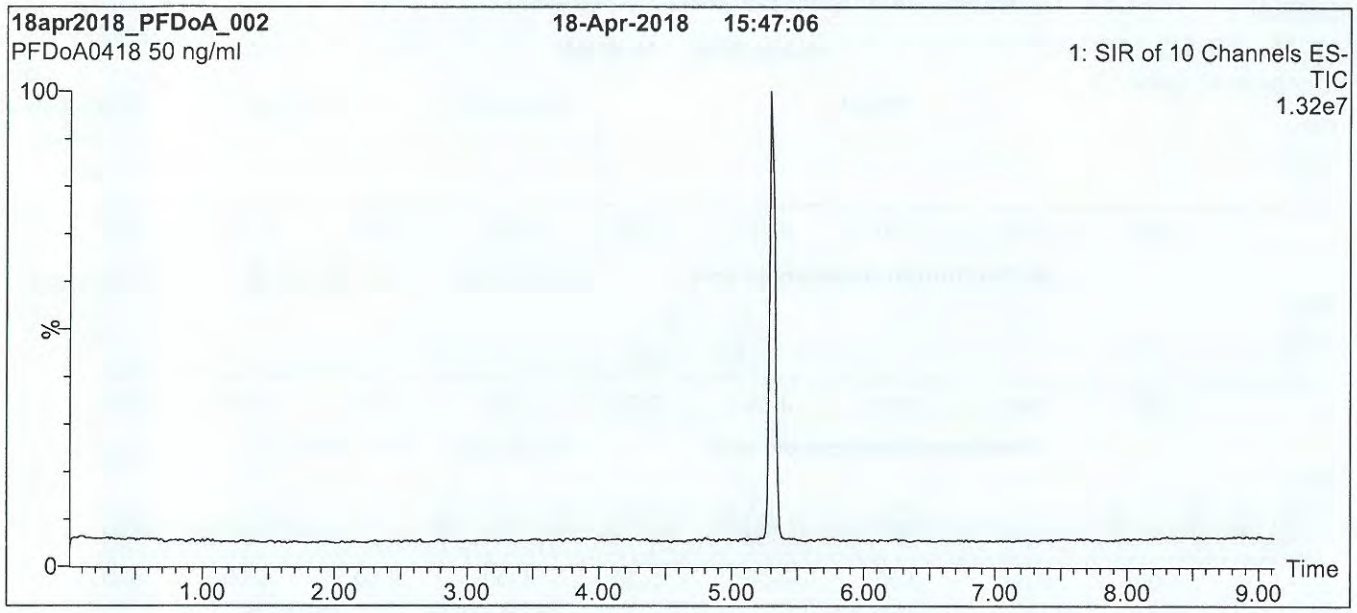
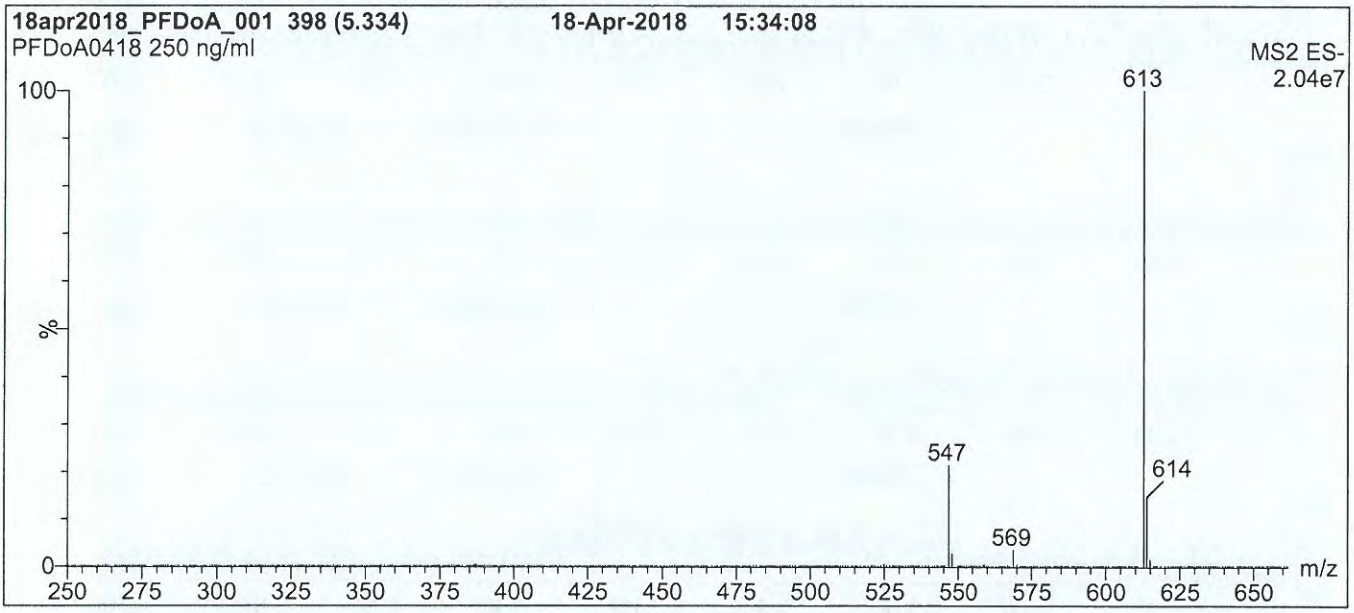


Figure 2: **PFDoA; LC/MS Data (Mass Spectrum)**



Conditions for Figures 1 & 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 85% 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

Experiments: SIR of 10 channels
Full Scan (250 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5 (variable for SIR (2-12))
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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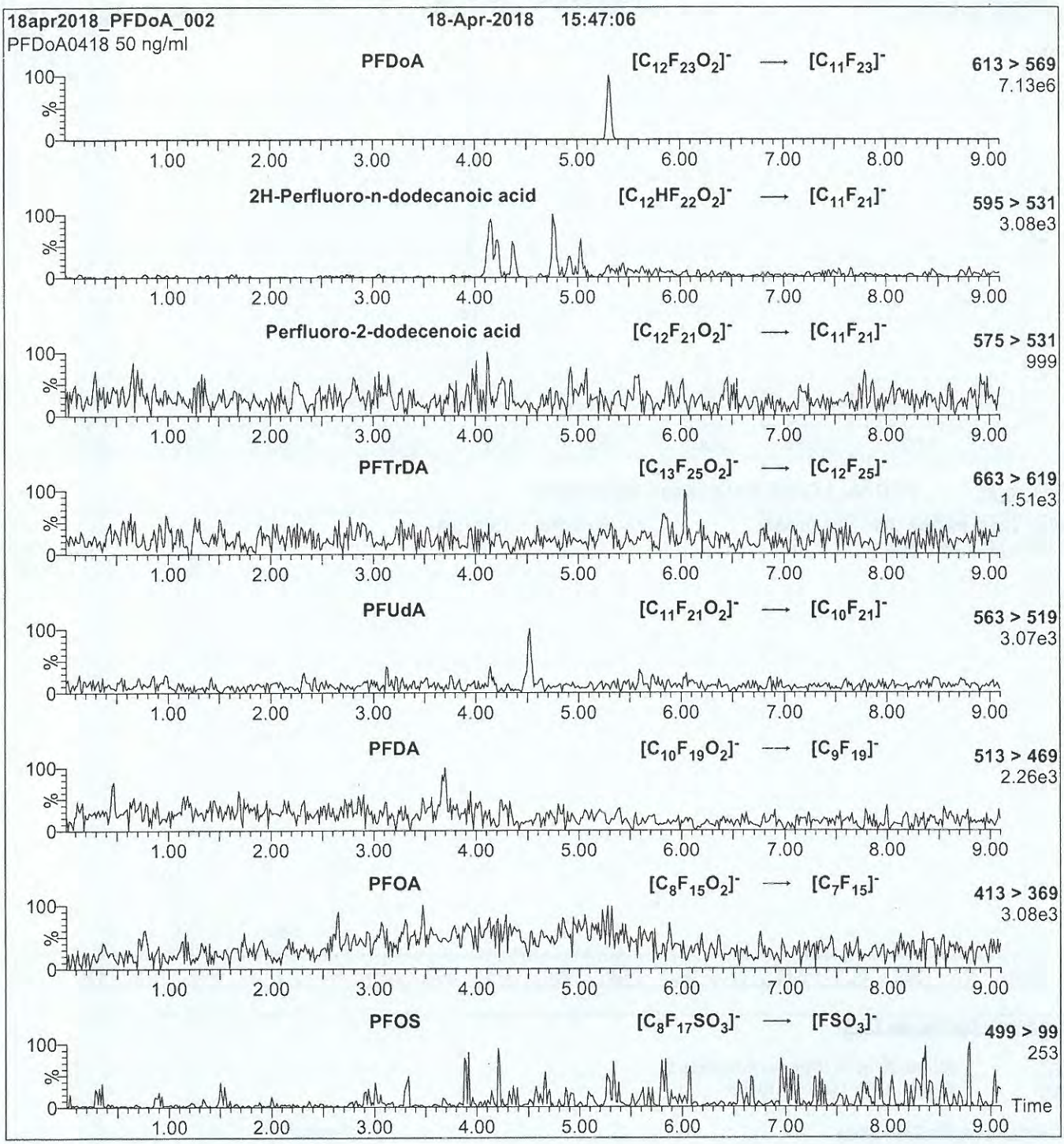
Figure 3: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (PFDoA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.47e-3

Collision Energy (eV) = 12

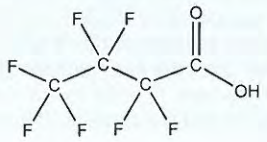
1BL2035

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid
LOT NUMBER: PFBA1118

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) 11/28/2018
EXPIRY DATE: (mm/dd/yyyy) 11/28/2023
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:** 11/29/2018 (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

1802035

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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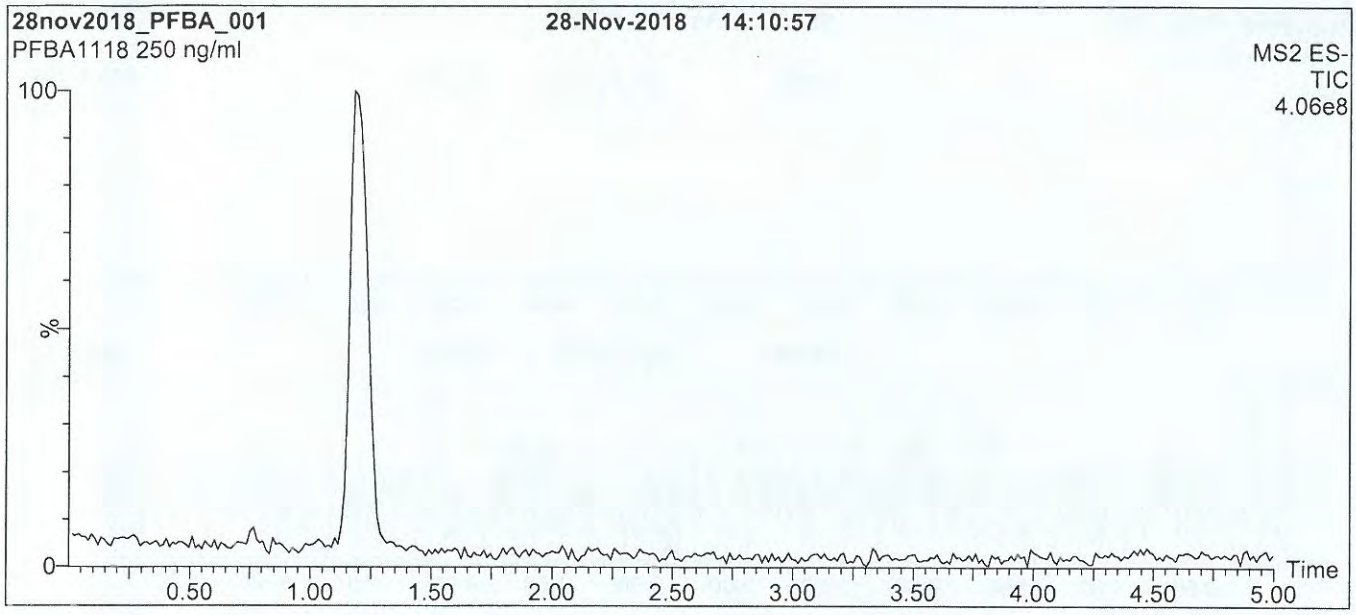
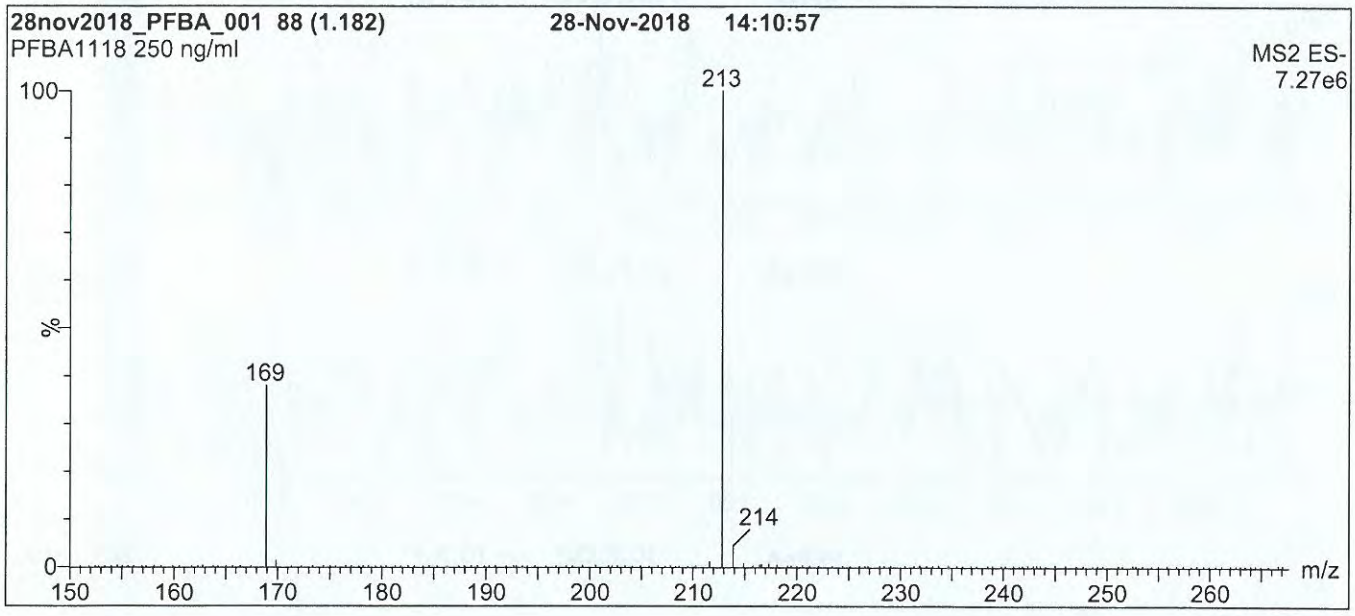
1802035

Figure 1: **PFBA; 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

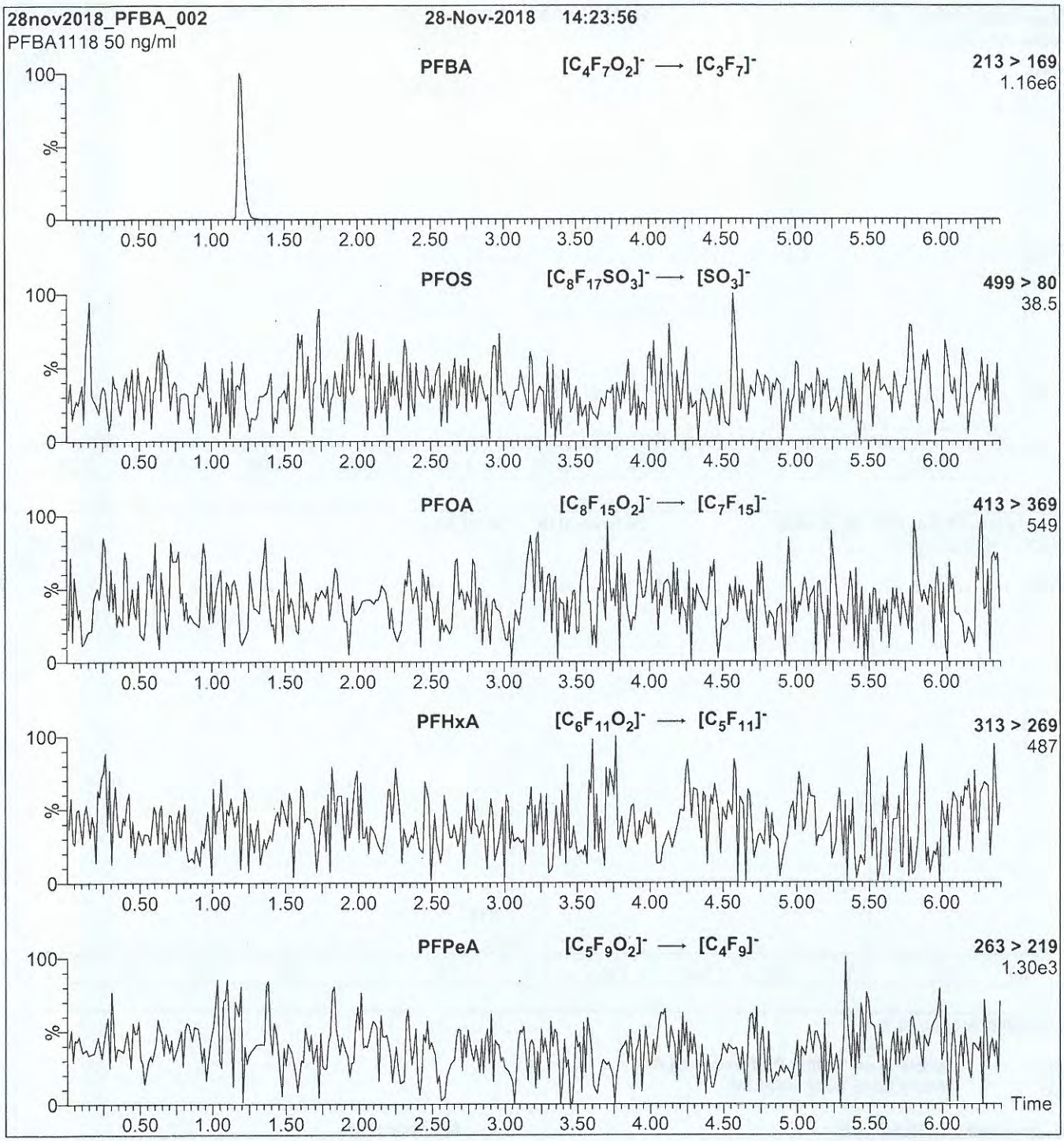
MS Parameters

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

1812035

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

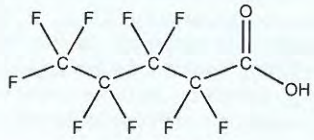
Collision Gas (mbar) = 2.79e-3
Collision Energy (eV) = 8

1812036

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0218
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)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
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 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:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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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 ISO 17034 REFERENCE MATERIAL PRODUCER

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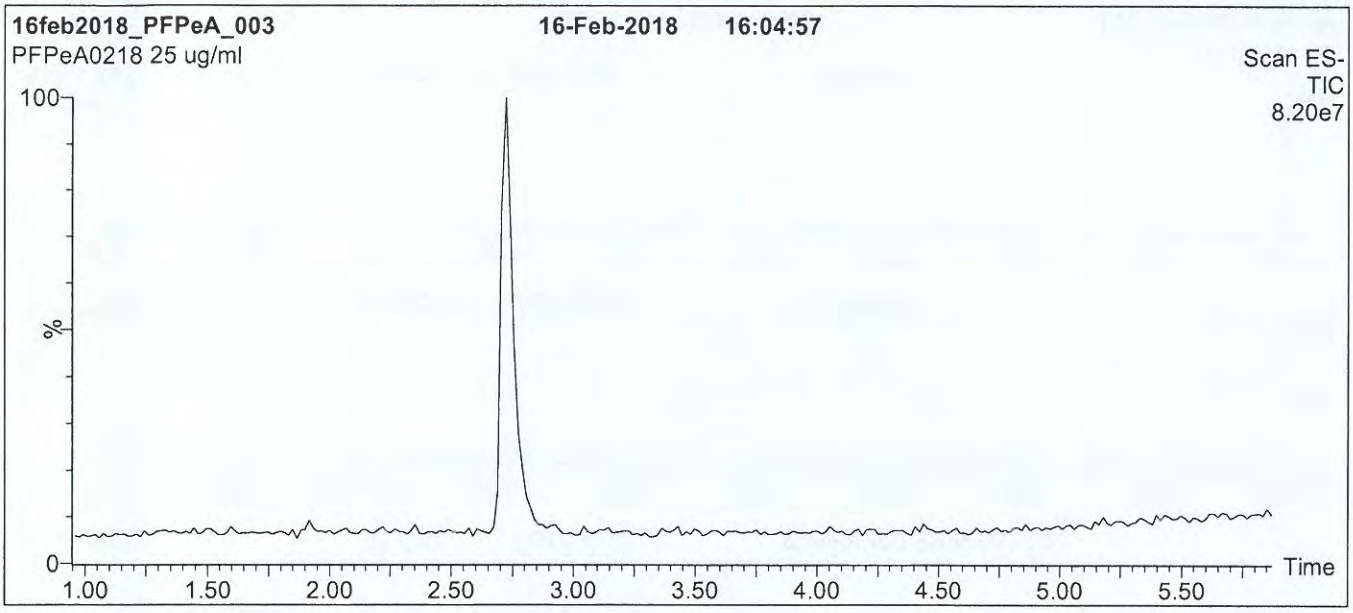
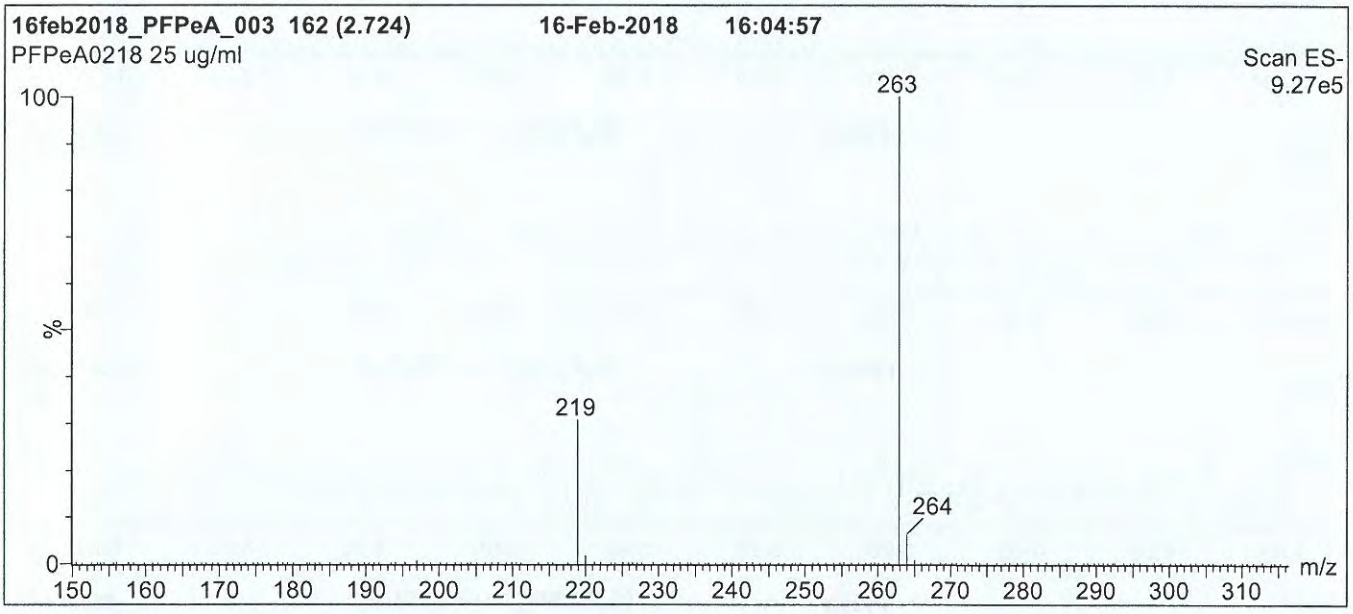
18L2036

Figure 1: **PFPeA; 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

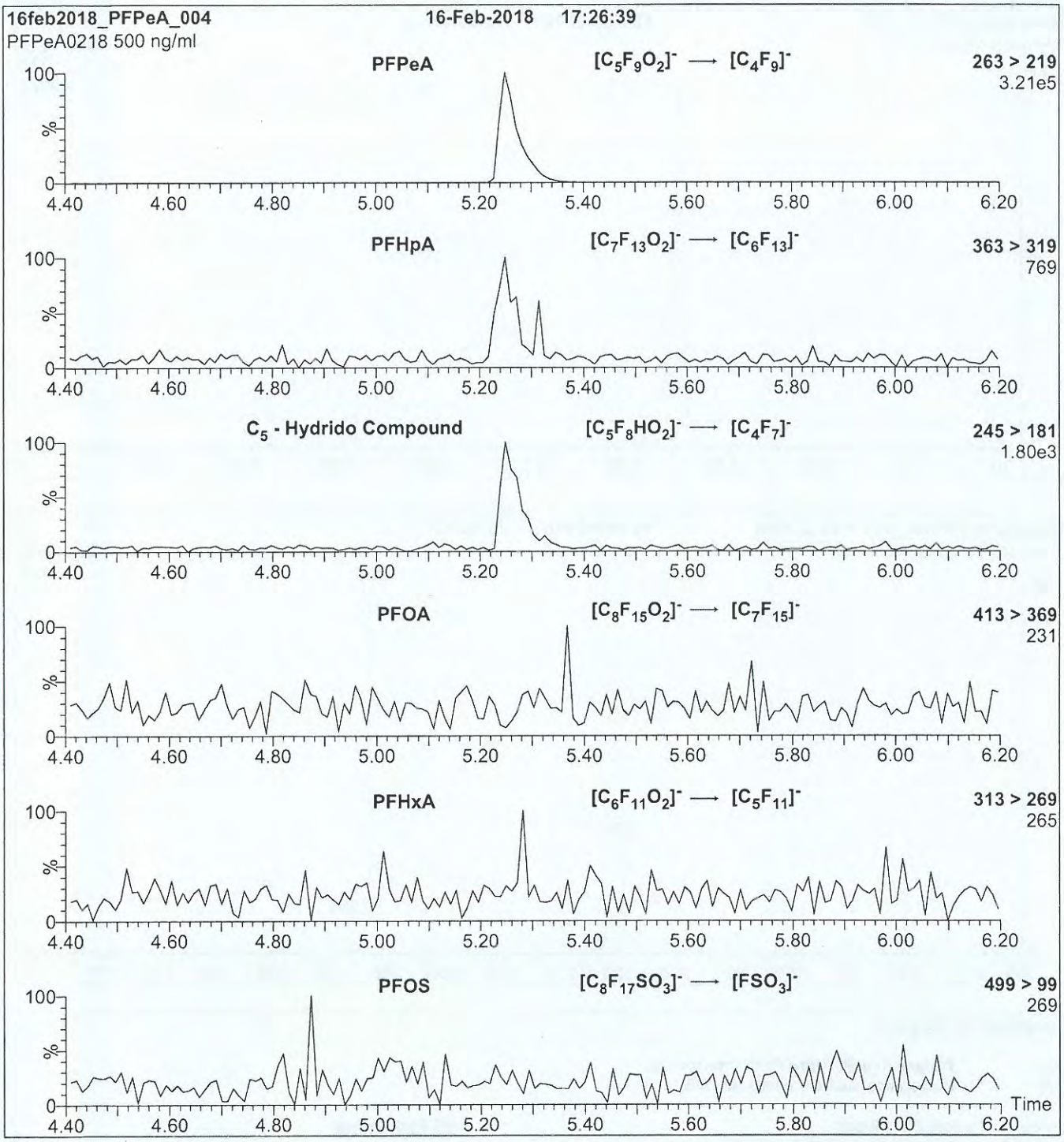
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

1812036

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

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) = 3.28e-3
Collision Energy (eV) = 9

18L2037

WELLINGTON LABORATORIES

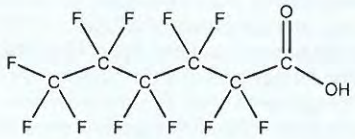
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA0518

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/18/2018
EXPIRY DATE: (mm/dd/yyyy) 05/18/2023
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 ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2018 (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

1812037

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:

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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.

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LIMITED WARRANTY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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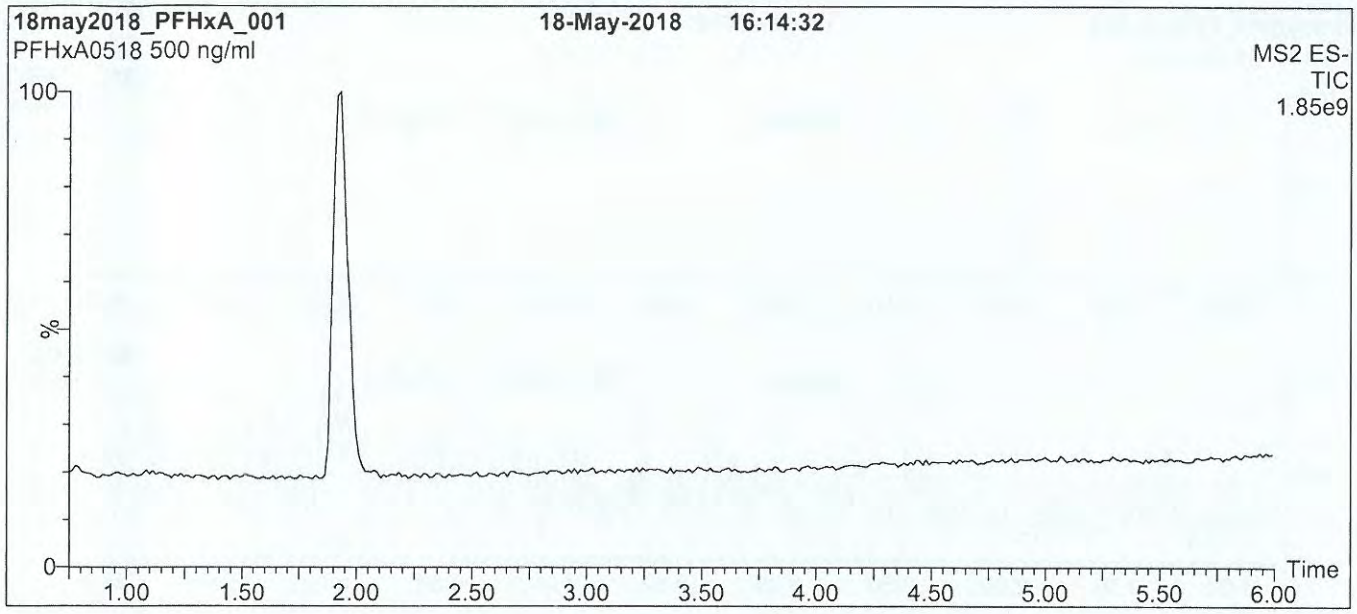
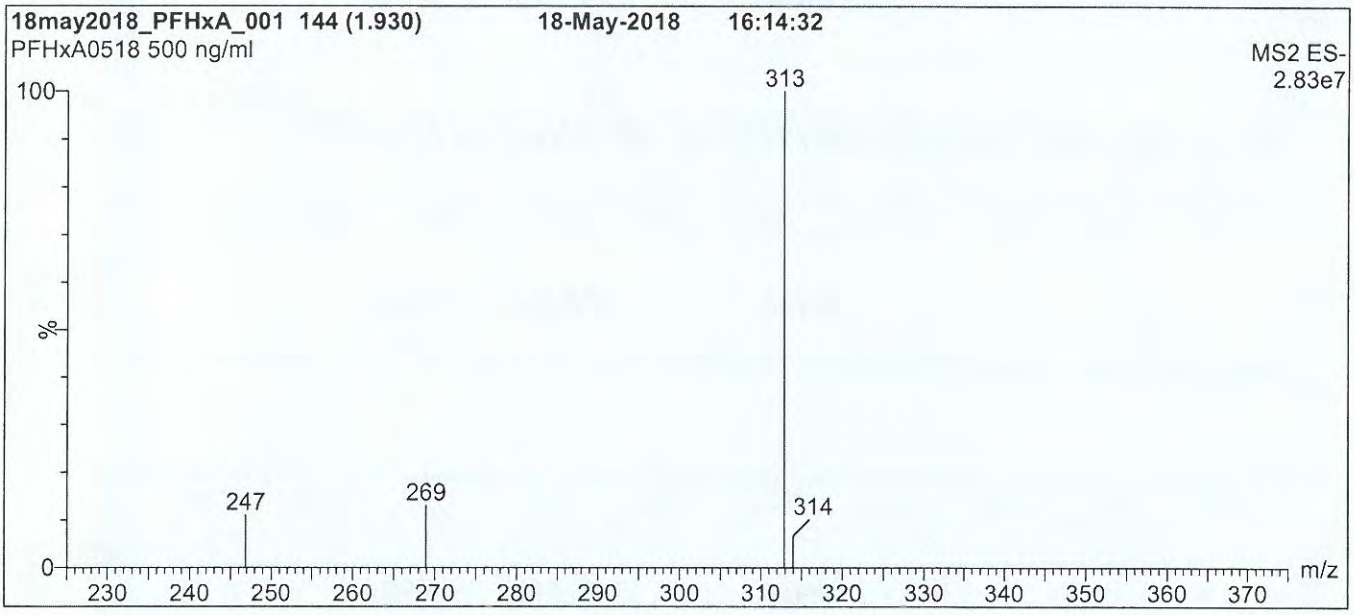
1812037

Figure 1: **PFHxA; 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 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 (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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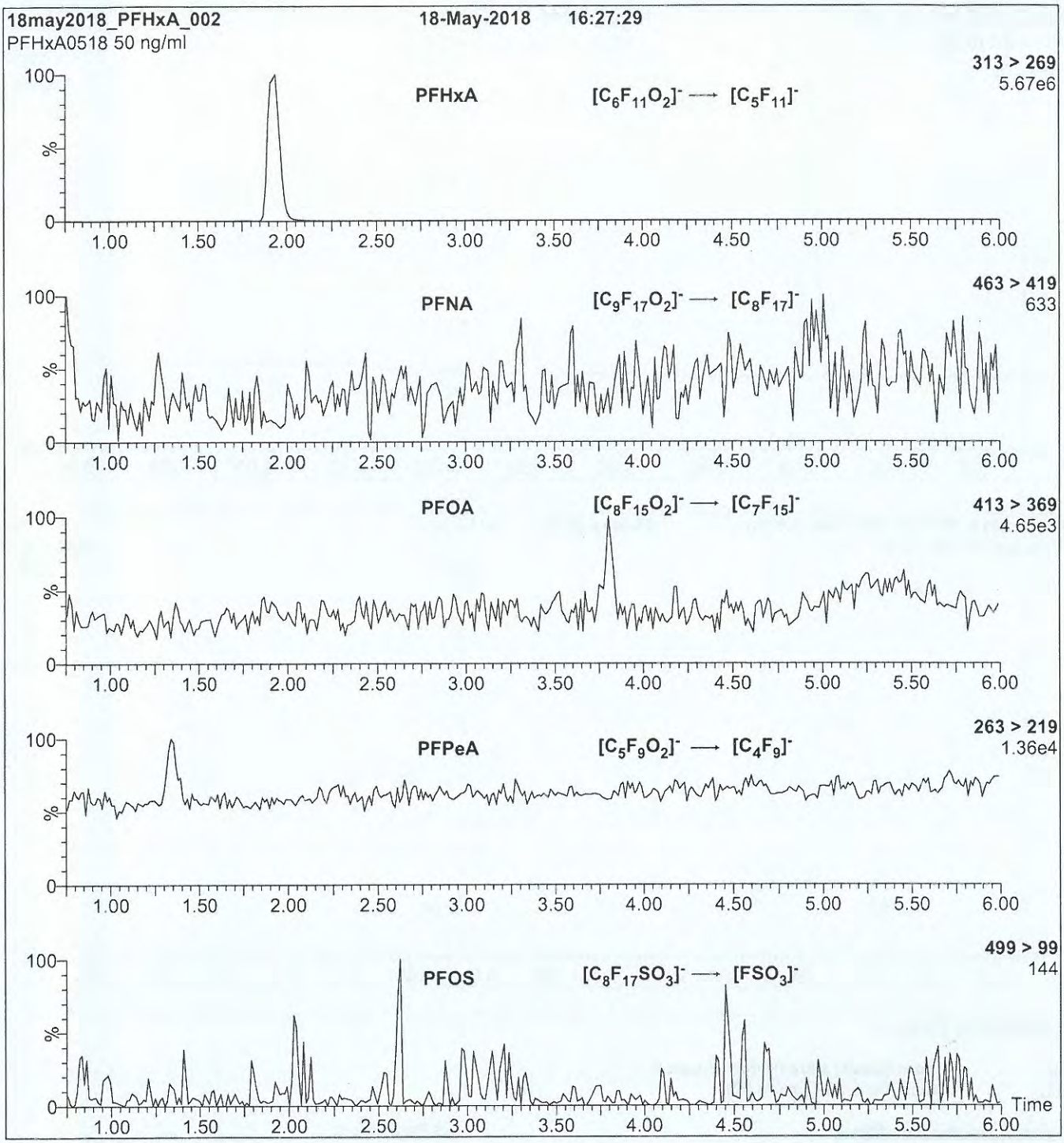
Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFHxA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

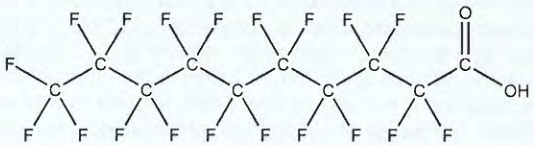
Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 8

1812038

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA1118
COMPOUND:	Perfluoro-n-decanoic acid		
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)	11/12/2018		
EXPIRY DATE: (mm/dd/yyyy)	11/12/2023		
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 ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/15/2018 (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

18L2038

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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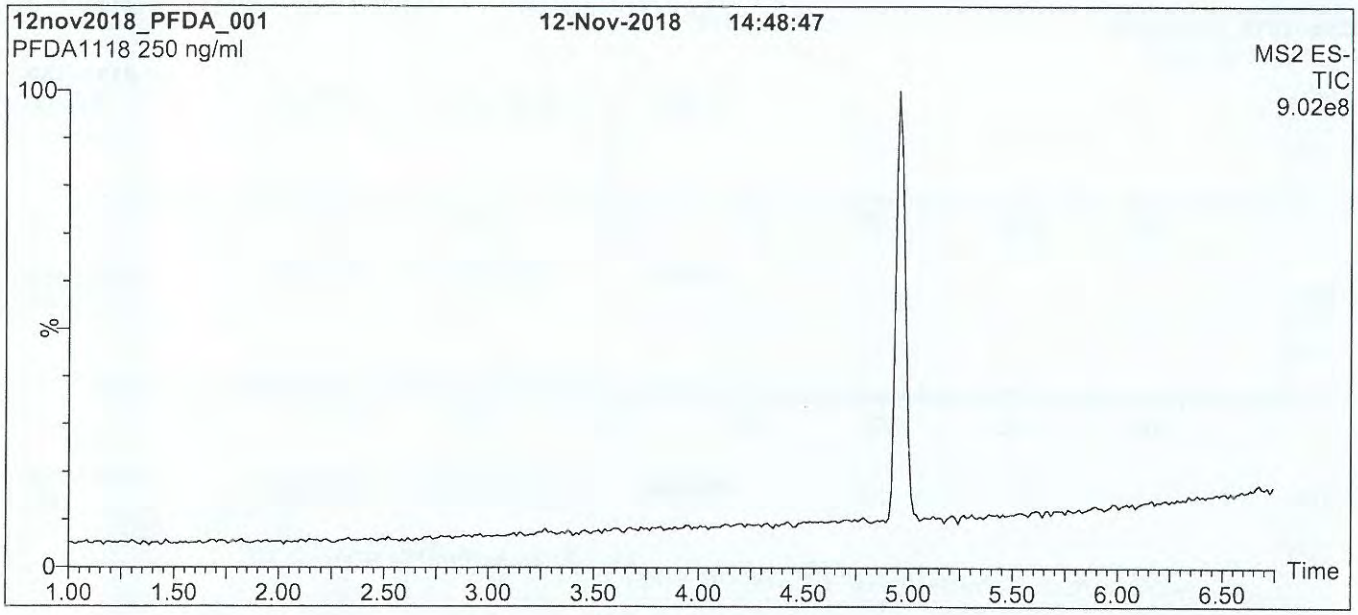
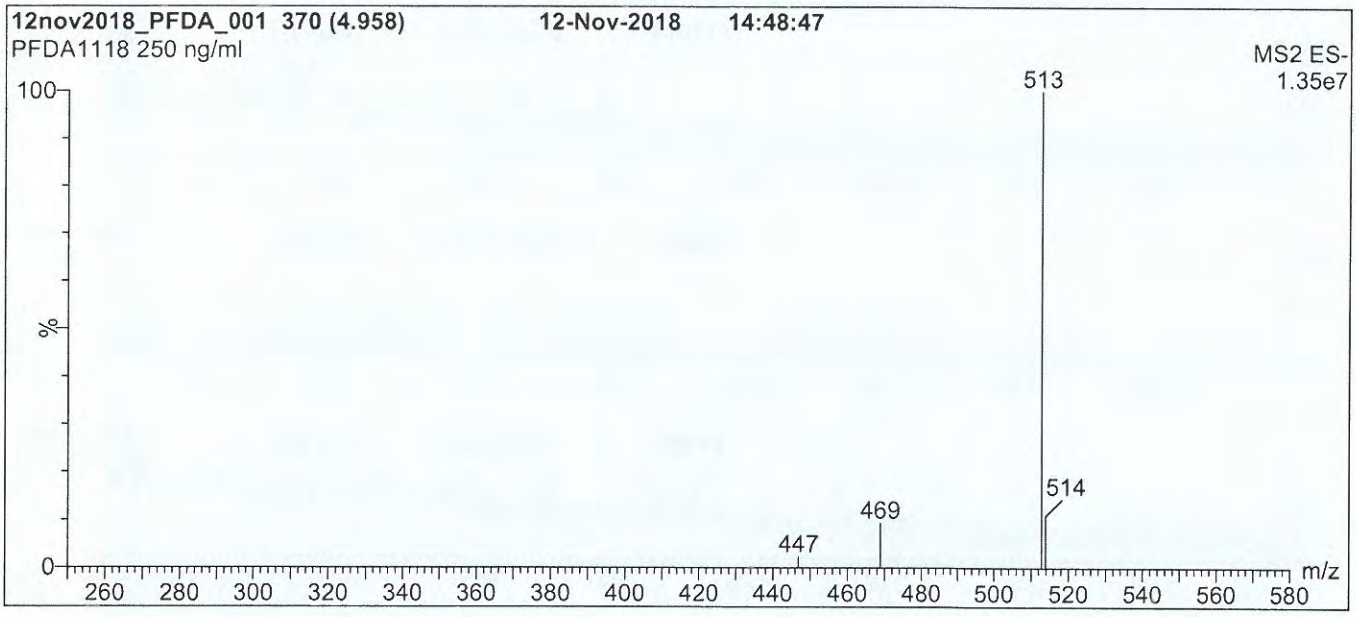
1812038

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: 12 min

Flow: 300 µl/min

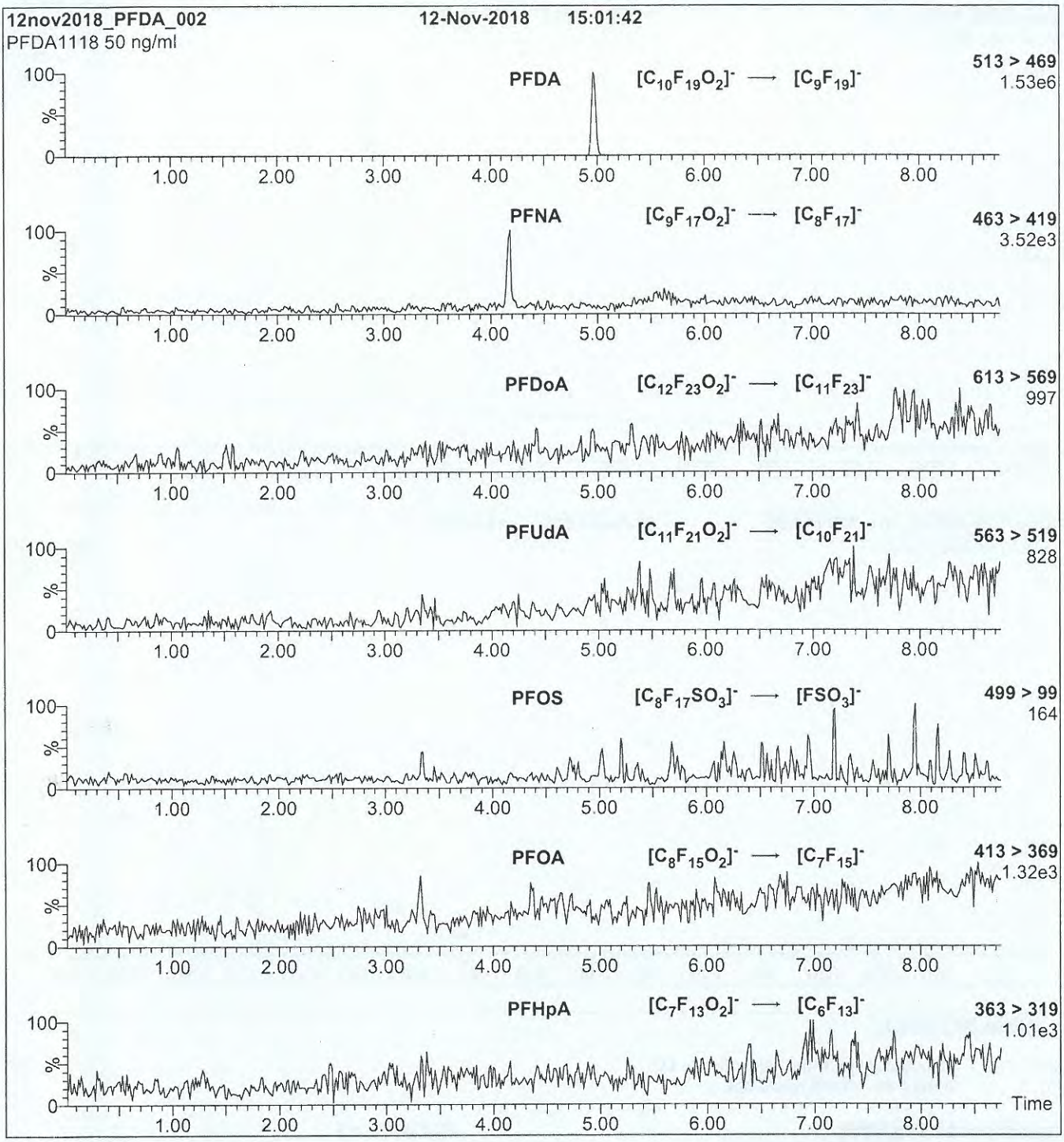
MS Parameters

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

1812038

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) = 3.04e-3
Collision Energy (eV) = 10

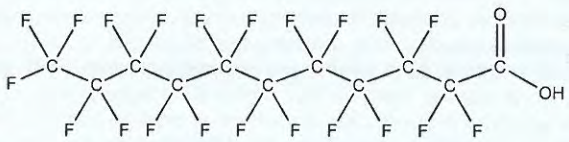
1812039

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA0818

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) 08/23/2018
EXPIRY DATE: (mm/dd/yyyy) 08/23/2023
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.
- 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:** 08/24/2018 (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

1812039

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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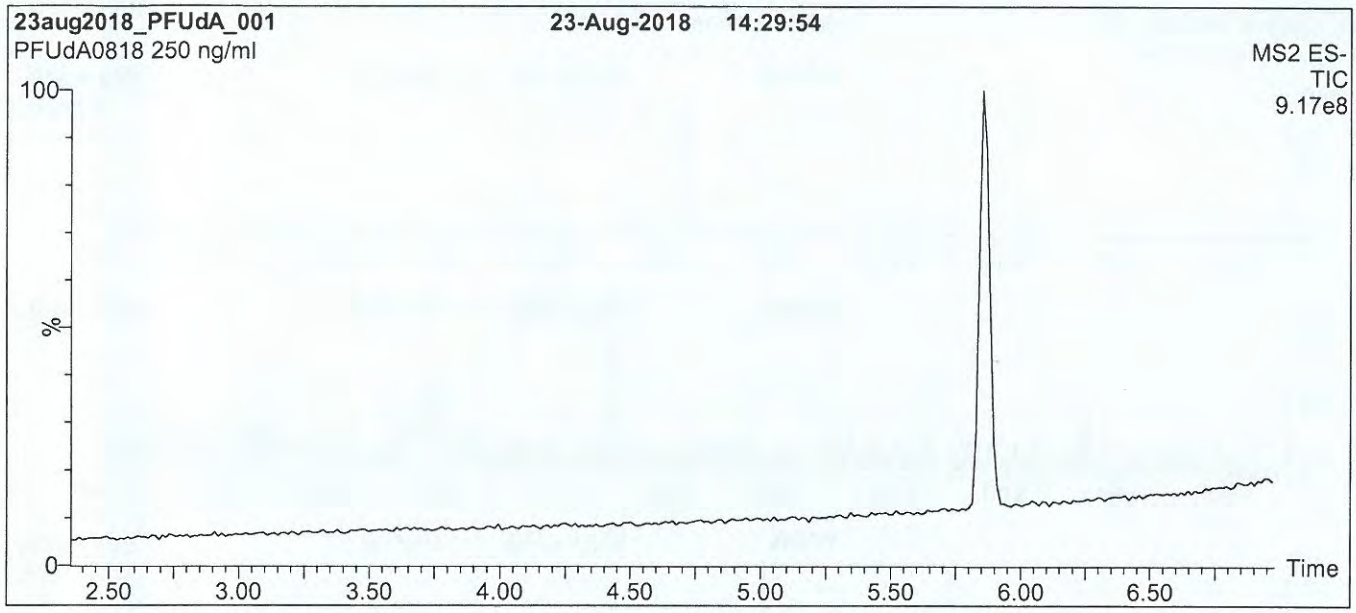
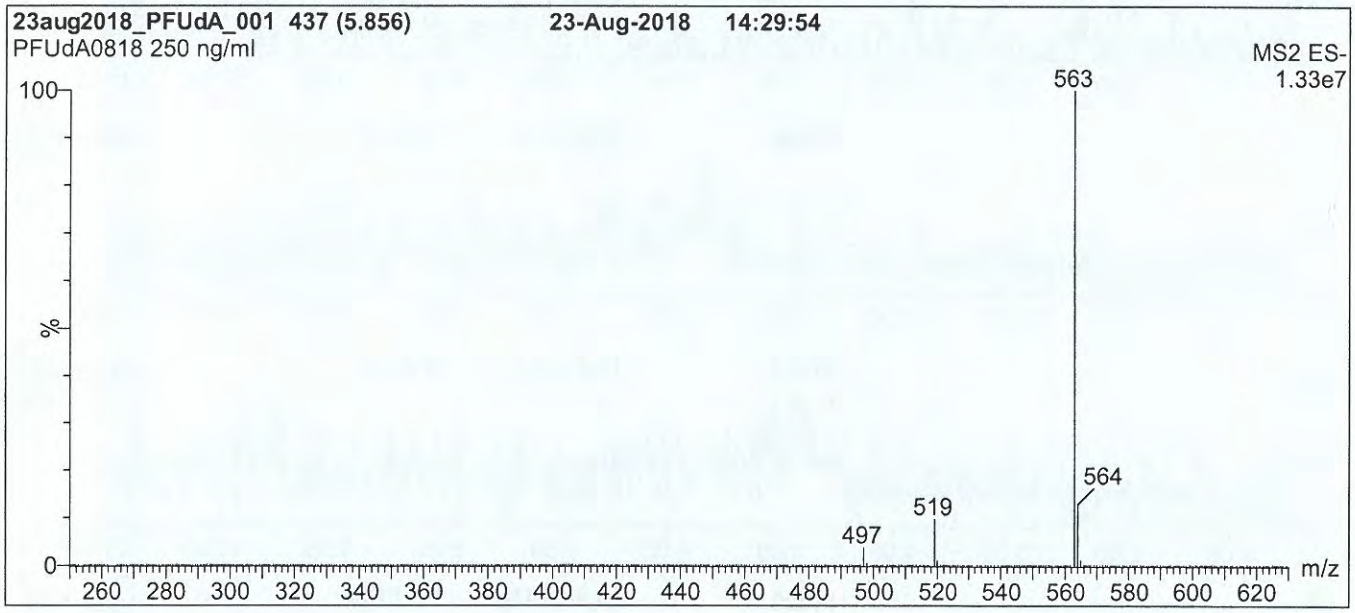
18L2039

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: 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

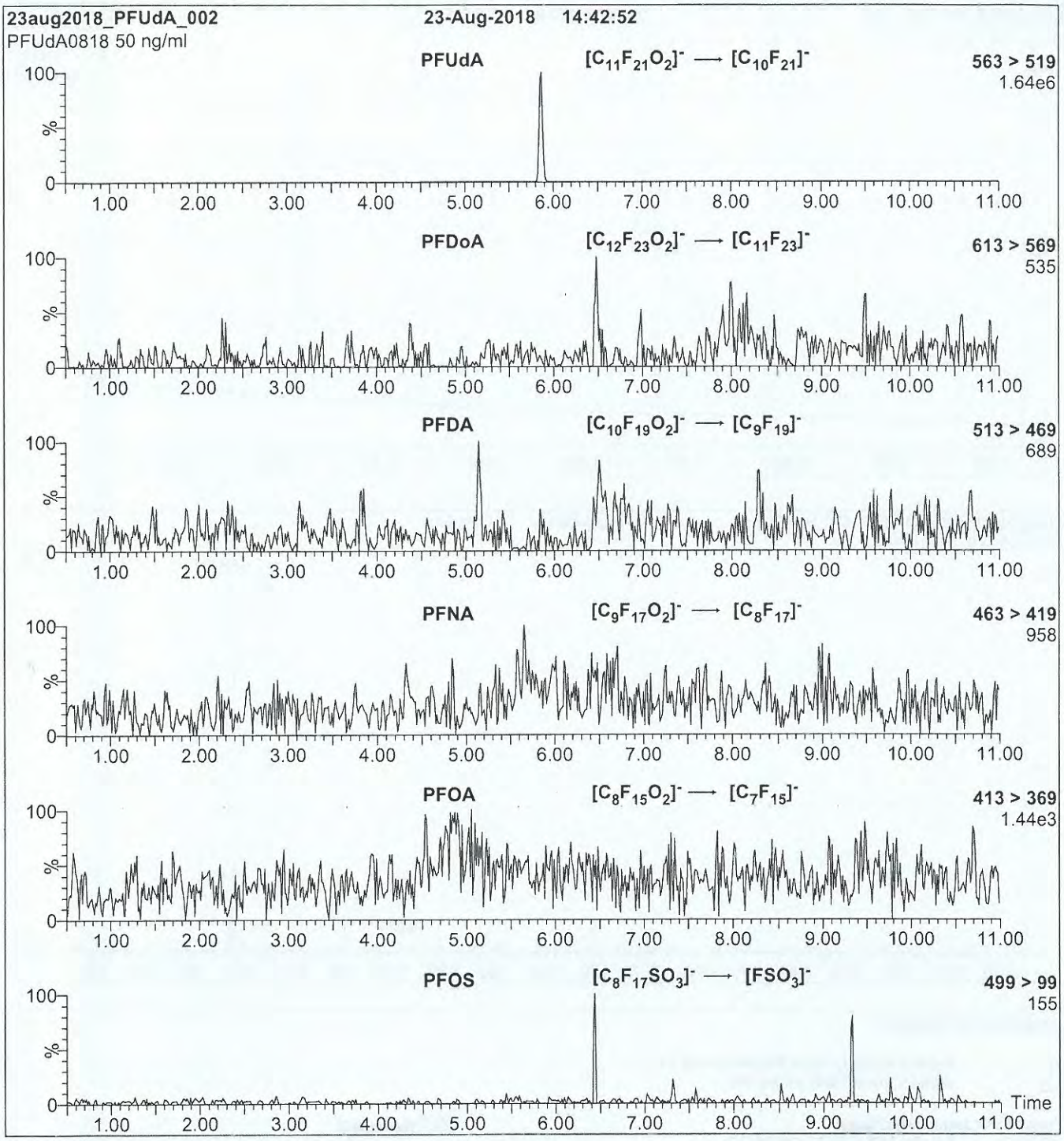
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1812039

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) = 3.45e-3
Collision Energy (eV) = 12

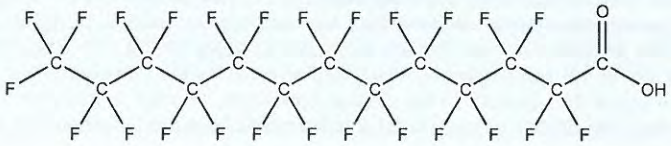
18L2040

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid
LOT NUMBER: PFTrDA0218

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) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
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 ~ 0.1% 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:** 02/20/2018 (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

1812040

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).

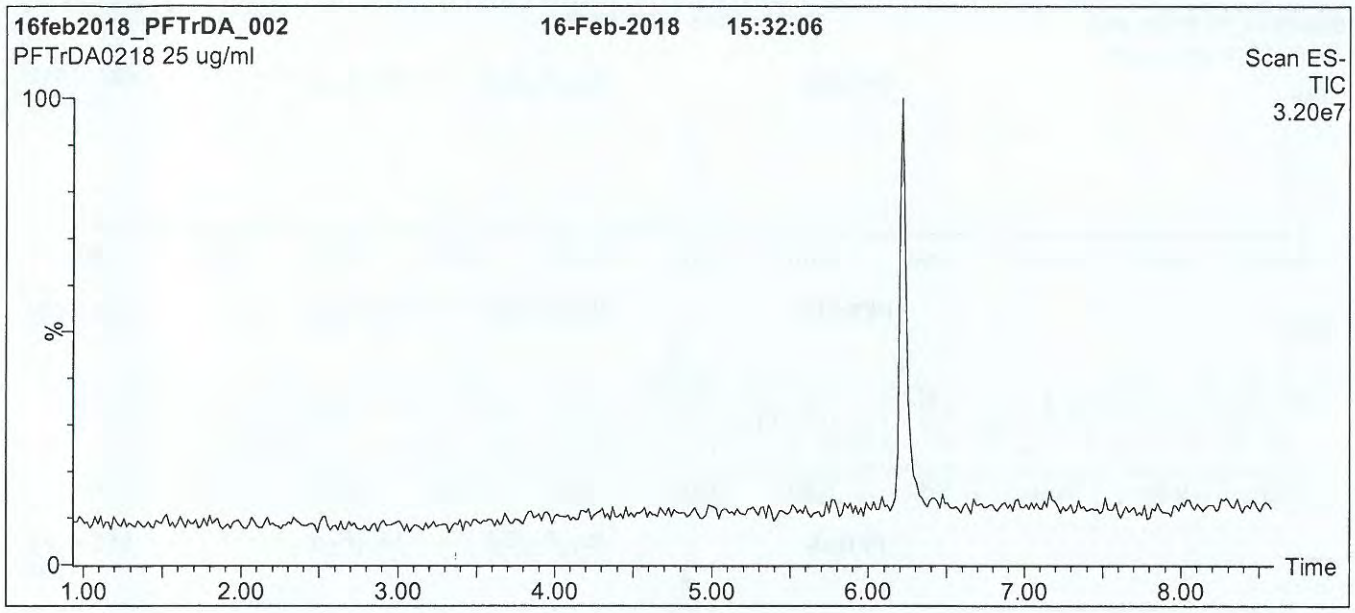
CALA Testing Accreditation No. A1226

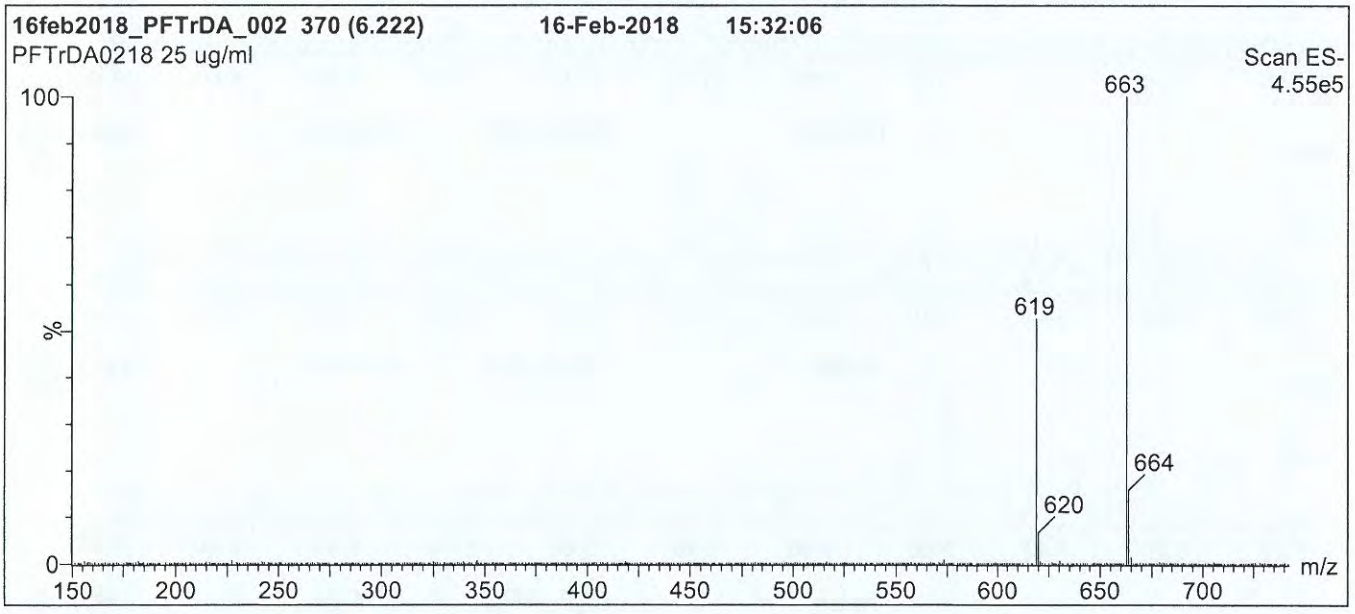
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2040

Figure 1: **PFTrDA; 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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

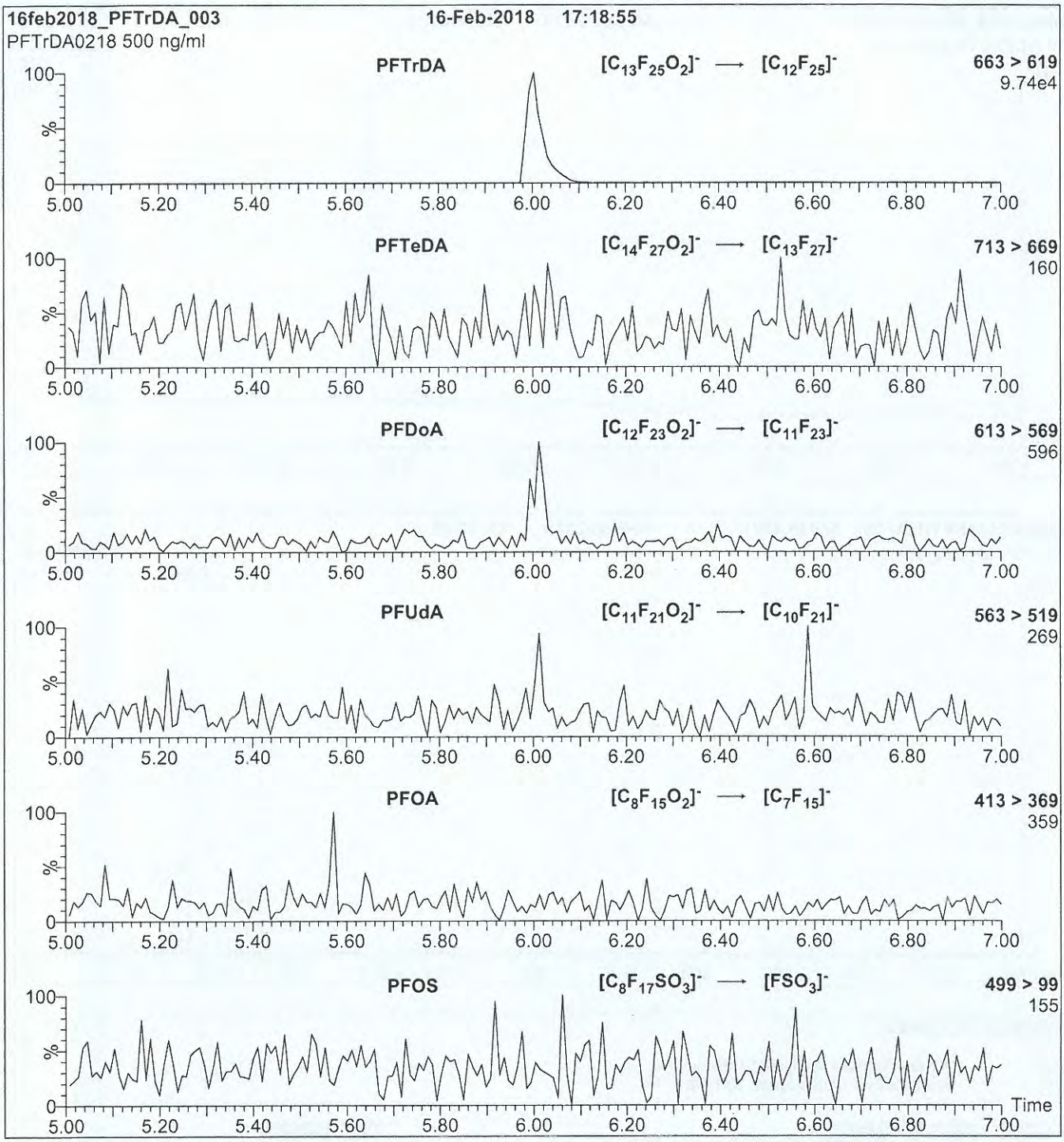
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

1862040

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

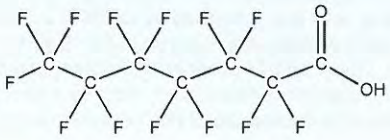
Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 15

1812041

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA0718
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)	07/12/2018		
EXPIRY DATE: (mm/dd/yyyy)	07/12/2023		
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:** 07/18/2018 (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

1812041

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).

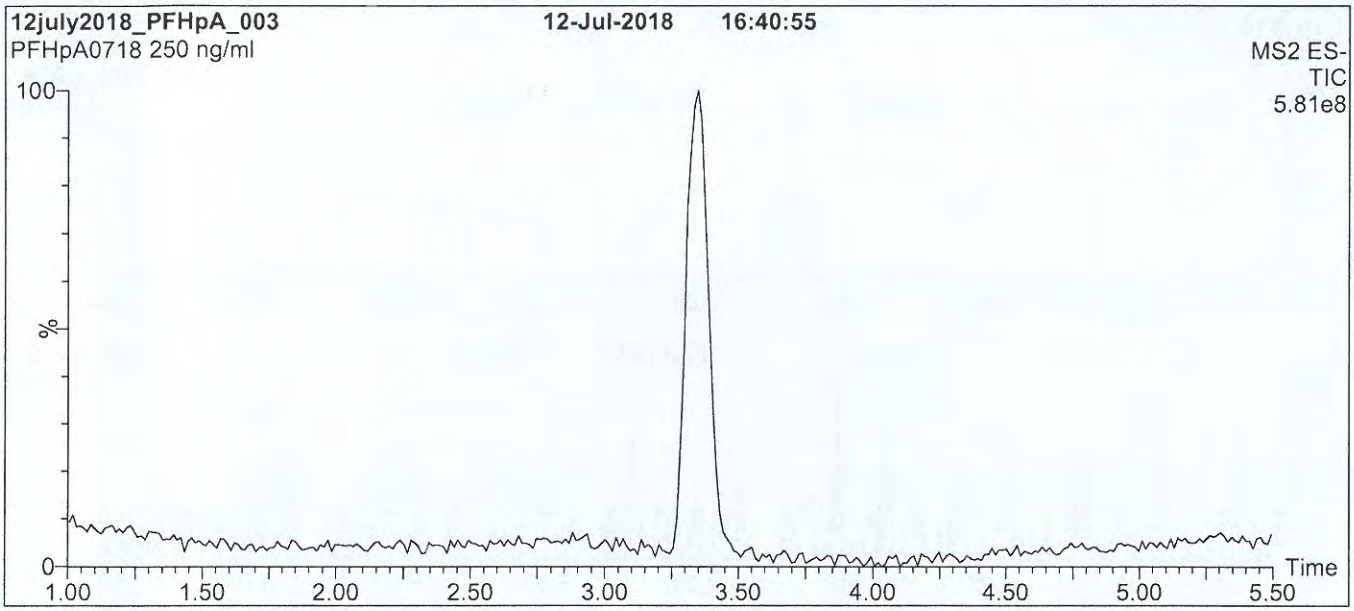
CALA Testing Accreditation No. A1226

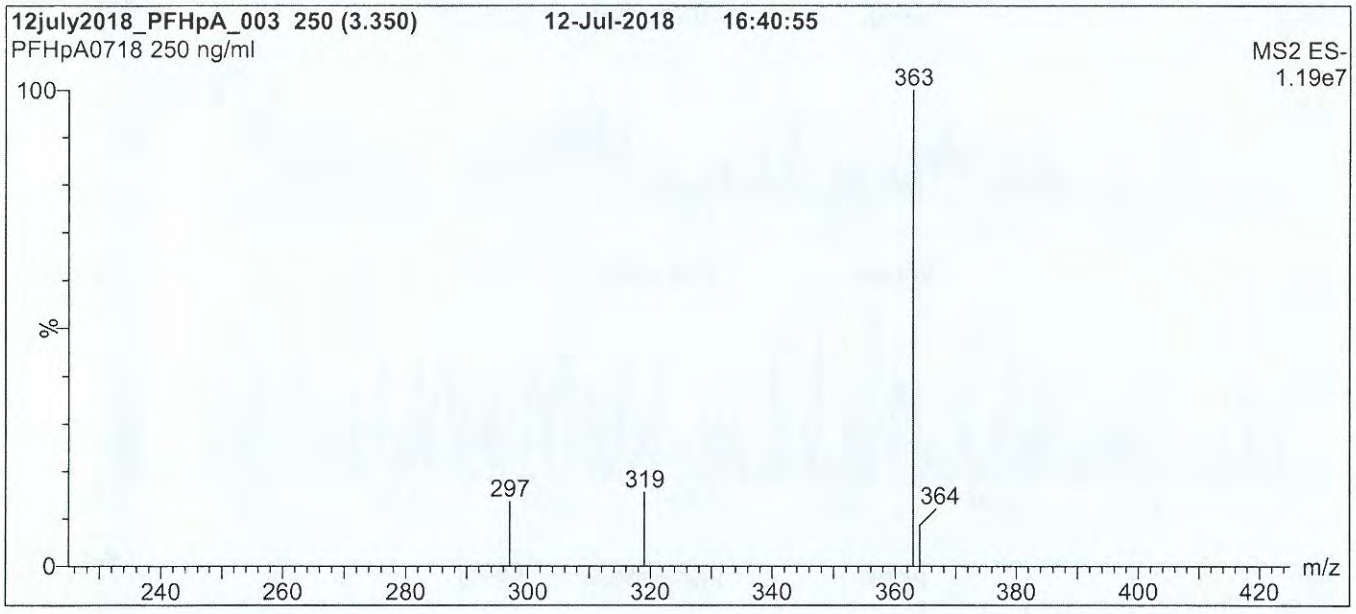
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2041

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 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

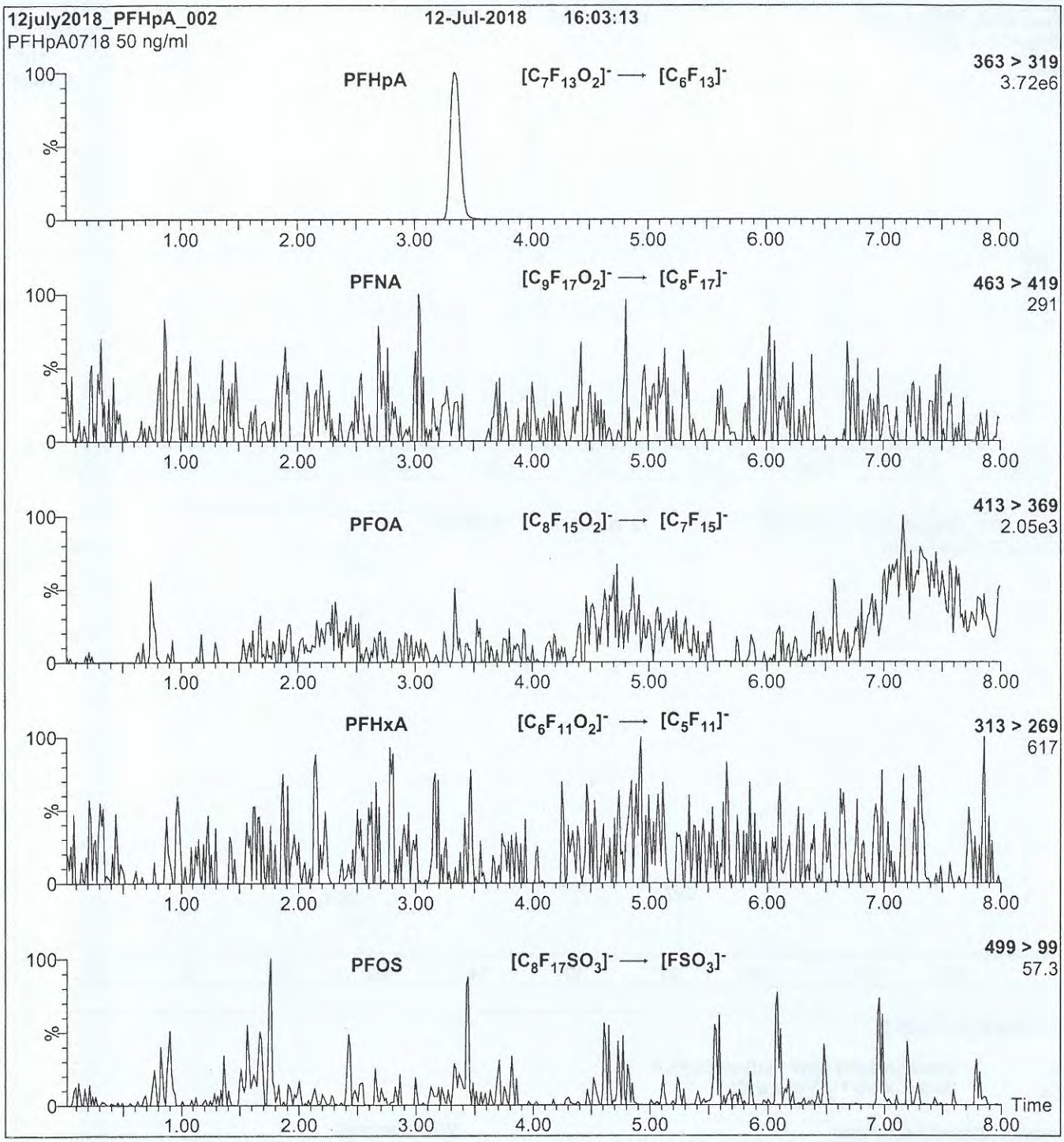
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2041

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

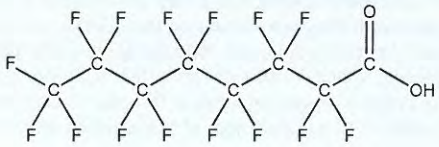
Collision Gas (mbar) = 3.47e-3
Collision Energy (eV) = 8

18L2042

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0818
COMPOUND:	Perfluoro-n-octanoic acid		
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)	08/23/2018		
EXPIRY DATE: (mm/dd/yyyy)	08/23/2023		
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.
- 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:** 08/24/2018 (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

1812042

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:

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HOMOGENEITY:

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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,...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.

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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:

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).

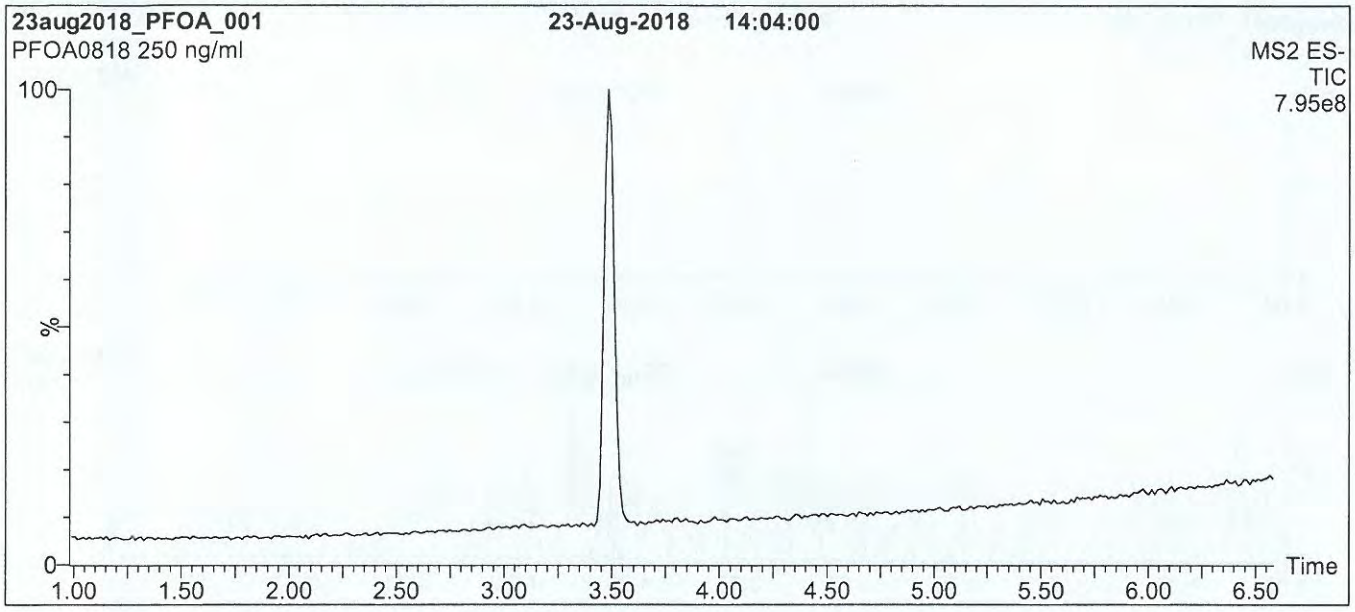
CALA Testing Accreditation No. A1226

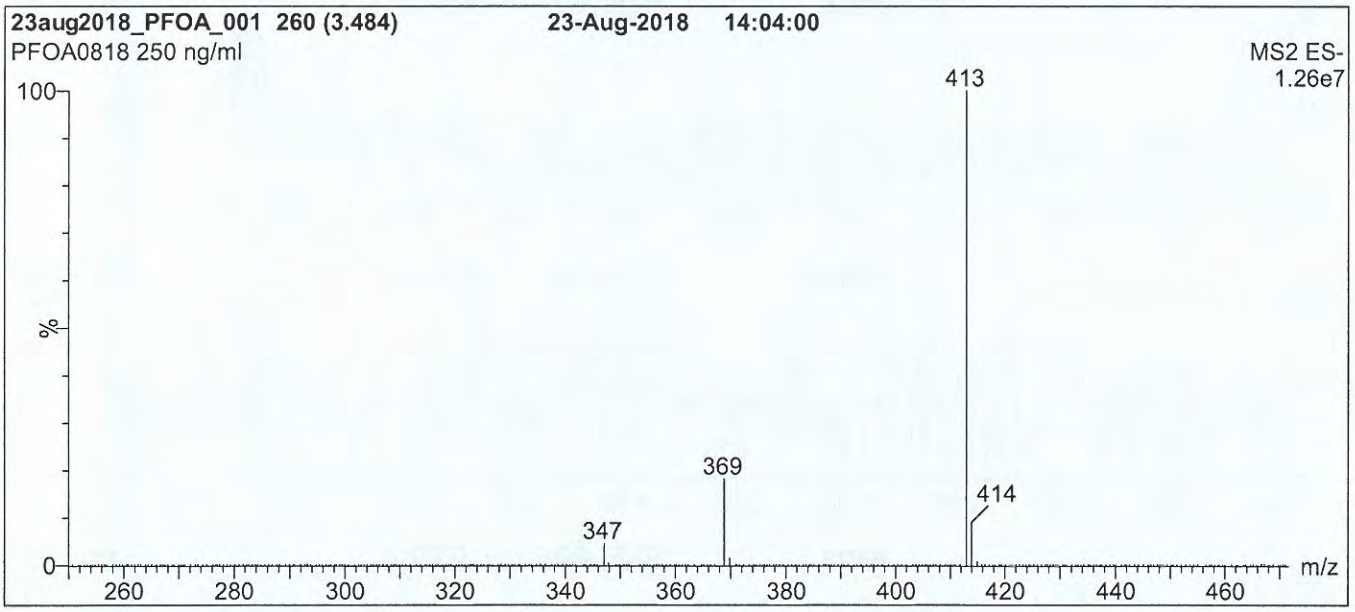
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2042

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: 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

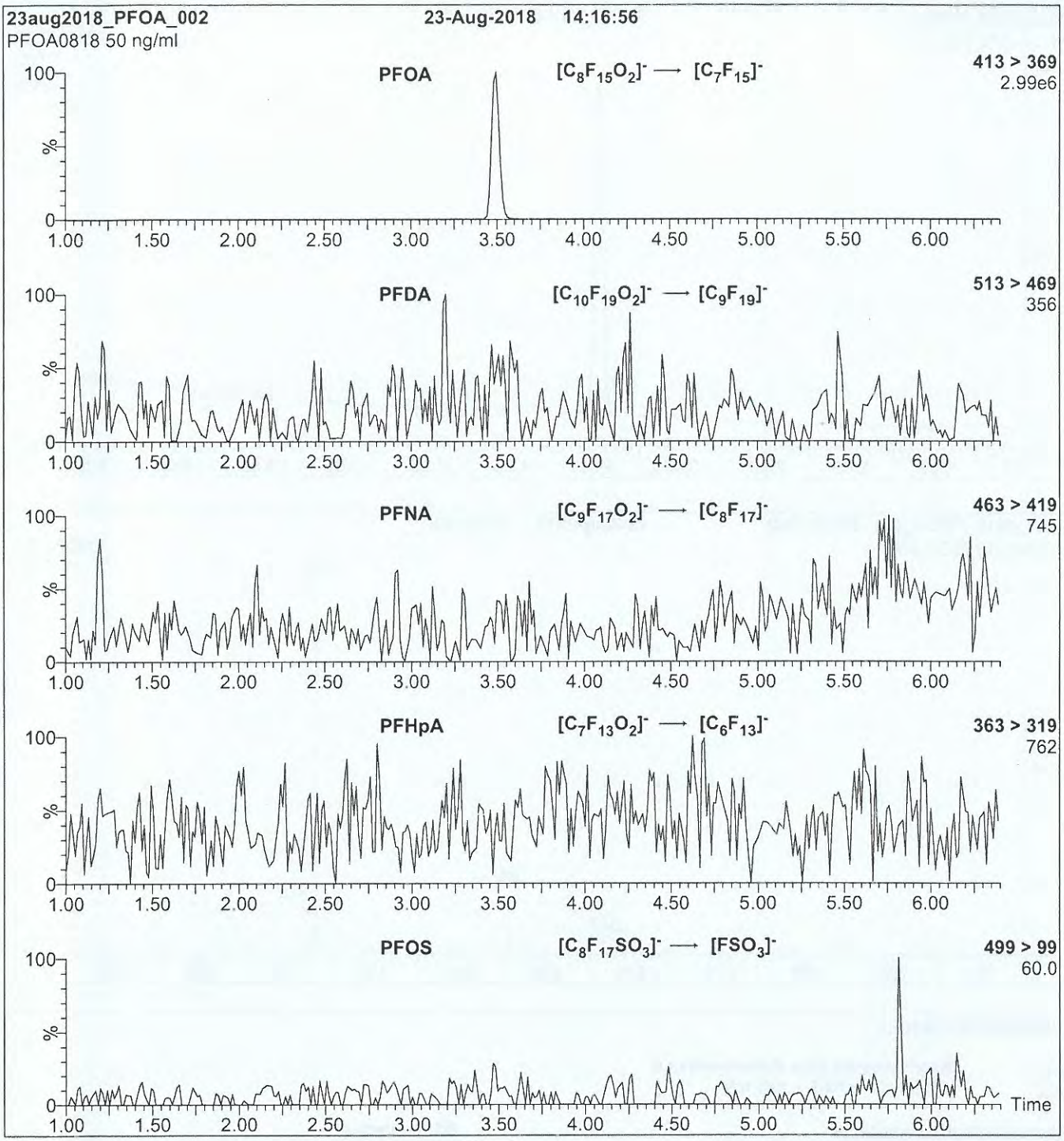
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1812042

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

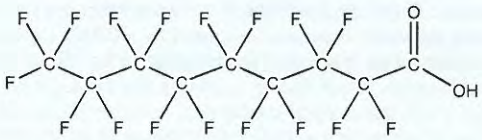
Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

1812043

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA0218
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)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
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 ~ 0.2% 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:** 02/20/2018 (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

18L2043

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).

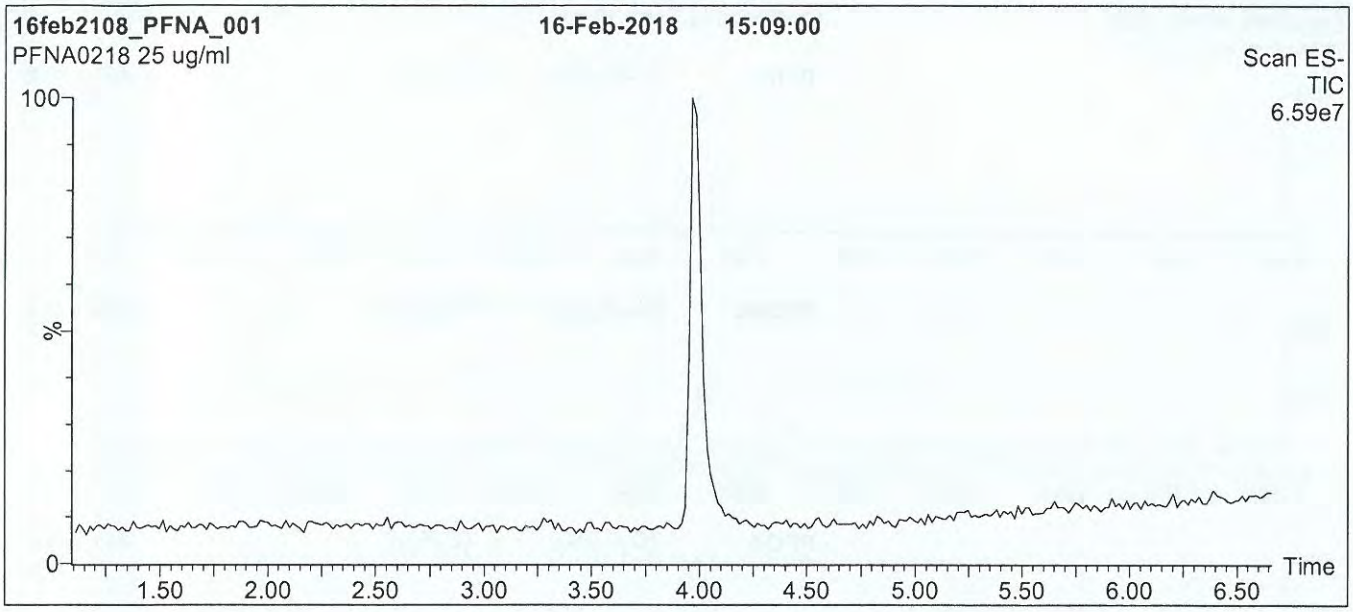
CALA Testing Accreditation No. A 1226

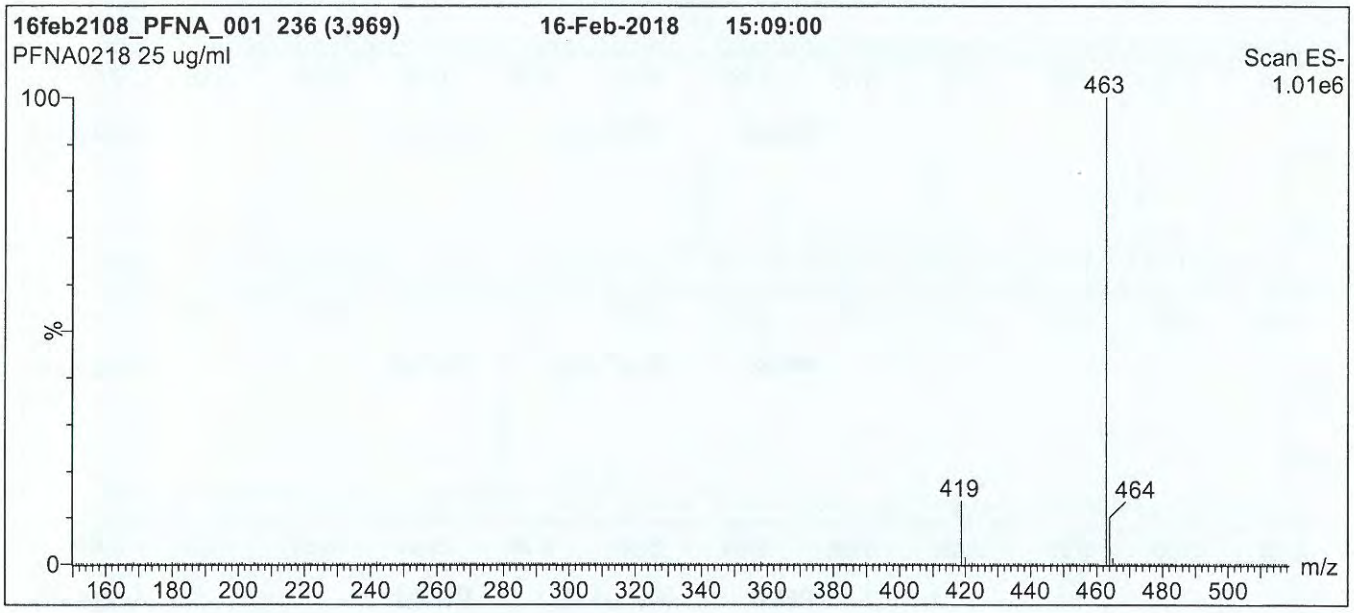
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2043

Figure 1: **PFNA; 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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

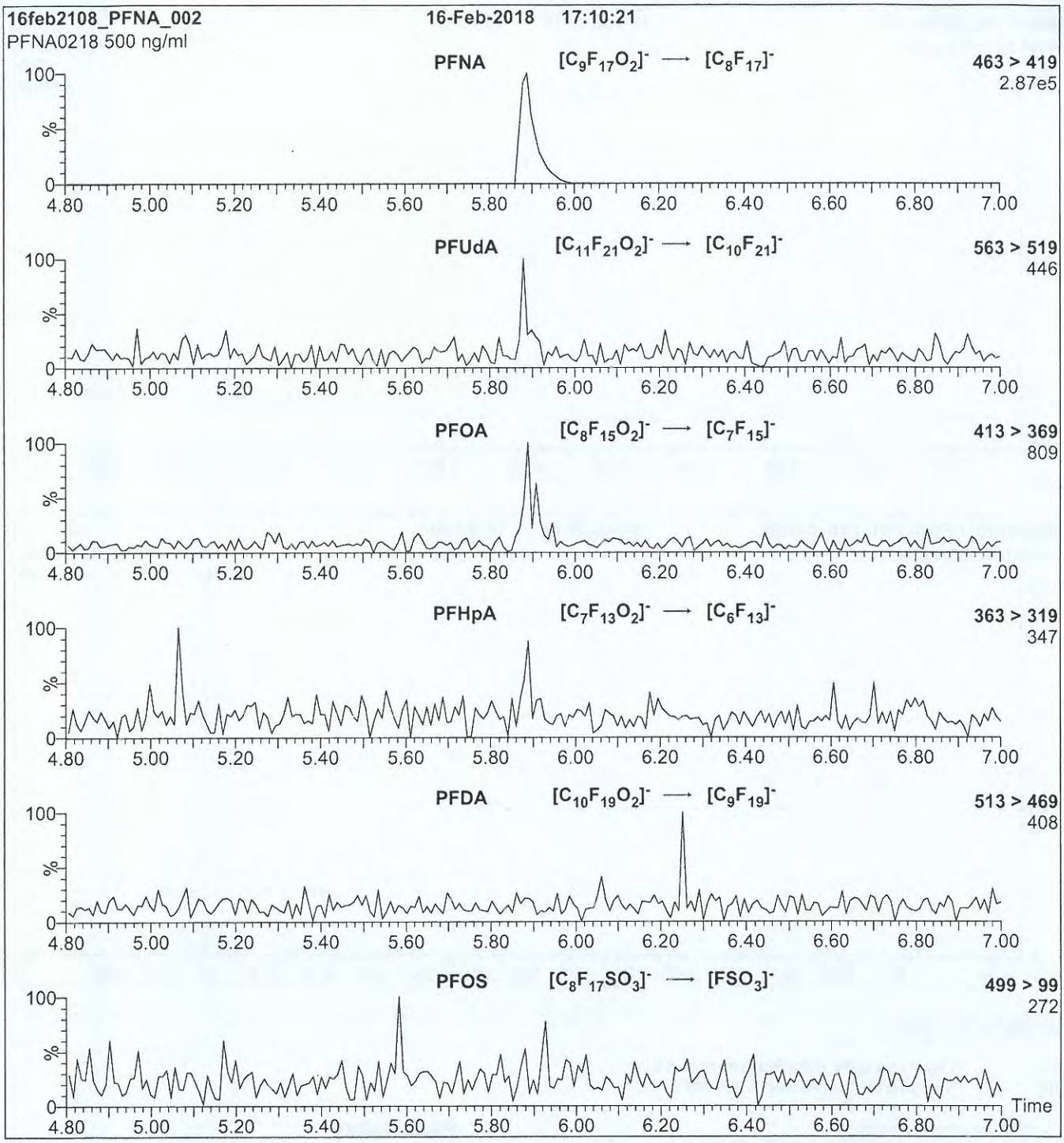
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

1812043

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

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) = 3.24e-3
Collision Energy (eV) = 11

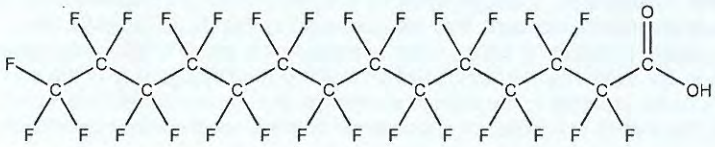
18L2044

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA0818

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) 08/23/2018
EXPIRY DATE: (mm/dd/yyyy) 08/23/2023
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.
- 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 PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/05/2018 (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

18L2044

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.

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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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).

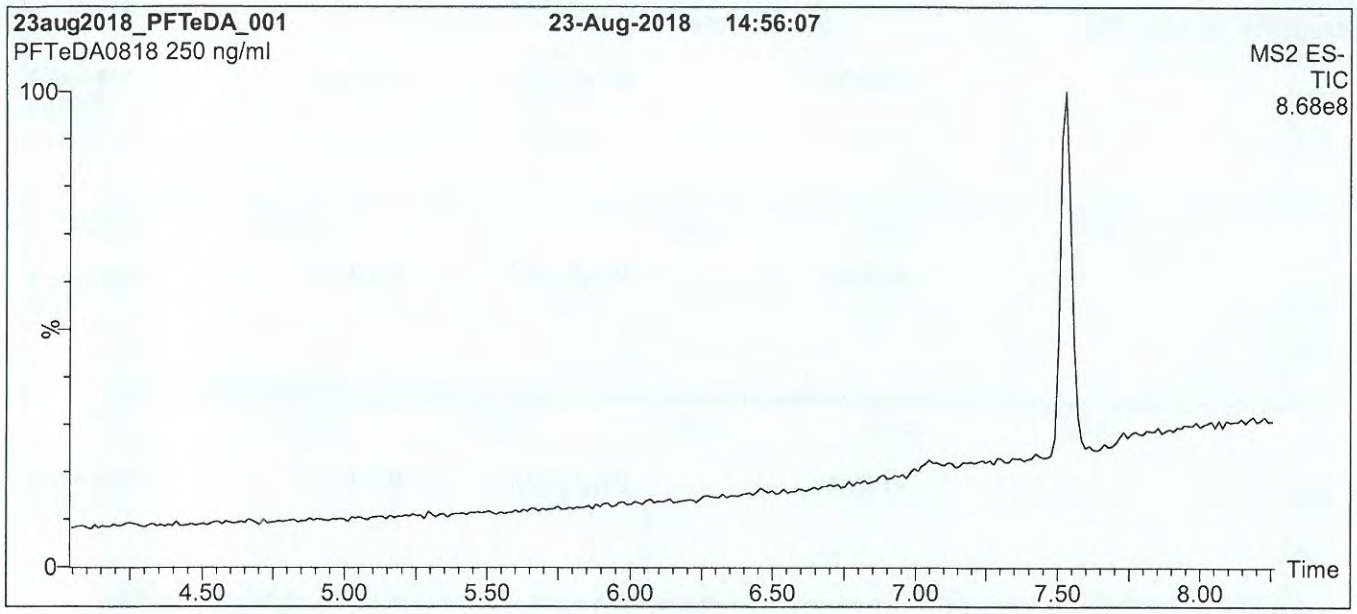
CALA Testing Accreditation No. A 1226

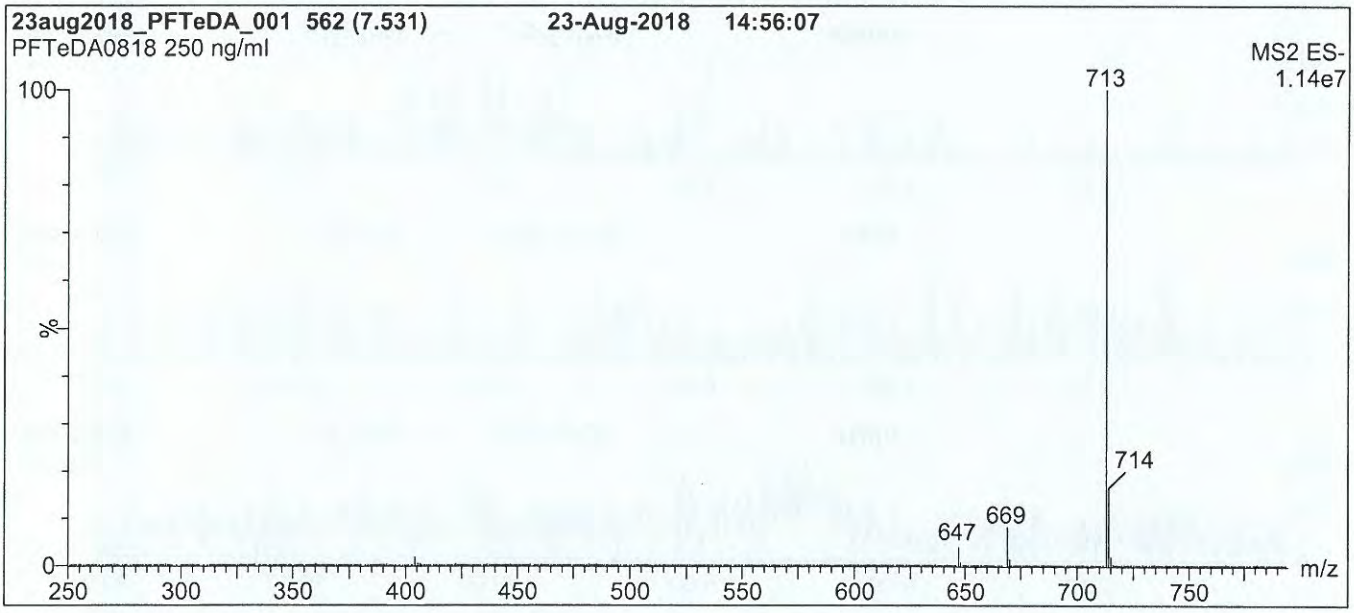
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812044

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: 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

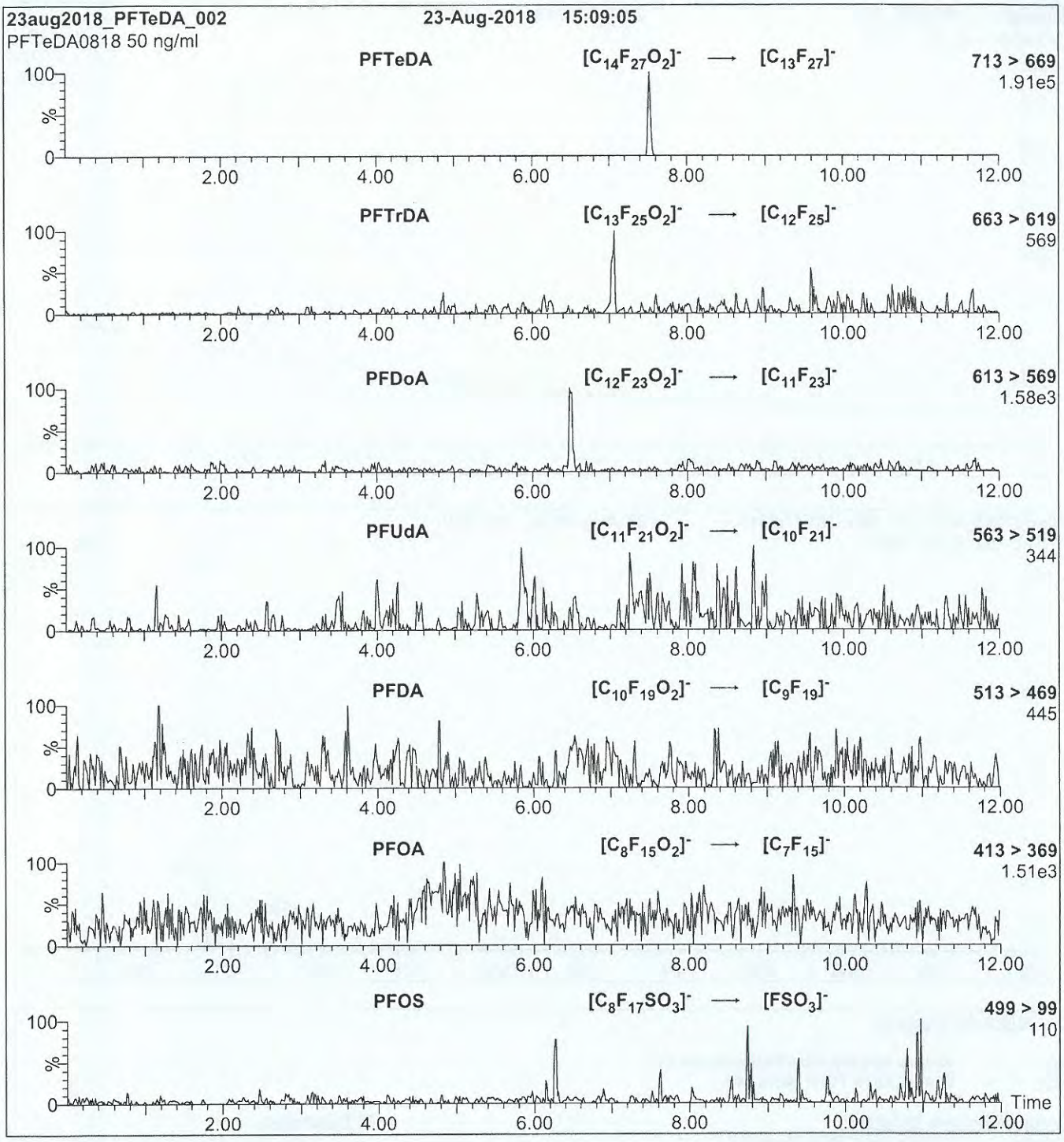
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2044

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) = 3.45e-3
Collision Energy (eV) = 12

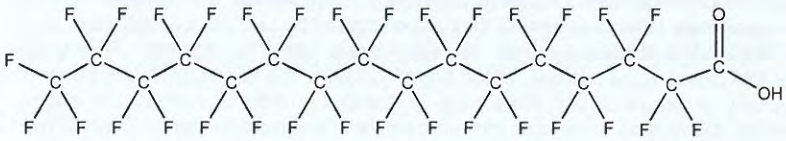
1812045

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
COMPOUND: Perfluoro-n-hexadecanoic acid
LOT NUMBER: PFHxDA0717

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) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (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

1812045

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).

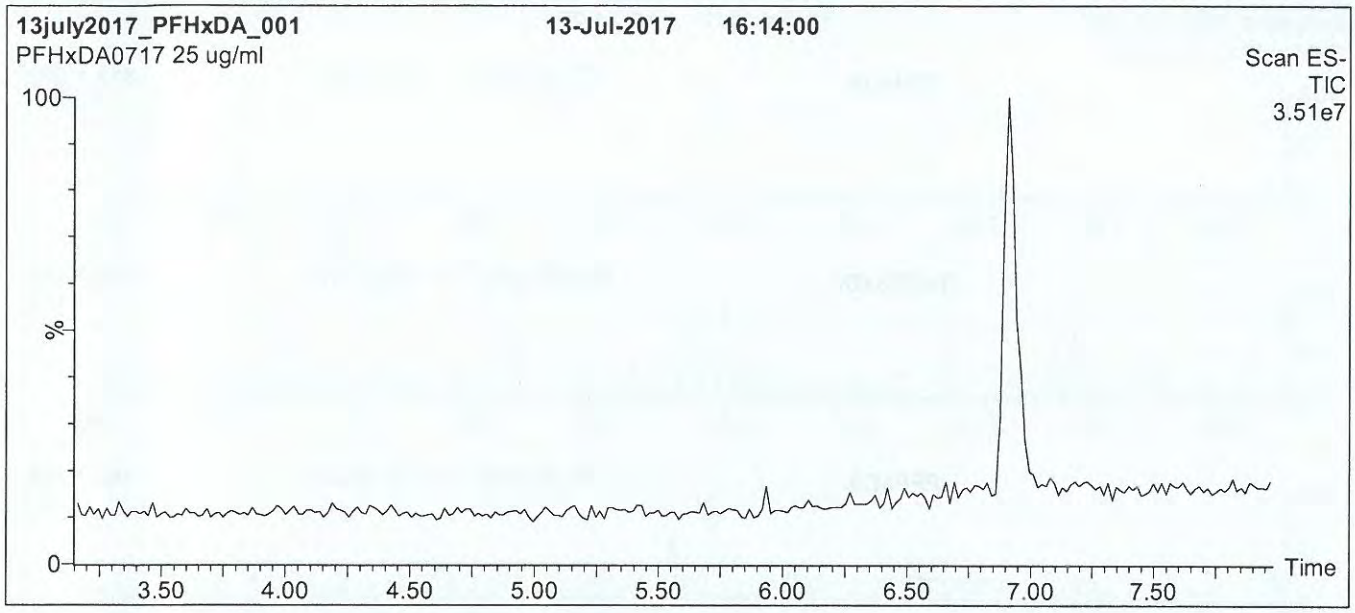
CALA Testing Accreditation No. A 1226

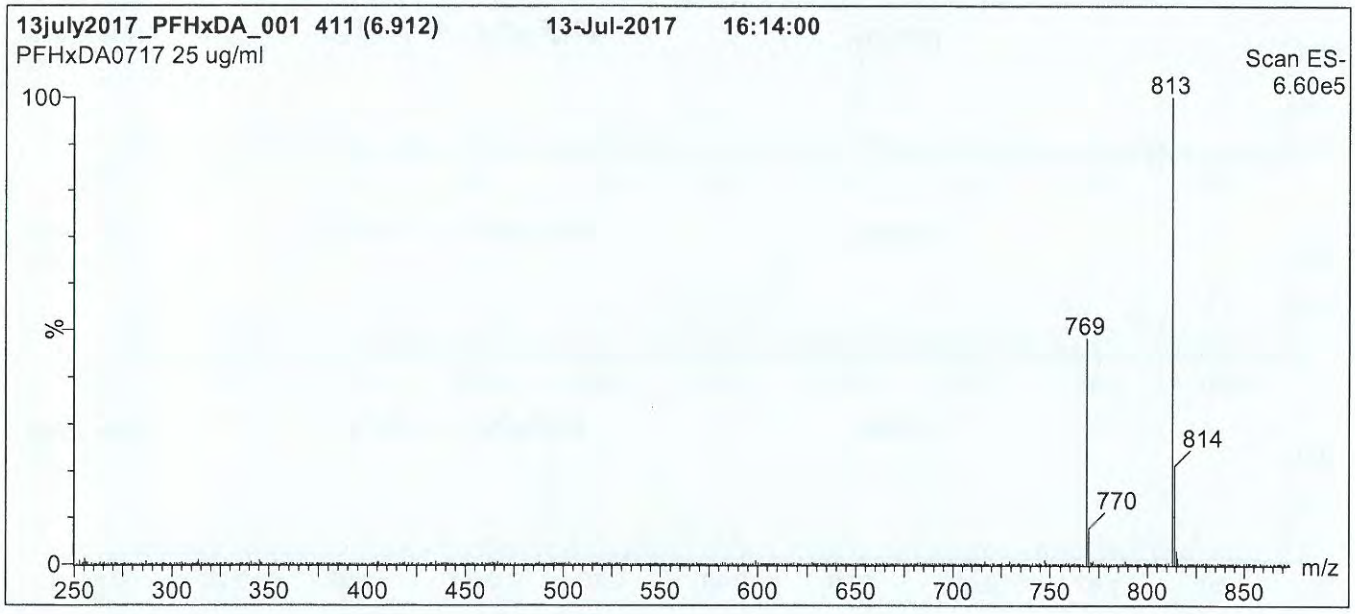
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2045

Figure 1: **PFHxDA; 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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

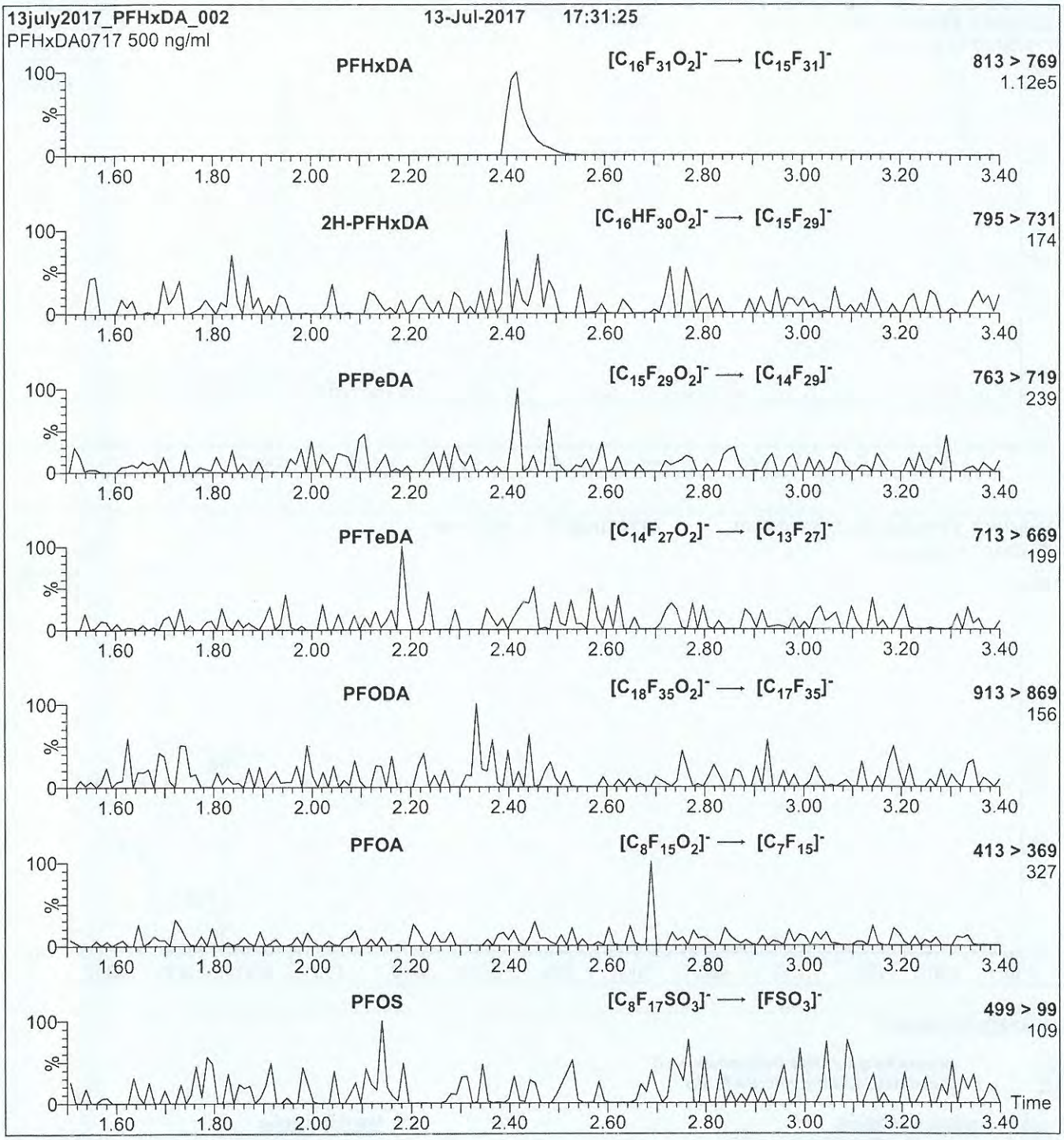
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

182045

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

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) = 3.13e-3
Collision Energy (eV) = 15

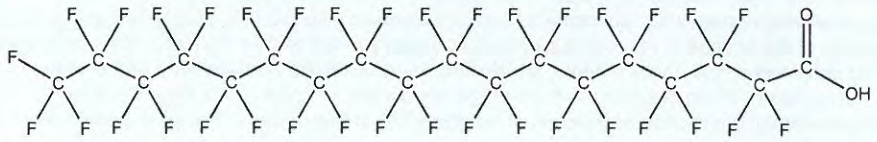
18L2046

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0717

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) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (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

1812046

INTENDED USE:

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HAZARDS:

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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:

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).

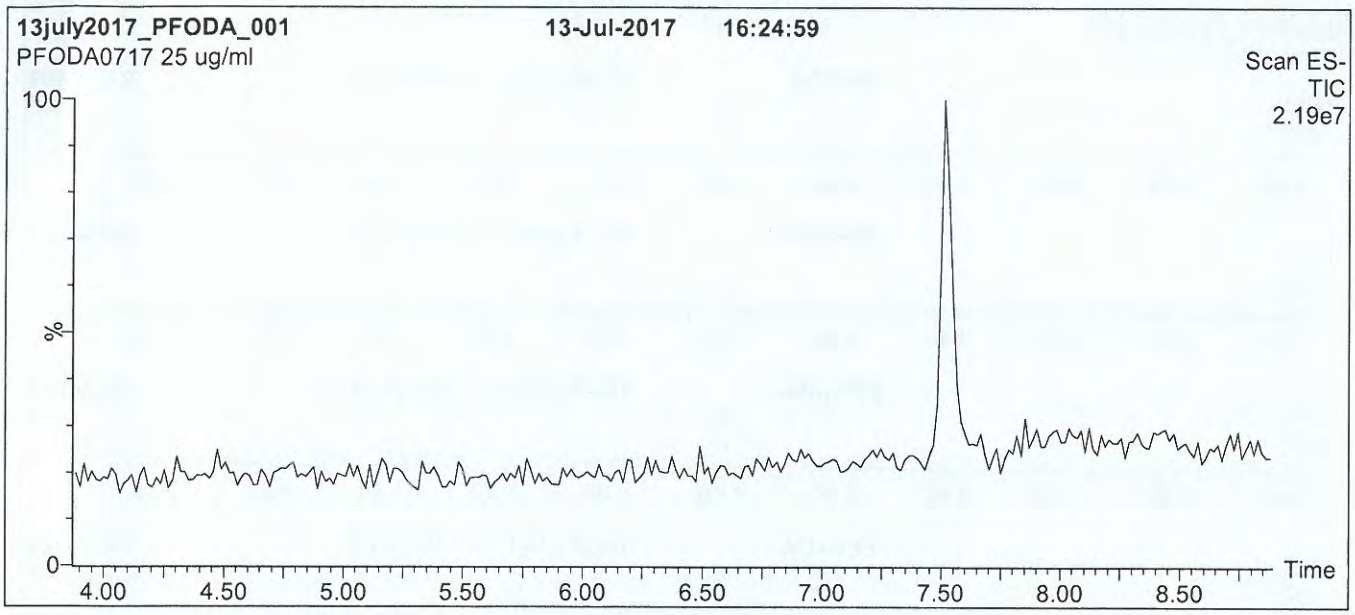
CALA Testing Accreditation No. A 1226

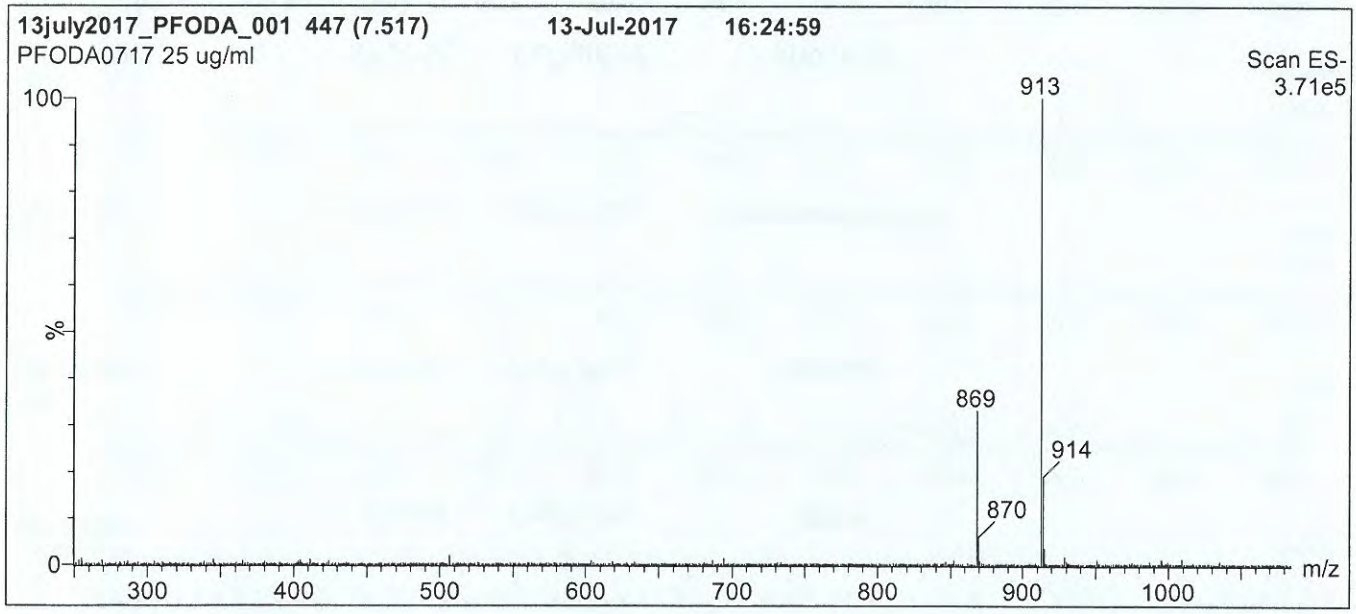
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812046

Figure 1: **PFODA; 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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

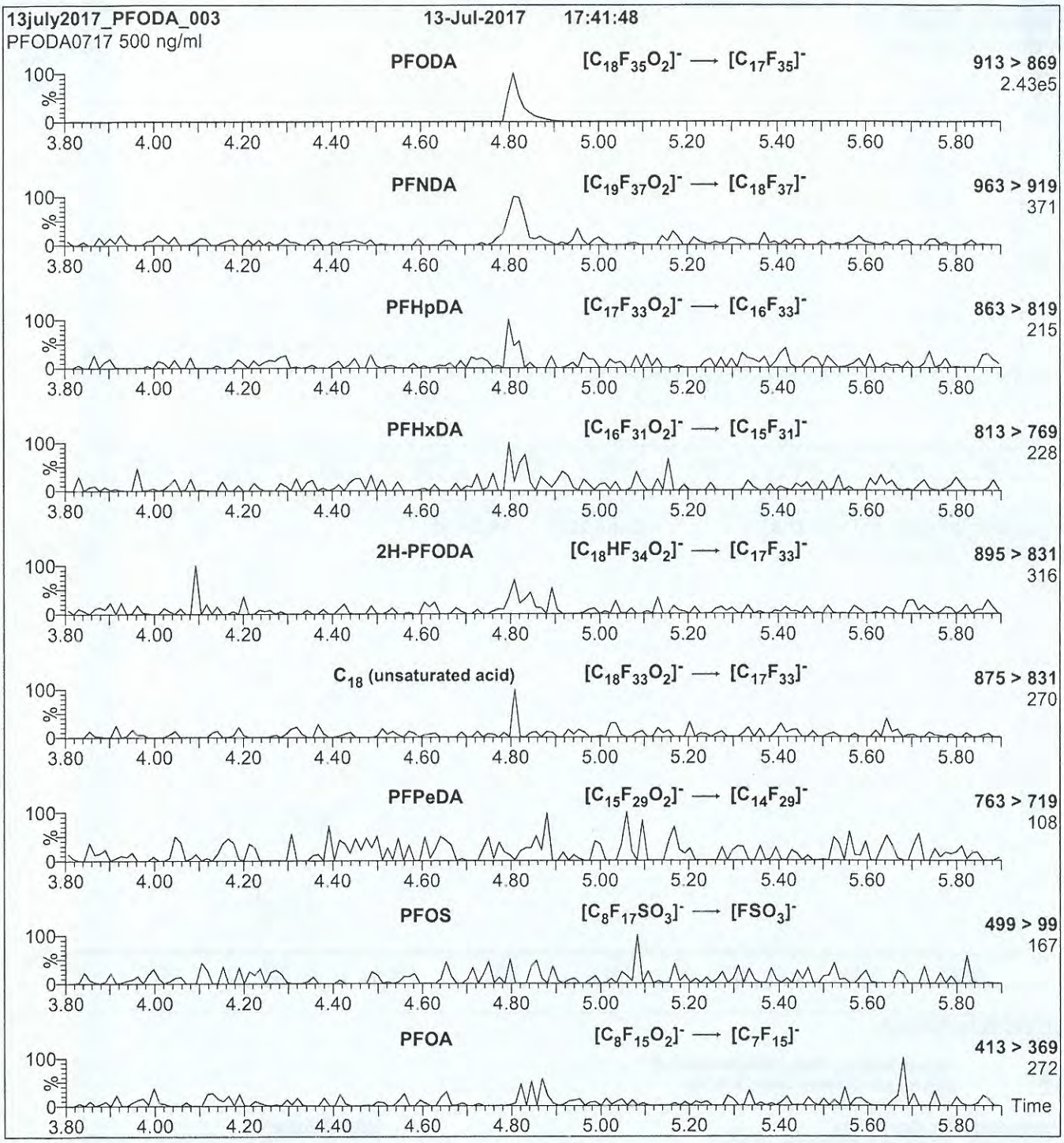
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18L2046

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

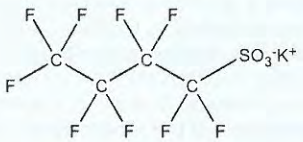
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

1812047

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0418
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)	05/04/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/04/2023		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2018 (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

1812047

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.

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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.

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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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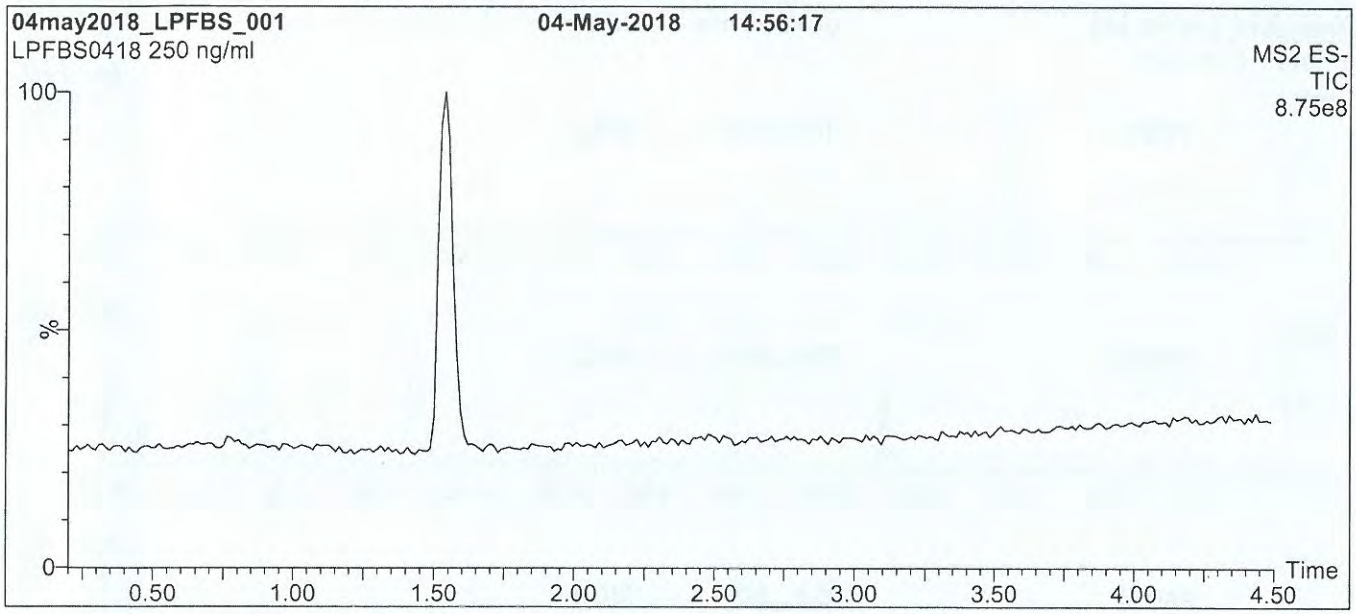
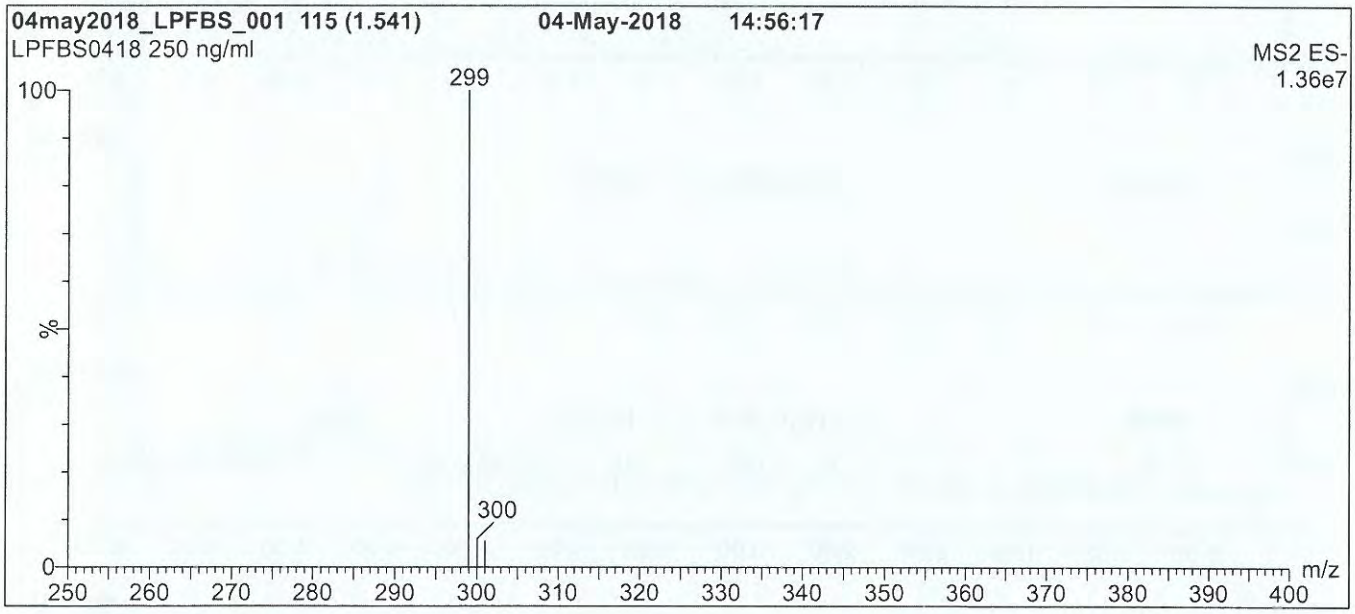
18L2047

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 80% 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

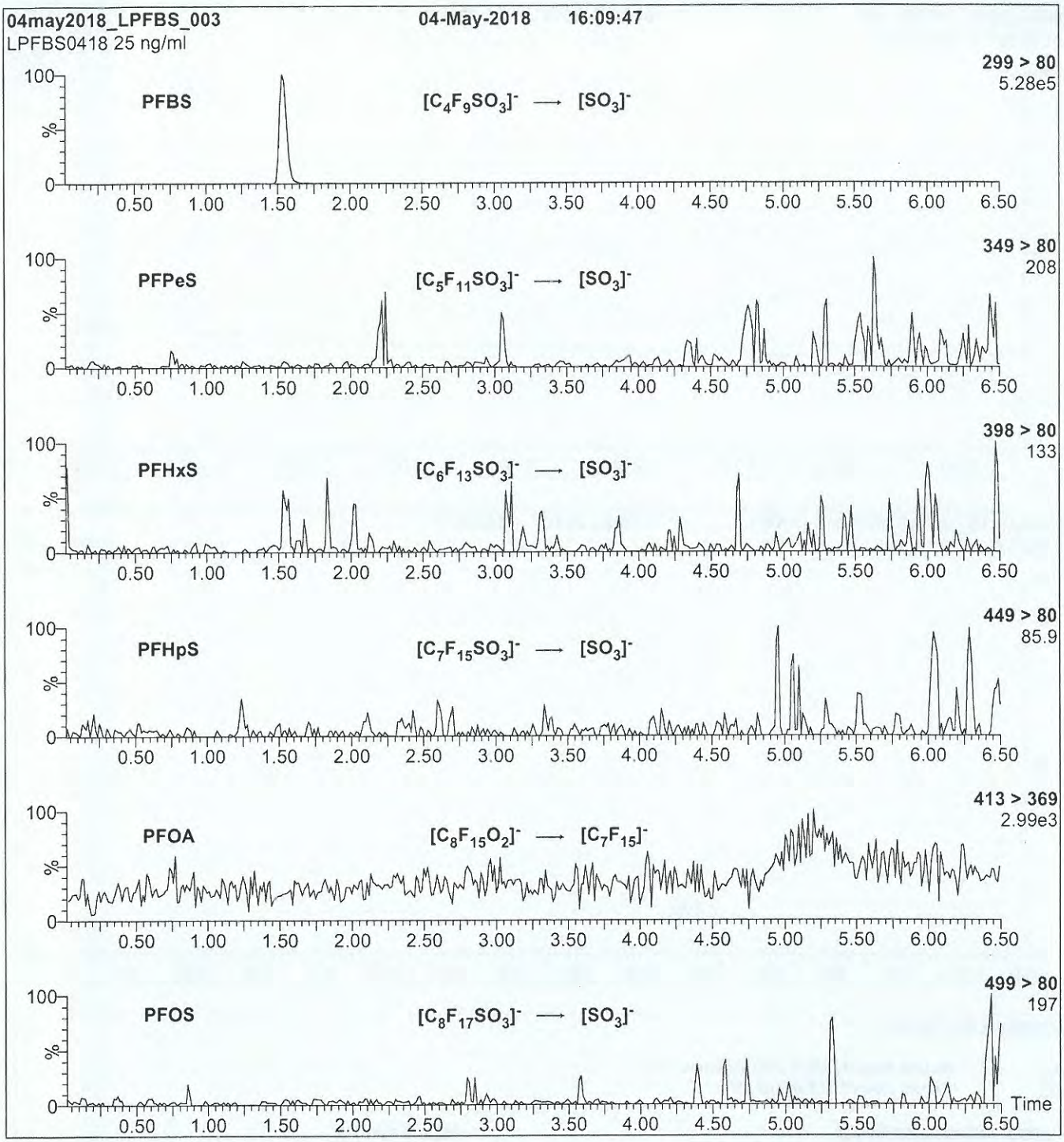
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812047

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) = 3.45e-3
Collision Energy (eV) = 30

1812048

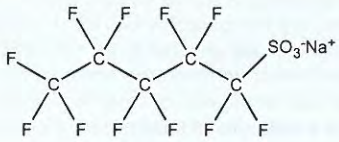
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate
LOT NUMBER: LPFPeS0718

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)	07/12/2018		
EXPIRY DATE: (mm/dd/yyyy)	07/12/2023		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/18/2018 (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

1812048

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:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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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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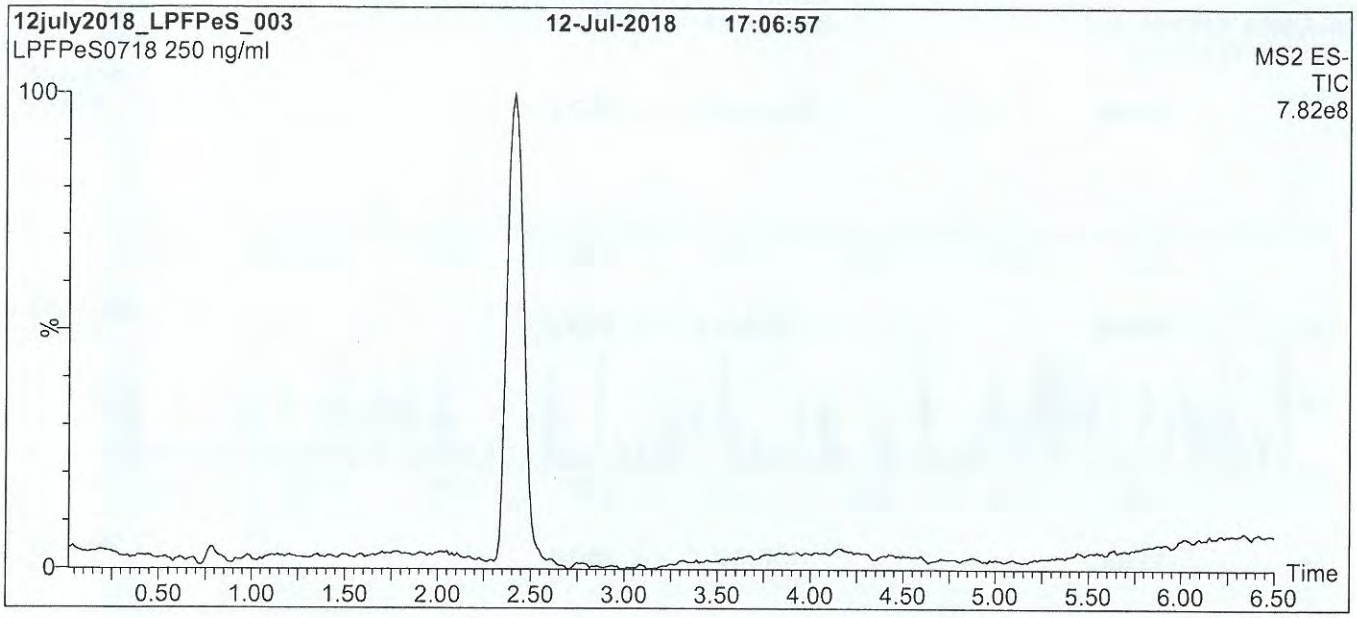
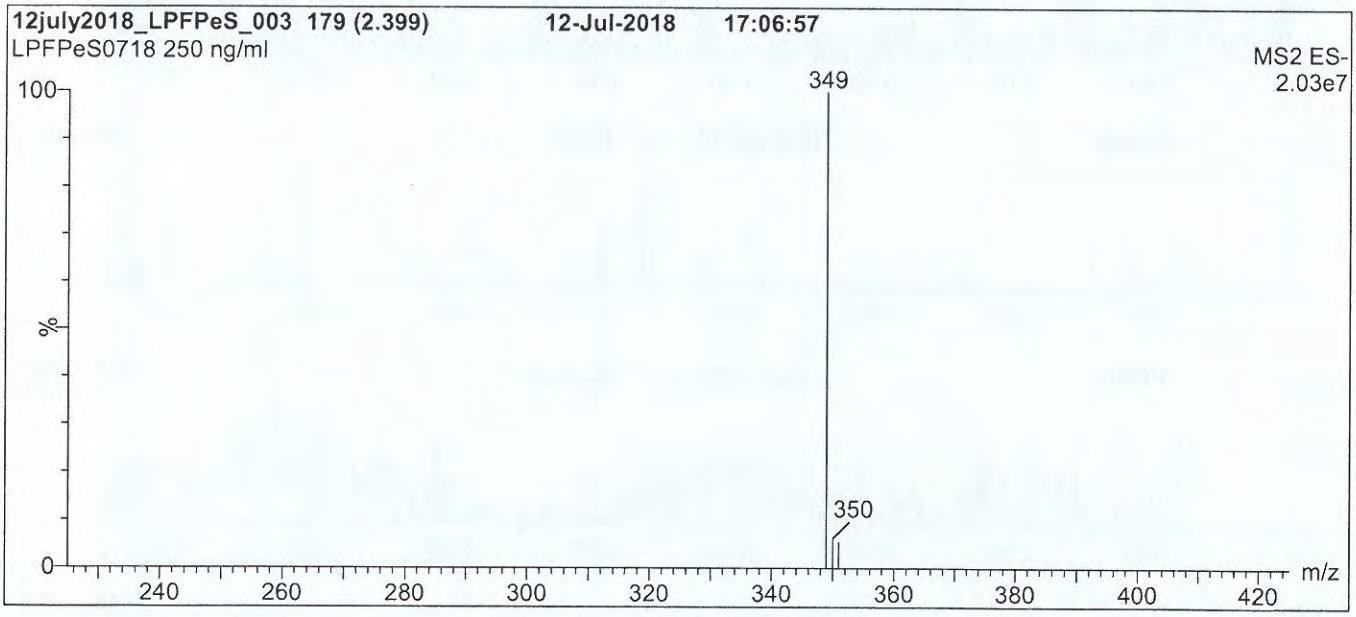
18L2048

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: 50% (80:20 MeOH:ACN) / 50% 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

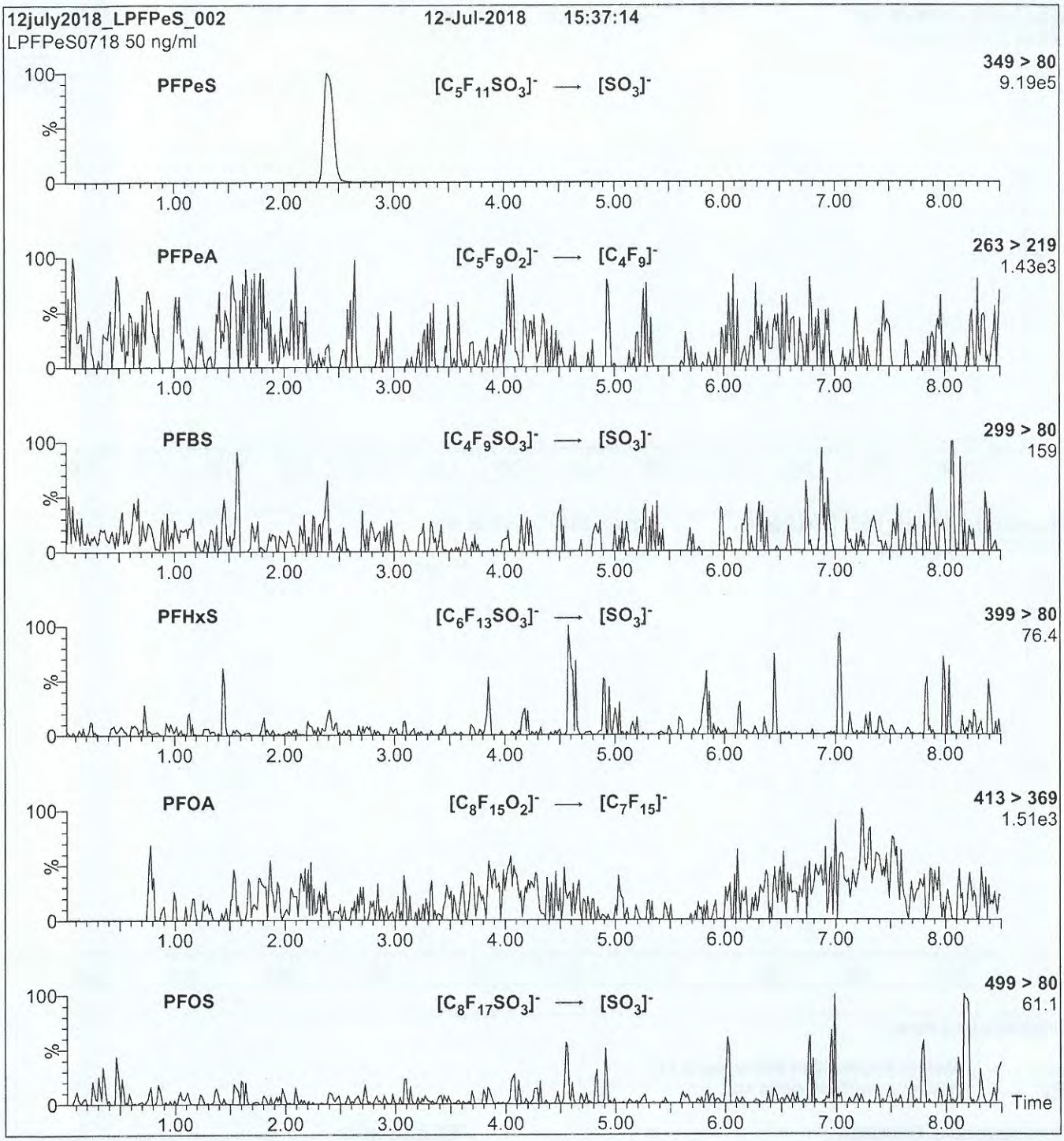
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1812048

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) = 3.47e-3
Collision Energy (eV) = 32

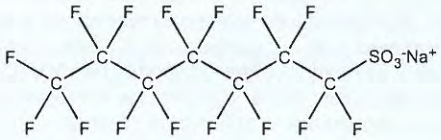
18L2049

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS0418

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/04/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/04/2023		
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 ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/17/2018 (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

1812049

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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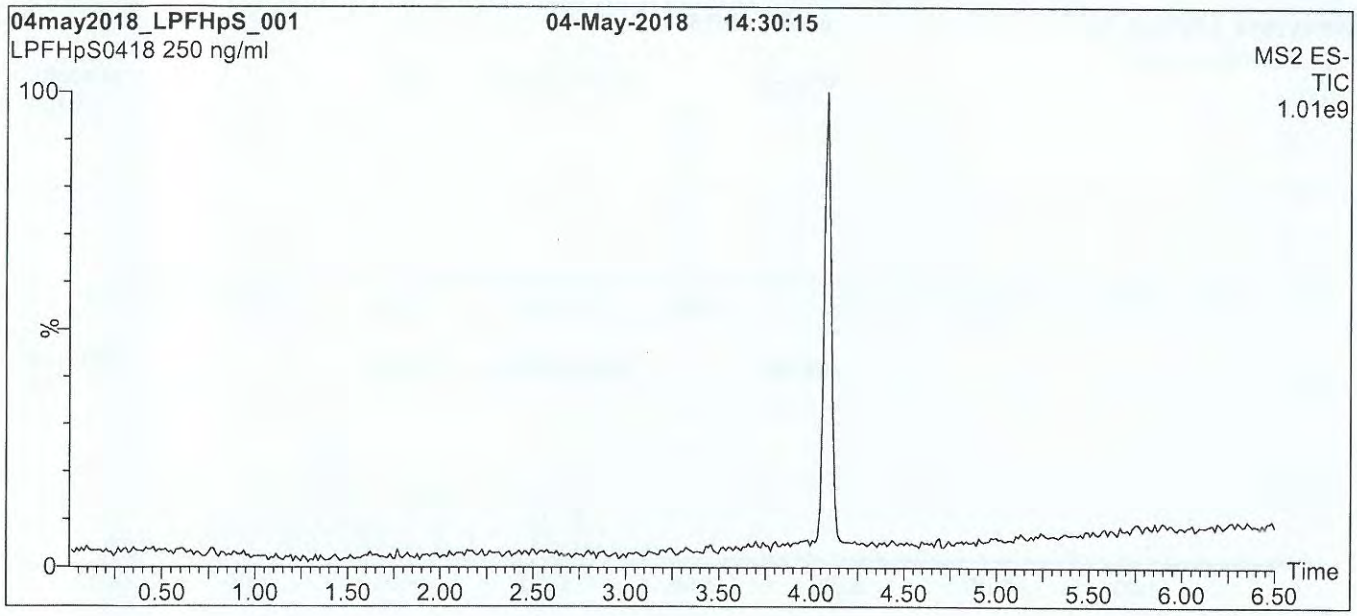
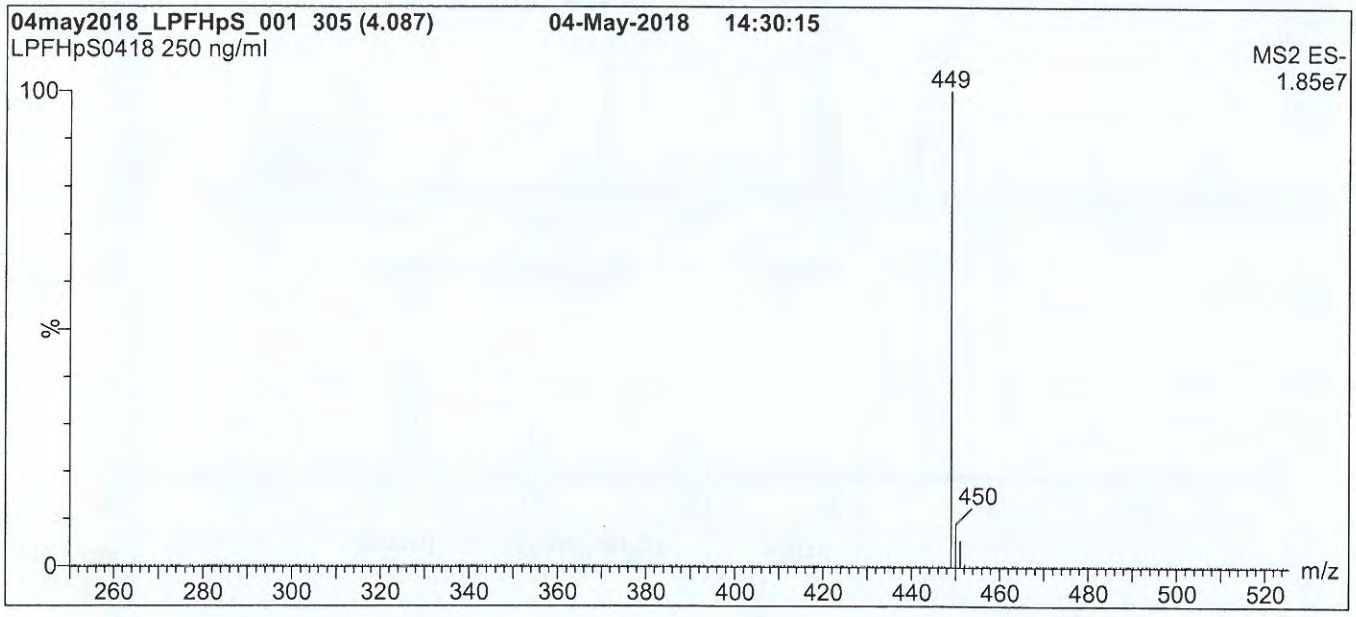
18L2049

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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% 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

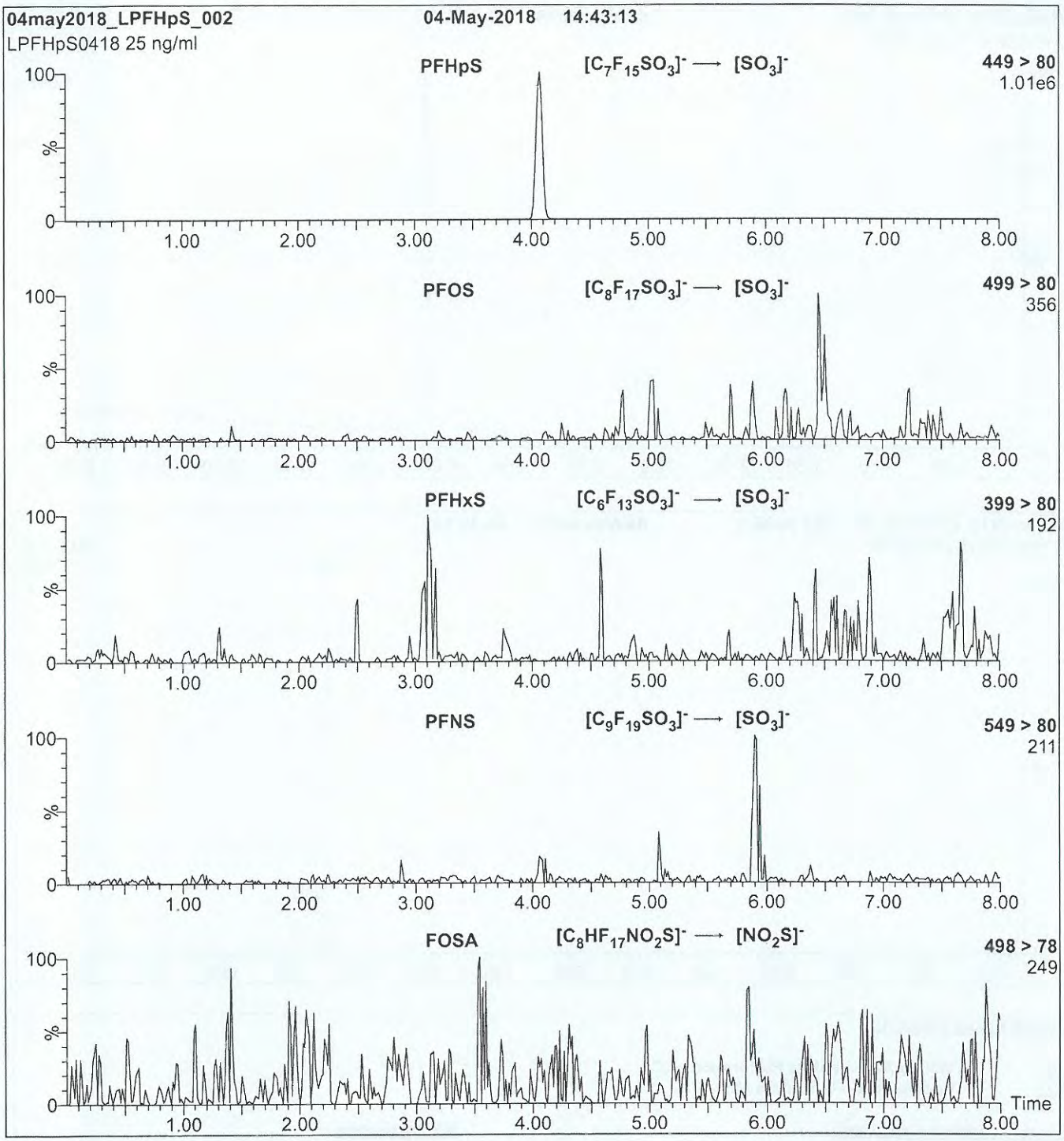
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18L2049

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

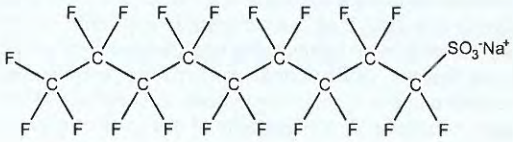
MS Parameters
Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 42

18L2050

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFNS	**LOT NUMBER:**	LPFNS0718
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)	07/13/2018		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2023		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/18/2018 (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

18L2050

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).

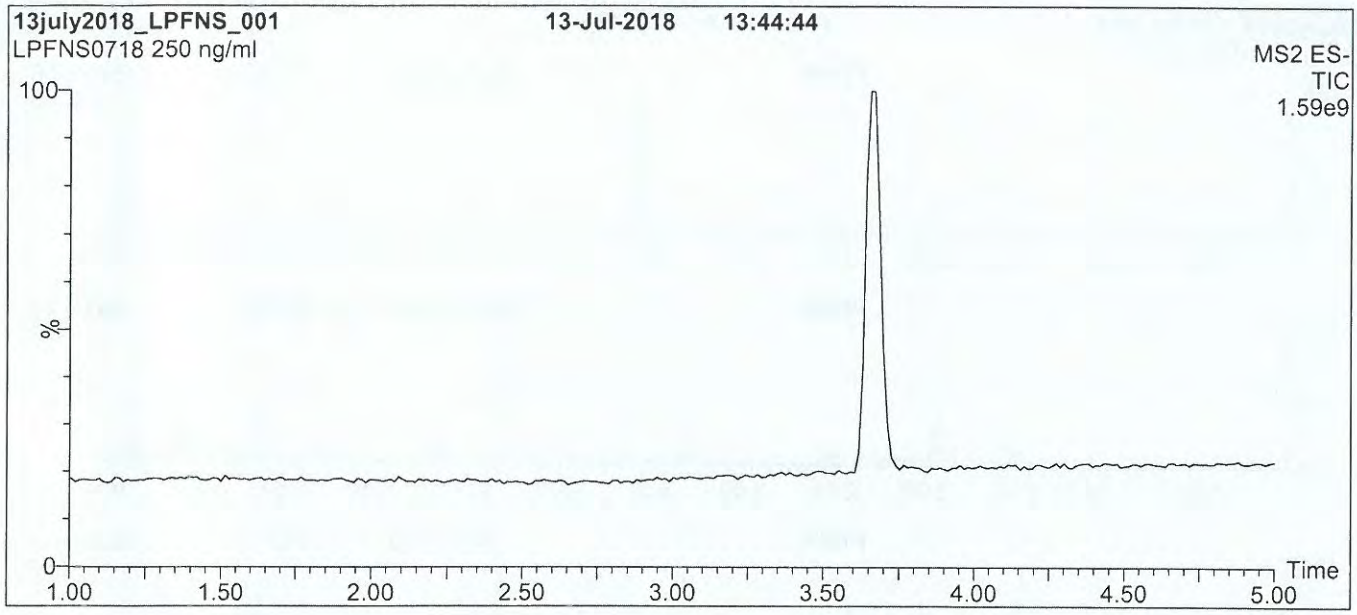
CALA Testing Accreditation No. A 1226

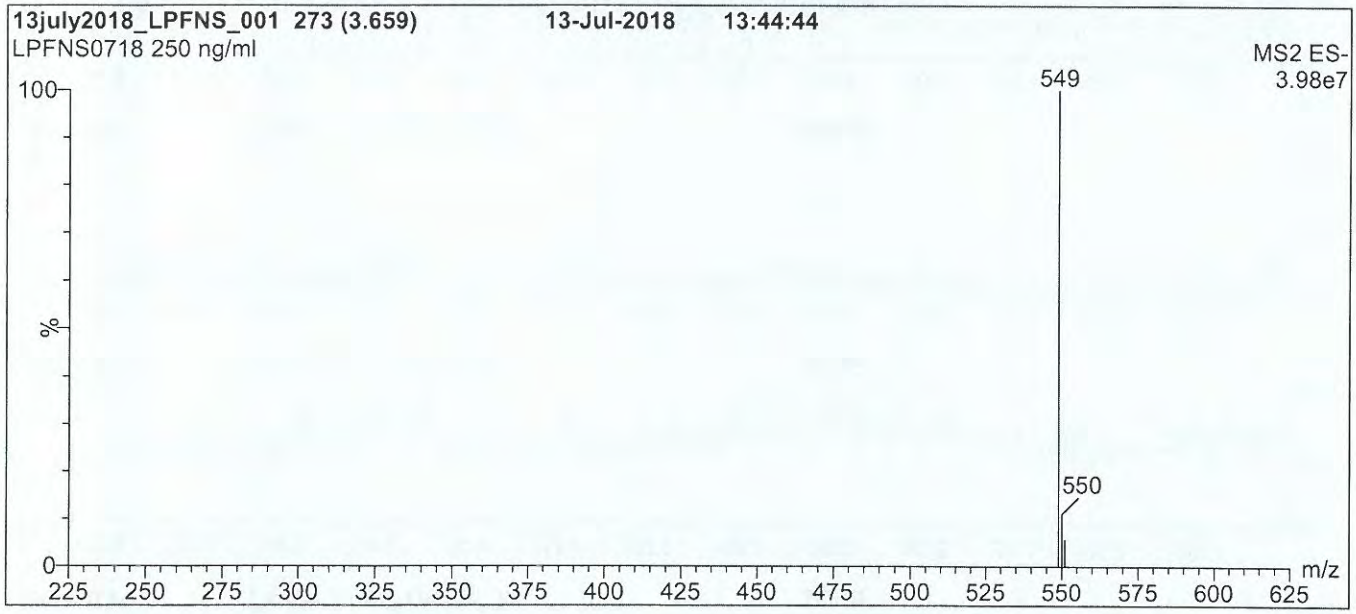
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812050

Figure 1: **L-PFNS; 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

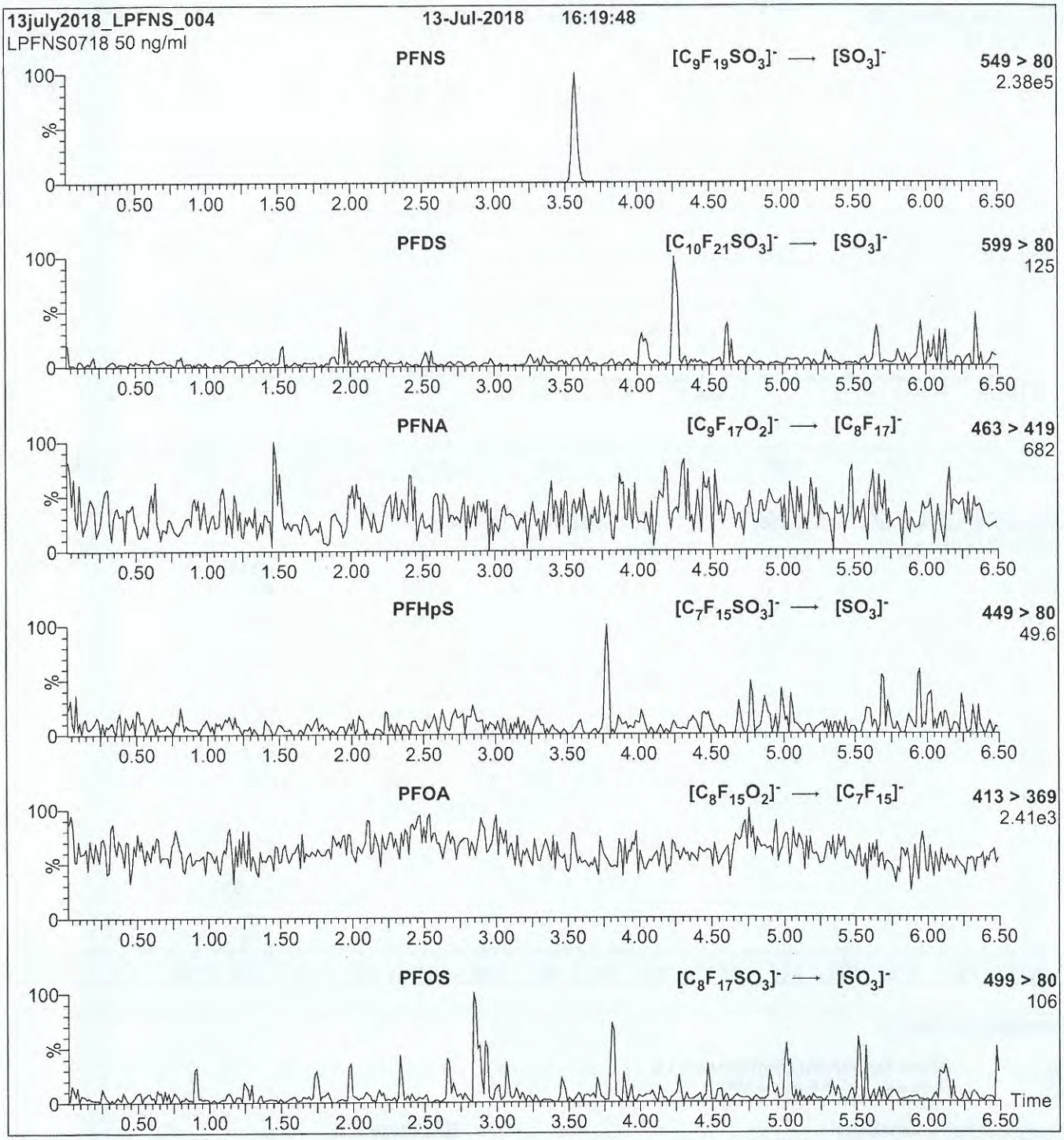
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1812050

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) = 3.45e-3
Collision Energy (eV) = 64

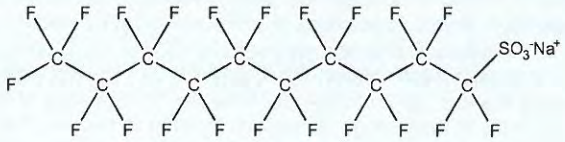
1812057

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS1018
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)	10/05/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/05/2023		
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 ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/09/2018 (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

1812057

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:

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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:

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. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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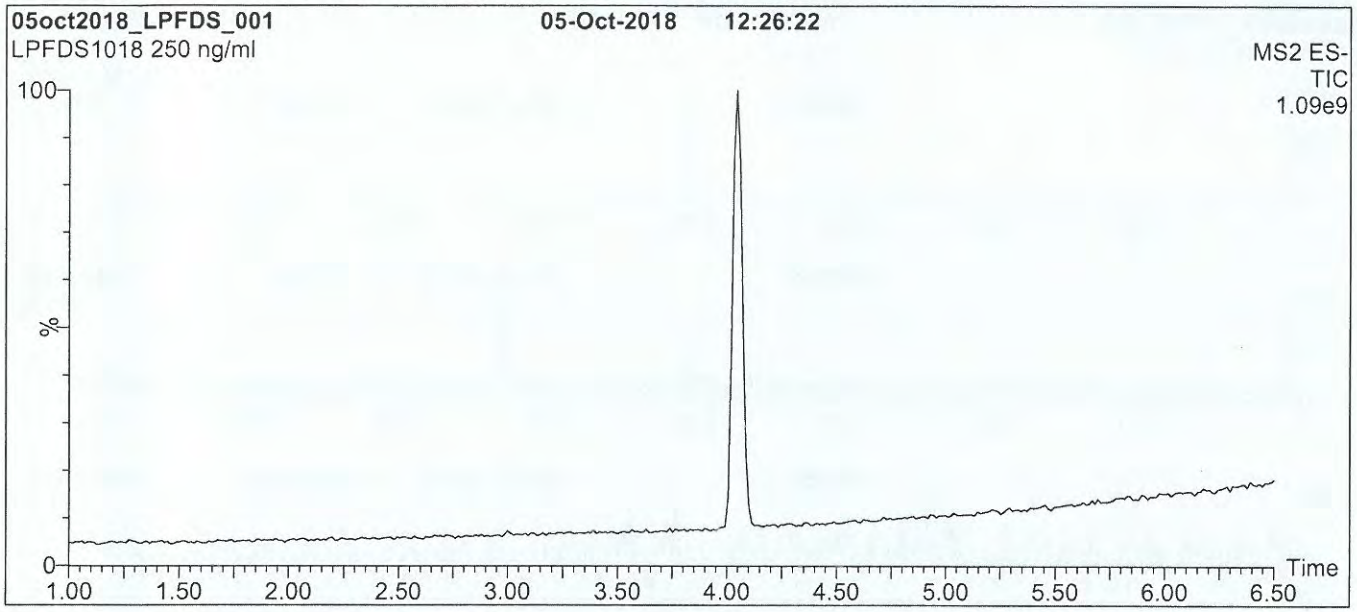
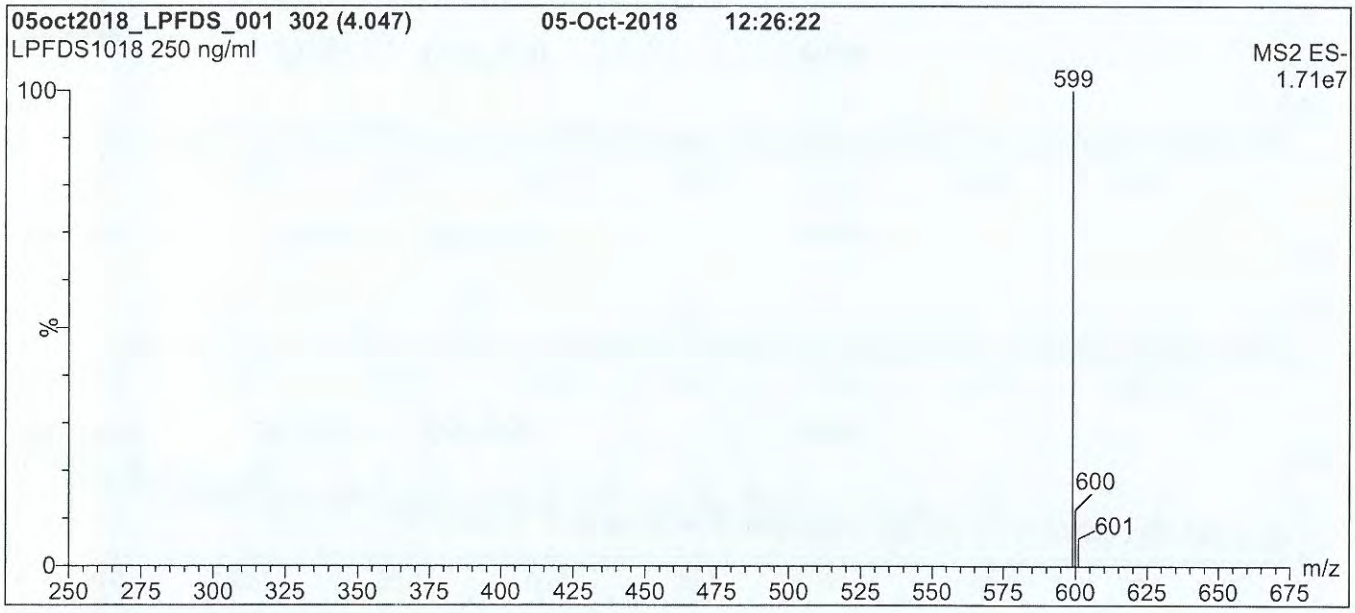
18L2051

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: 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

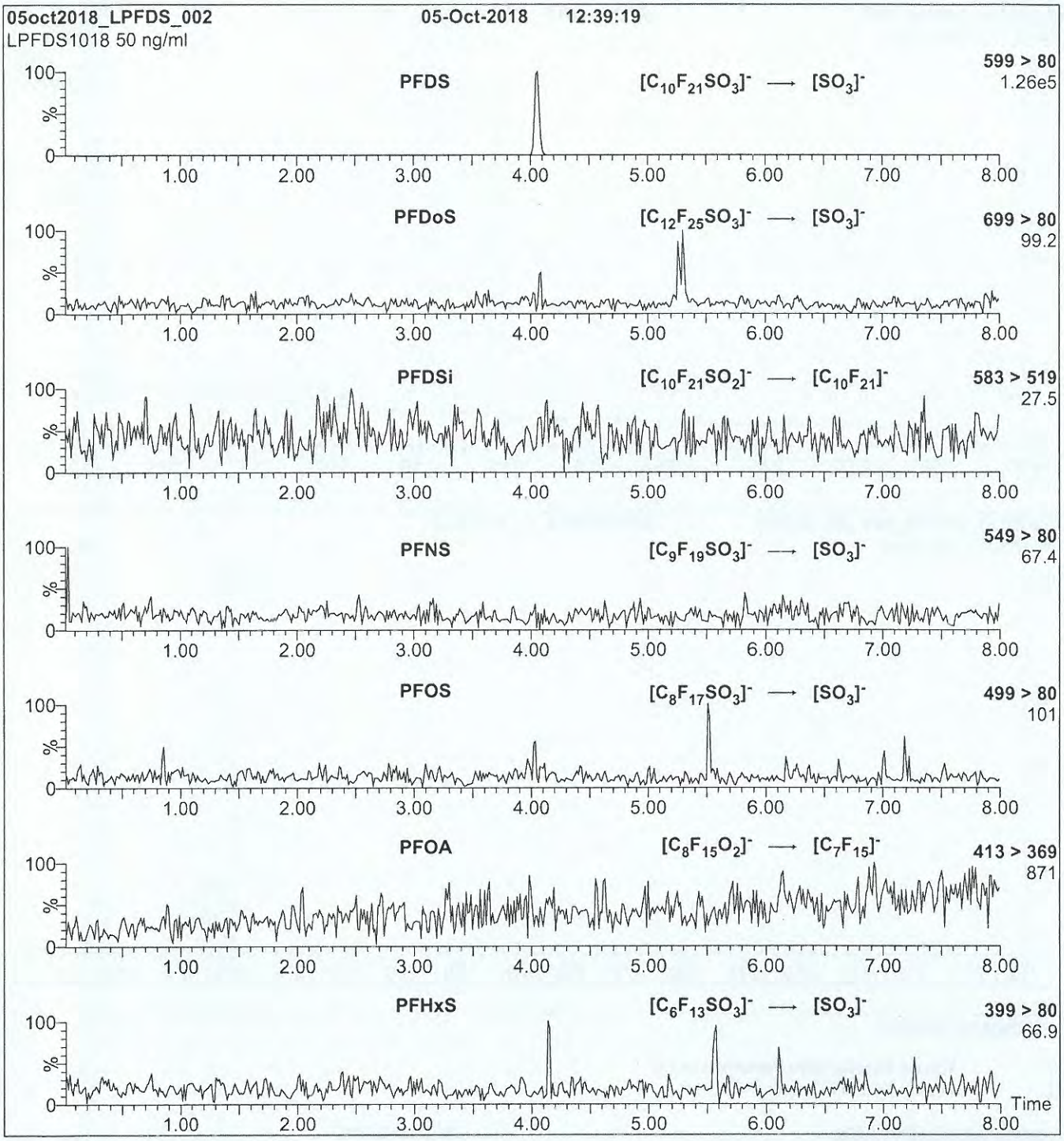
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1862057

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) = 2.97e-3
Collision Energy (eV) = 56

1812052

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).

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1812052

INTENDED USE:

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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.

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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1812052

Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

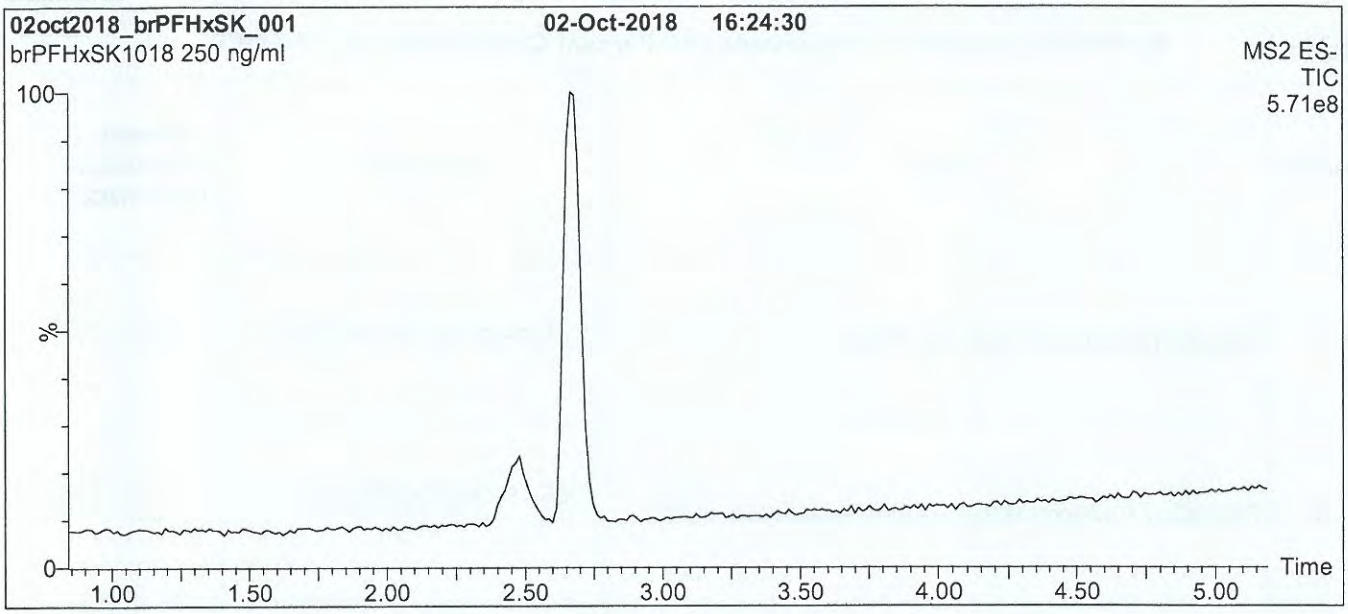
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

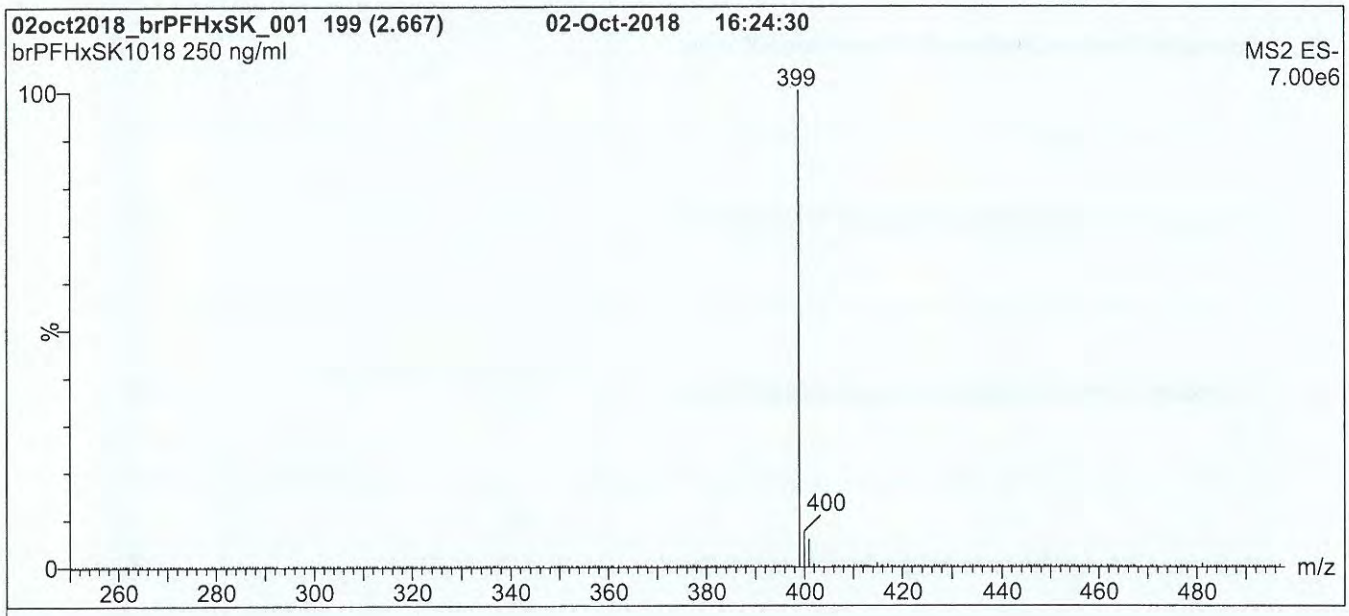
* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: _____ **Date:** 10/05/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

18L2052

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

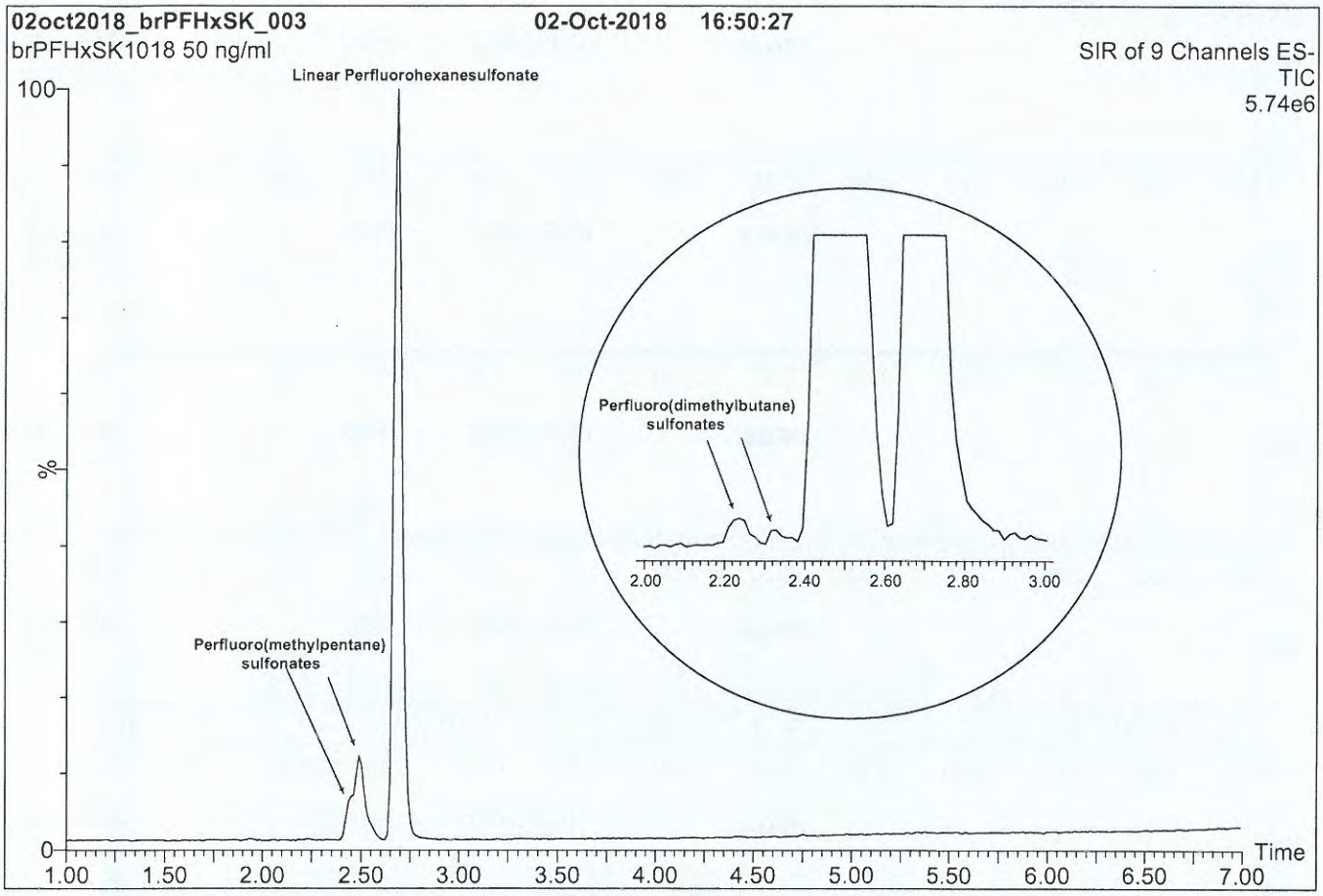
MS Parameters

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

1812052

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

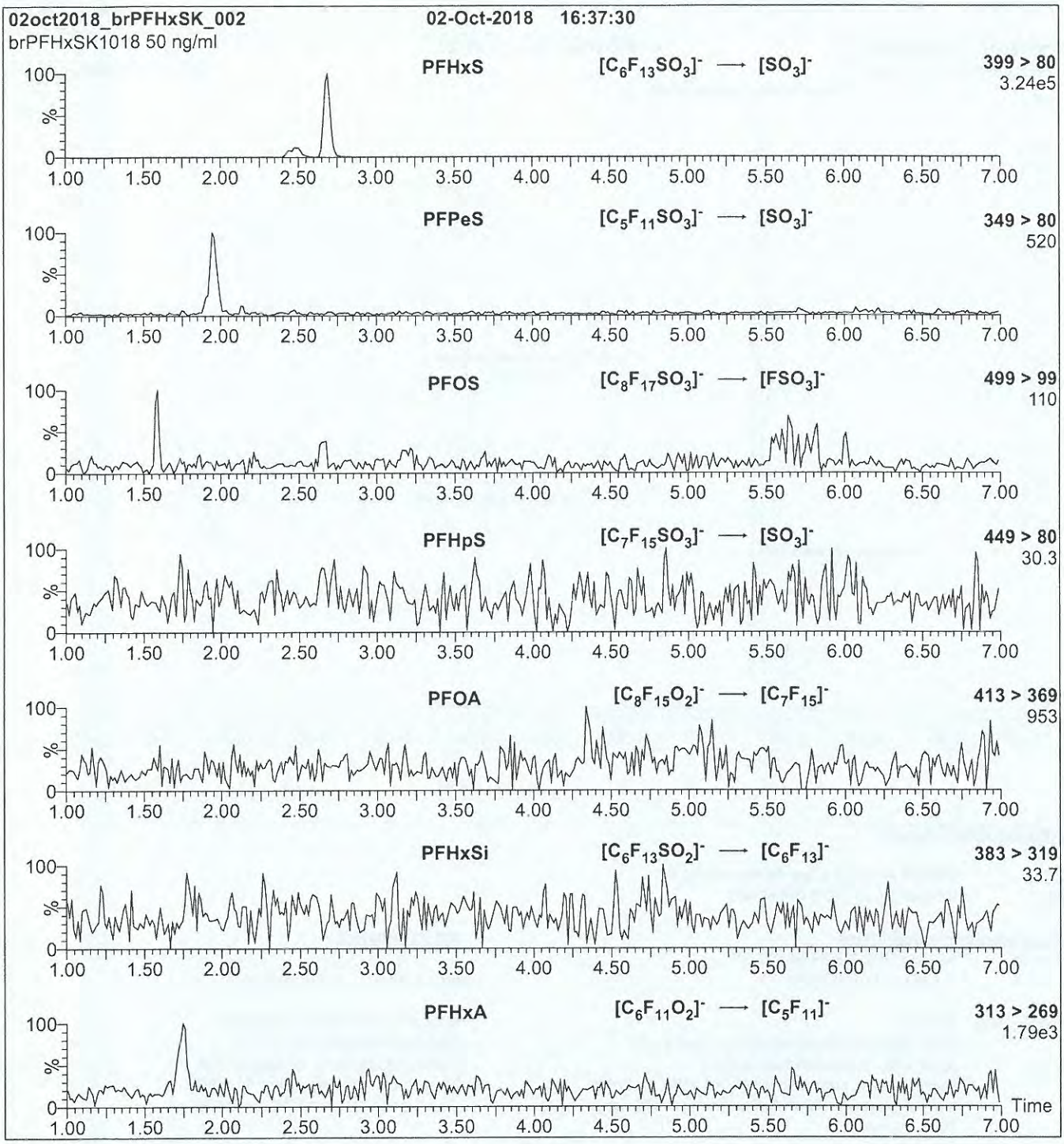
MS Parameters

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

1812052

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

1812053

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0418
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)	04/09/2018
LAST TESTED: (mm/dd/yyyy)	04/18/2018
EXPIRY DATE: (mm/dd/yyyy)	04/18/2023
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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1862053

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:

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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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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	$CF_3C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2SO_3^-K^+$	0.07

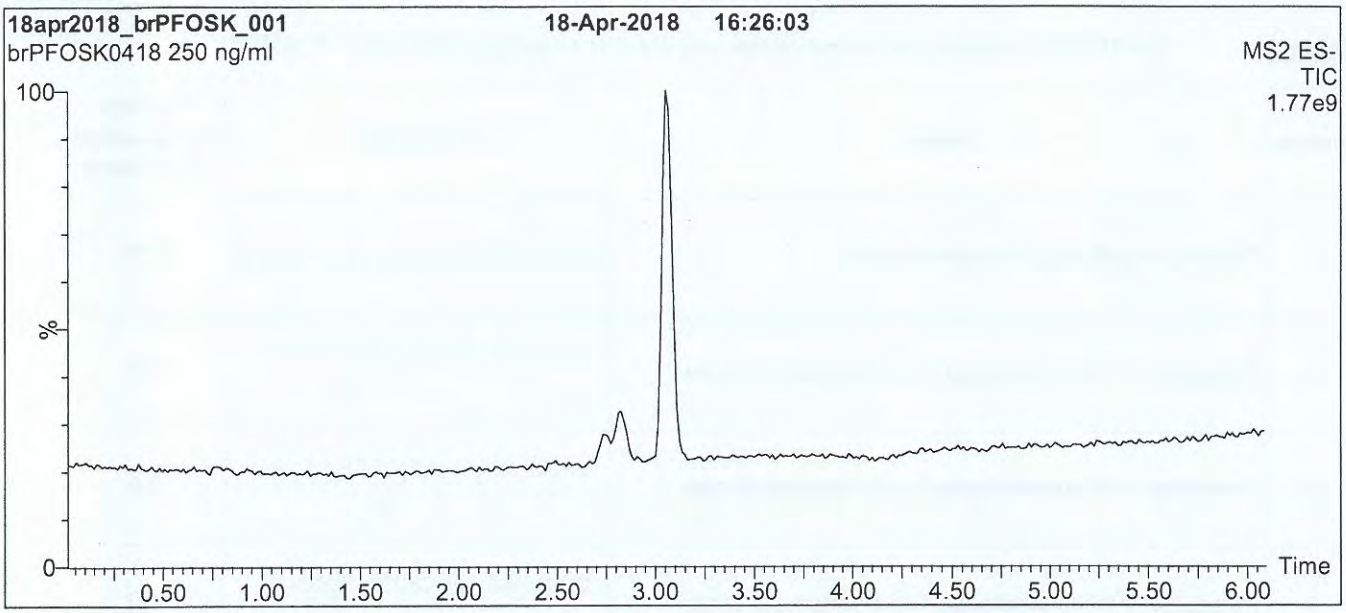
* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

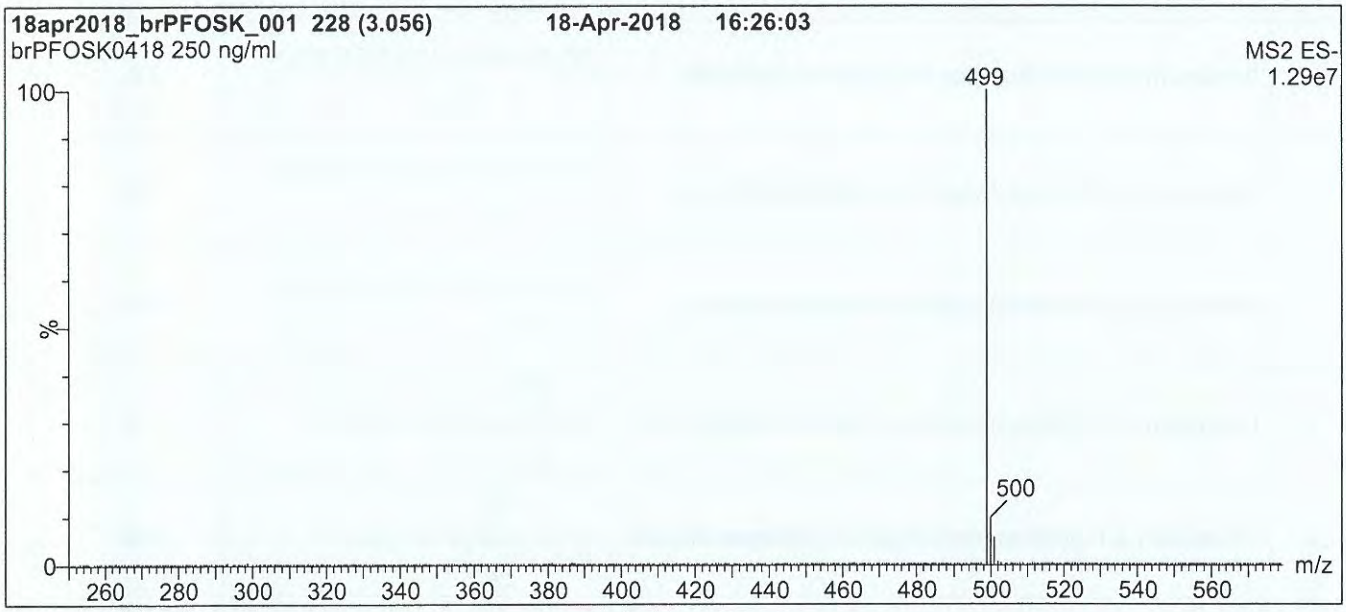
Certified By: _____ **Date:** 04/23/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

1812053

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: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7 min and hold for 3 min.
Return to initial conditions over 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) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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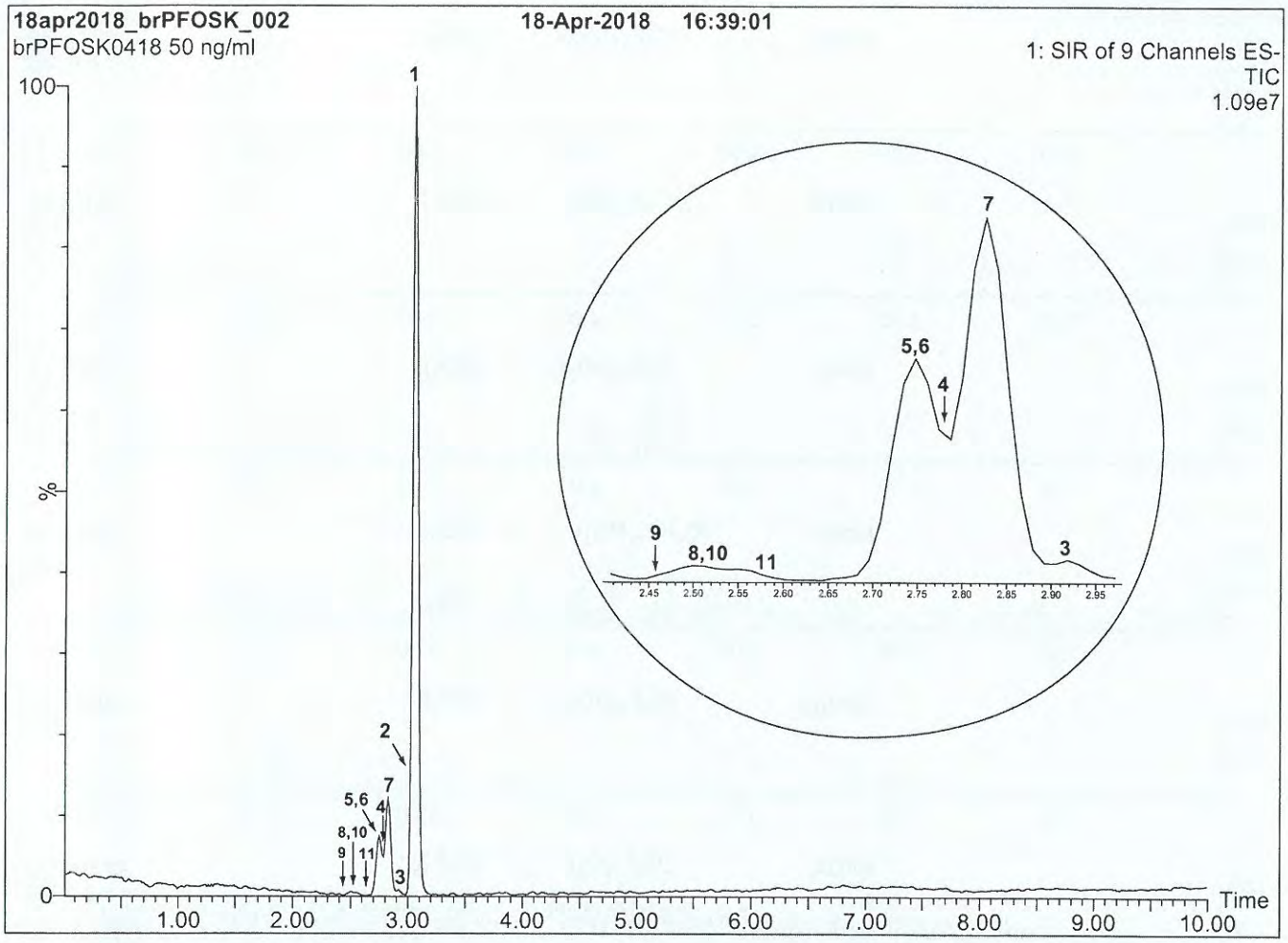
Figure 2: **br-PFOSK; LC/MS Data (SIR)**



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
60% (80:20 MeOH:ACN) / 40% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7 min and hold for 3 min.
Return to initial conditions over 0.75 min.
Time: 12 min

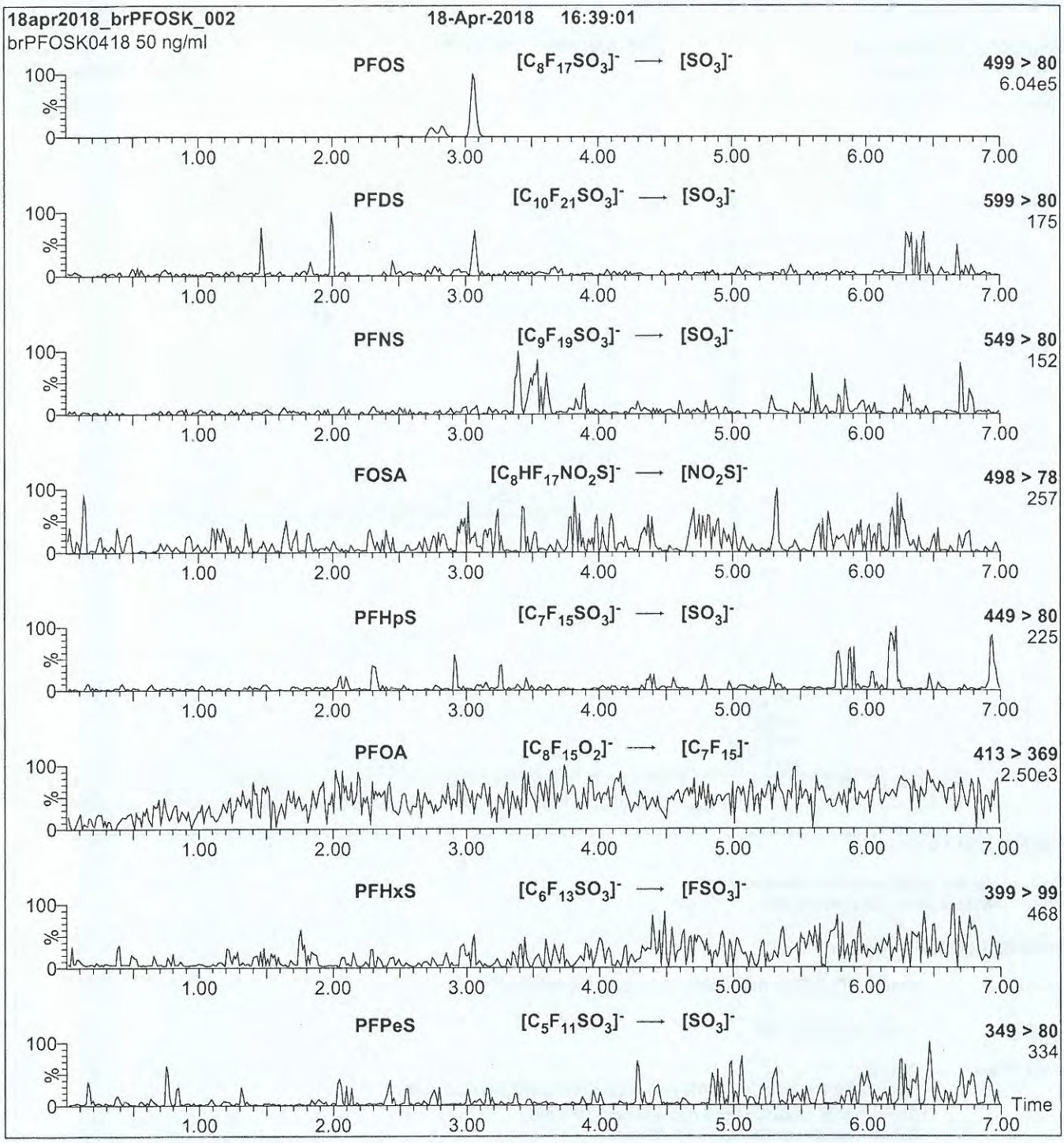
Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 150 °C
Desolvation = 500 °C
Cone Voltage = 2 - 20V (variable)

18L2053

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) = 3.47e-3
Collision Energy (eV) = 64

18L2054

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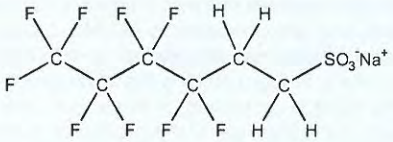
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS0718

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



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)	07/03/2018		
EXPIRY DATE: (mm/dd/yyyy)	07/03/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS Data (Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 07/05/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

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1812054

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:

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. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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1812054

Figure 1: 4:2FTS; LC/MS Data (SIR)

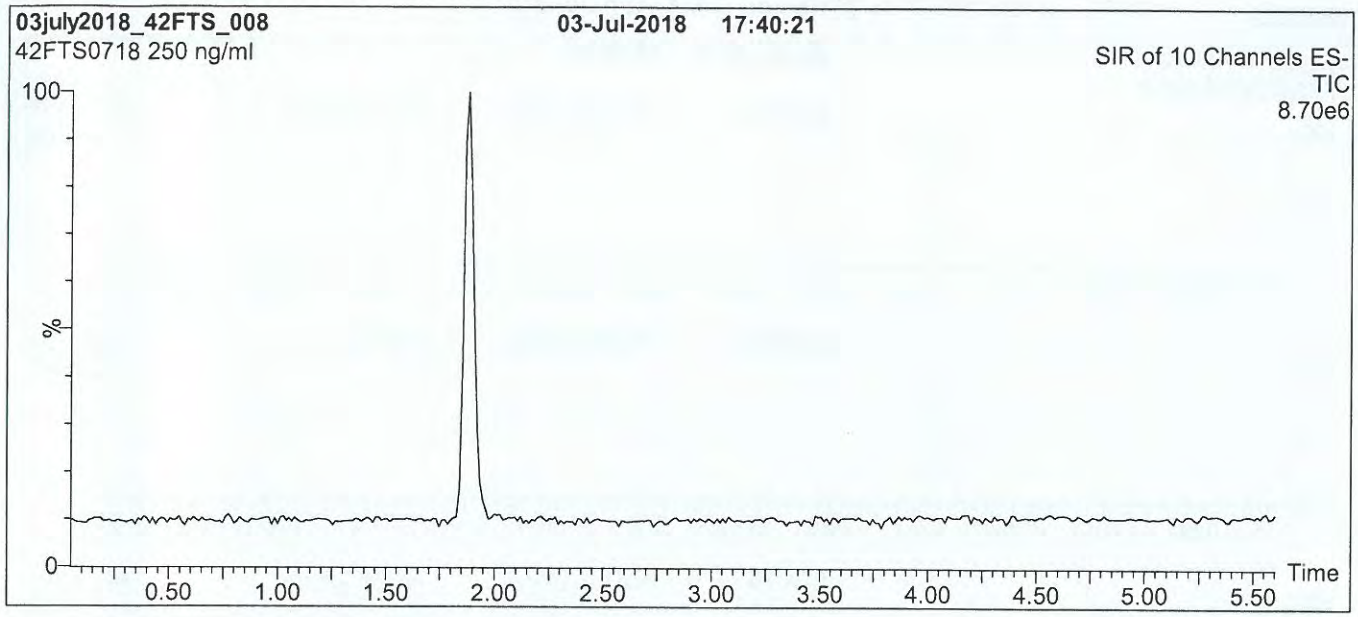
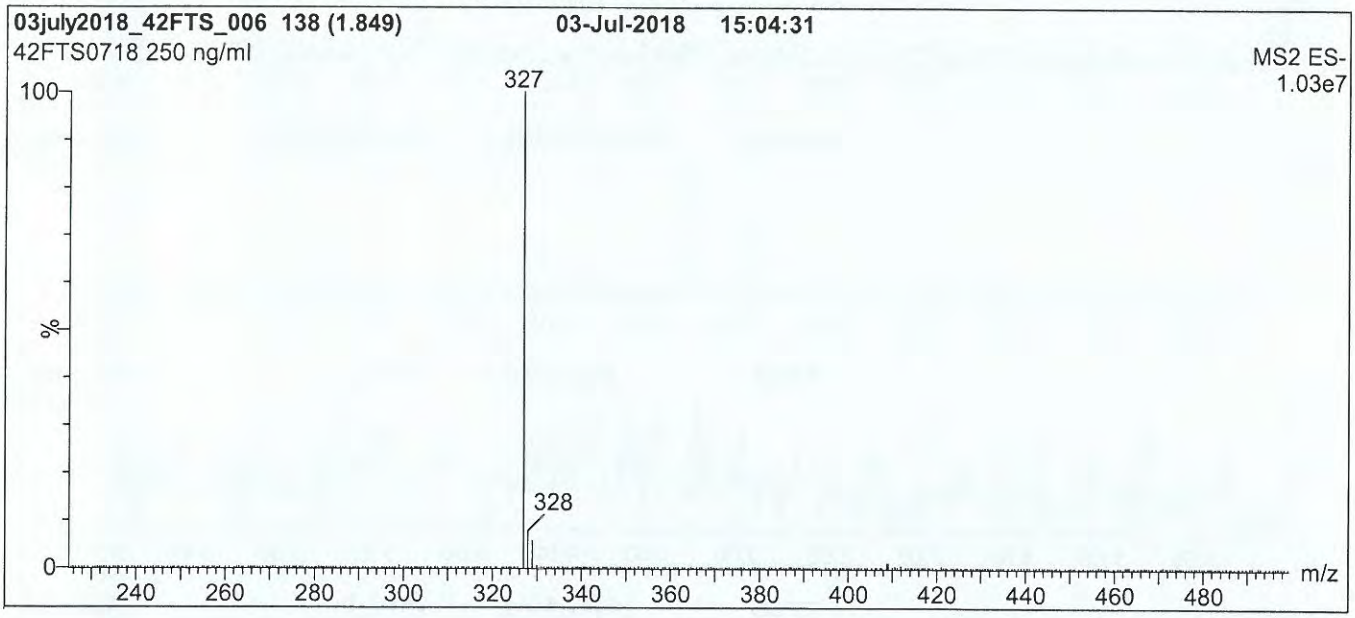


Figure 2: 4:2FTS; LC/MS Data (Mass Spectrum)



Conditions for Figures 1 & 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 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

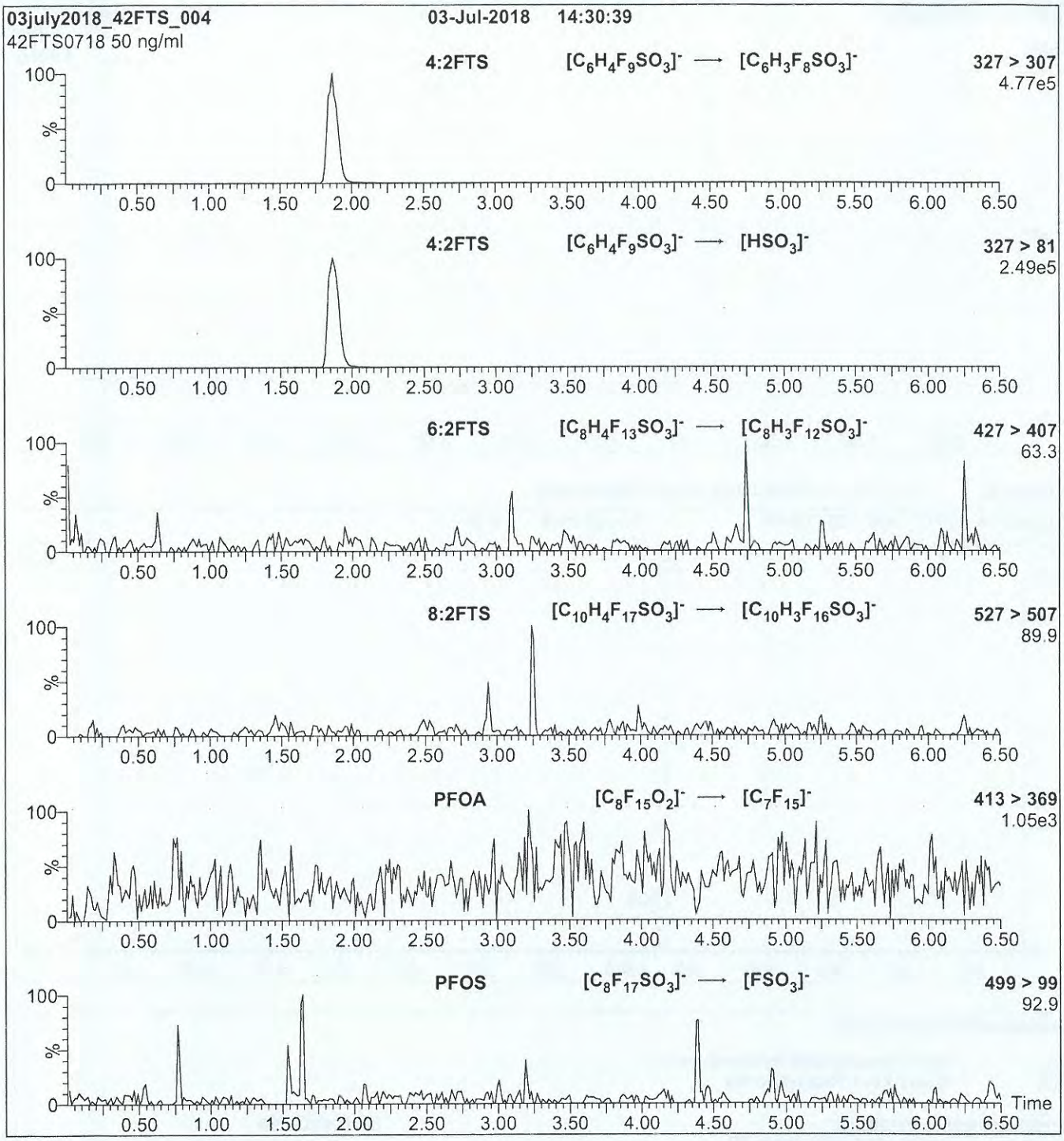
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25 (variable for SIR (2-20))
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812054

Figure 3: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (4:2FTS)

Mobile phase: Same as Figures 1 & 2

Flow: 300 µl/min

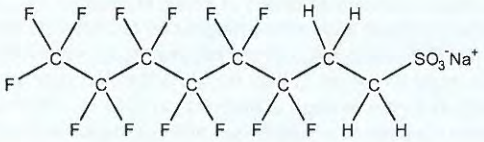
MS Parameters
Collision Gas (mbar) = 3.55e-3
Collision Energy (eV) = 18

1812655

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	6:2FTS	**LOT NUMBER:**	62FTS0418
COMPOUND:	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate		
STRUCTURE:		**CAS #:**	Not available



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)	04/03/2018		
EXPIRY DATE: (mm/dd/yyyy)	04/03/2023		
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 ~ 0.3% of sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2FTS).

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

18L2055

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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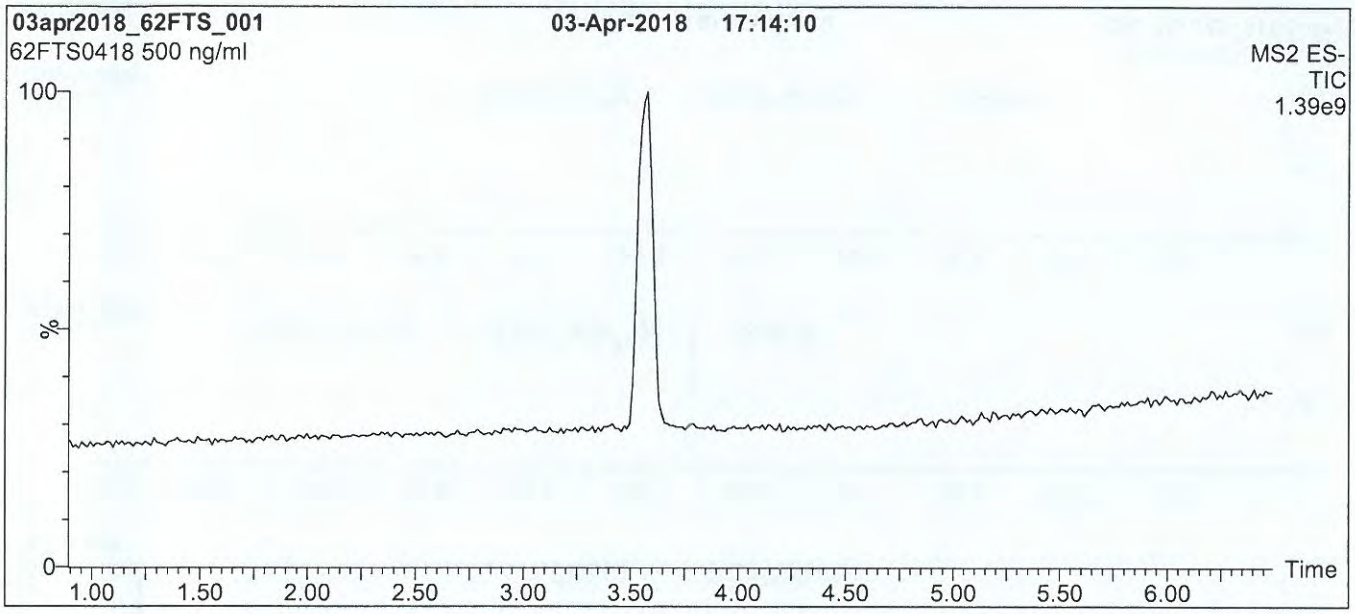
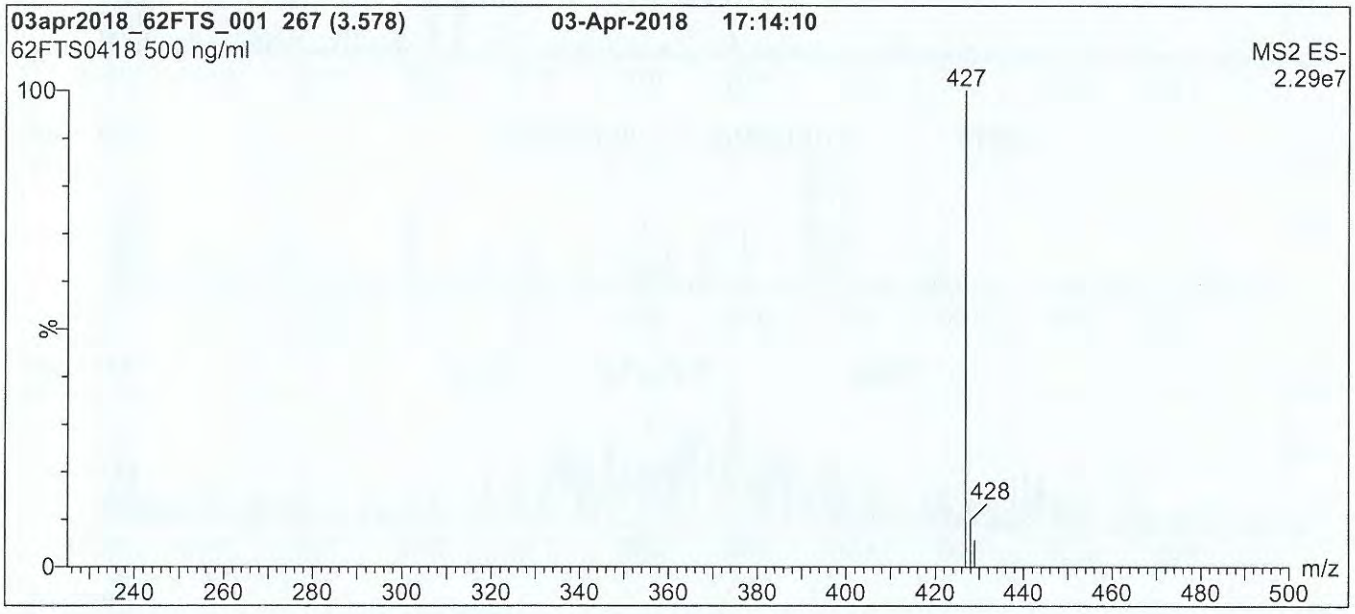
1812055

Figure 1: **6:2FTS; 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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% 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

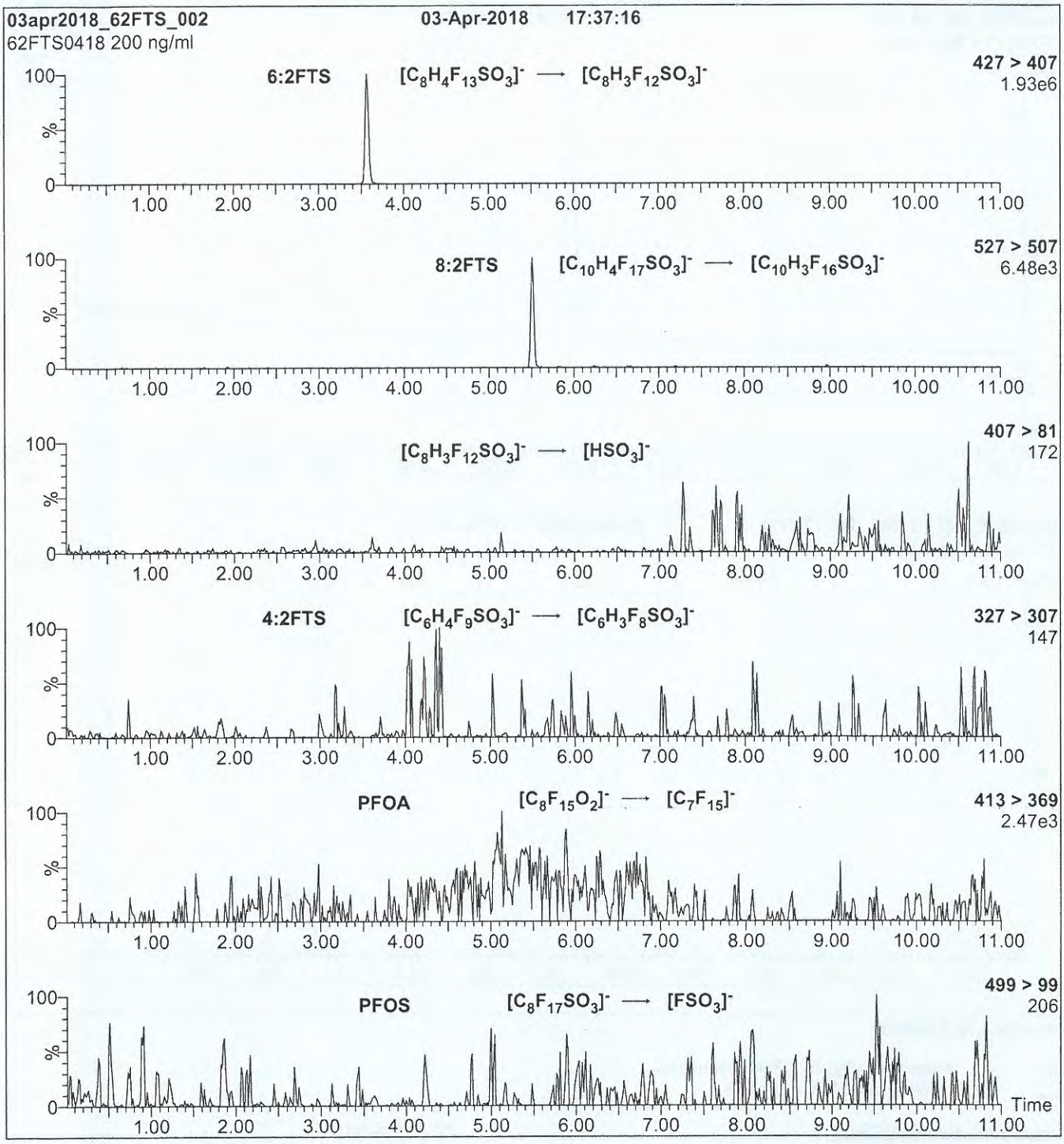
MS Parameters

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) = 750

1812055

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) = 3.39e-3
Collision Energy (eV) = 20

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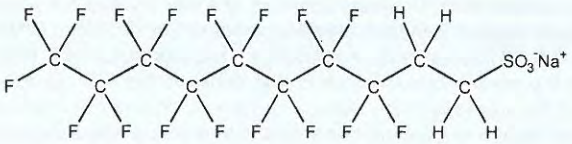
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1118
COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** Not available



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)	11/28/2018			
EXPIRY DATE: (mm/dd/yyyy)	11/28/2023			
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:** 11/29/2018 (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

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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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UNCERTAINTY:

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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:

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).

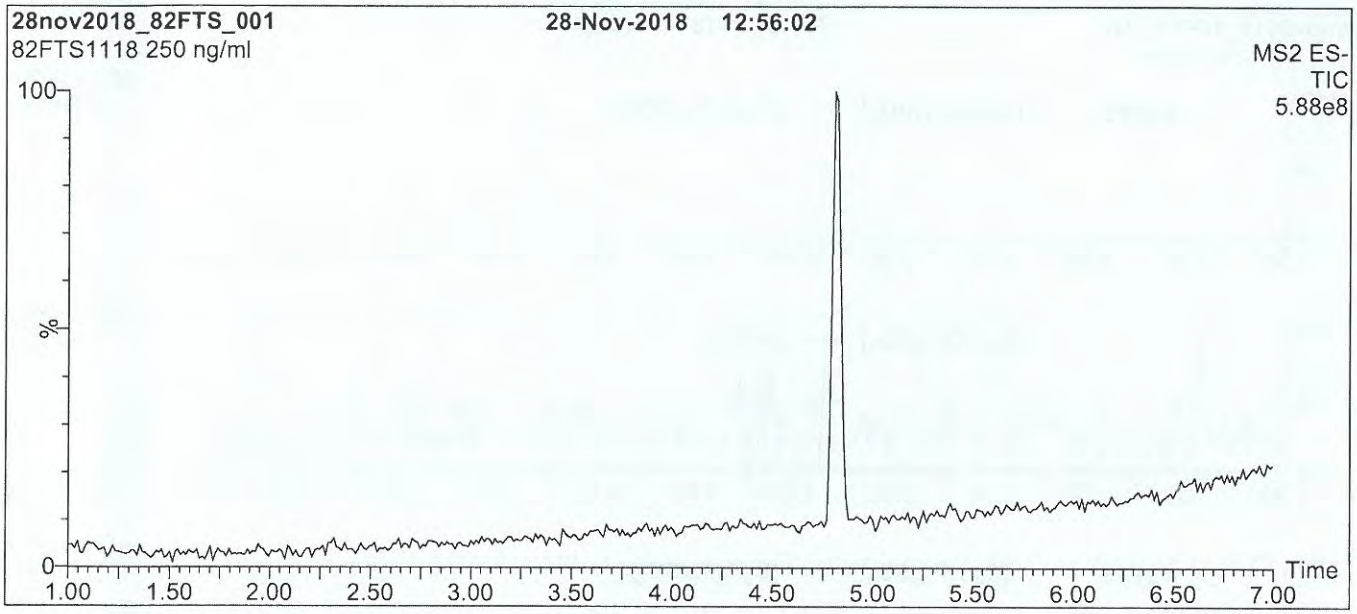
CALA Testing Accreditation No. A1226

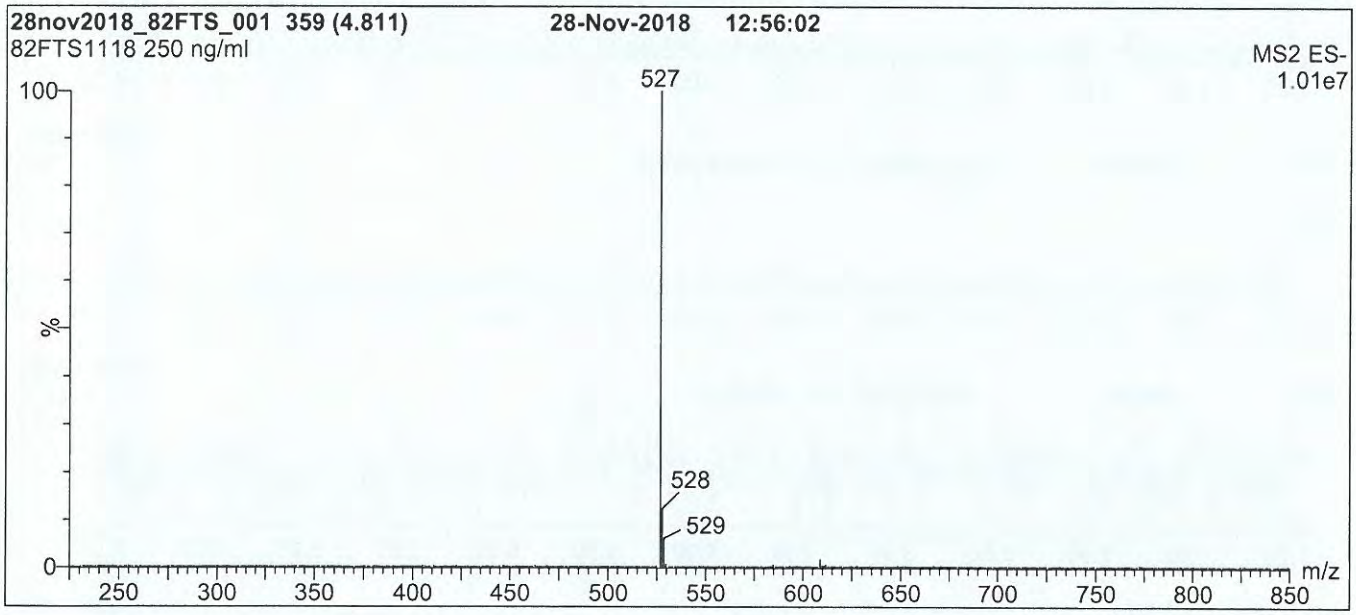
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812056

Figure 1: **8:2FTS; 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: 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

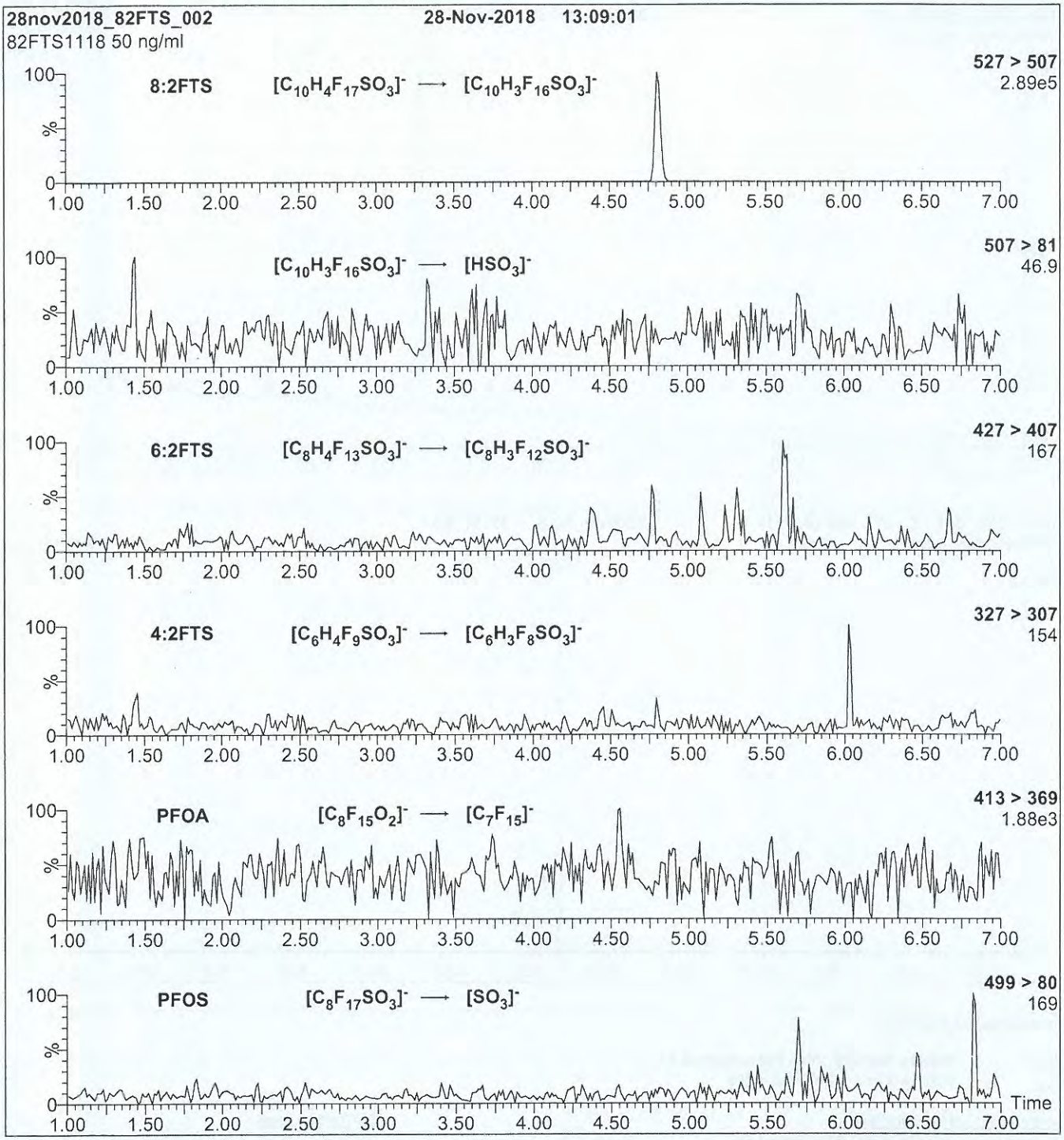
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812056

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

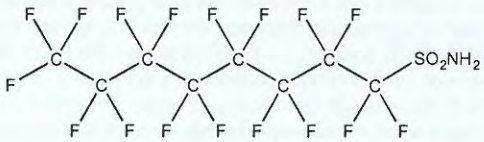
Collision Gas (mbar) = 2.74e-3
Collision Energy (eV) = 26

1812057

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0618I
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)	06/20/2018		
EXPIRY DATE: (mm/dd/yyyy)	06/20/2023		
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:** 06/25/2018 (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

1812057

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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.

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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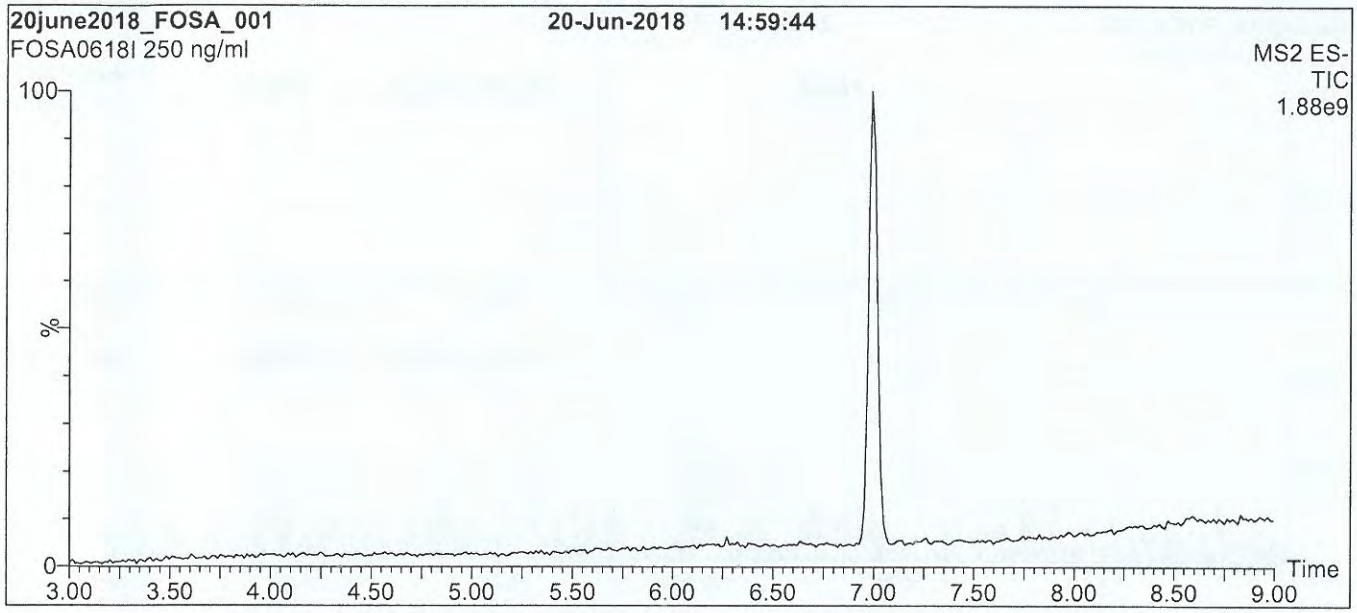
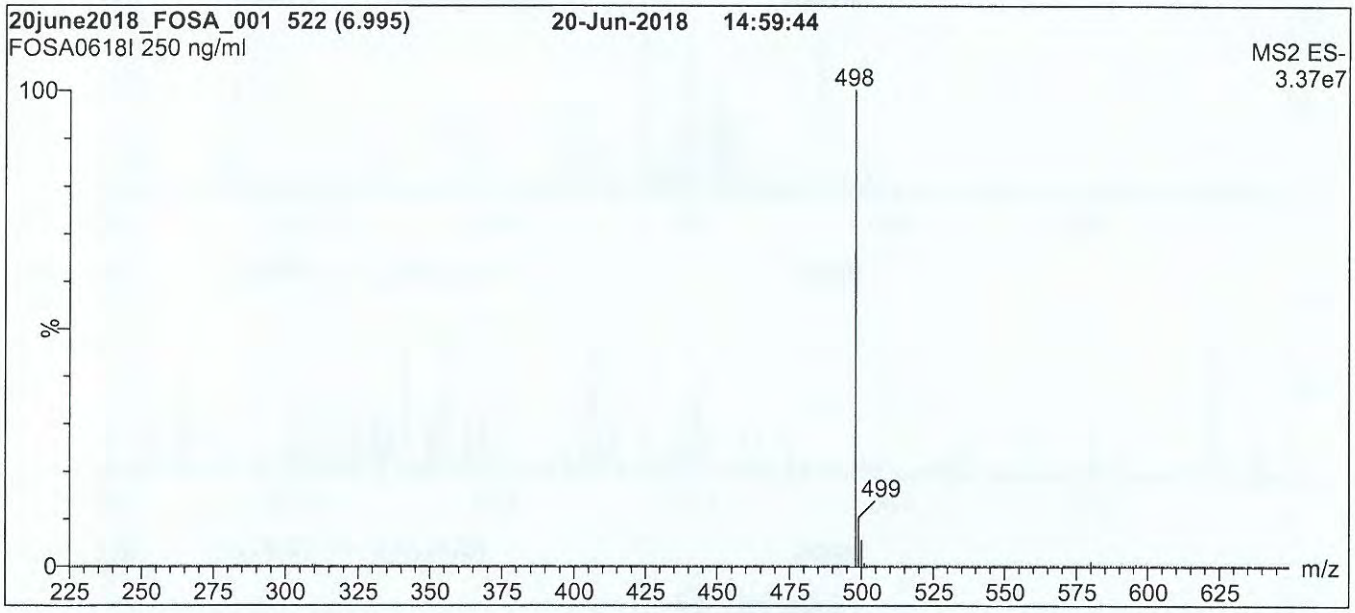
1812057

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: 50% (80:20 MeOH:ACN) / 50% 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 (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) = 750

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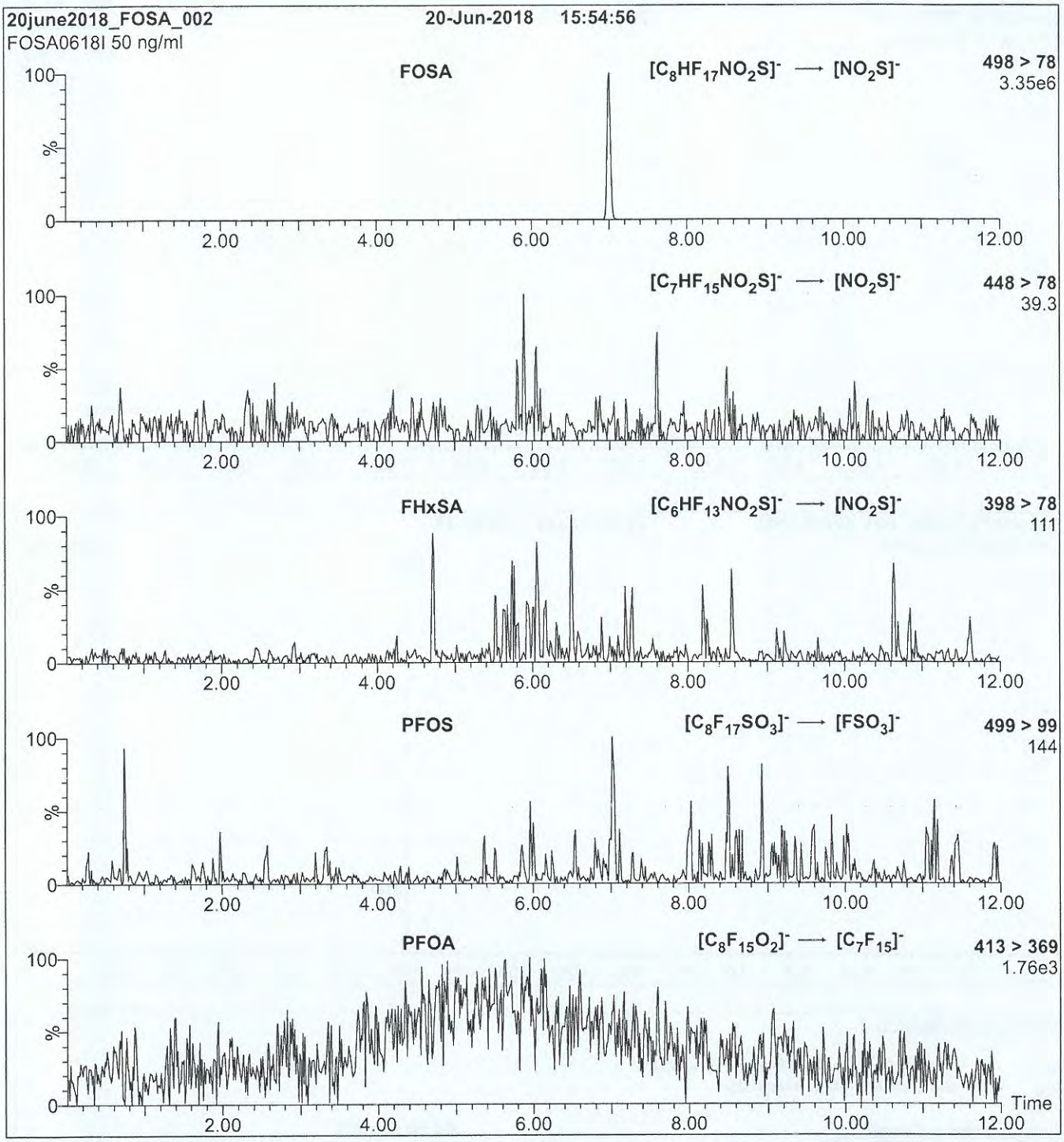
Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (FOSA-I)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3

Collision Energy (eV) = 30

1812058

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
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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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18L2058

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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1812058

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

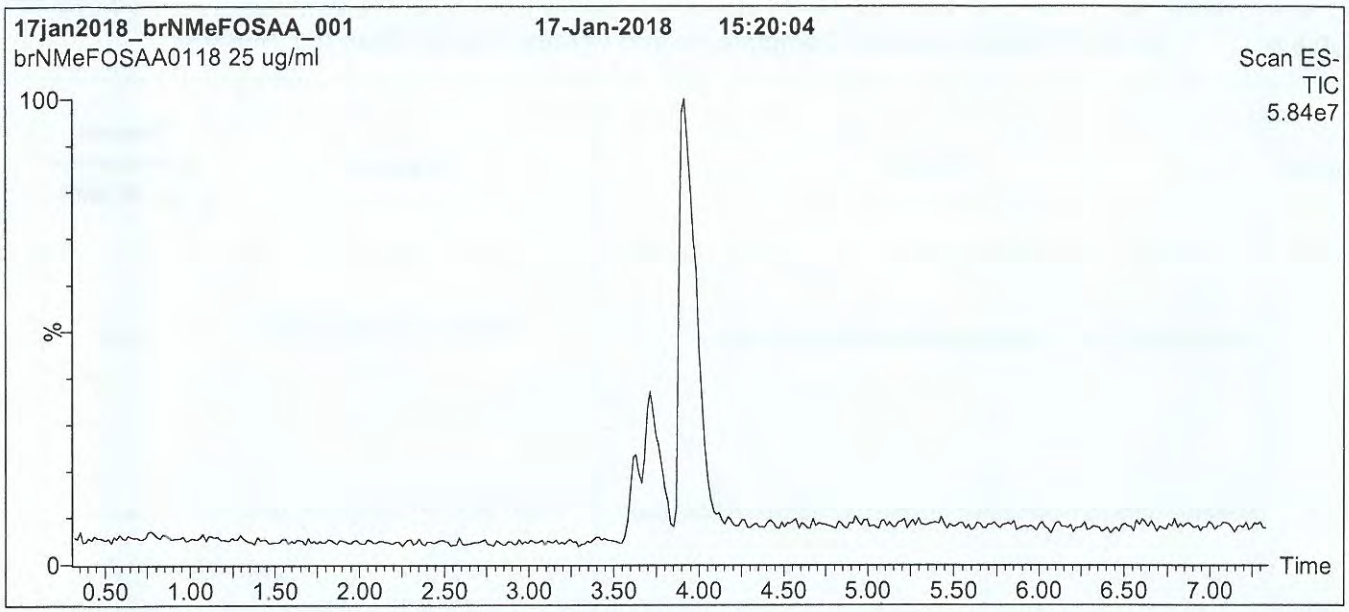
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

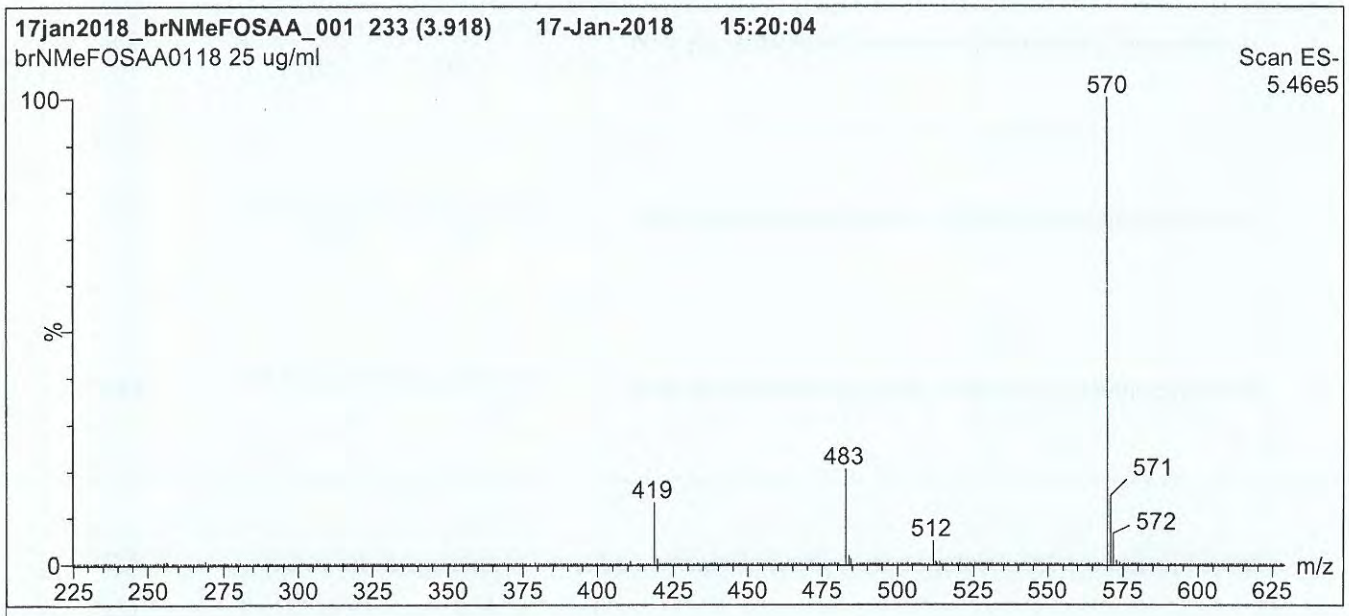
Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

18L2058

Figure 1: **br-NMeFOSAA; 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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

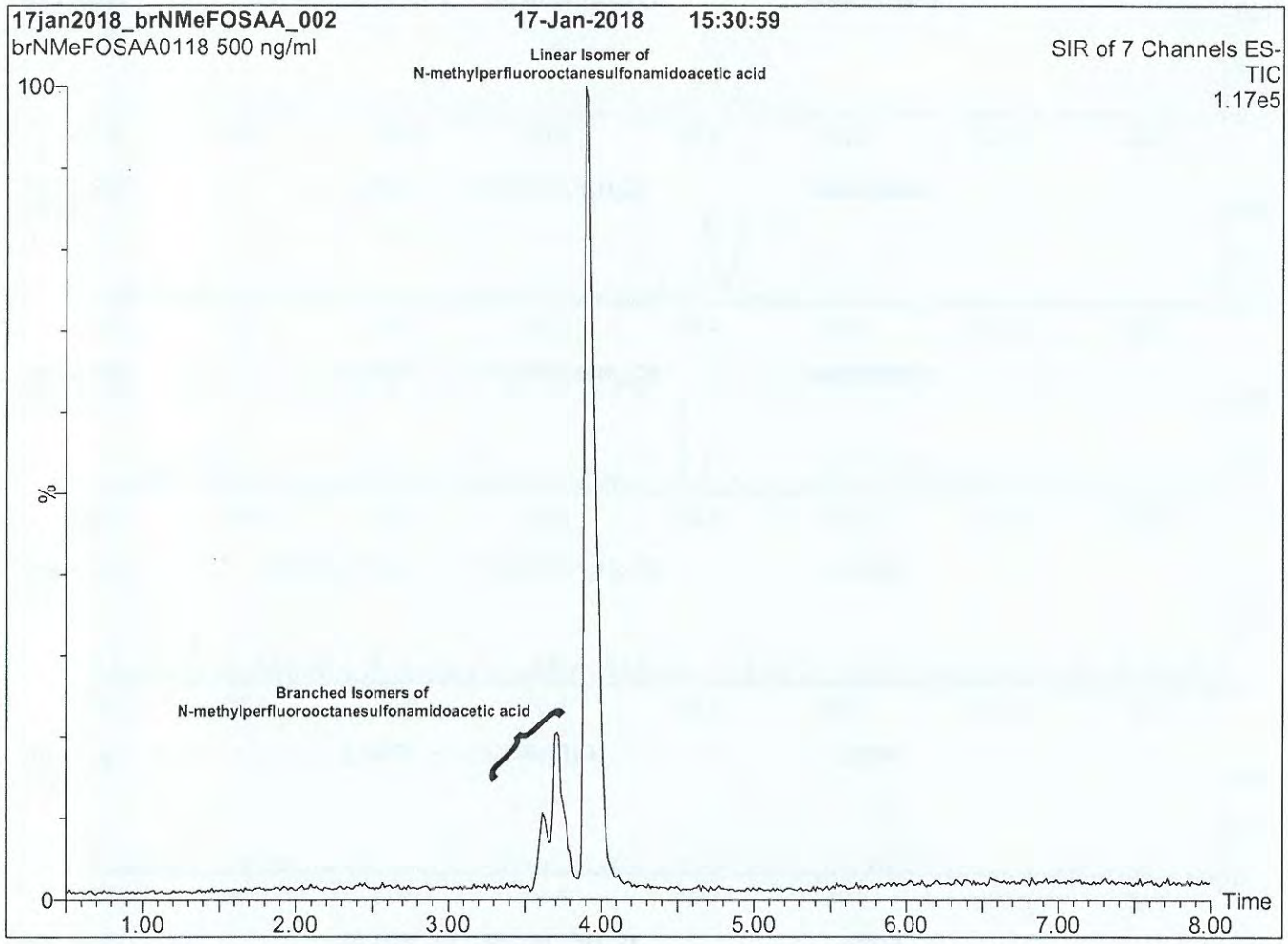
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

1812058

Figure 2: **br-NMeFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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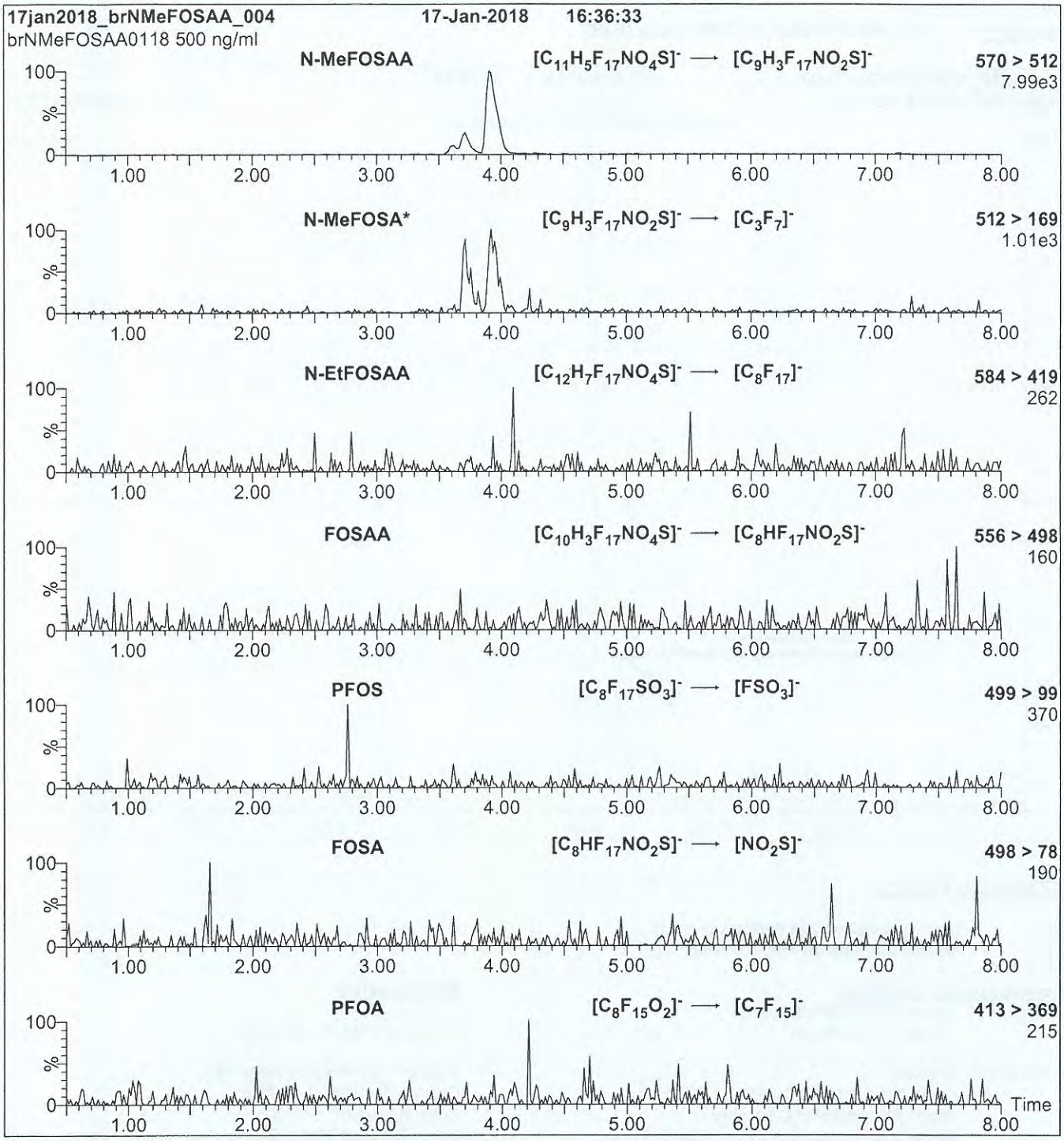
Figure 3: **br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

1812059

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0718
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/25/2018
LAST TESTED: (mm/dd/yyyy)	07/26/2018
EXPIRY DATE: (mm/dd/yyyy)	07/26/2023
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.
- Contains ~ 0.6% of perfluoro-n-octanoic acid.

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18L2059

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. 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

1802059

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

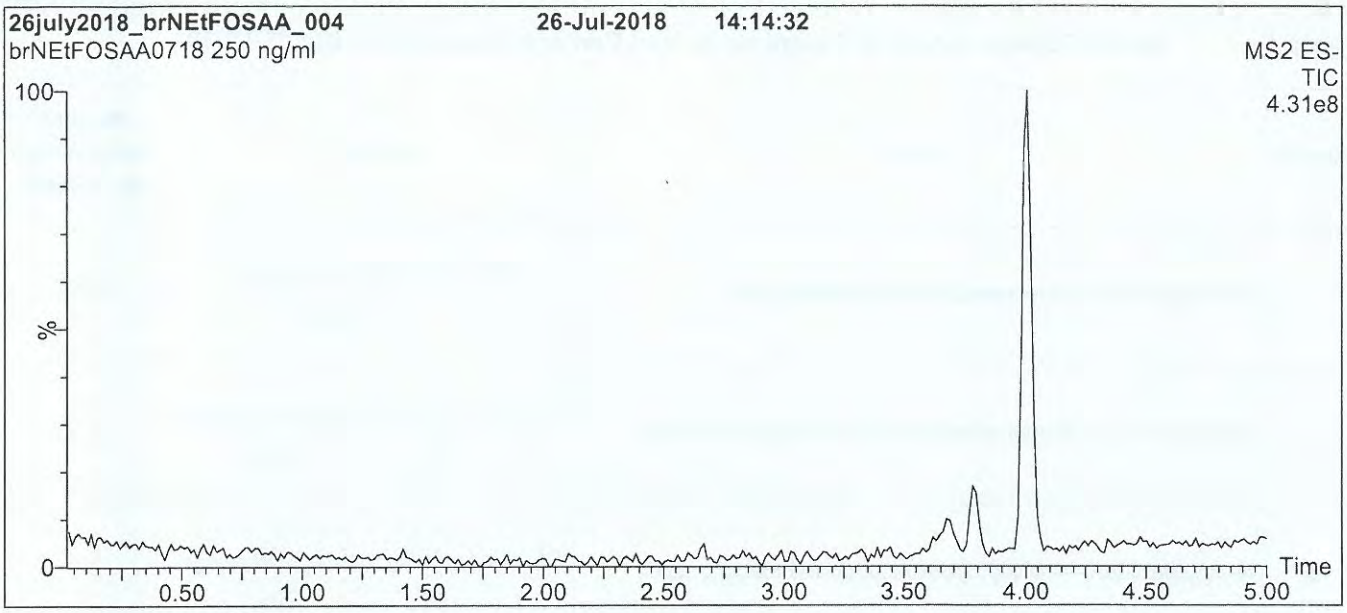
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

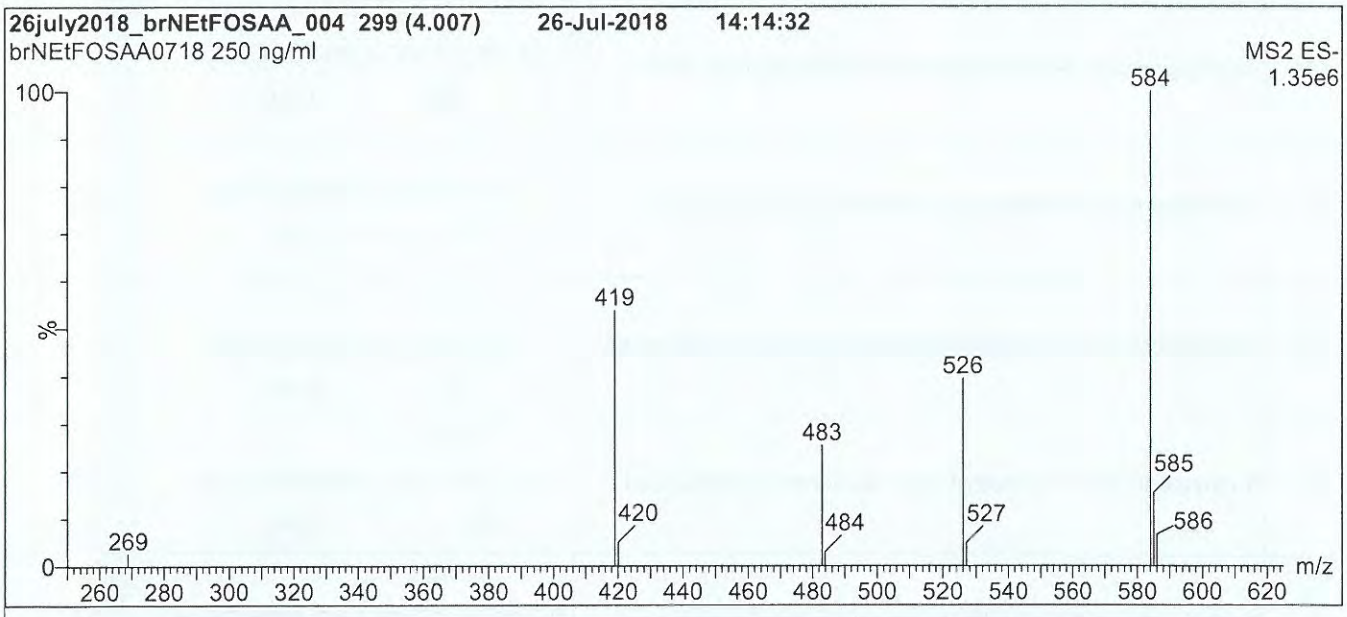
Certified By: _____ **Date:** 07/27/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

1812059

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: 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) = 64
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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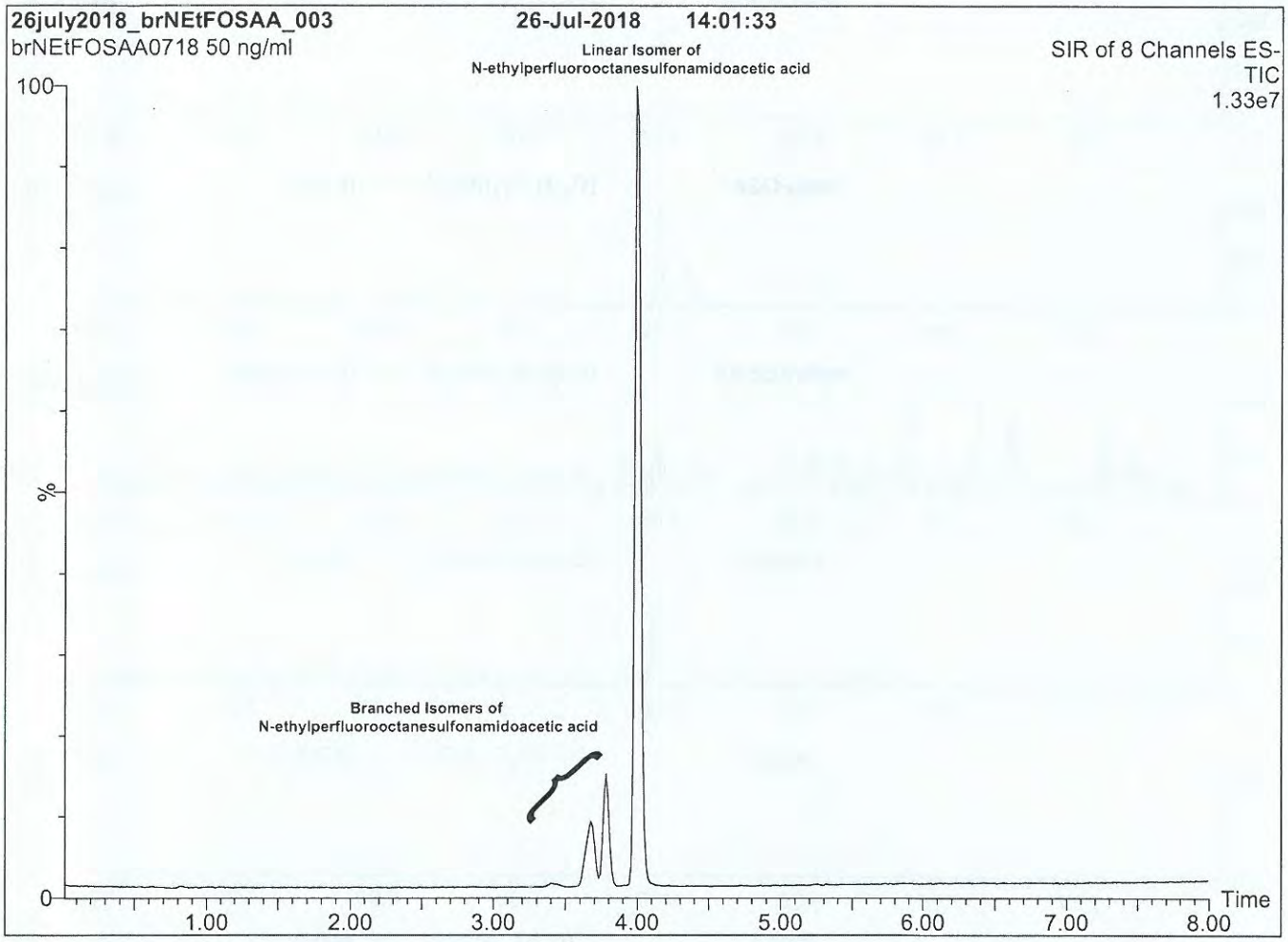
Figure 2: **br-NEtFOSAA; LC/MS Data (SIR)**



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: 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) = 0.50
Cone Voltage (V) = variable (2-64)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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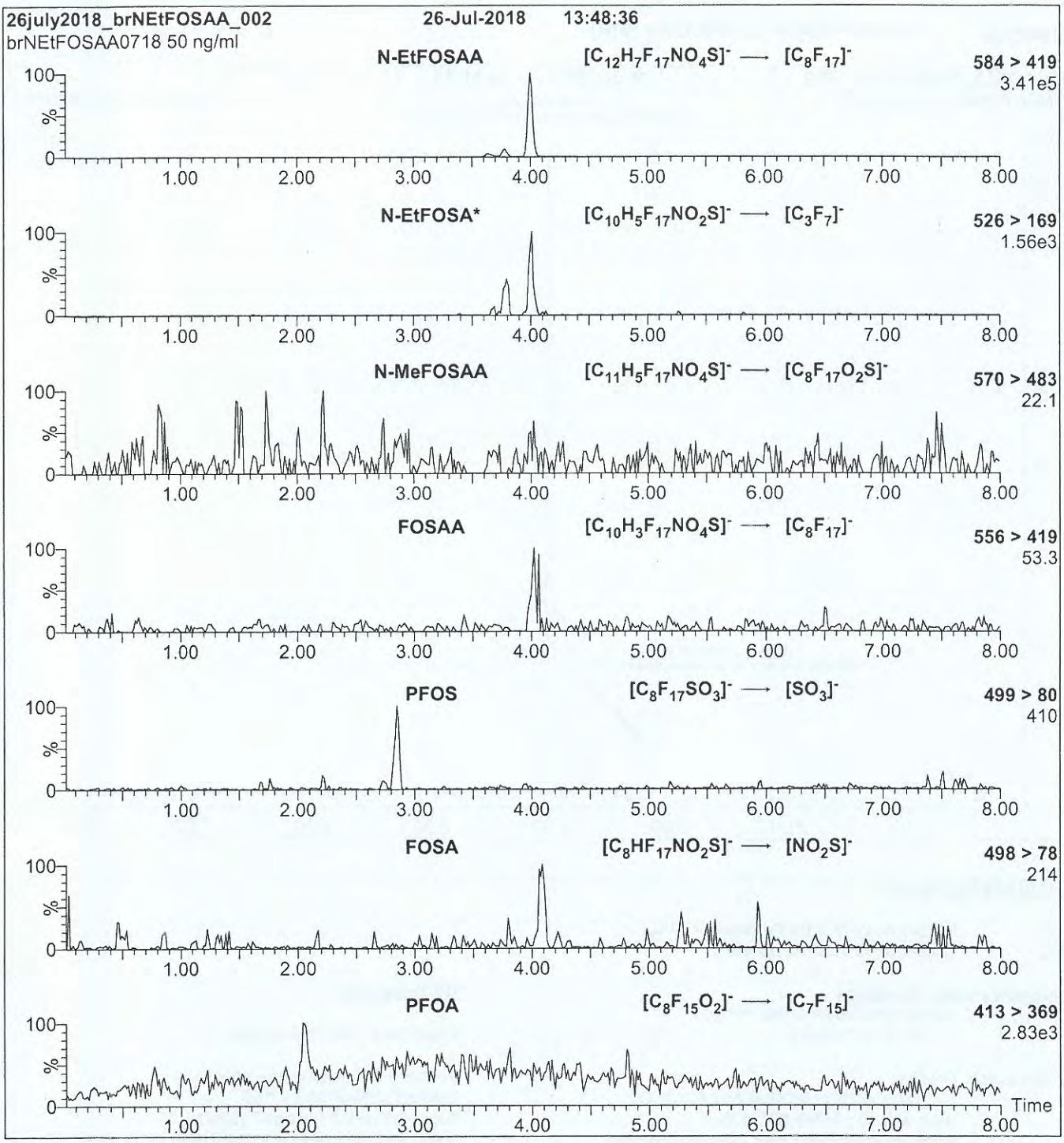
Figure 3: **br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*__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

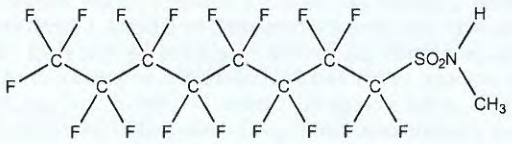
Collision Gas (mbar) = 3.76e-3
Collision Energy (eV) = 18

1812060

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0518M
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)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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18L2060

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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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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:

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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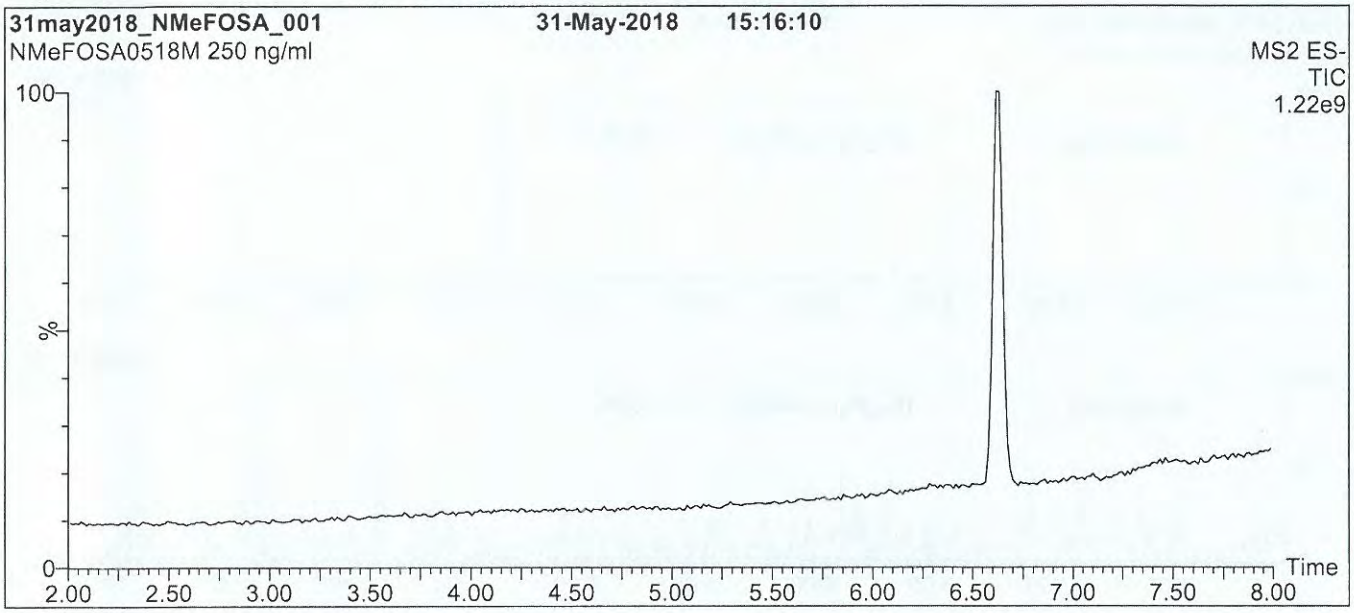
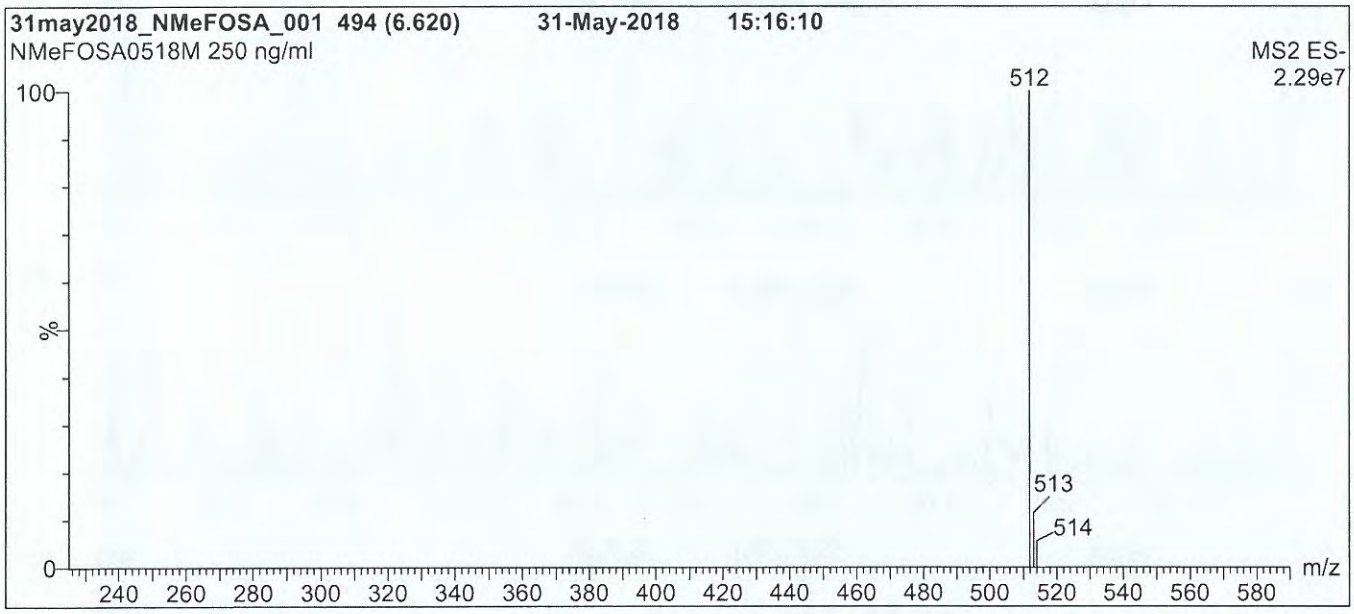
1812000

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 C_{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 85% 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) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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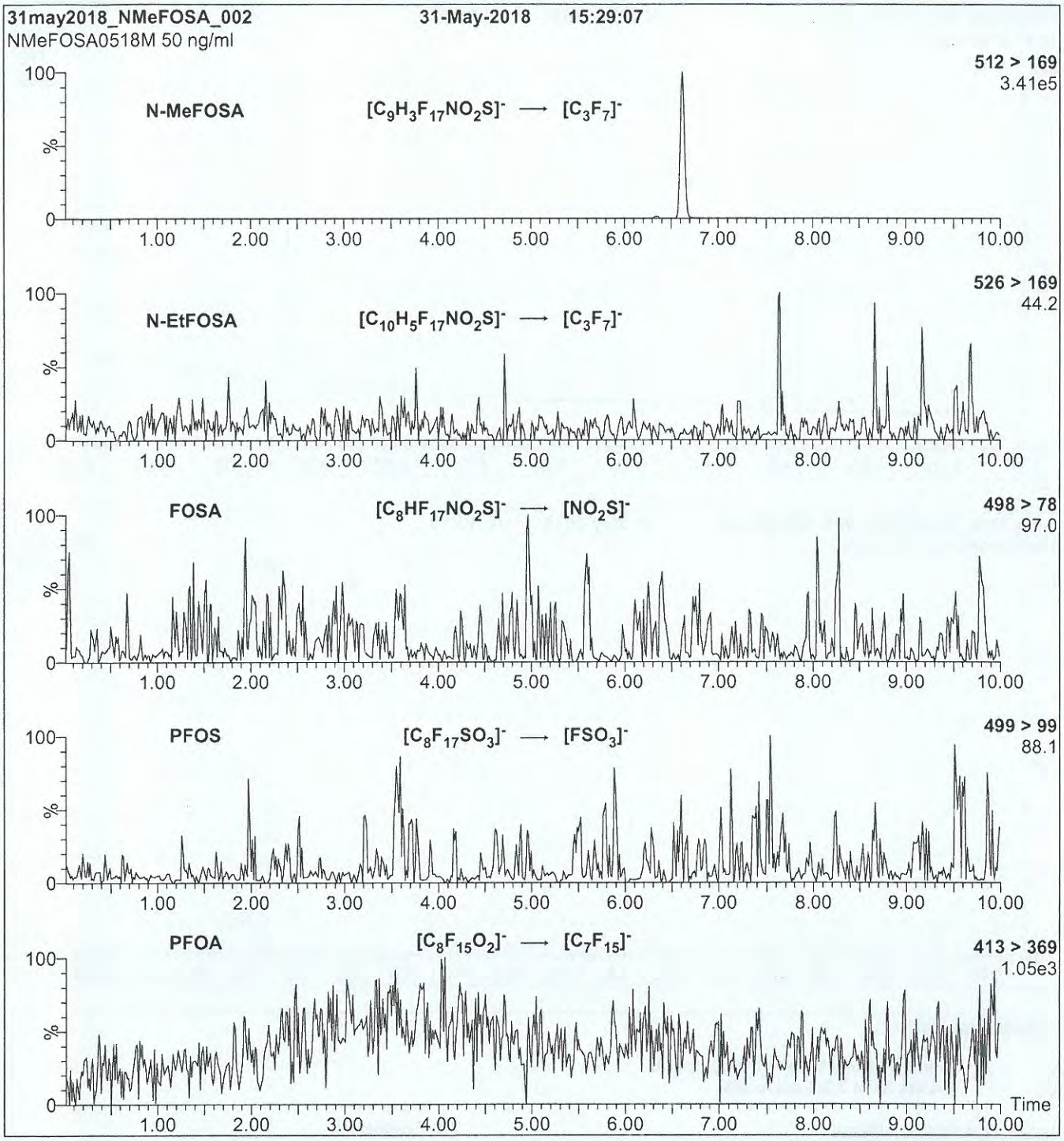
Figure 2: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

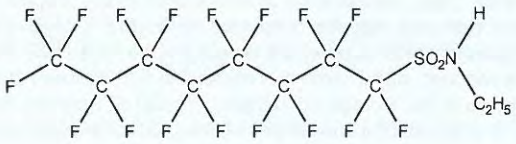
Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

1812061

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0518M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
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)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
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 ~ 0.5% branched isomers of N-ethylperfluorooctanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/12/2018 (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

1820601

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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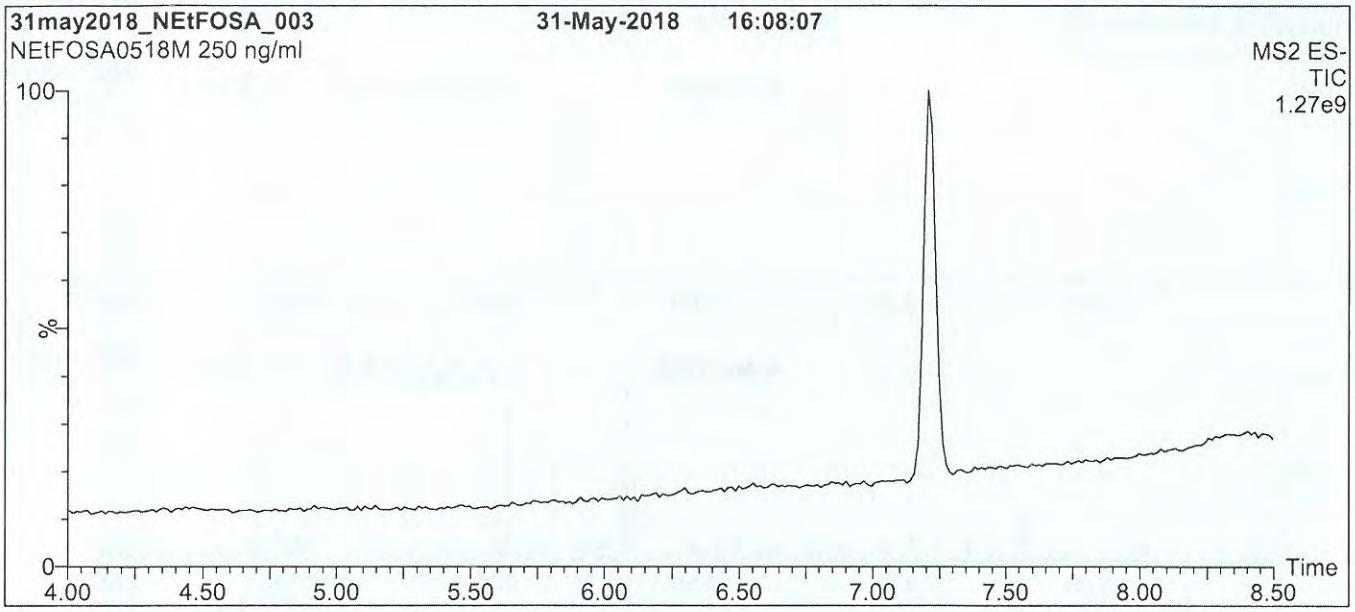
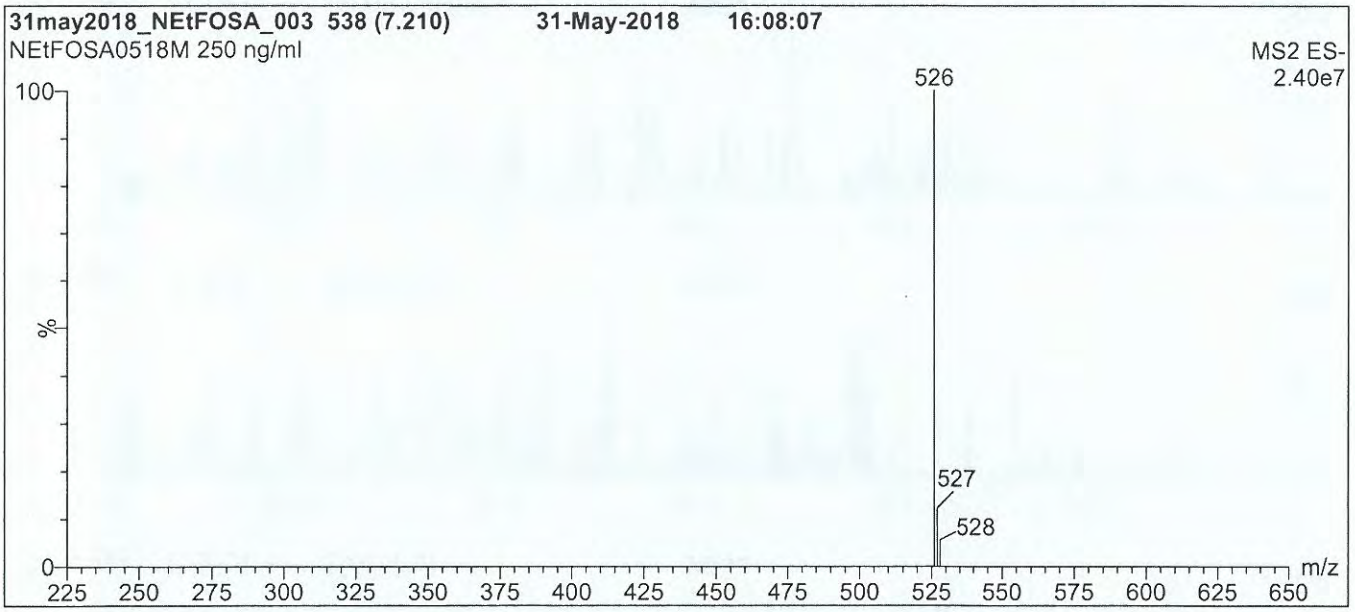
1812061

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 C_{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 85% 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

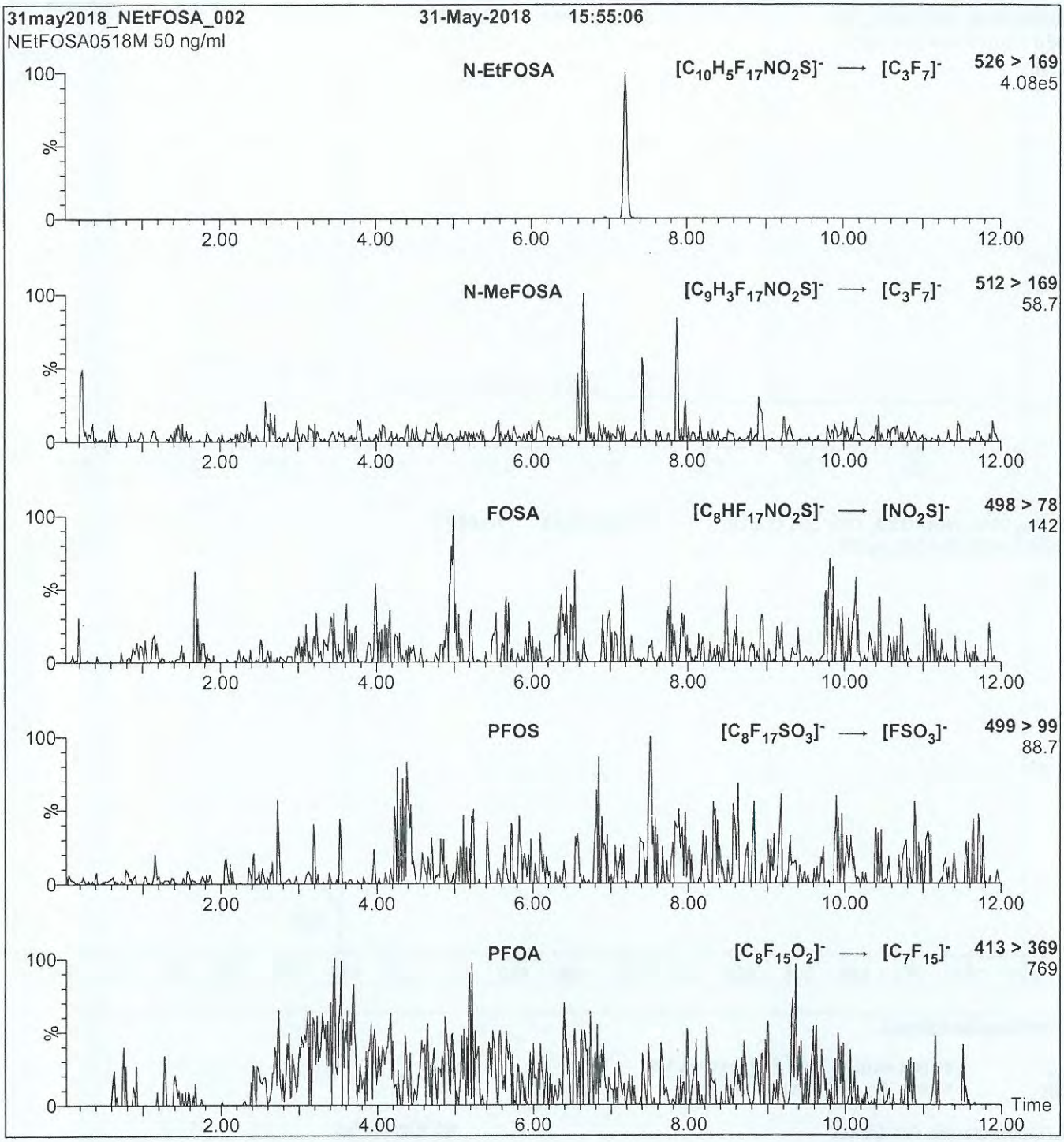
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812061

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) = 3.37e-3
Collision Energy (eV) = 24

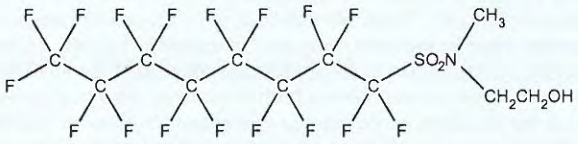
1812062

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE0418M
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)	05/17/2018 (HRGC/LRMS) 05/03/2018 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	05/17/2023		
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:** 05/25/2018 (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

1812062

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).

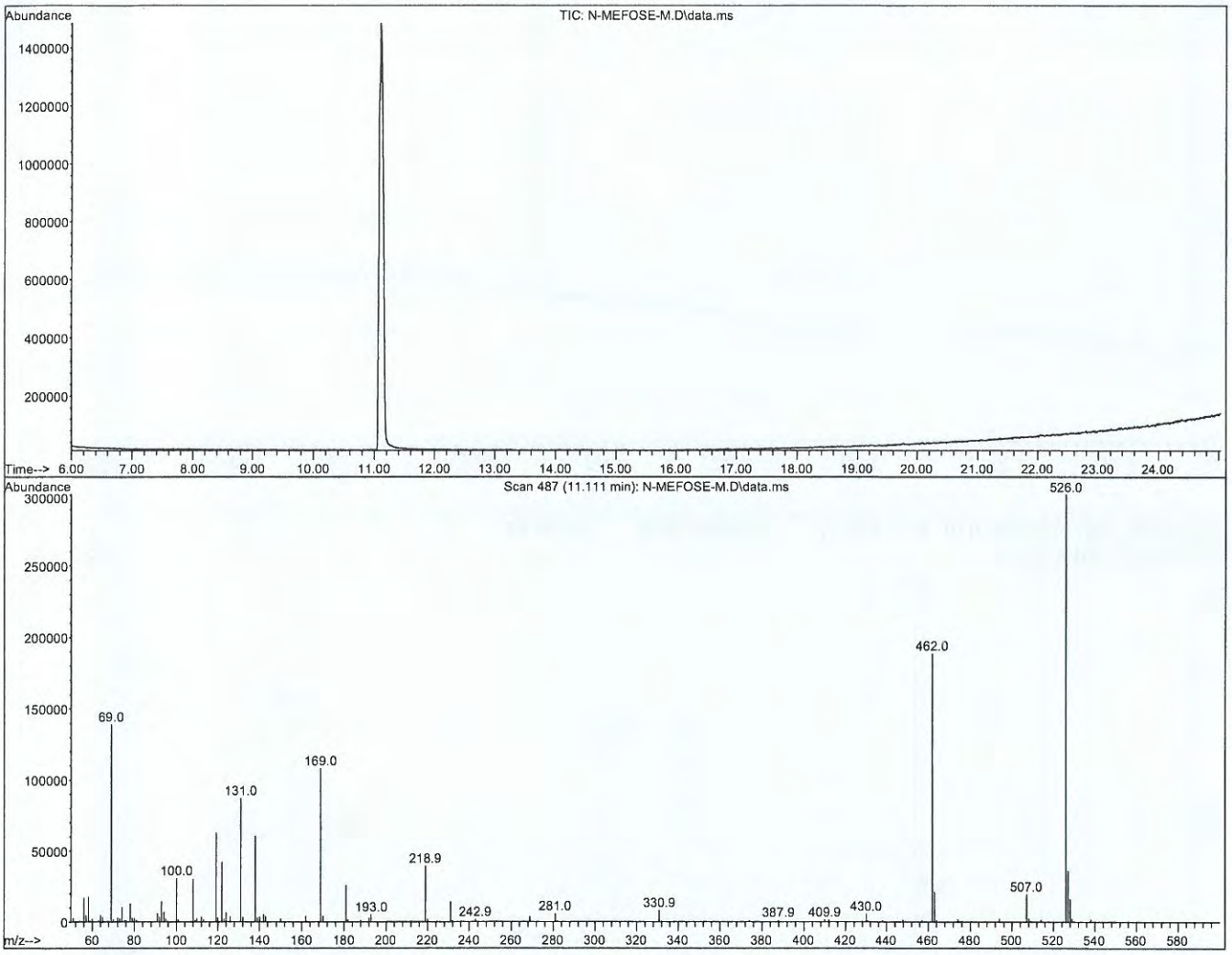
CALA Testing Accreditation No. A 1226

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

18L2062

Figure 1: **N-MeFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

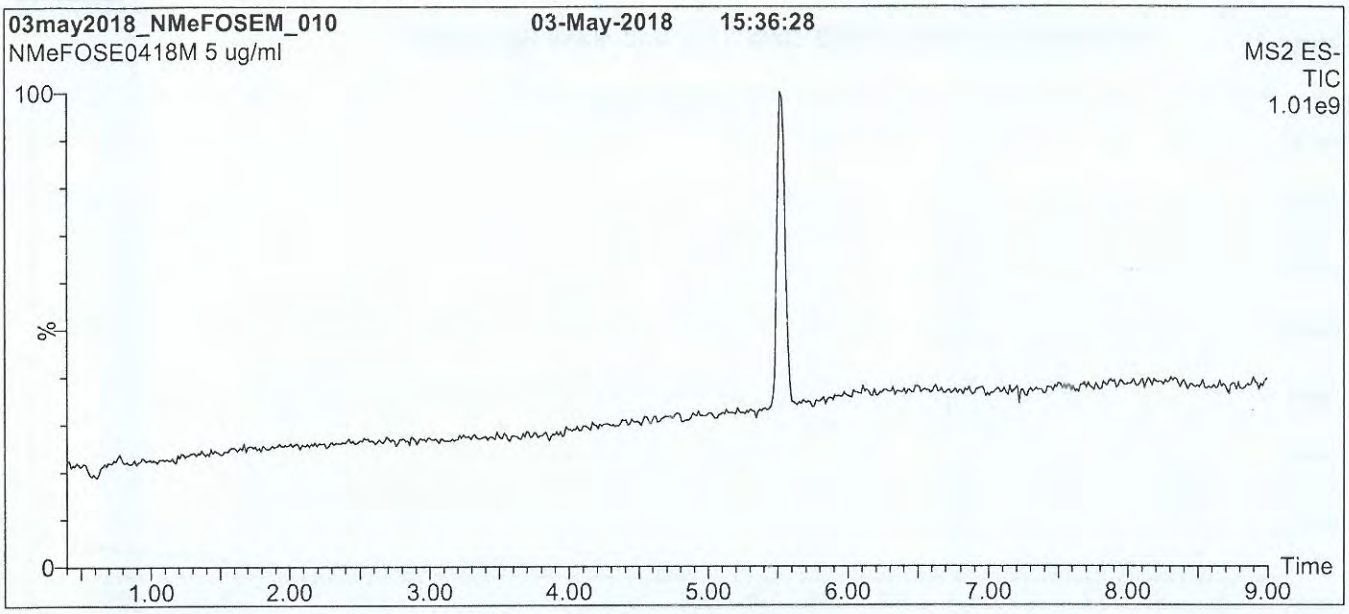
Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

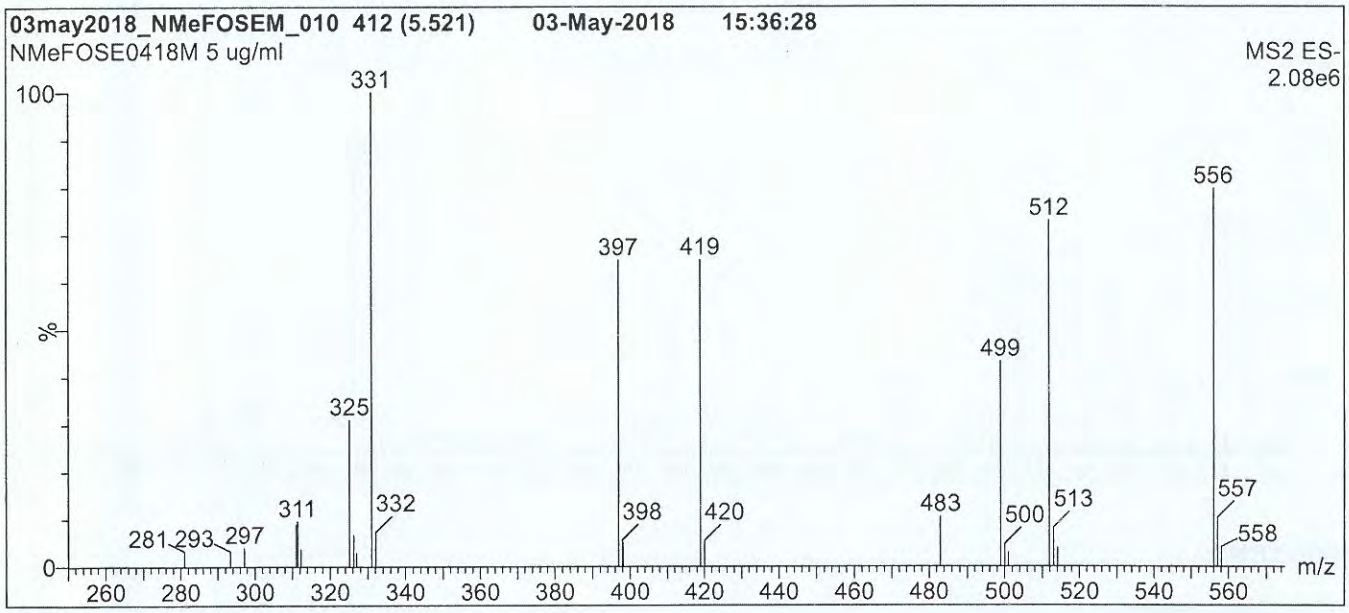
Chromatographic Conditions:

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)

~~18L2062~~ GRB 01/15/19
18L2062

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 85% 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) = 750

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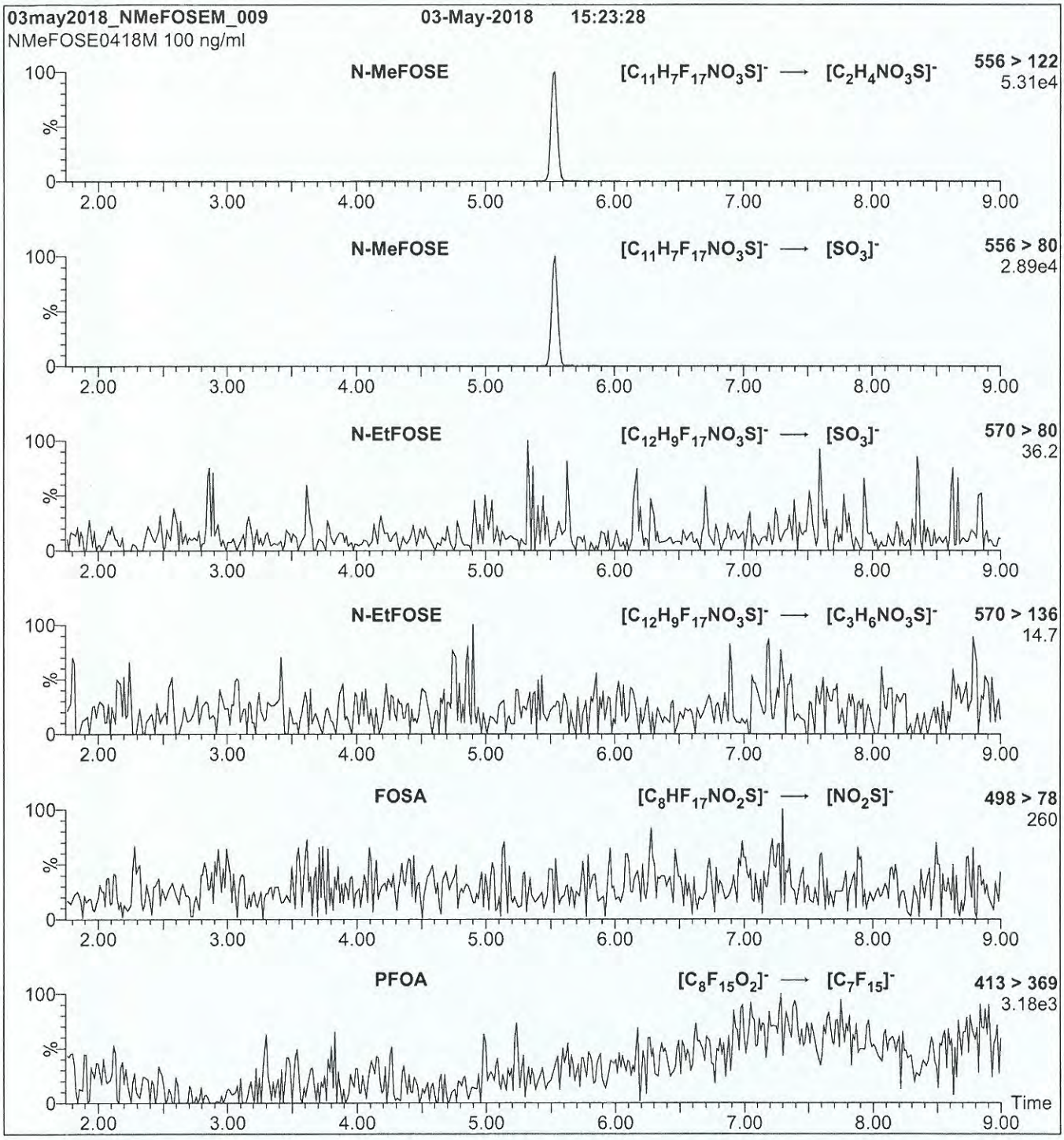
Figure 3: **N-MeFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**



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) = 3.47e-3
Collision Energy (eV) = 36

1812063

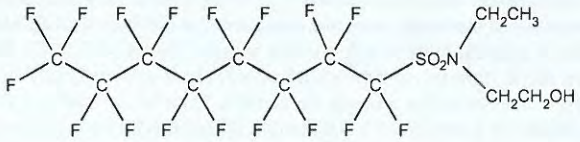
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE0518M

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)	06/04/2018 (HRGC/LRMS) 05/30/2018 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	06/04/2023		
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:** 06/04/2018 (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

1812063

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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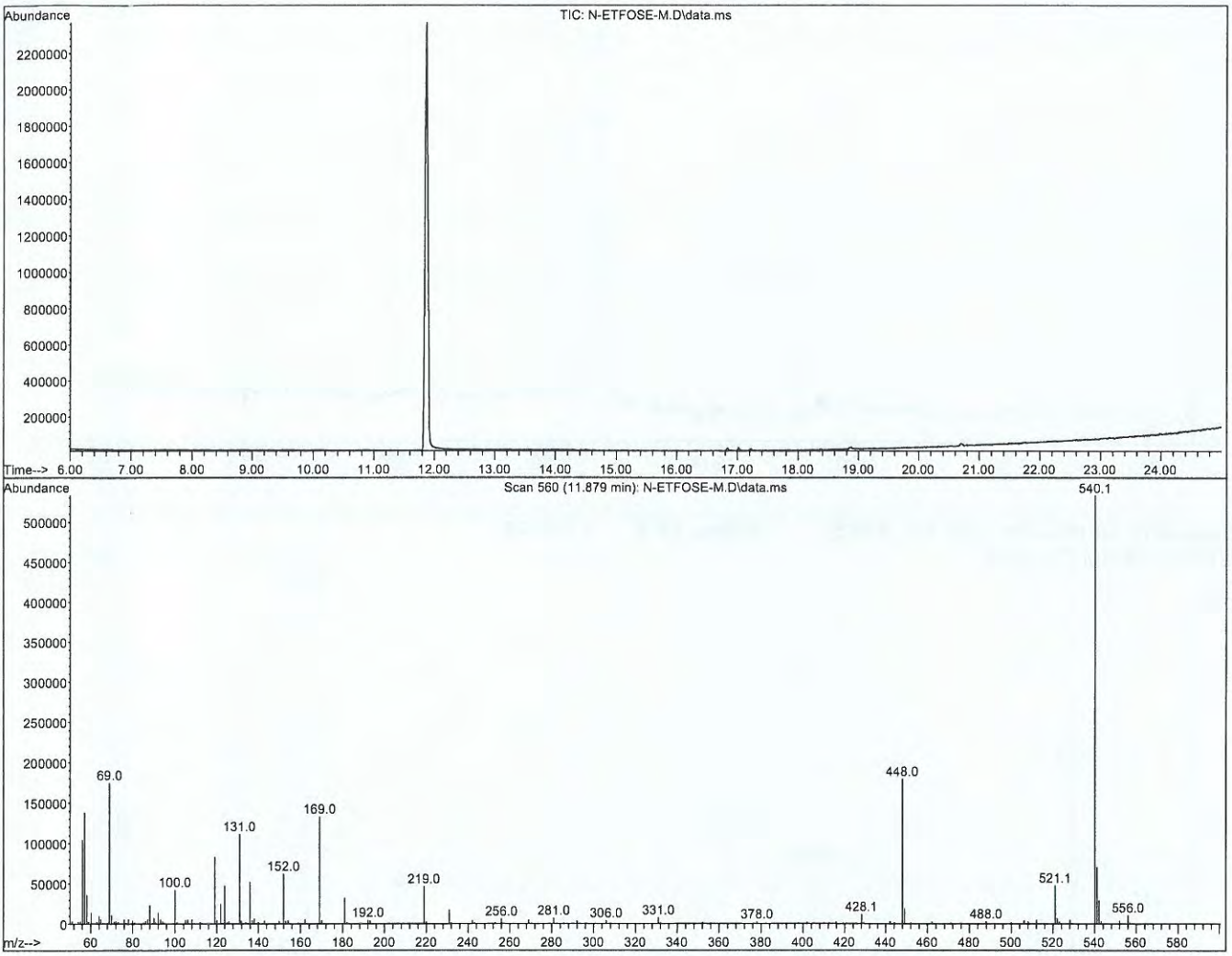
1812063

Figure 1: **N-EtFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

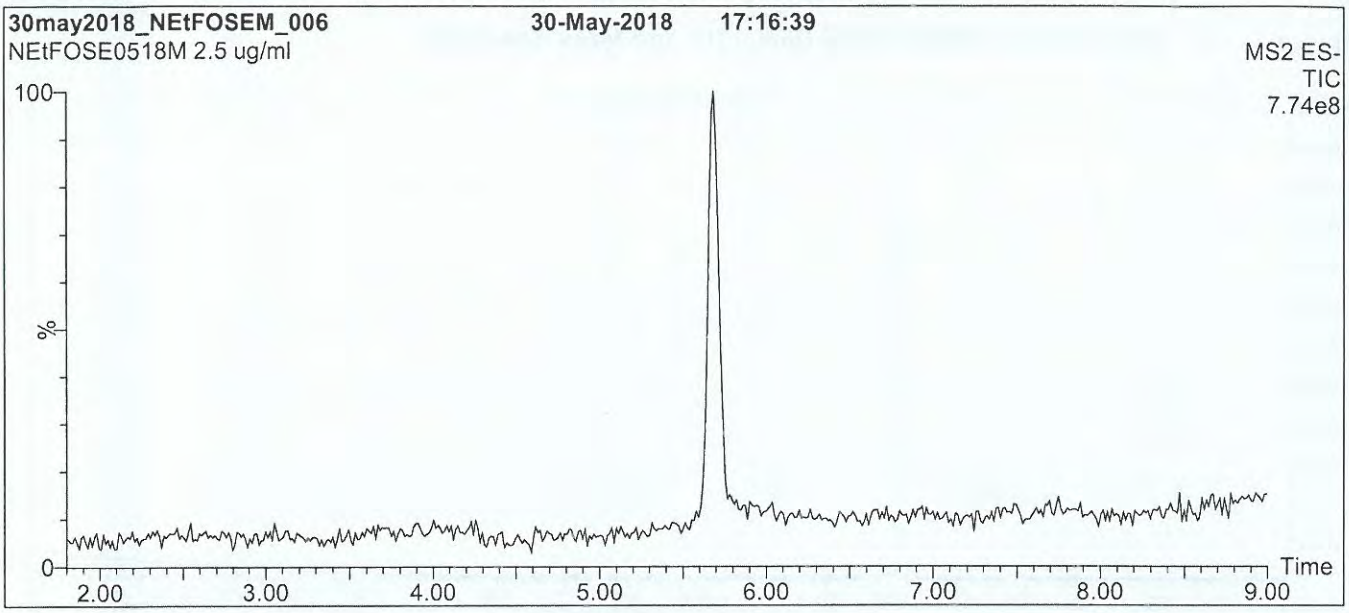
Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

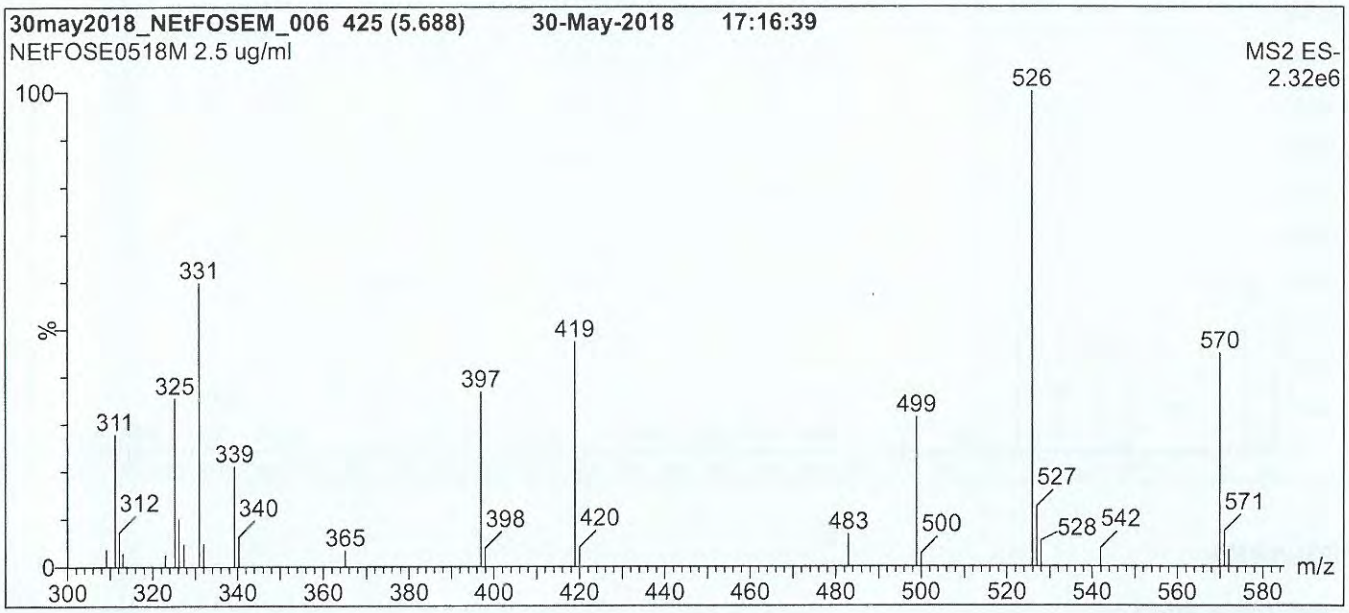
Chromatographic Conditions:

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)

1812063

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 C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% MeOH / 30% H_2O
Ramp to 85% 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

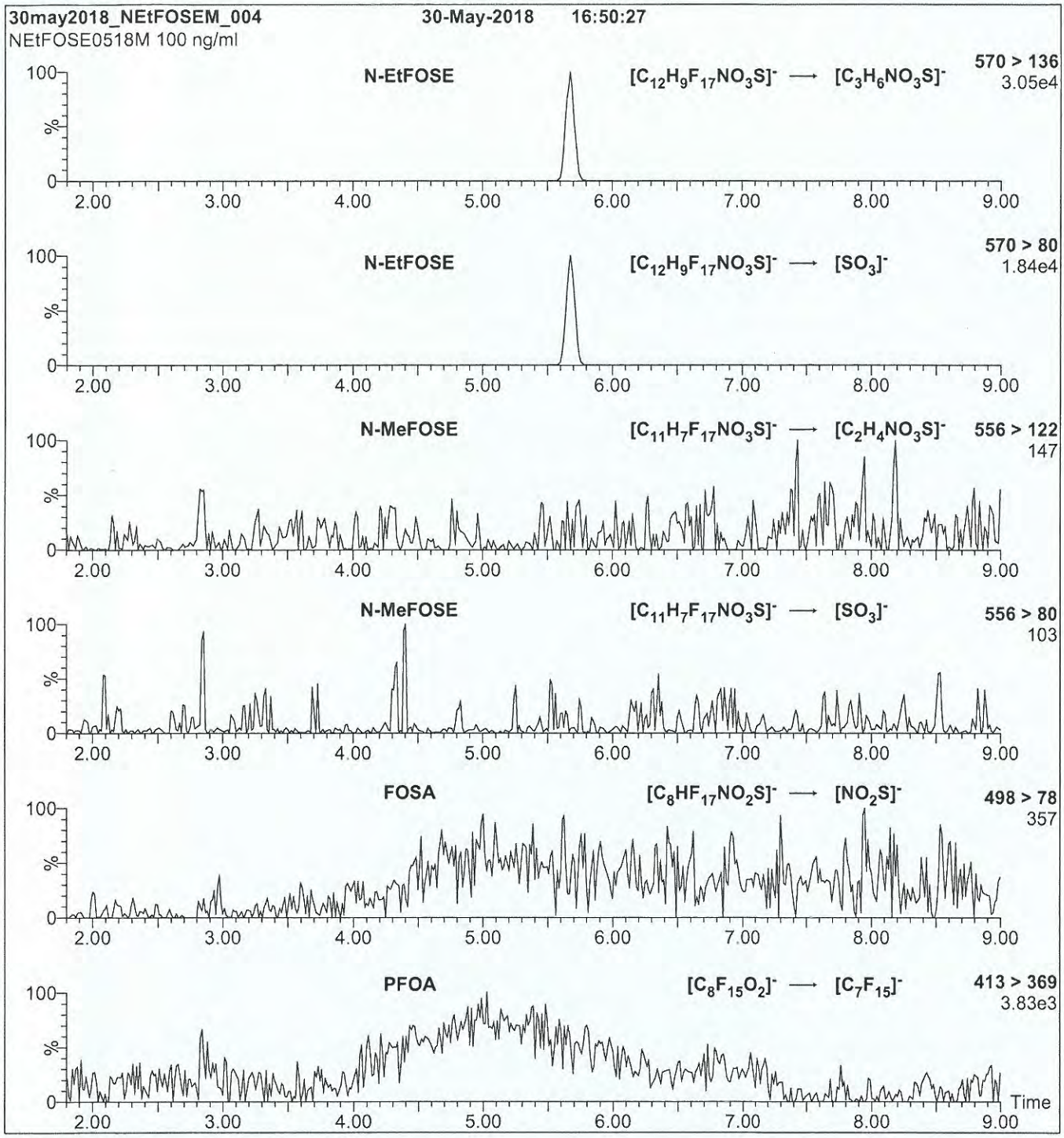
MS Parameters

Experiment: Full Scan (300 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (l/hr) = 750

18L2063

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) = 3.45e-3
Collision Energy (eV) = 32

18L2071

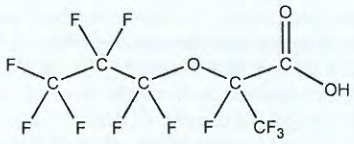
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA1018

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)	10/24/2018		
EXPIRY DATE: (mm/dd/yyyy)	10/24/2021		
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 GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/29/2018 (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

1812071

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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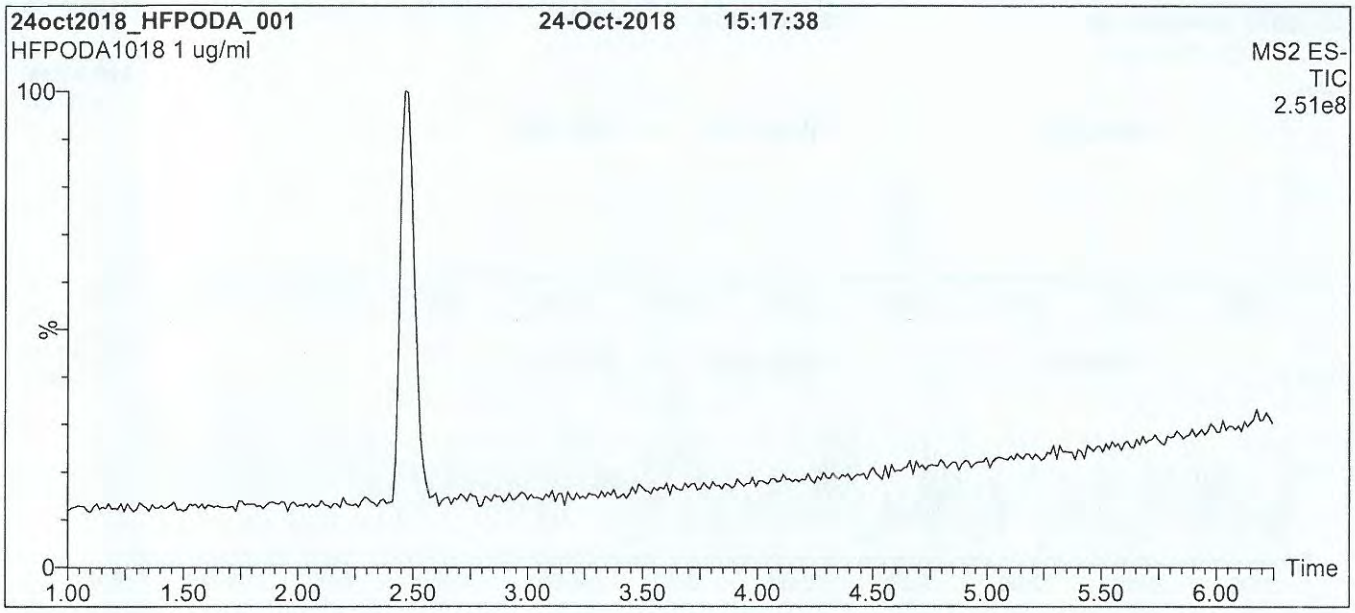
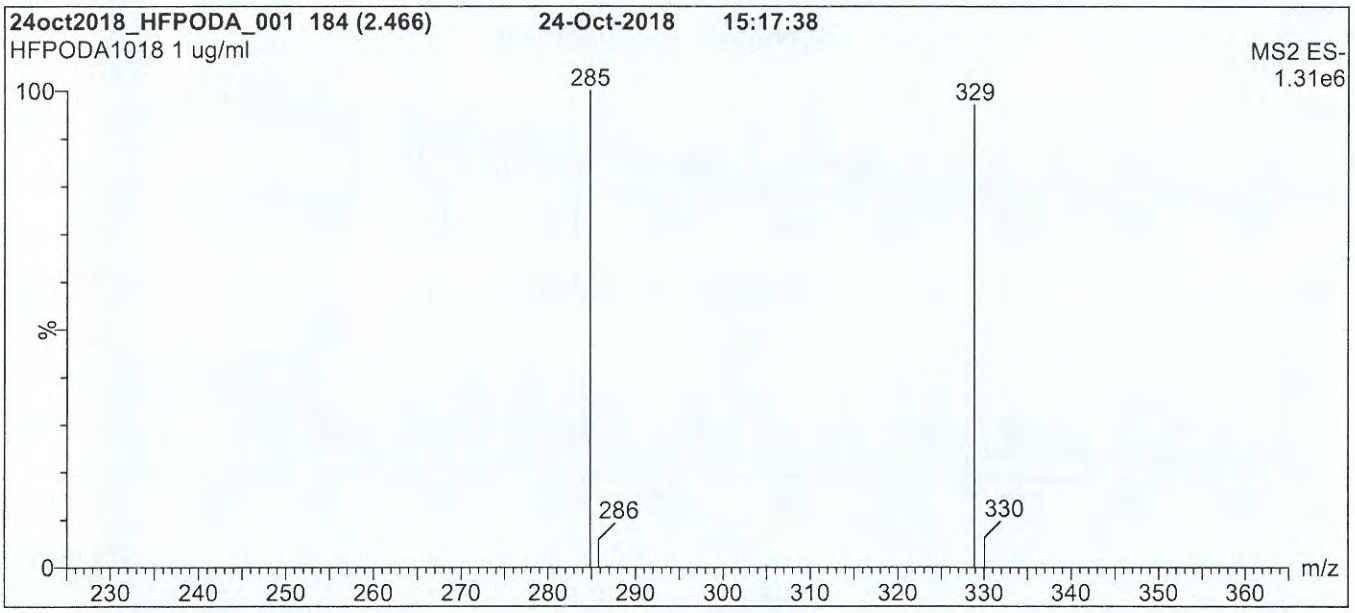
18L2071

Figure 1: **HFPO-DA; 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: 45% (80:20 MeOH:ACN) / 55% 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

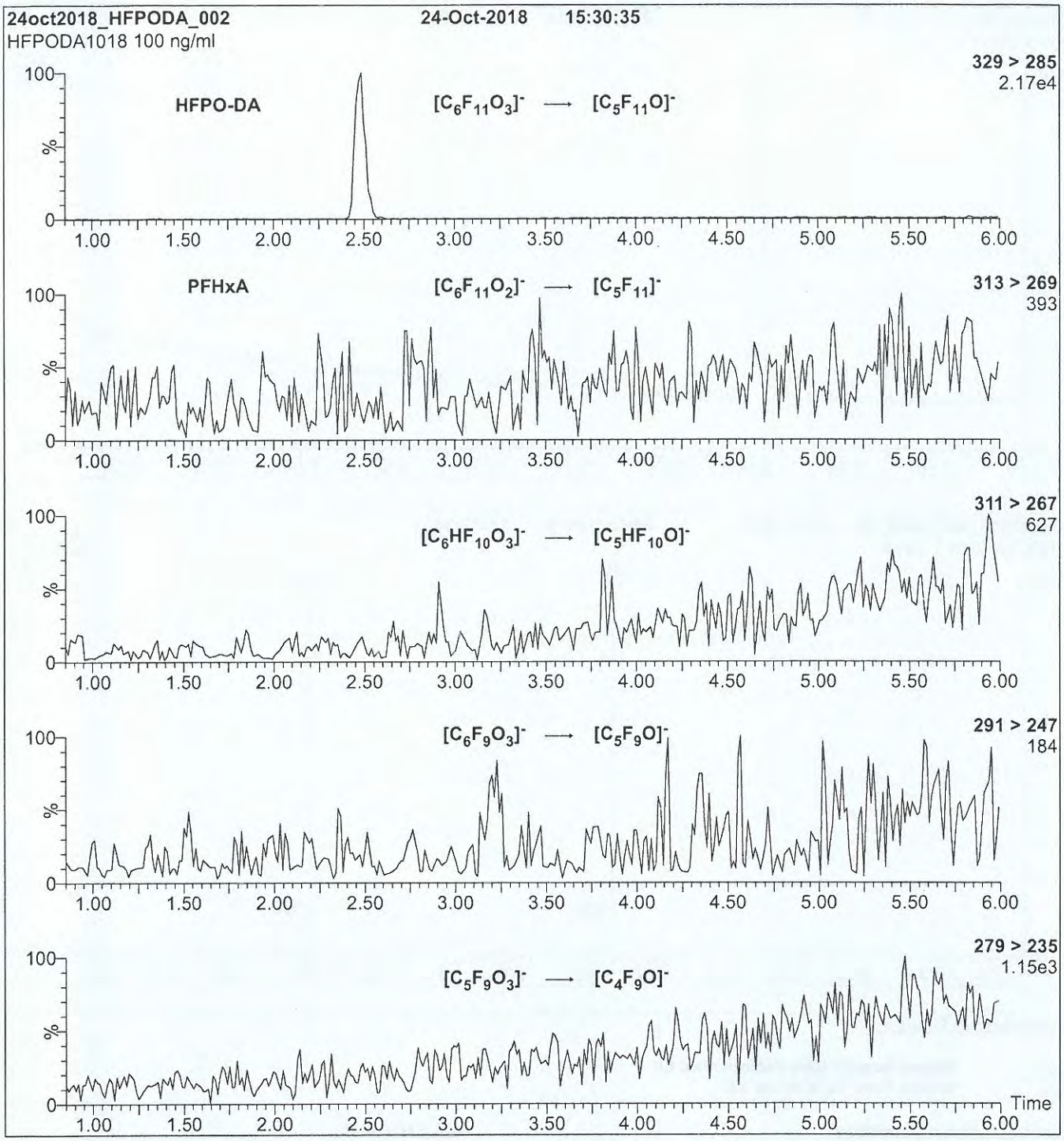
MS Parameters

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

1812071

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) = 3.02e-3
Collision Energy (eV) = 6

1812072

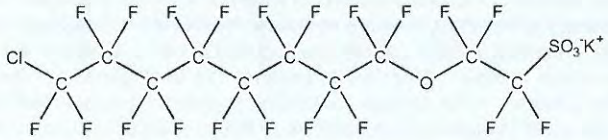
WELLINGTON LABORATORIES

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

1812072

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 ISO 17034 REFERENCE MATERIAL PRODUCER

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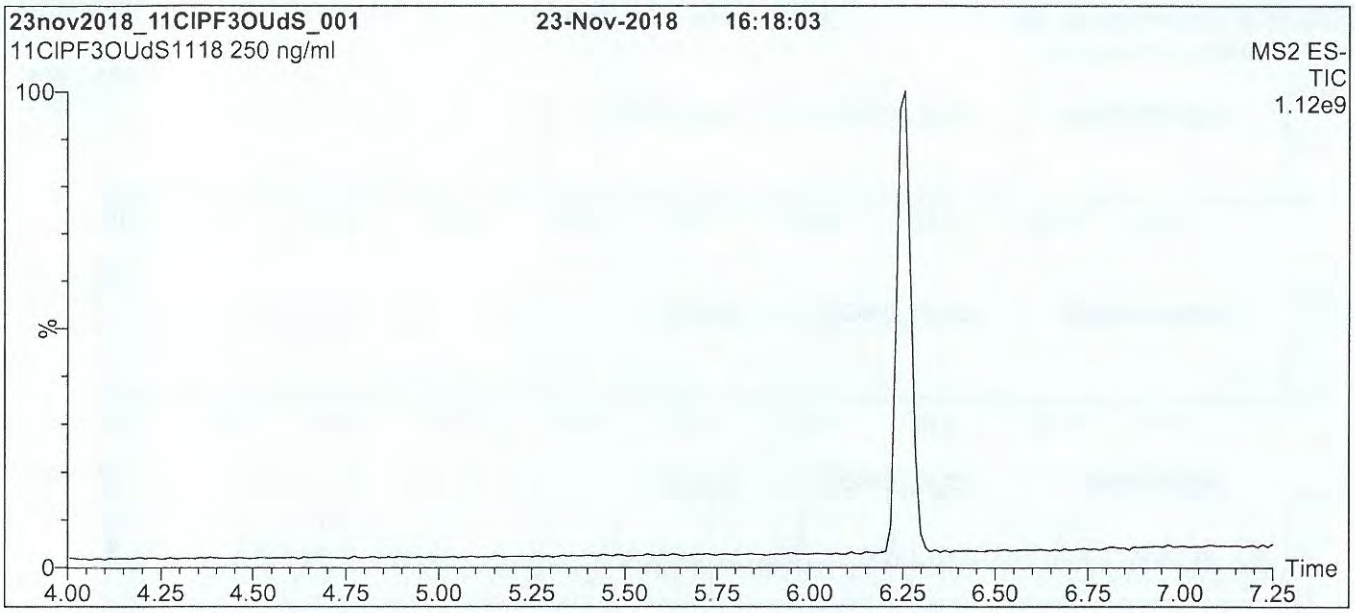
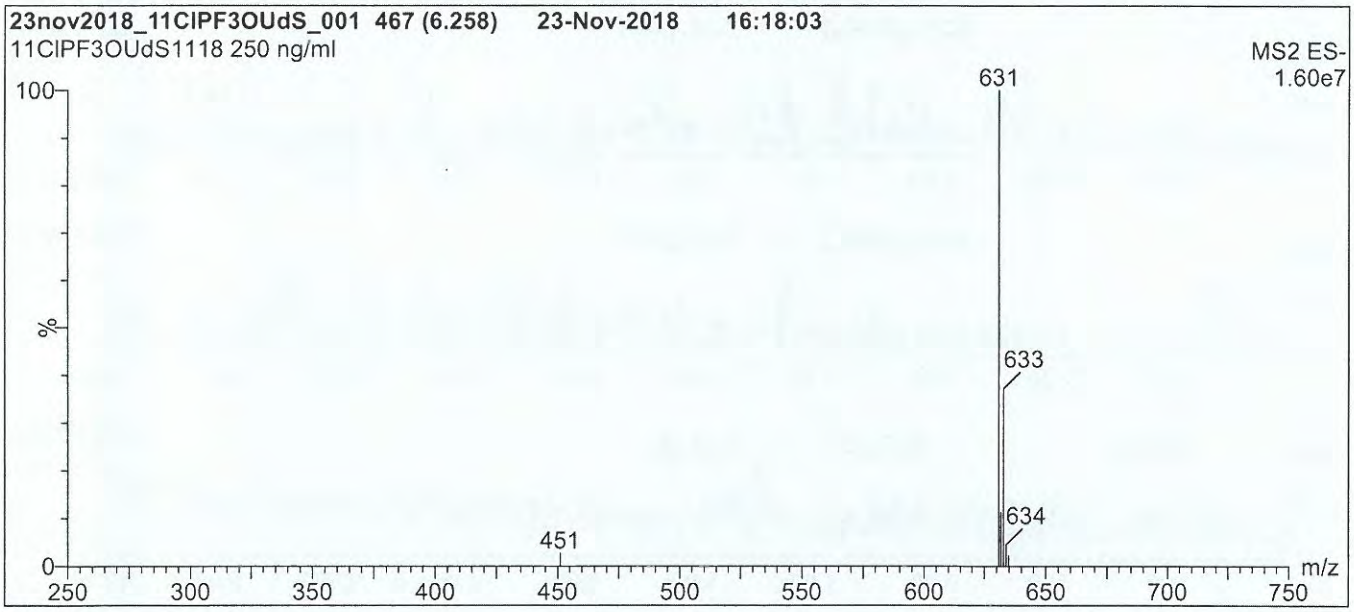
1812072

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

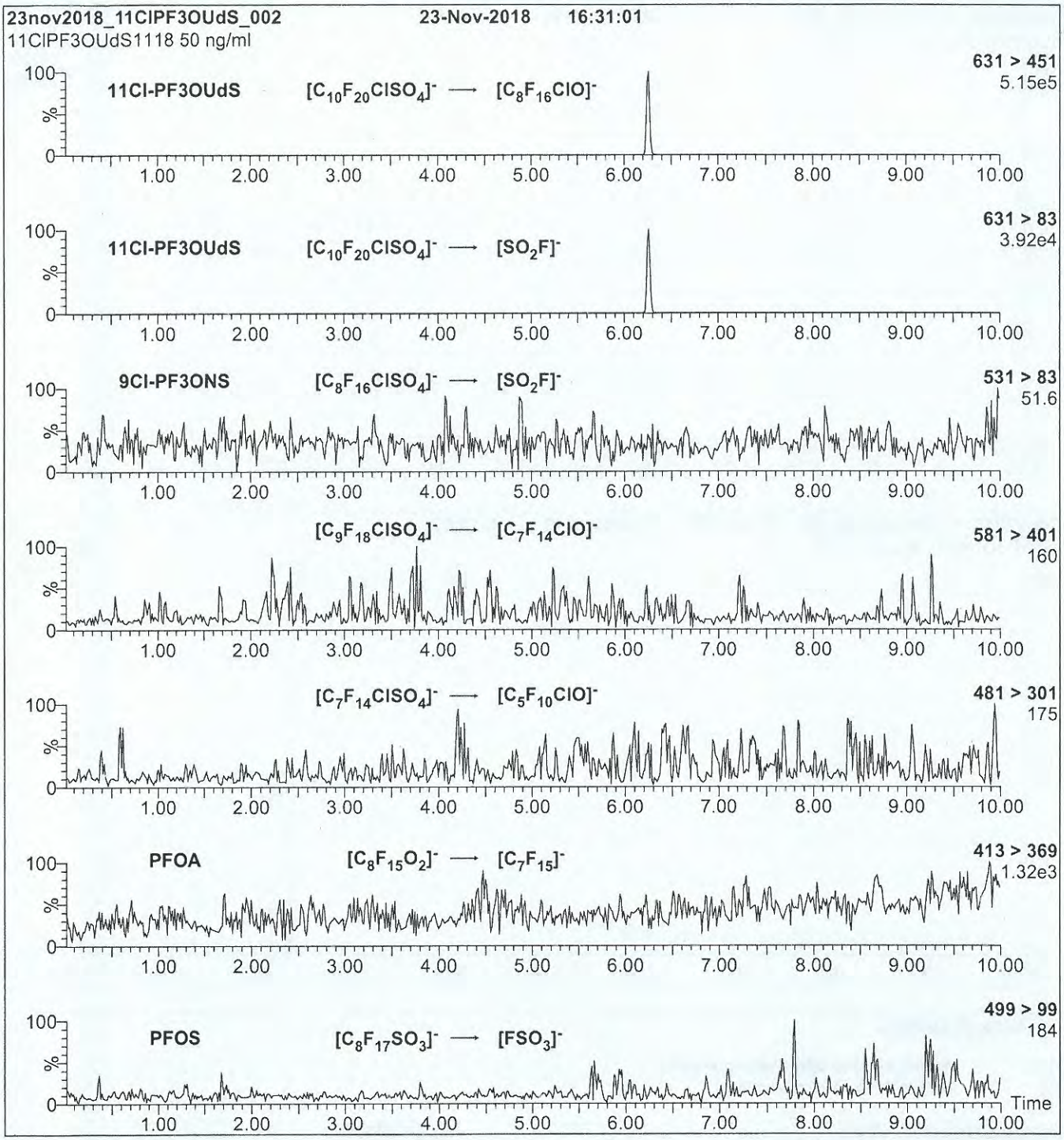
MS Parameters

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

18L2072

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

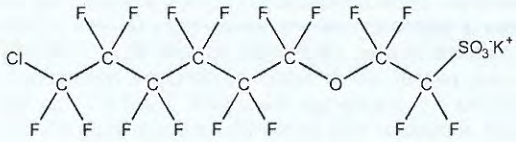
Collision Gas (mbar) = 2.84e-3
Collision Energy (eV) = 24

18L2073

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	9Cl-PF3ONS	**LOT NUMBER:**	9ClPF3ONS1118
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)	11/22/2018		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2023		
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 the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/23/2018 (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

1812073

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:

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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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. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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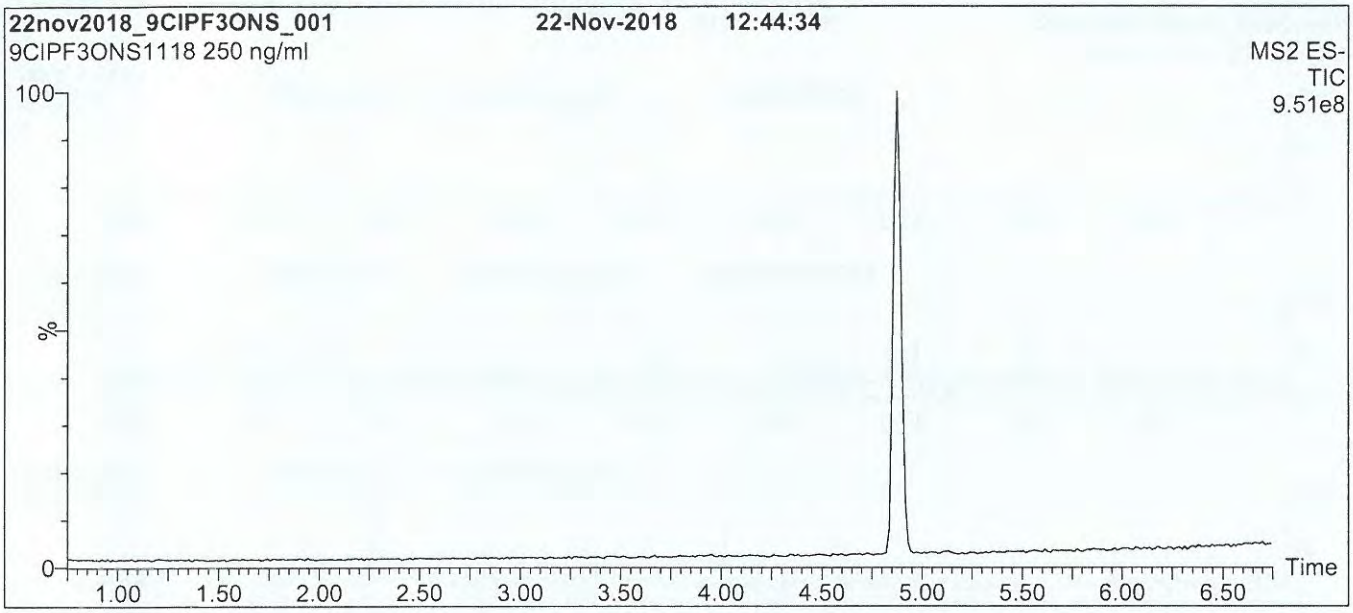
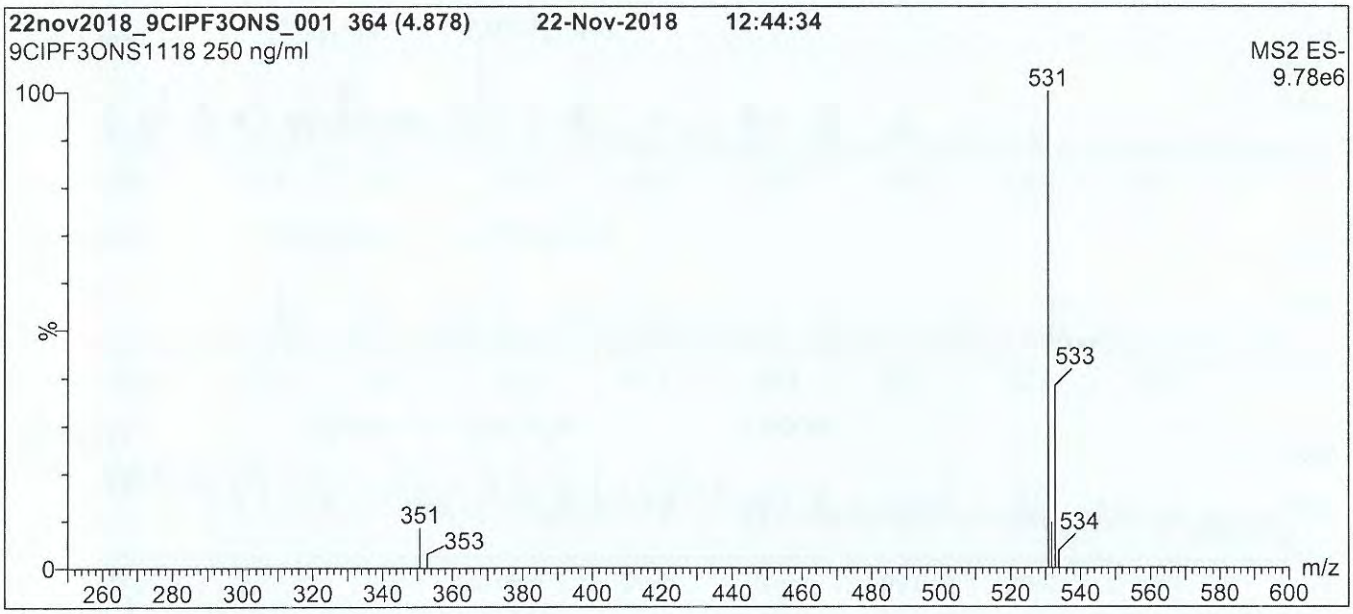
18L2073

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: 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

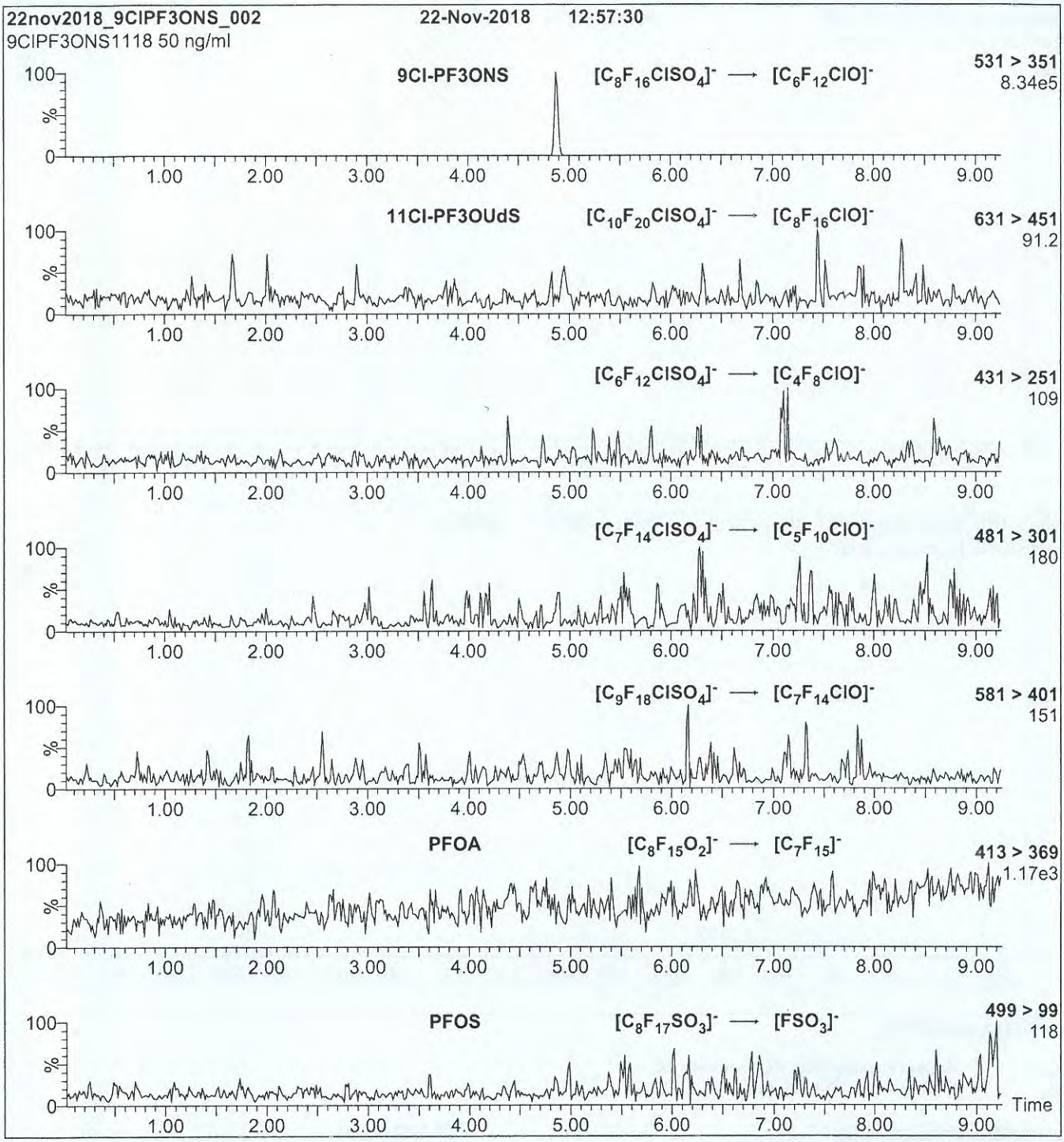
MS Parameters

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

1812073

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) = 3.16e-3
Collision Energy (eV) = 20

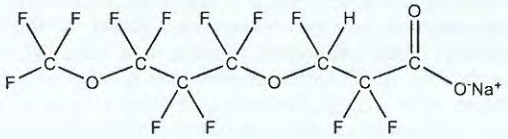
18L2074

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: NaDONA
LOT NUMBER: NaDONA0318
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 Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/26/2018		
EXPIRY DATE: (mm/dd/yyyy)	03/26/2023		
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.
- 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:** 03/27/2018 (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

1812074

INTENDED USE:

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HANDLING:

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TRACEABILITY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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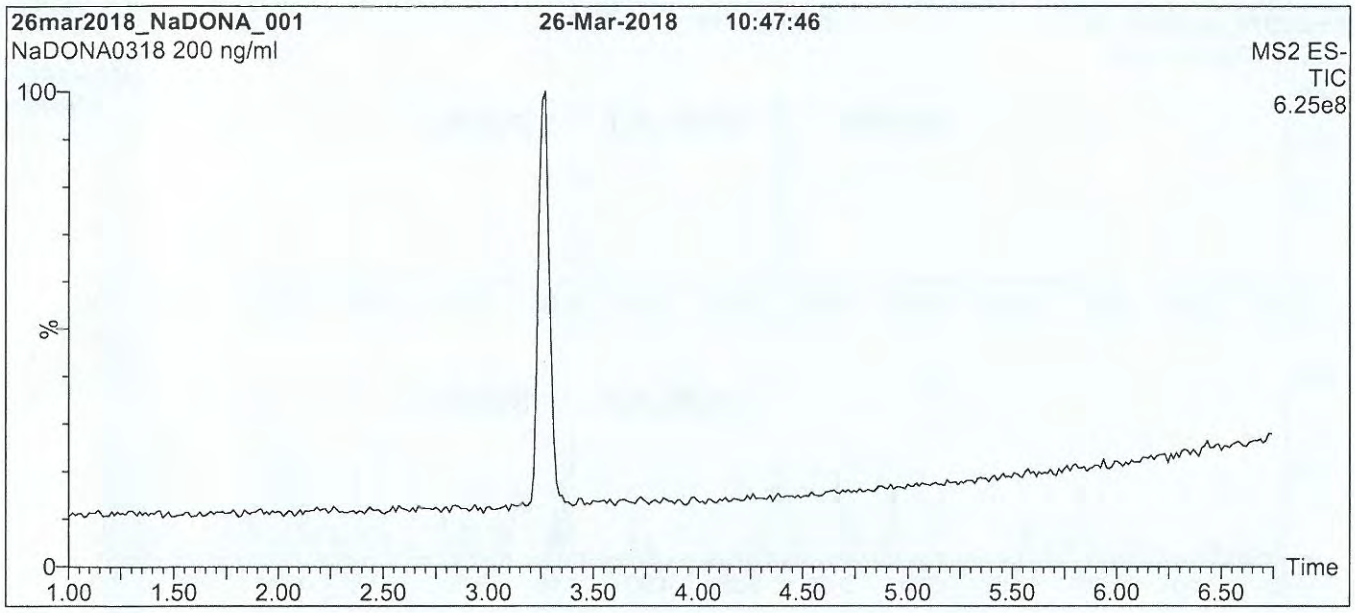
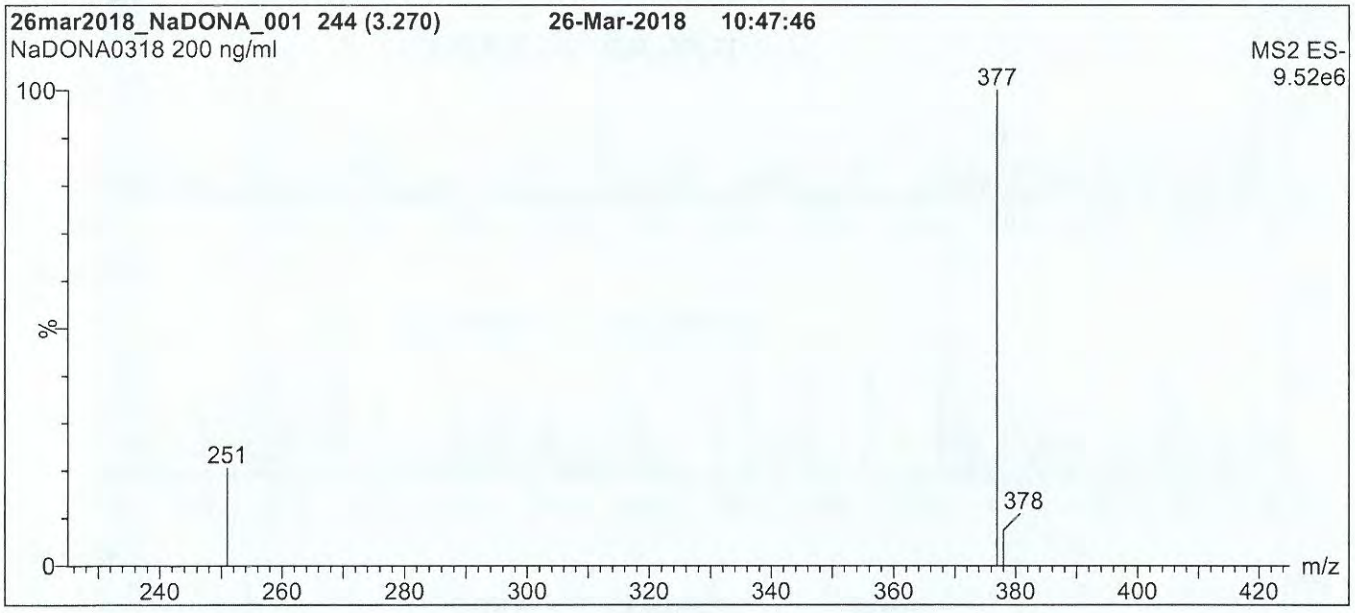
18L2074

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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% 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

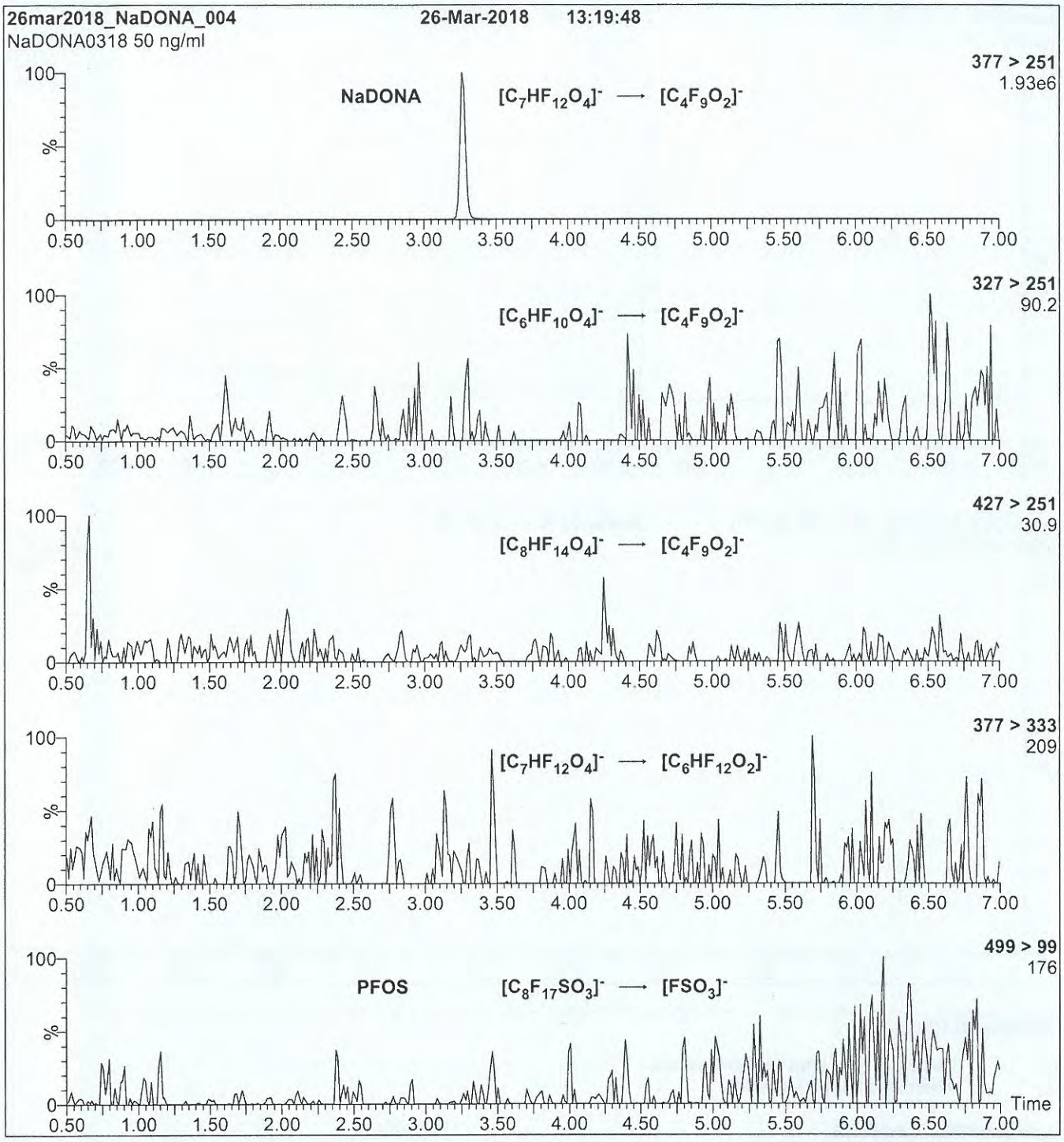
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812074

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

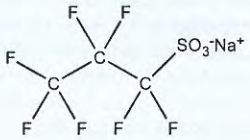
Collision Gas (mbar) = 3.65e-3
Collision Energy (eV) = 10

18L2076

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

1812076

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,...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 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).

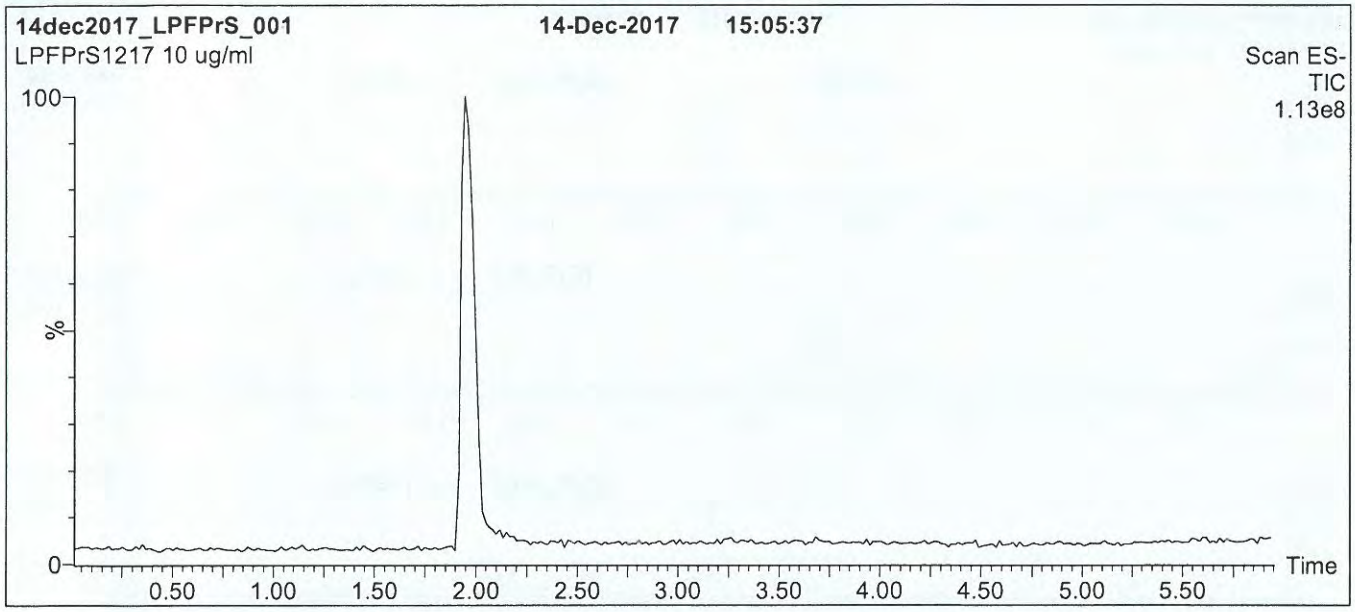
CALA Testing Accreditation No. A 1226

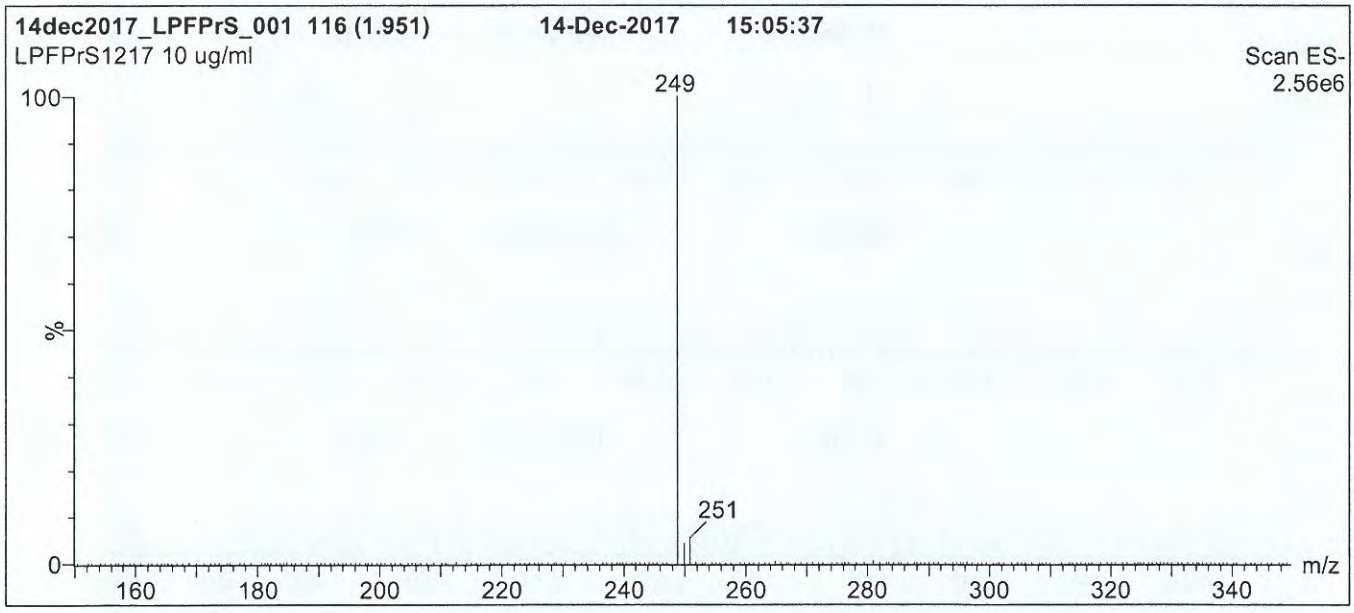
ANAB ACCREDITED Reference Material Producer

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

1812076

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

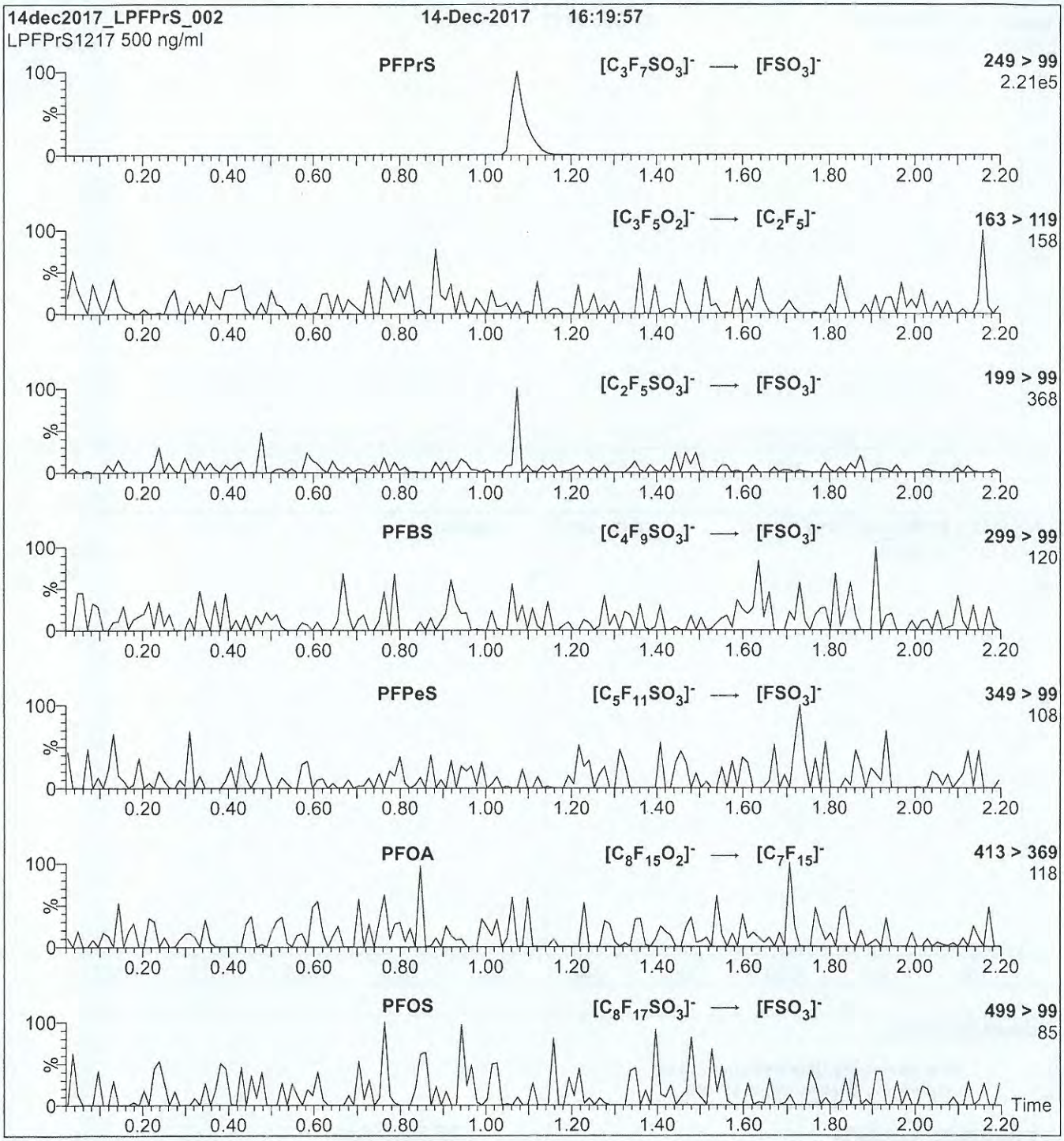
MS Parameters

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

1812076

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

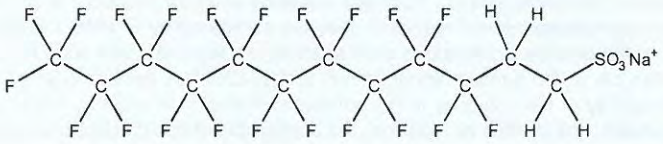
18L2078

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS0718
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)	07/13/2018			
EXPIRY DATE: (mm/dd/yyyy)	07/13/2021			
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:** 07/16/2018 (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

18L2078

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.

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The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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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:

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. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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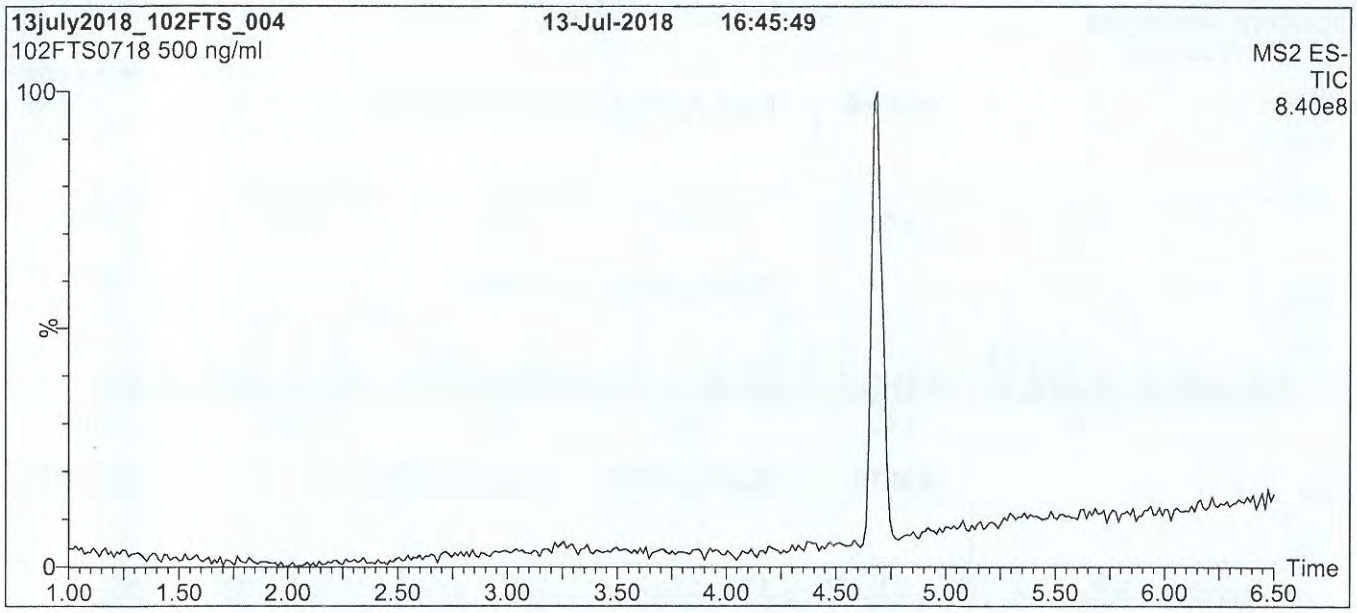
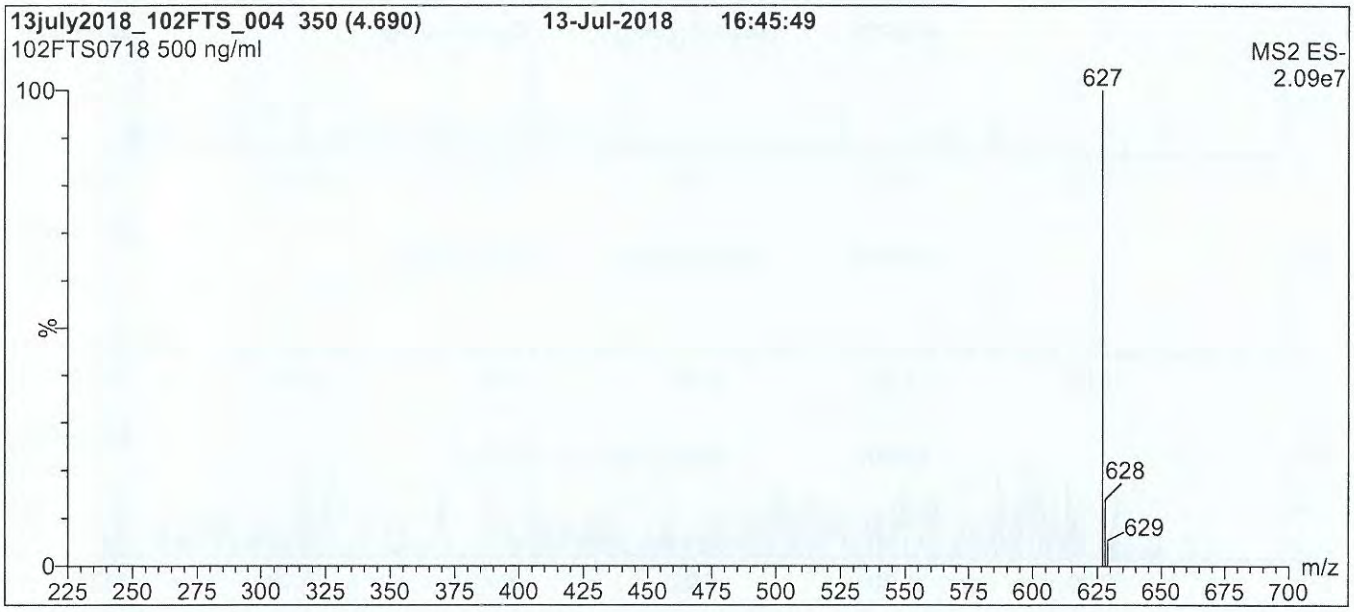
18L2078

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

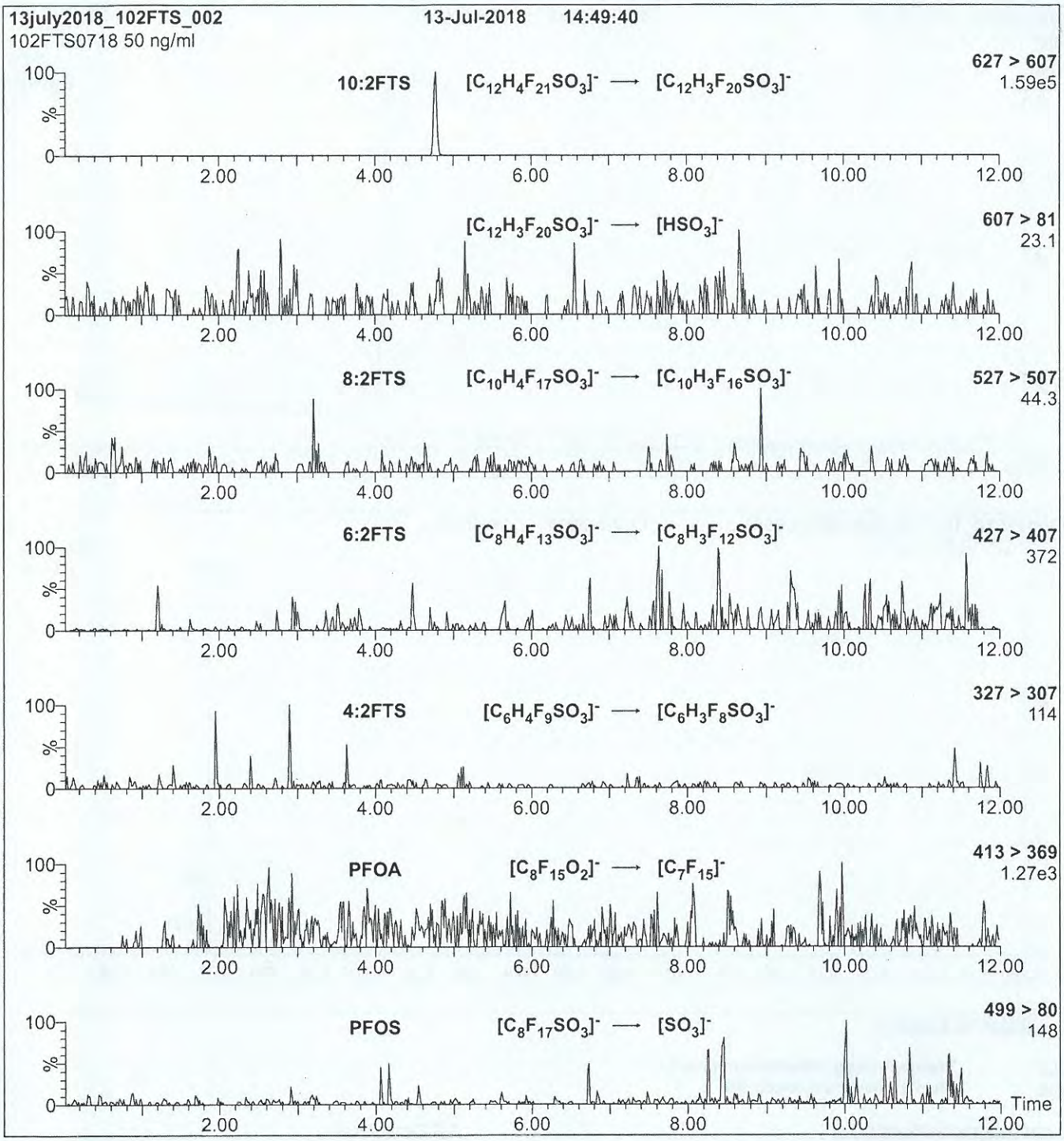
MS Parameters

Experiment: Full Scan (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) = 750

1812078

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) = 3.47e-3
Collision Energy (eV) = 25

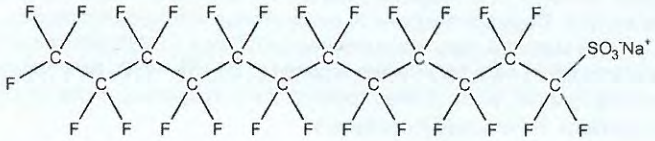
19B0712

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDoS
LOT NUMBER: LPFDoS0916
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:
CAS #: Not available



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)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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 ~ 0.7% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.7% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/17/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

19B0712

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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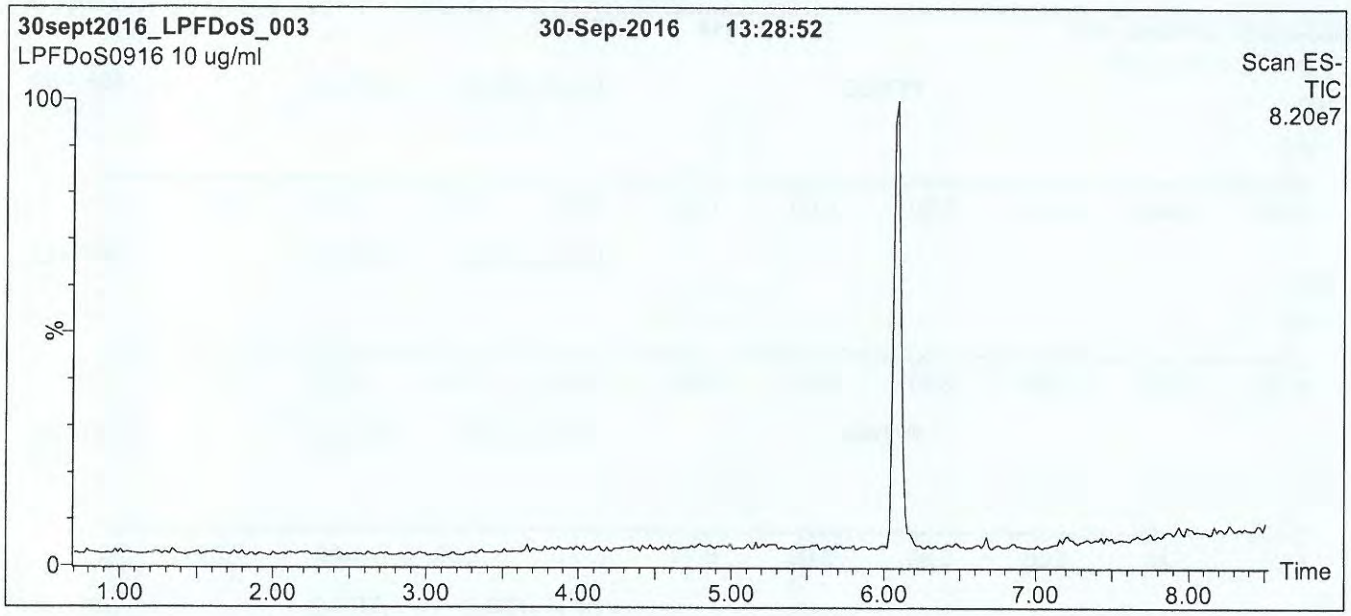
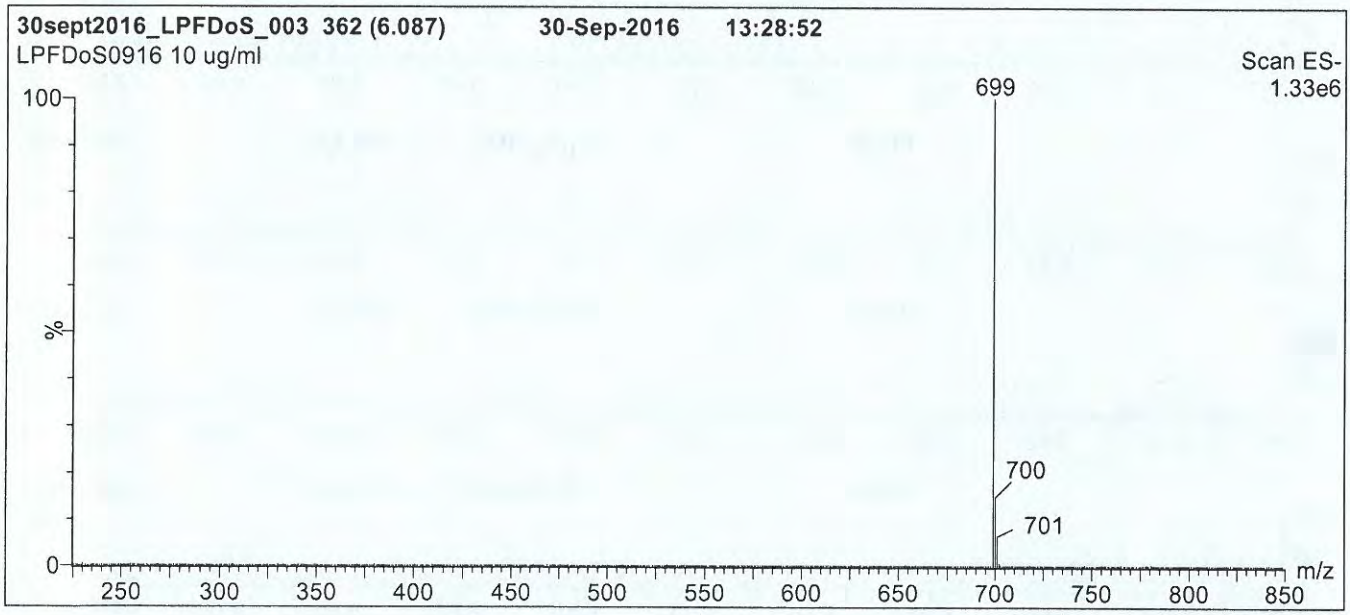
19B0712

Figure 1: **L-PFDoS; 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: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

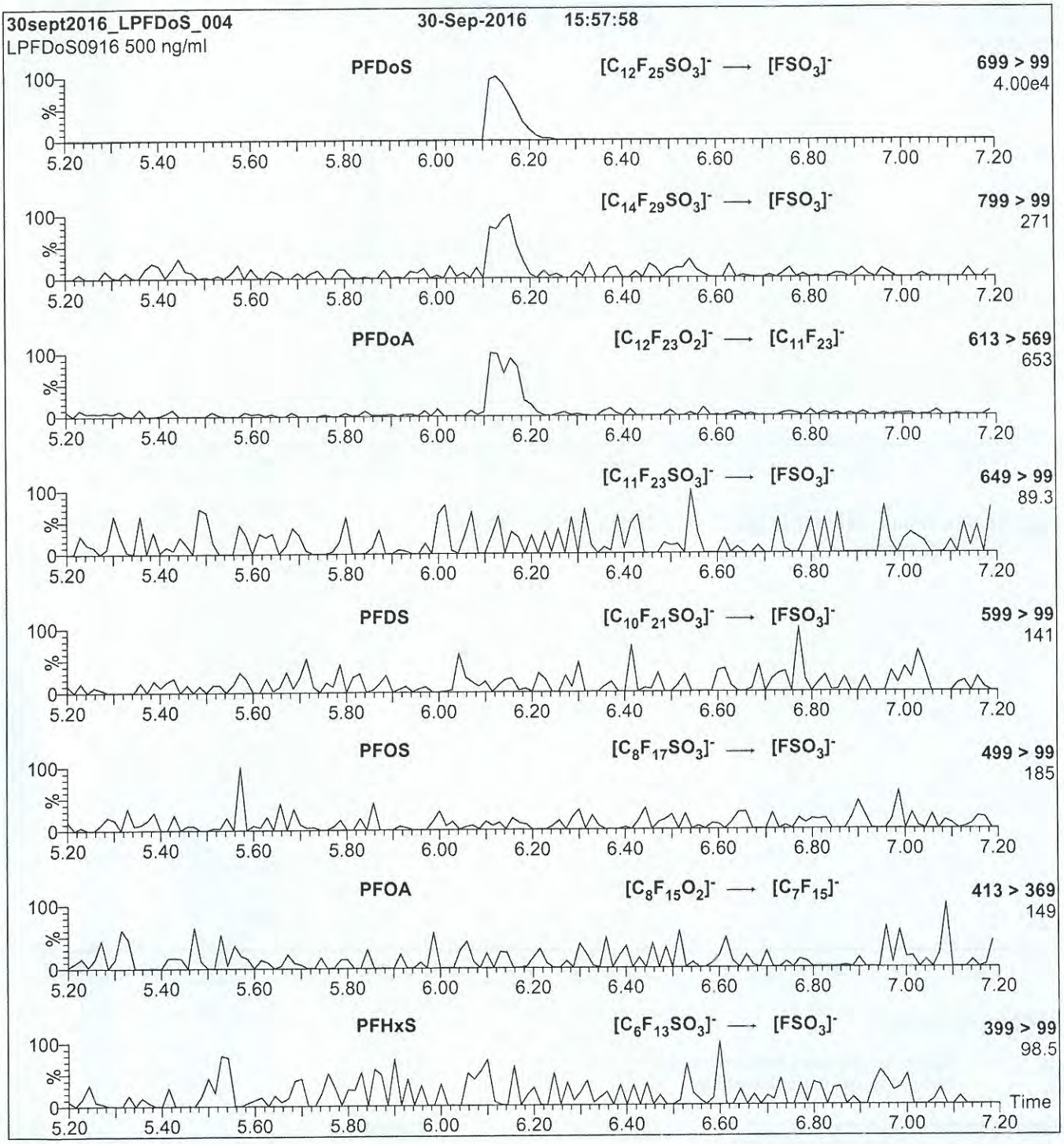
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 80.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

19B0712

Figure 2: **L-PFDoS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFDoS)

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) = 3.35e-3
Collision Energy (eV) = 50

Analytical Standard Record

Vista Analytical Laboratory

19E2202

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18L2018	18O2-PFHxS	20-Dec-18	** Vendor **	22-Mar-23	1.06
18L2021	13C2-FOUEA	20-Dec-18	** Vendor **	14-Nov-19	1
18L2022	13C4-PFBA	20-Dec-18	** Vendor **	16-Feb-23	1
18L2023	13C6-PFDA	20-Dec-18	** Vendor **	20-Sep-23	1
18L2024	13C9-PFNA	20-Dec-18	** Vendor **	23-May-22	1
18L2025	13C7-PFUdA	20-Dec-18	** Vendor **	20-Sep-23	1
18L2026	13C5-PFHxA	20-Dec-18	** Vendor **	27-Sep-23	1
18L2028	13C4-PFOS	20-Dec-18	** Vendor **	11-Sep-23	1.05
18L2029	13C8-PFOA	20-Dec-18	** Vendor **	29-Jun-23	1.02

Description:	PFC-RS	Expires:	14-Nov-19
Standard Type:	Reagent	Prepared:	23-May-19
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	28-May-19 09:02 by GRB

Expiration date set to expiration date of standard being used to create this one. GRB 05/22/19
18L2021 13C2-FOUEA EXP. 11/14/19

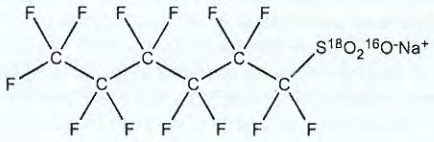
Analyte	CAS Number	Concentration	Units
18O2-PFHxS		1.25	ug/mL
13C9-PFNA		1.25	ug/mL
13C8-PFOA		1.25	ug/mL
13C7-PFUnA		1.25	ug/mL
13C6-PFDA		1.25	ug/mL
13C5-PFHxA		1.25	ug/mL
13C4-PFOS		1.25	ug/mL
13C4-PFBA		1.25	ug/mL
13C2-FOUEA		1.25	ug/mL

18L2018

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0318
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	1585941-14-5



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	03/22/2018		
EXPIRY DATE: (mm/dd/yyyy)	03/22/2023		
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.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (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

18L2018

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).

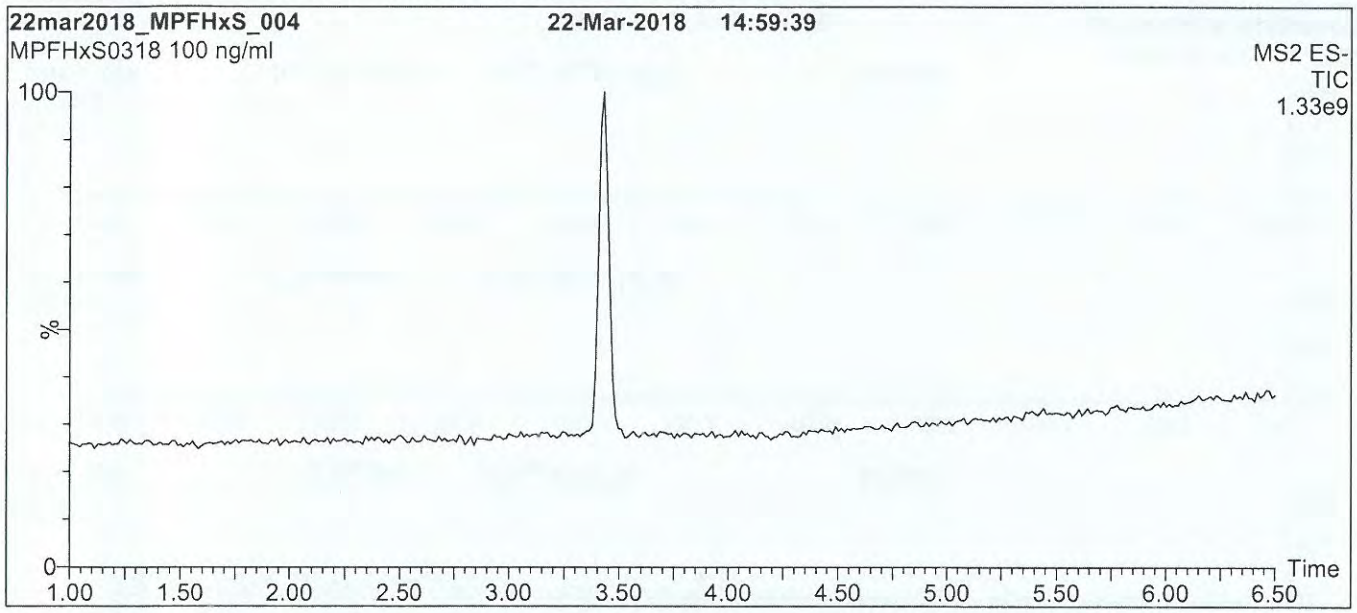
CALA Testing Accreditation No. A-1226

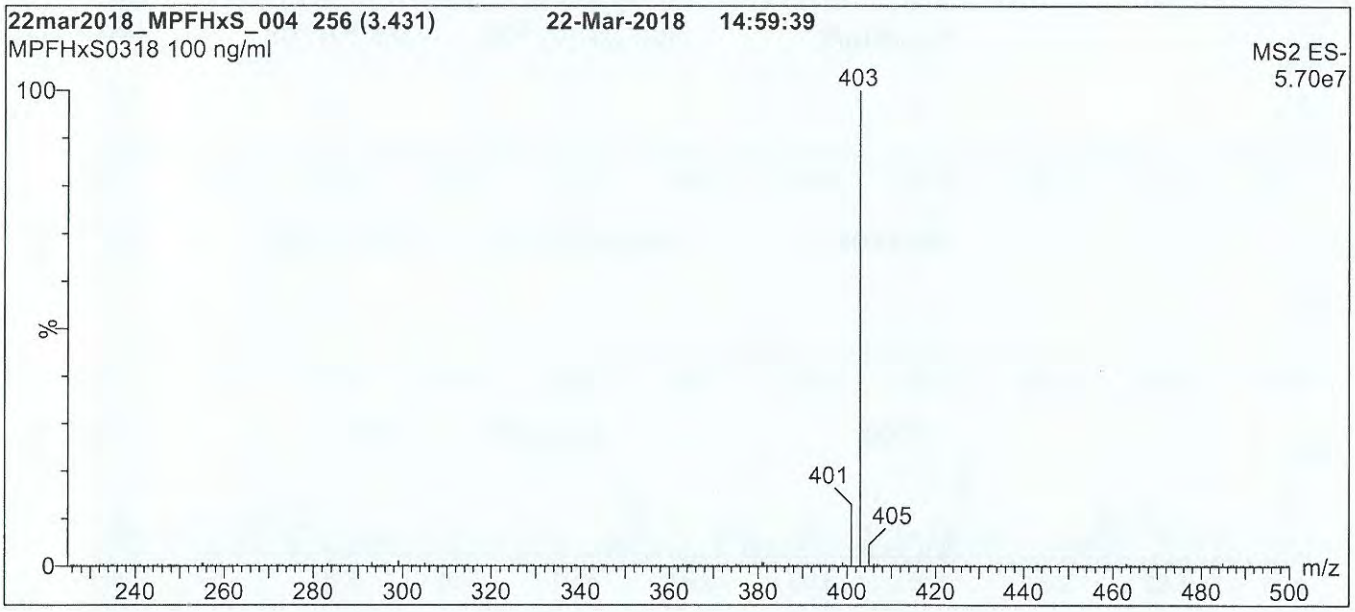
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2018

Figure 1: **MPFHxS; 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 80% 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

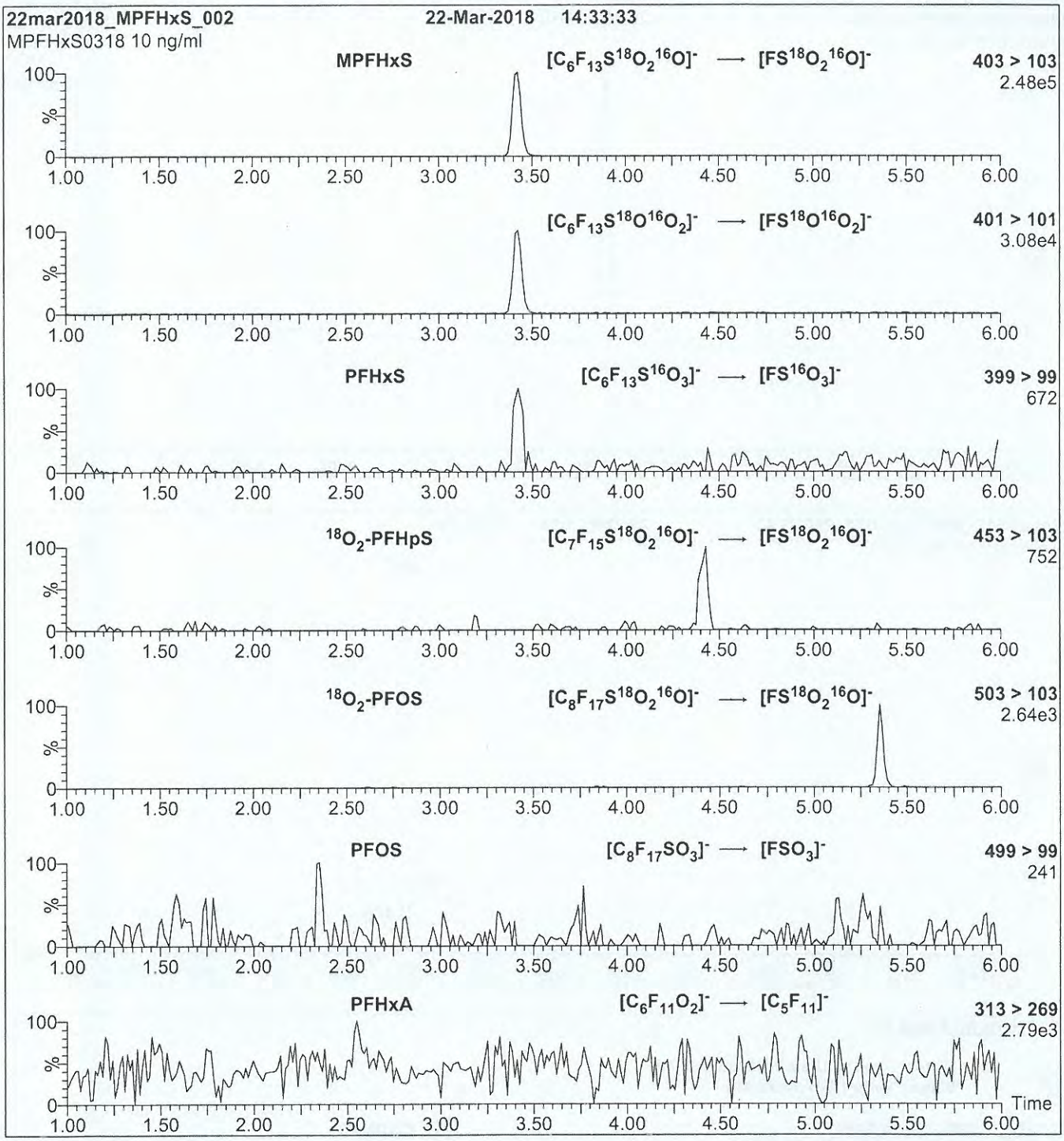
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18L2018

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.64e-3

Collision Energy (eV) = 32

18L2021

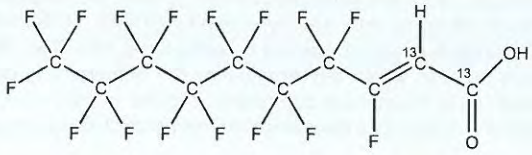
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MFOUEA
LOT NUMBER: MFOUEA1117
COMPOUND: 2H-Perfluoro-[1,2-$^{13}C_2$]-2-decenoic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_2F_{16}O_2$	**MOLECULAR WEIGHT:**	460.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Anhydrous Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/14/2019		
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.
- Dilution of this standard in methanol may lead to the formation of 2H-3-methoxy-perfluoro-[1,2-$^{13}C_2$]-2-decenoic acid. This reaction can be catalyzed by the presence of acid or base. All dilutions should be routinely checked for degradation.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/15/2017 (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

1812021

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).

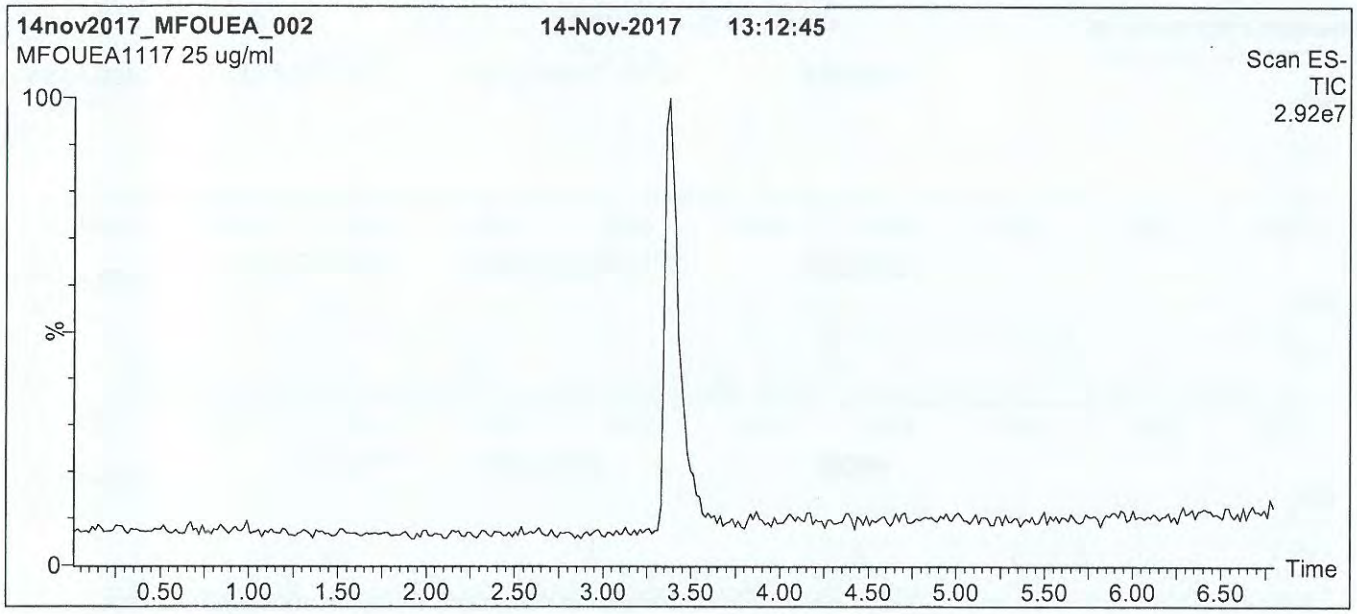
CALA Testing Accreditation No. A 1226

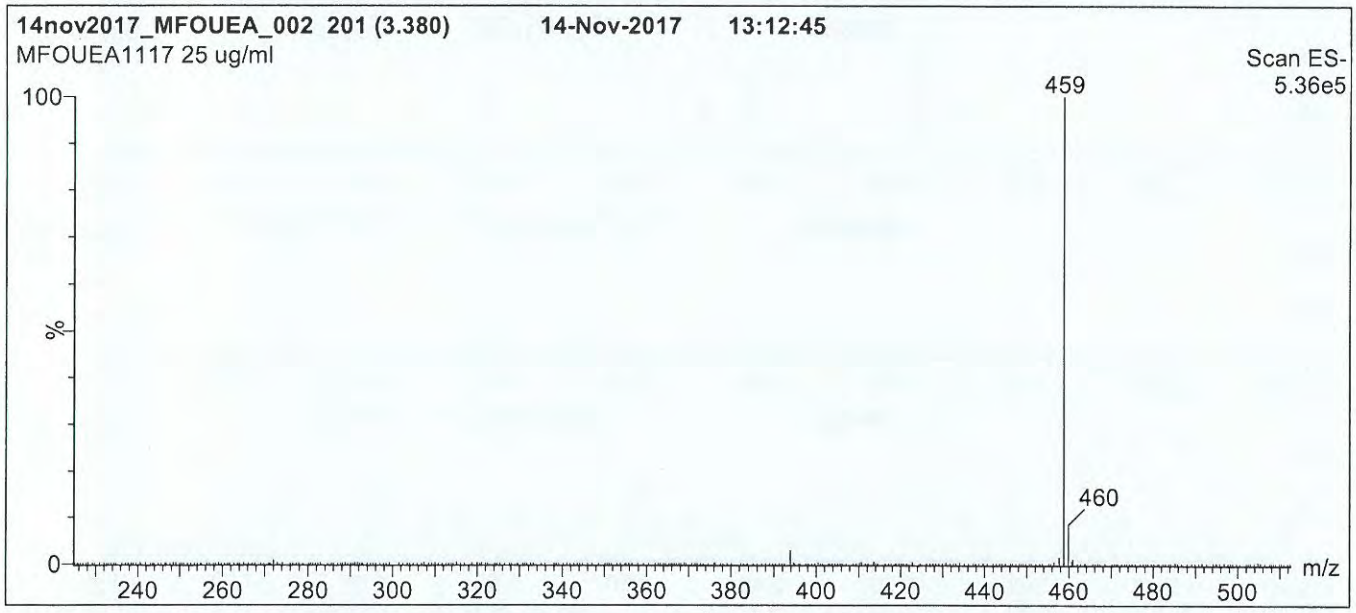
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

18L2021

Figure 1: **MFOUEA; 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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold
for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

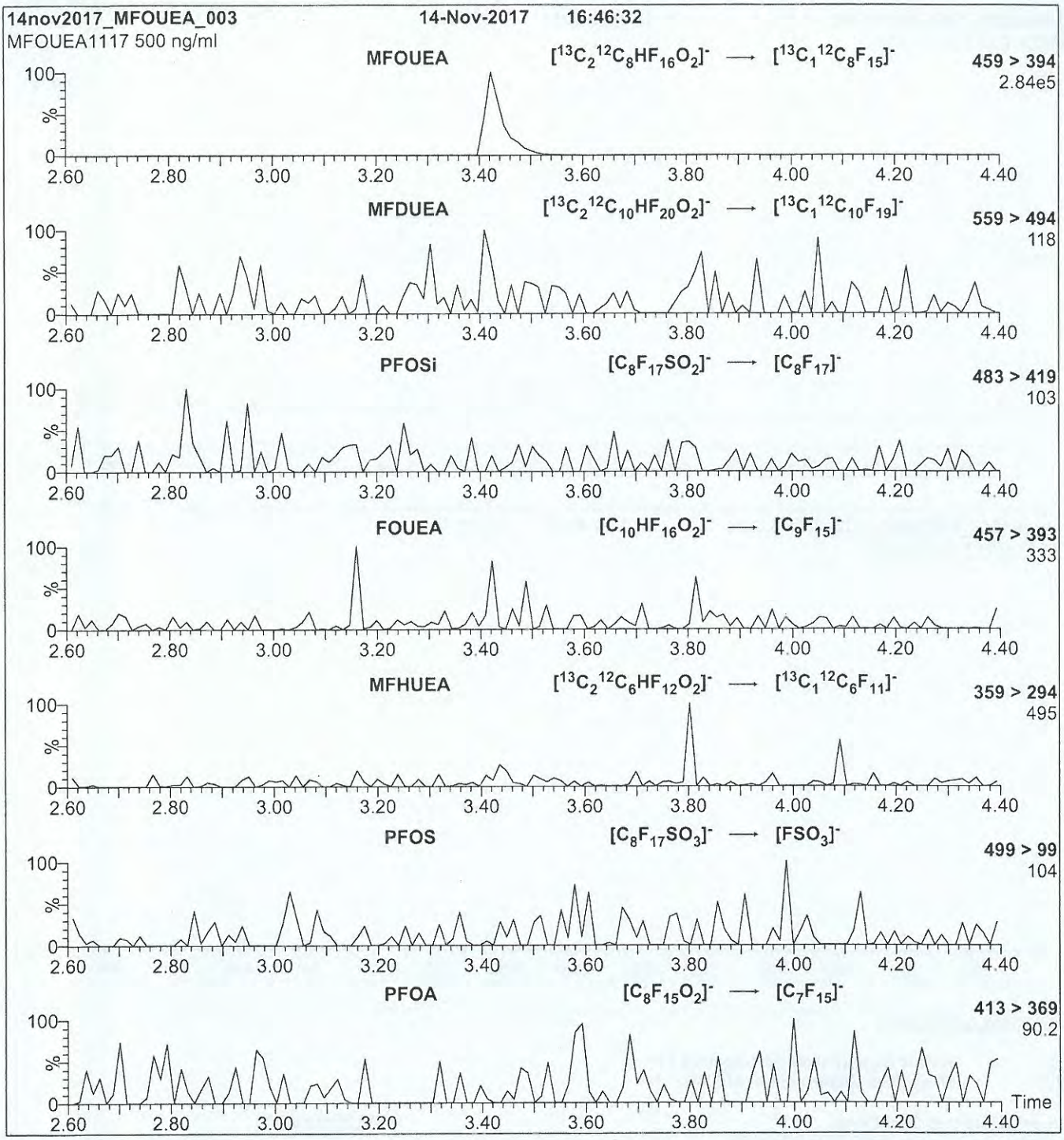
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 14.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

1/8/2021

Figure 2: **MFOUEA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MFOUEA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

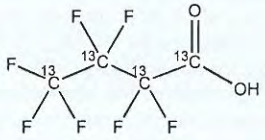
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 21

1812022

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0218
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
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)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
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:** 02/22/2018 (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

18L2022

INTENDED USE:

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HANDLING:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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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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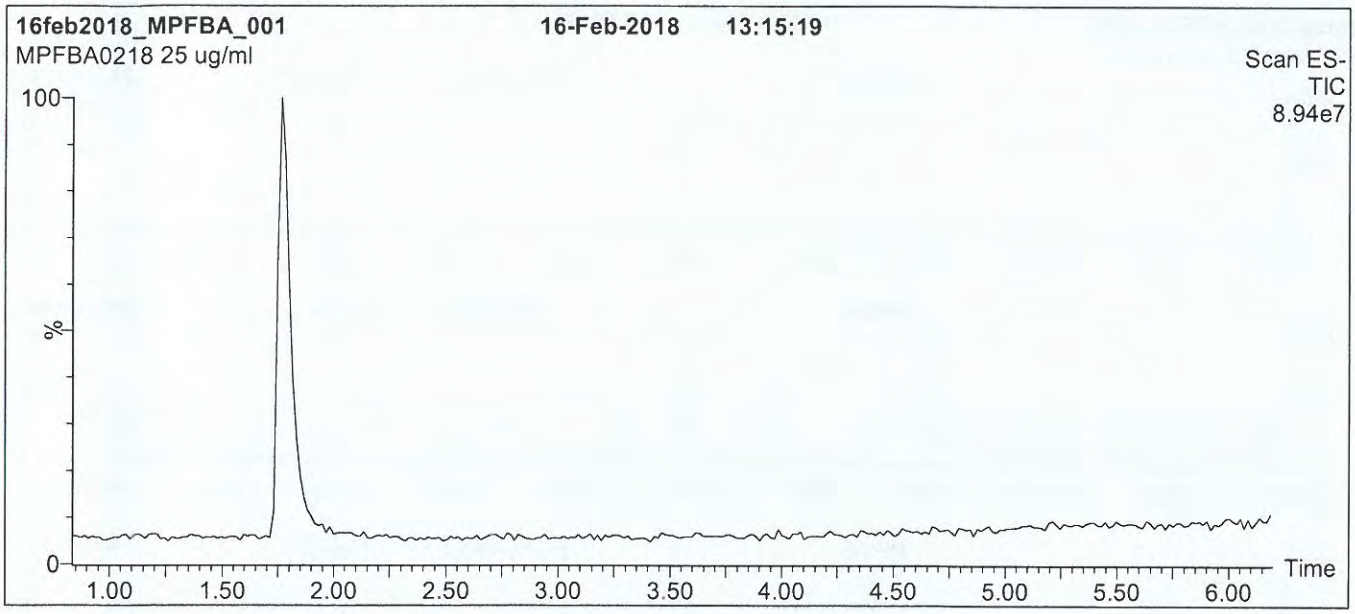
CALA Testing Accreditation No. A 1226

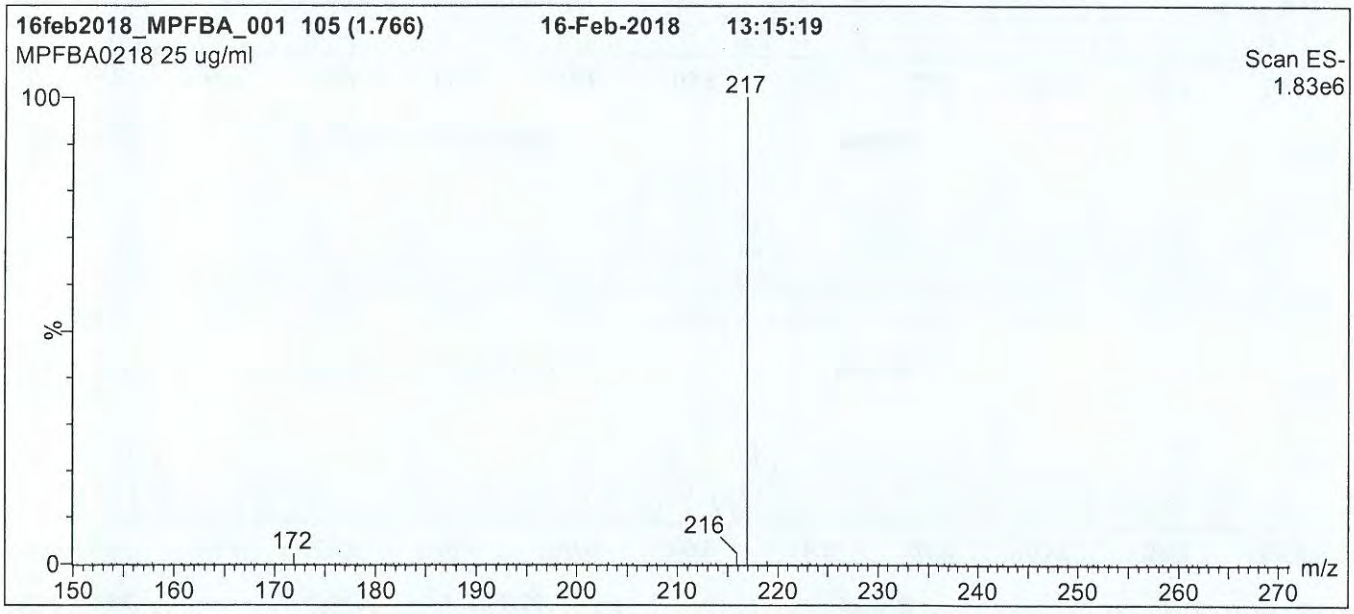
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

1812022

Figure 1: **MPFBA; 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

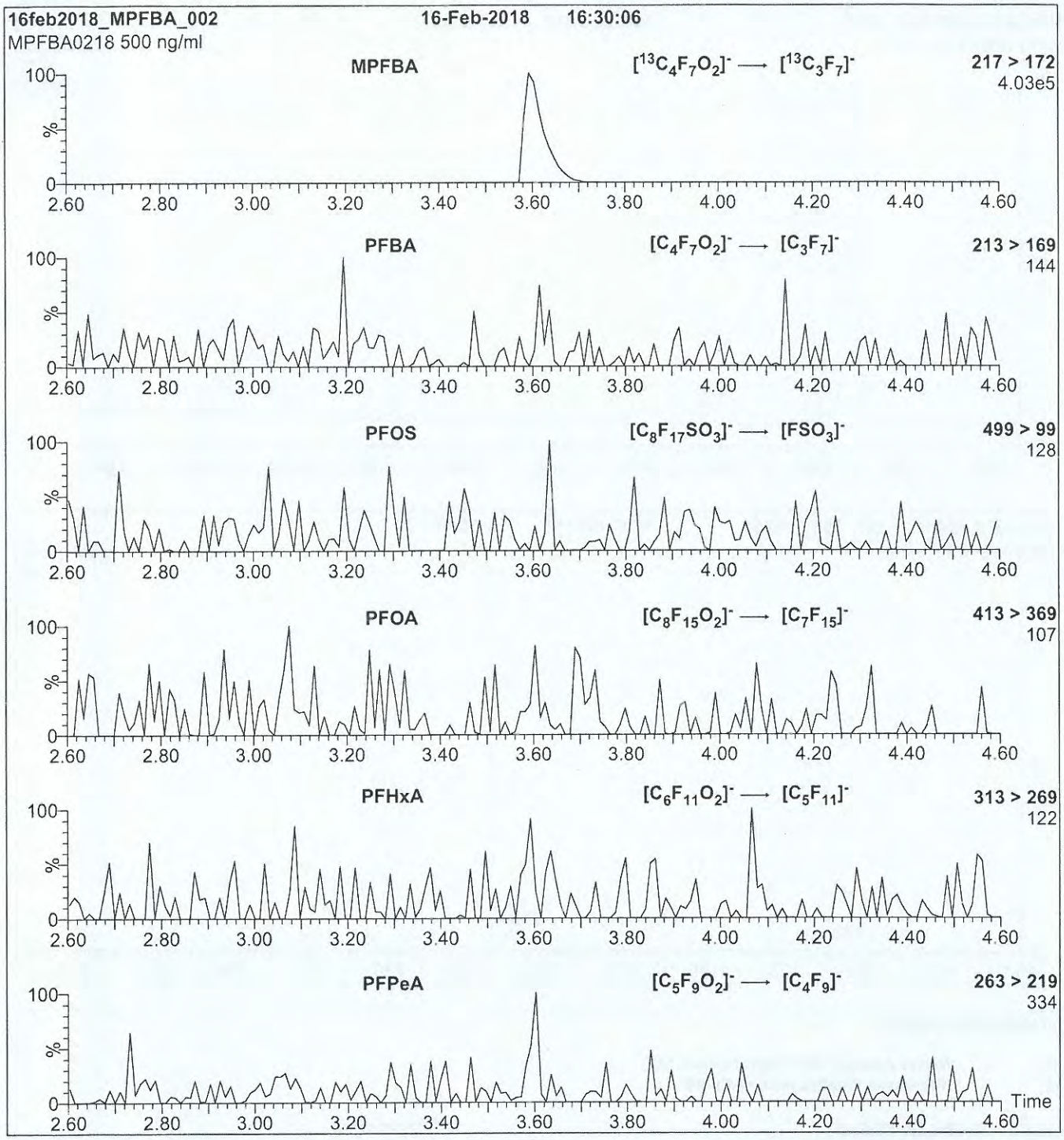
MS Parameters

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

1812022

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

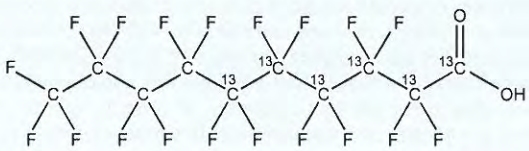
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

18L2023

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M6PFDA	**LOT NUMBER:**	M6PFDA0918
COMPOUND:	Perfluoro-n-[1,2,3,4,5,6-$^{13}C_6$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_6{}^{12}C_4HF_{19}O_2$	**MOLECULAR WEIGHT:**	520.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	09/20/2018		(1,2,3,4,5,6-$^{13}C_6$)
EXPIRY DATE: (mm/dd/yyyy)	09/20/2023		
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:** 10/03/2018 (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

18L2023

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:

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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).

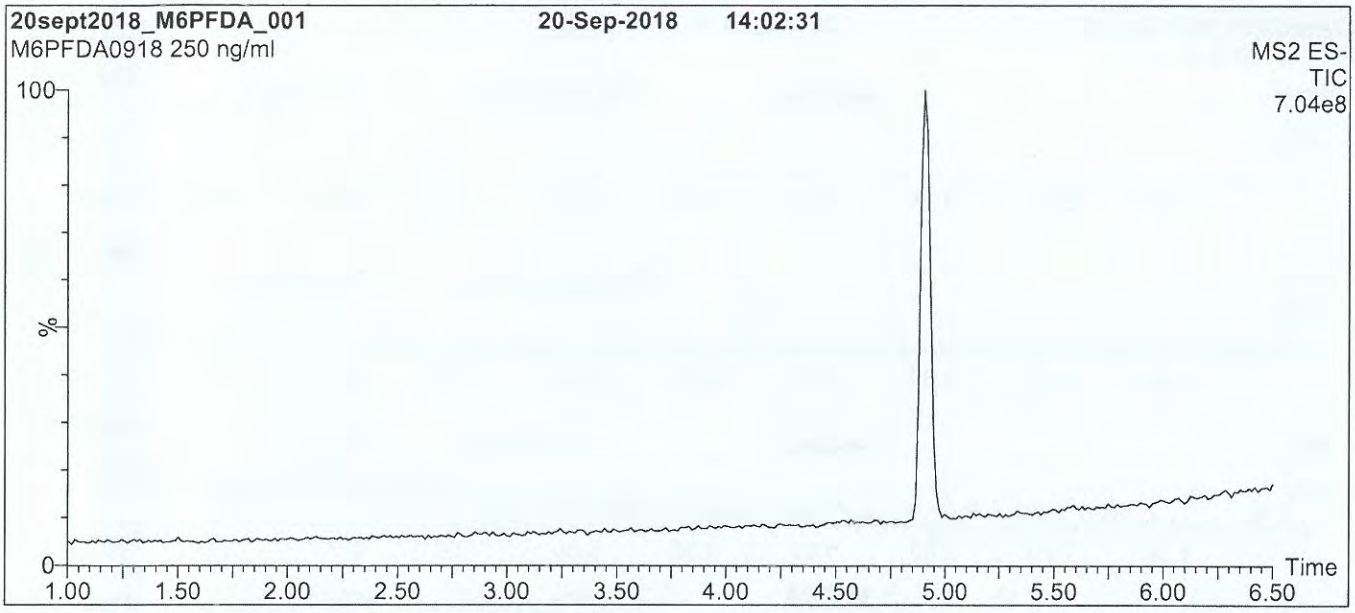
CALA Testing Accreditation No. A1226

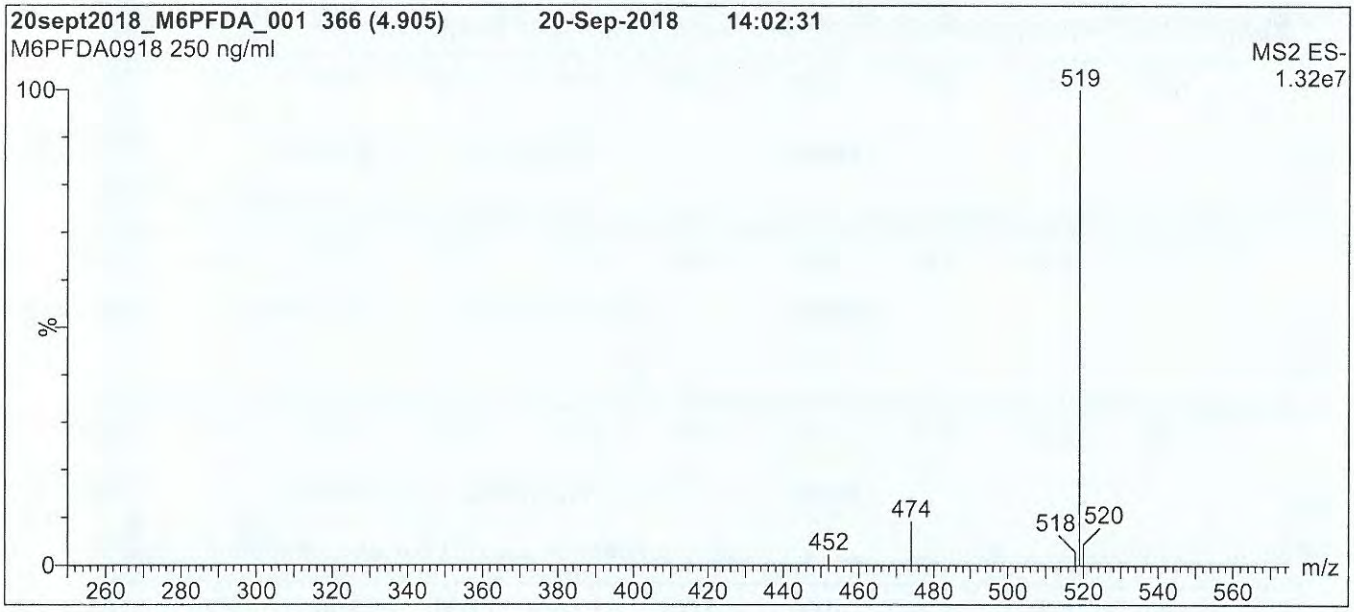
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

18L2023

Figure 1: **M6PFDA; 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

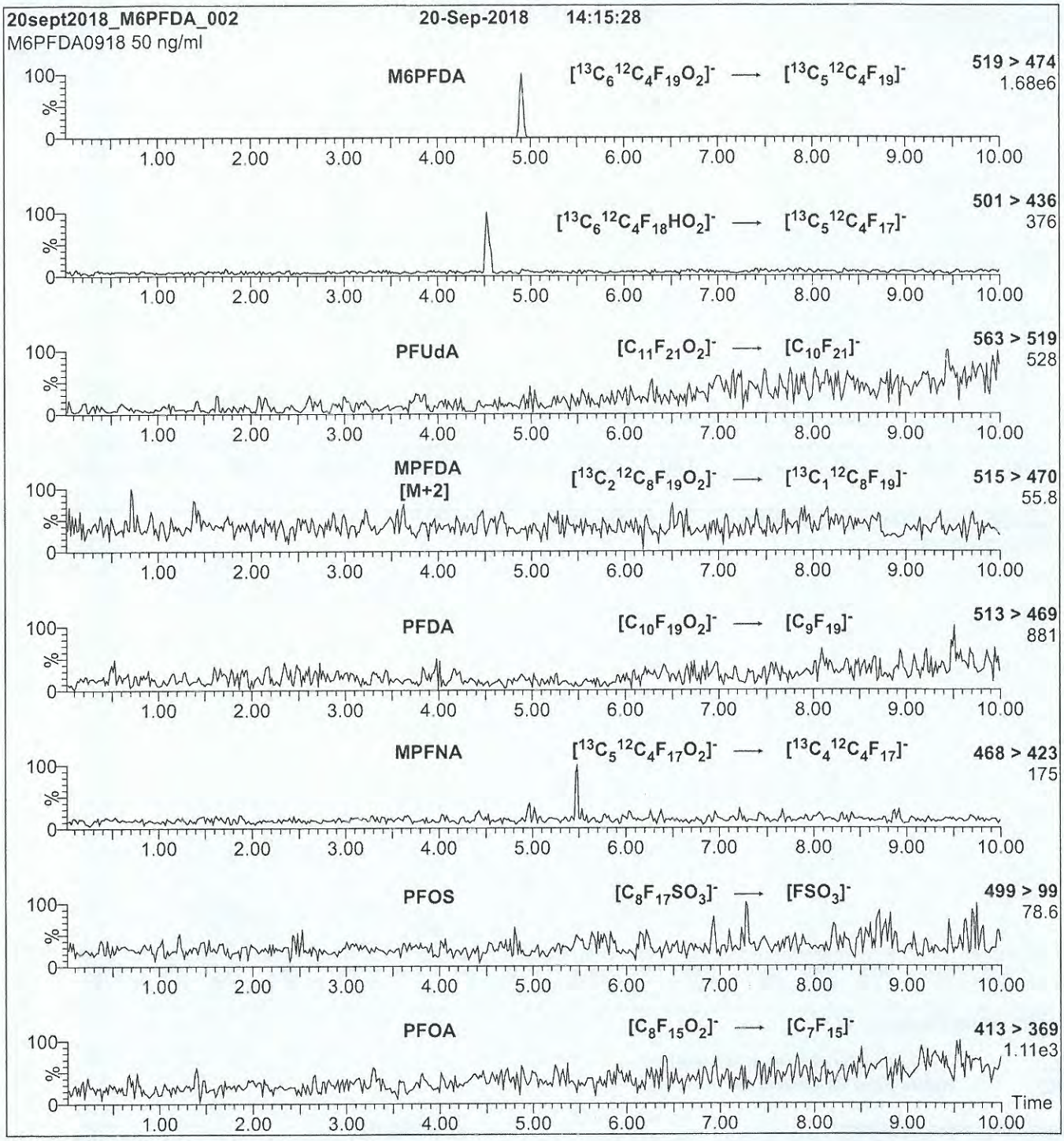
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1862023

Figure 2: **M6PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M6PFDA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 10

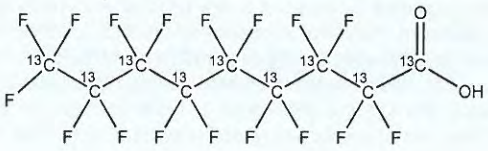
18L2024

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M9PFNA
LOT NUMBER: M9PFNA0517
COMPOUND: Perfluoro-n-[$^{13}C_9$]nonanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	473.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_9$)
LAST TESTED: (mm/dd/yyyy)	05/23/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/23/2022		
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 ~ 0.9% of $^{13}C_5{}^{12}C_4HF_{17}O_2$ (MPFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2017 (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

1812024

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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:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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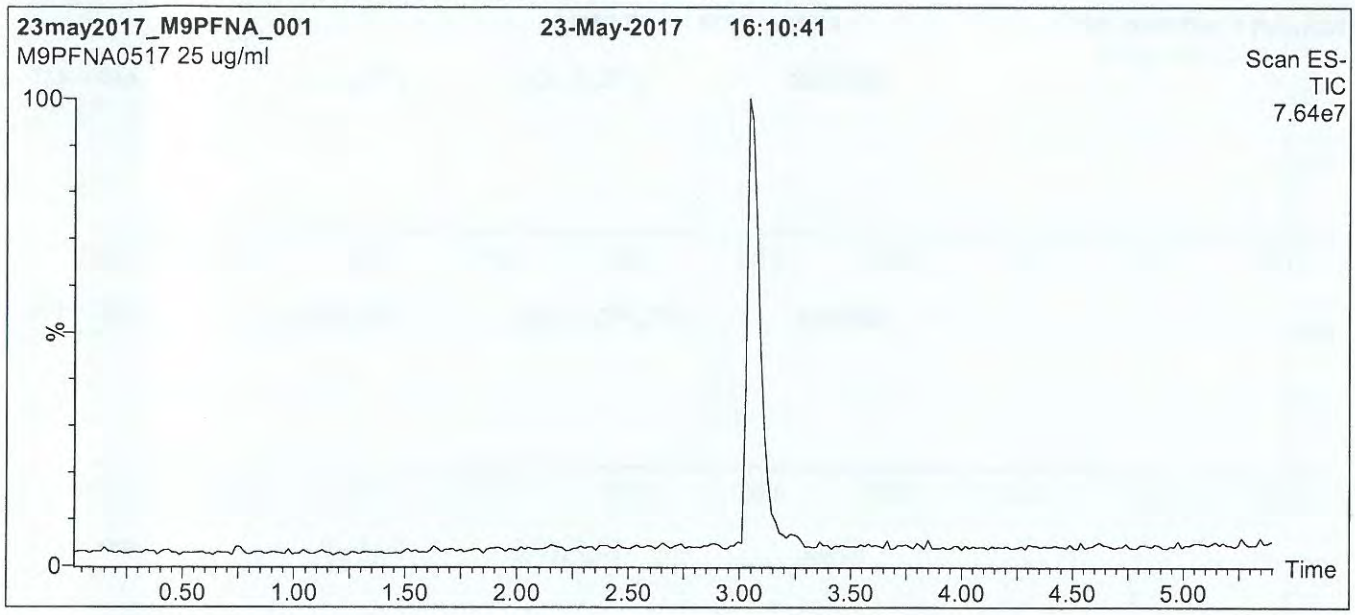
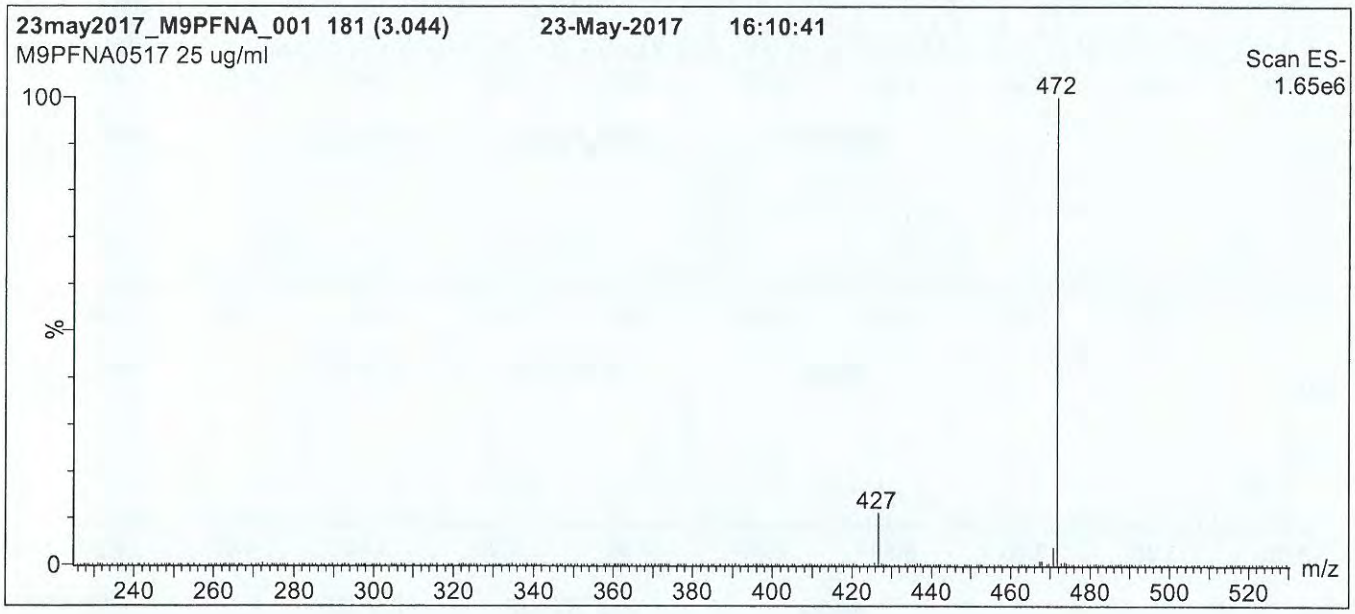
18L2024

Figure 1: **M9PFNA; 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: 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 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

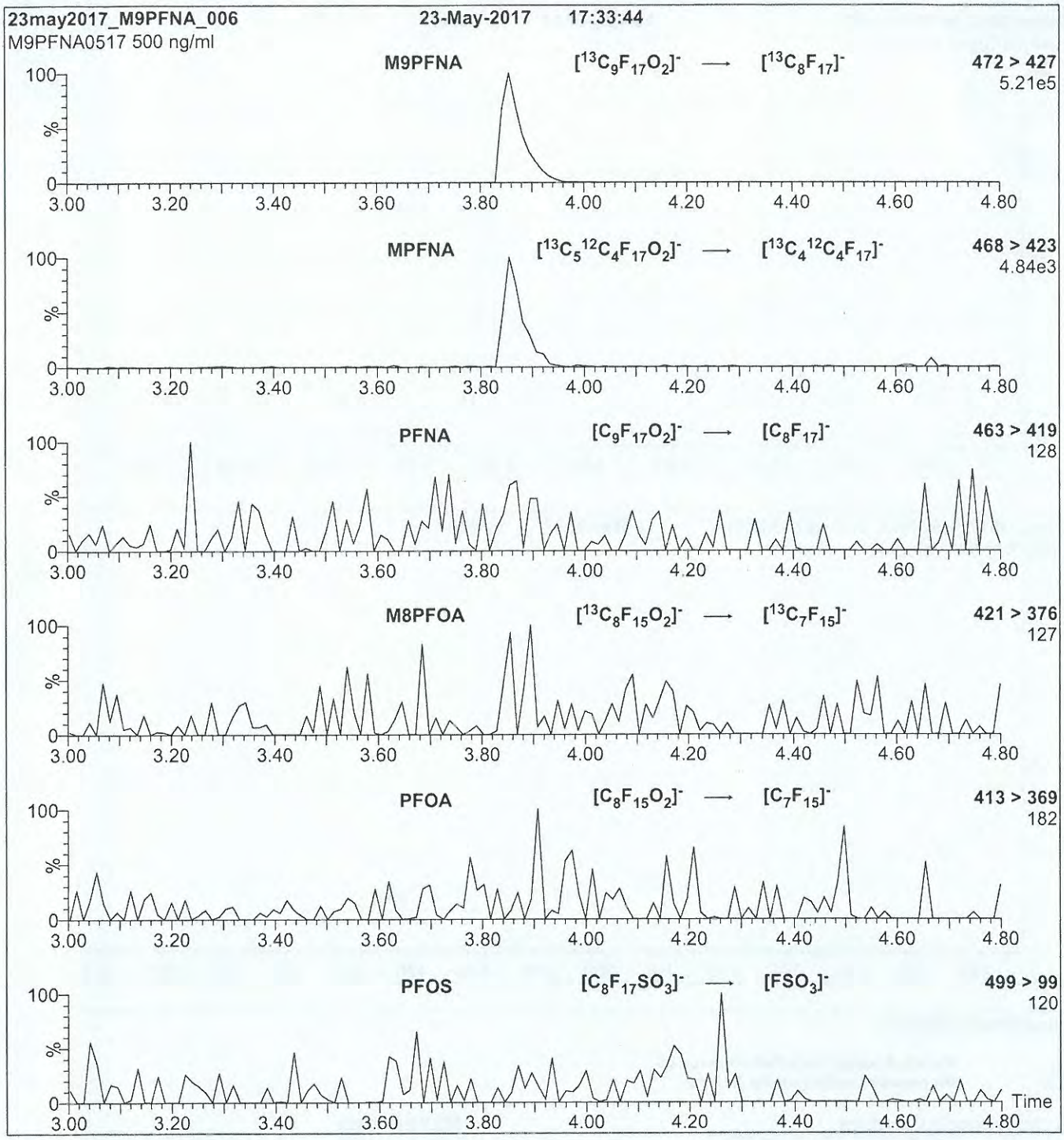
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18L2024

Figure 2: **M9PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M9PFNA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

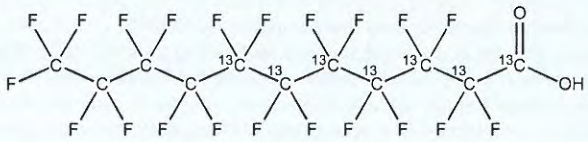
Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 11

18L2025

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M7PFUdA	**LOT NUMBER:**	M7PFUdA0918
COMPOUND:	Perfluoro-n-[1,2,3,4,5,6,7-$^{13}C_7$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_7{}^{12}C_4HF_{21}O_2$	**MOLECULAR WEIGHT:**	571.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5,6,7-$^{13}C_7$)
LAST TESTED: (mm/dd/yyyy)	09/20/2018		
EXPIRY DATE: (mm/dd/yyyy)	09/20/2023		
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:** 09/27/2018 (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

18L2025

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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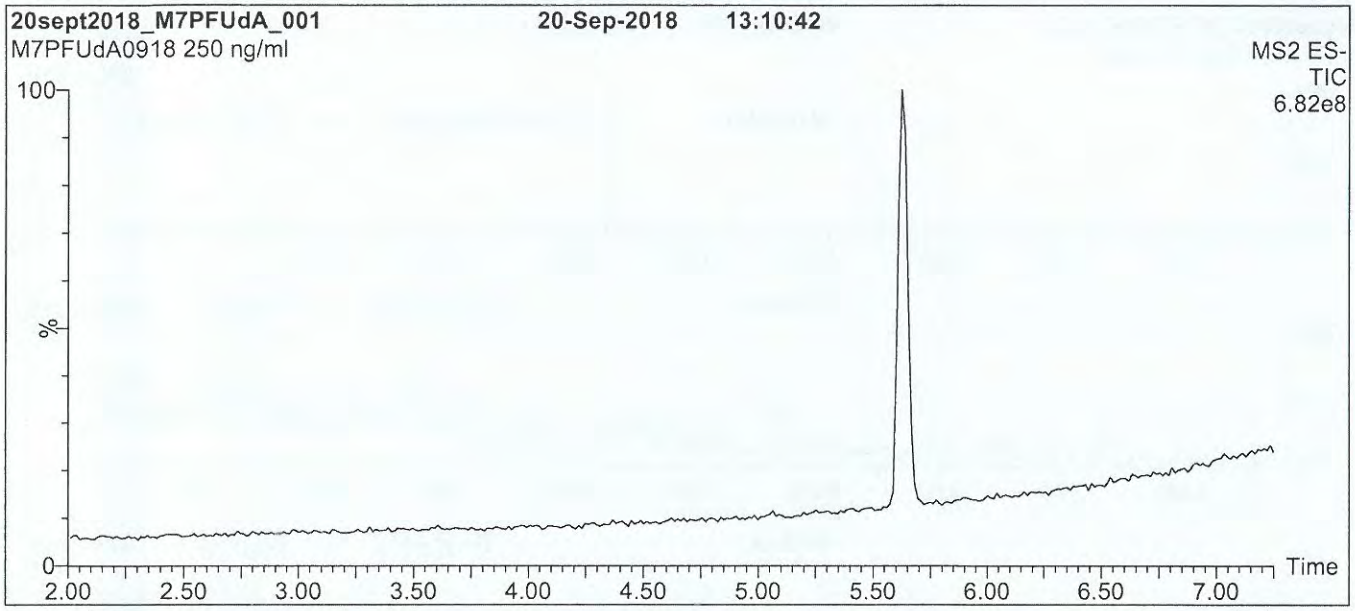
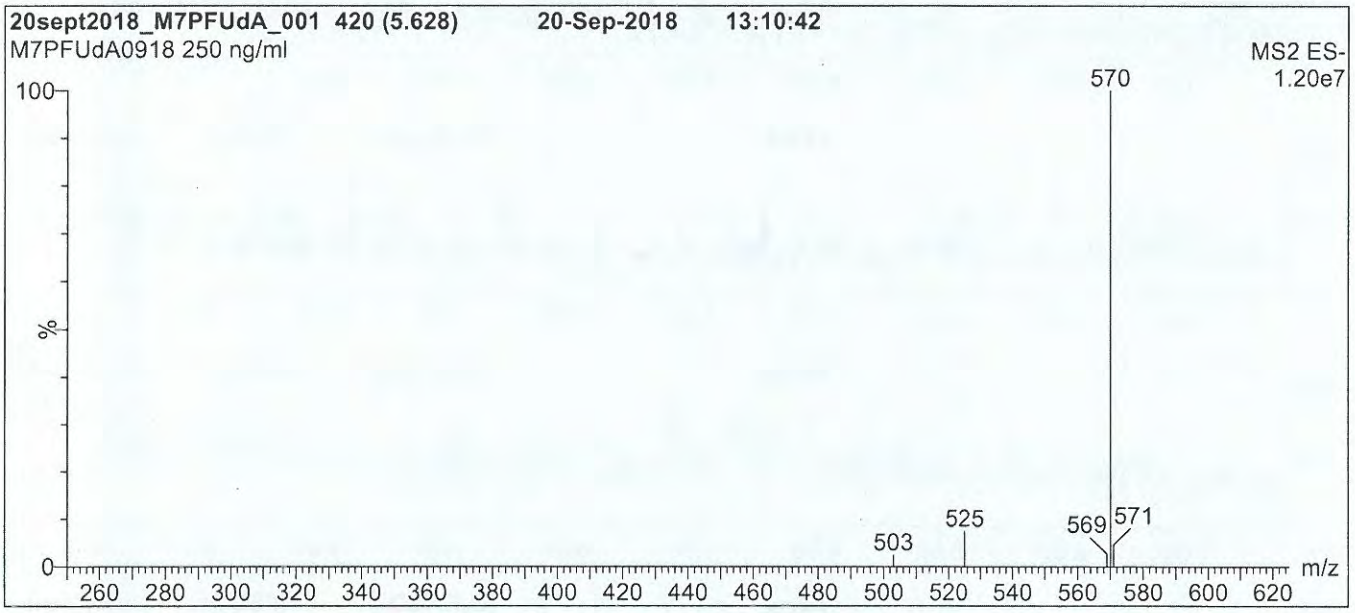
18L2025

Figure 1: **M7PFUdA; 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

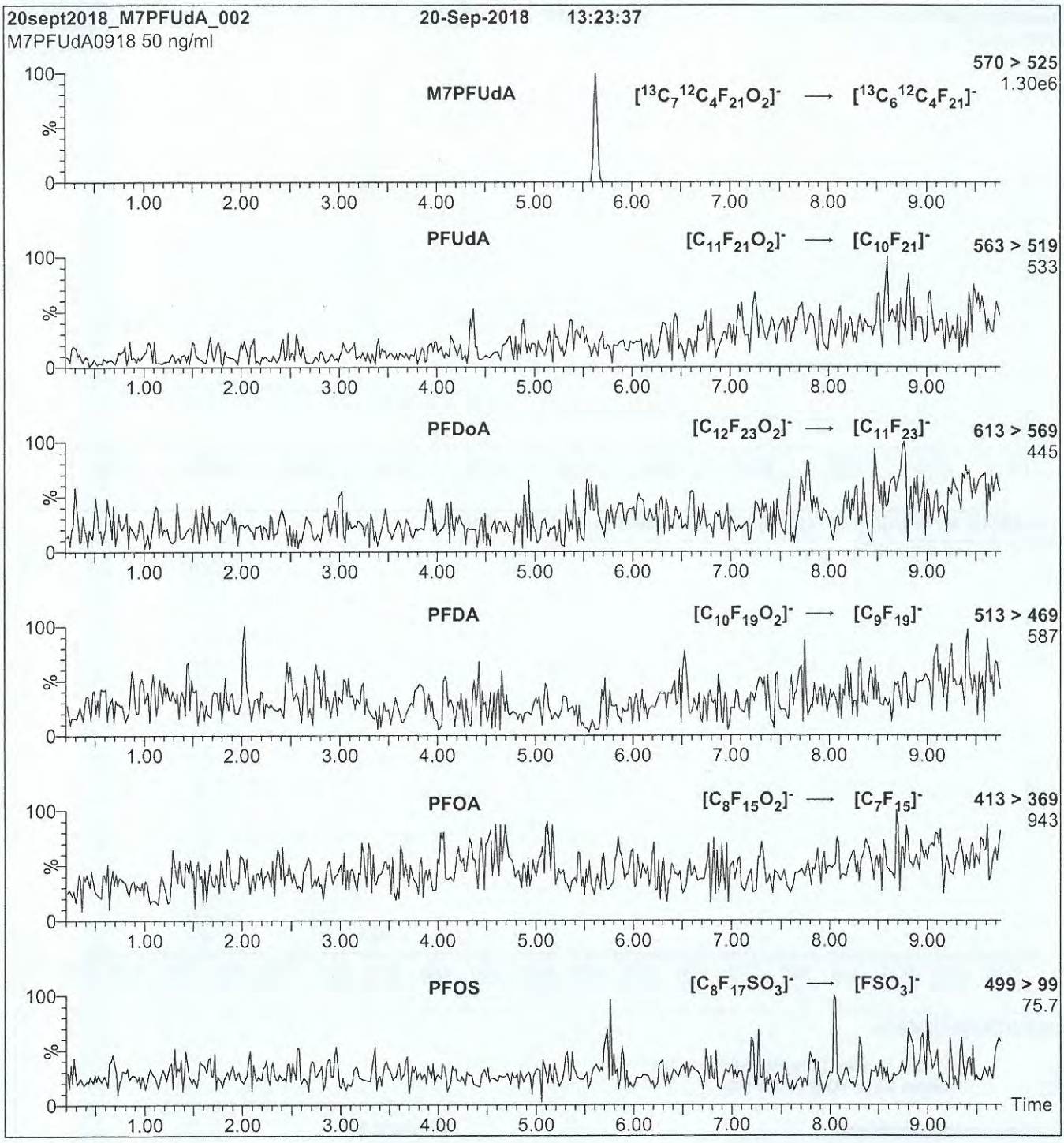
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

18L2025

Figure 2: **M7PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M7PFUdA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

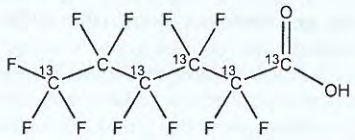
Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 12

18L2026

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFHxA	**LOT NUMBER:**	M5PFHxA0918
COMPOUND:	Perfluoro-n-[1,2,3,4,6-$^{13}C_5$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_1HF_{11}O_2$	**MOLECULAR WEIGHT:**	319.02
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,6-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	09/27/2018		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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Certified By: _____ **Date:** 10/01/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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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:

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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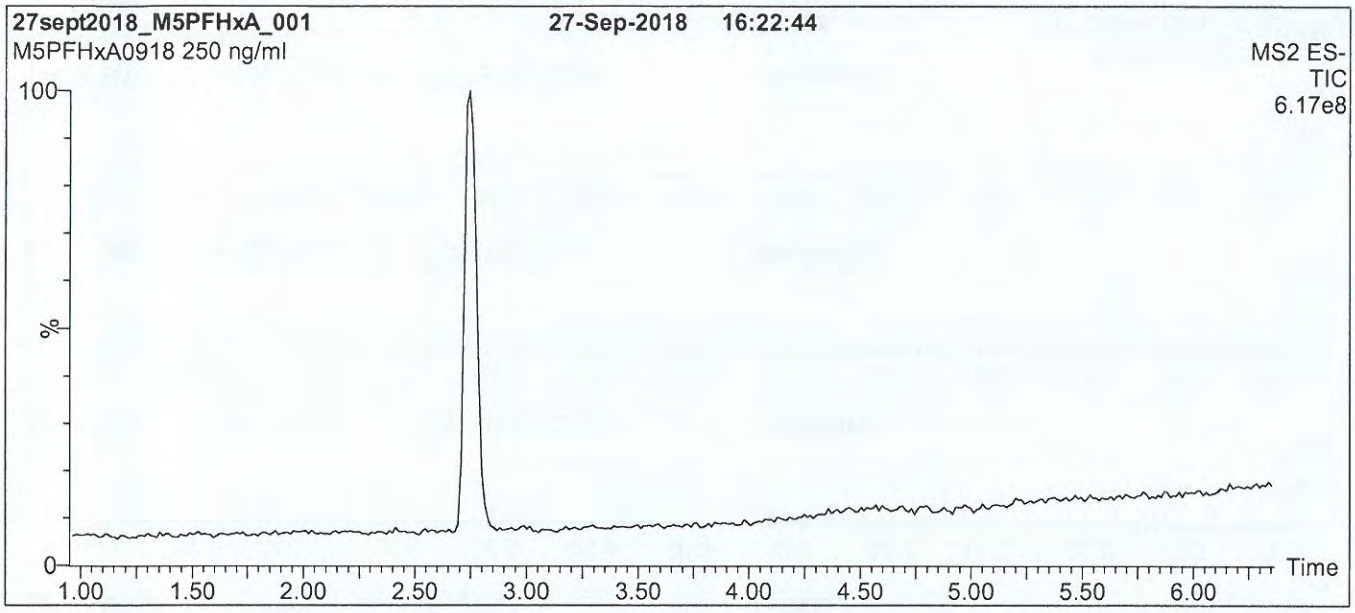
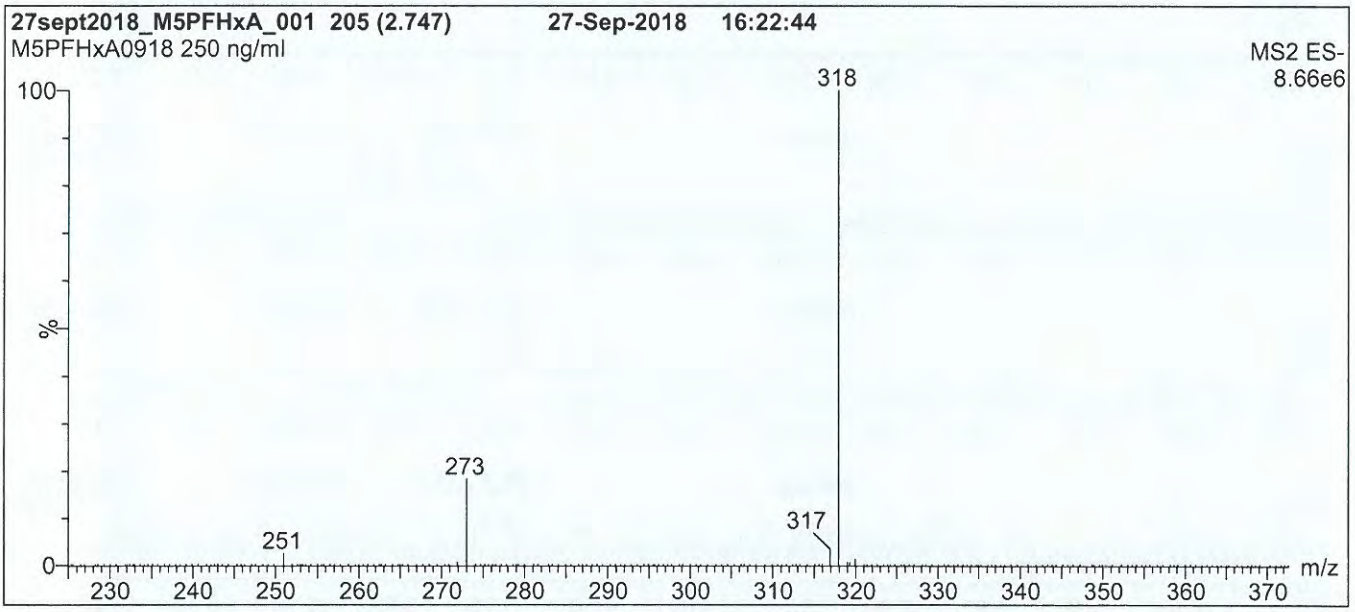
18L2026

Figure 1: **M5PFHxA; 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

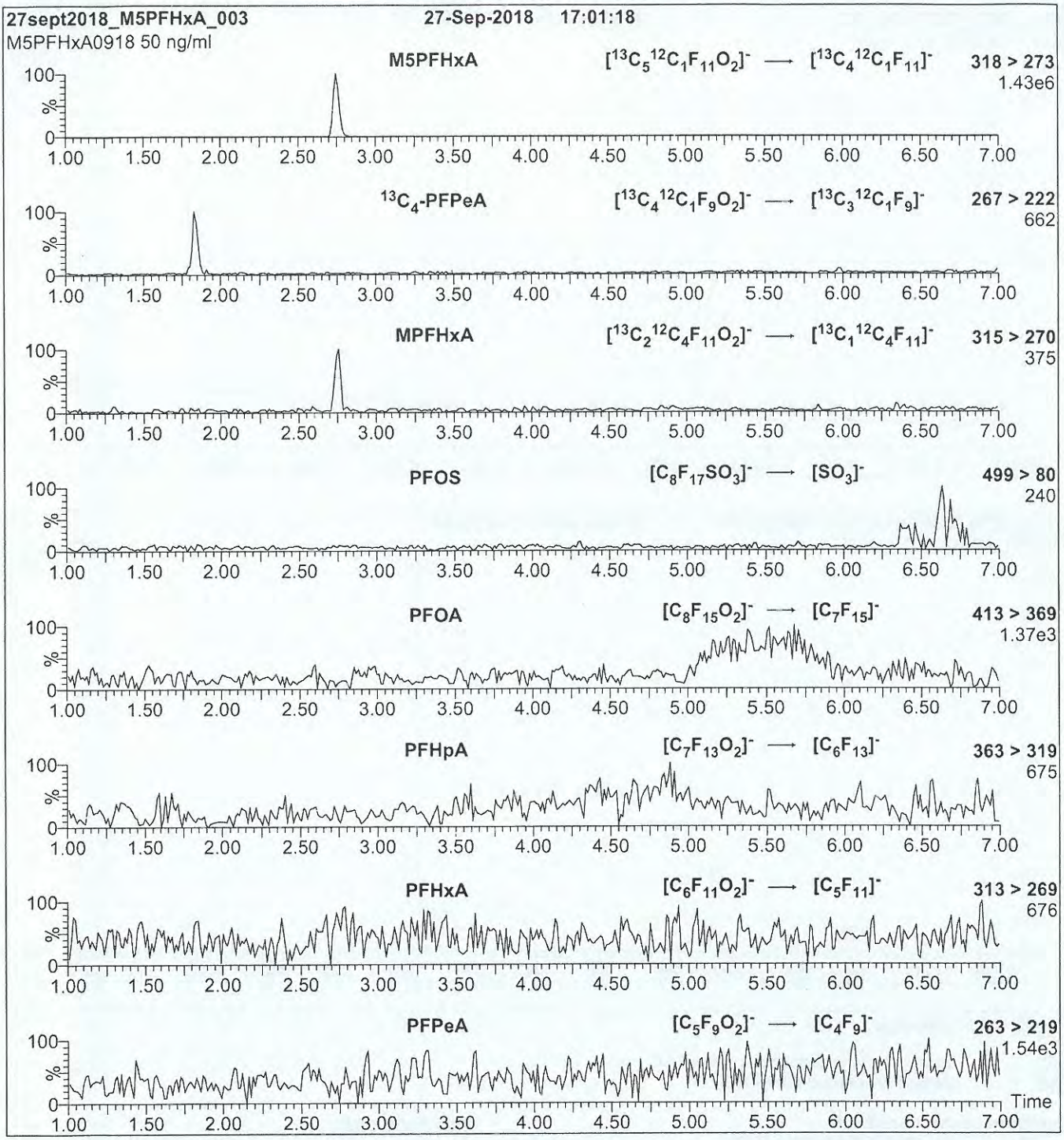
MS Parameters

Experiment: Full Scan (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

1812026

Figure 2: **M5PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M5PFHxA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.97e-3
Collision Energy (eV) = 8

18L2028

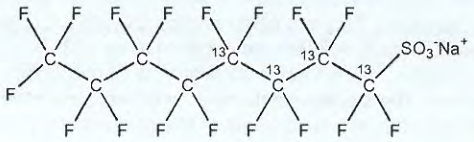
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0918

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	09/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	09/11/2023		
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 ~ 0.3% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/14/2018 (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

18L2028

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:

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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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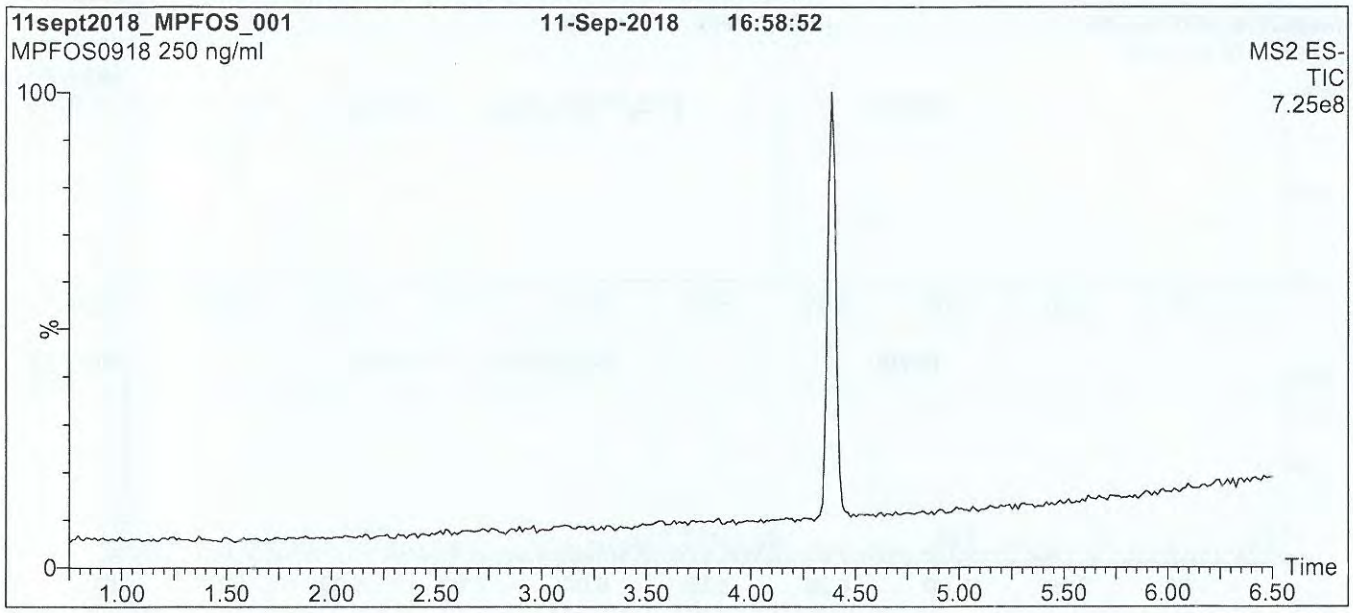
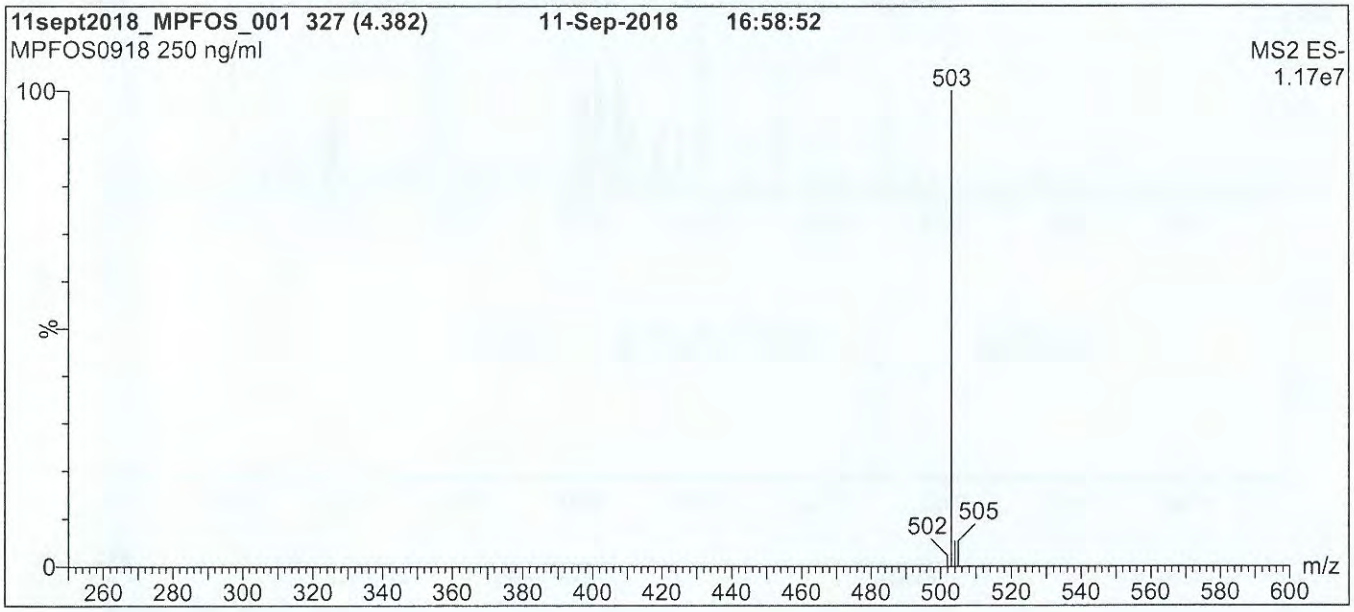
18L2028

Figure 1: **MPFOS; 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

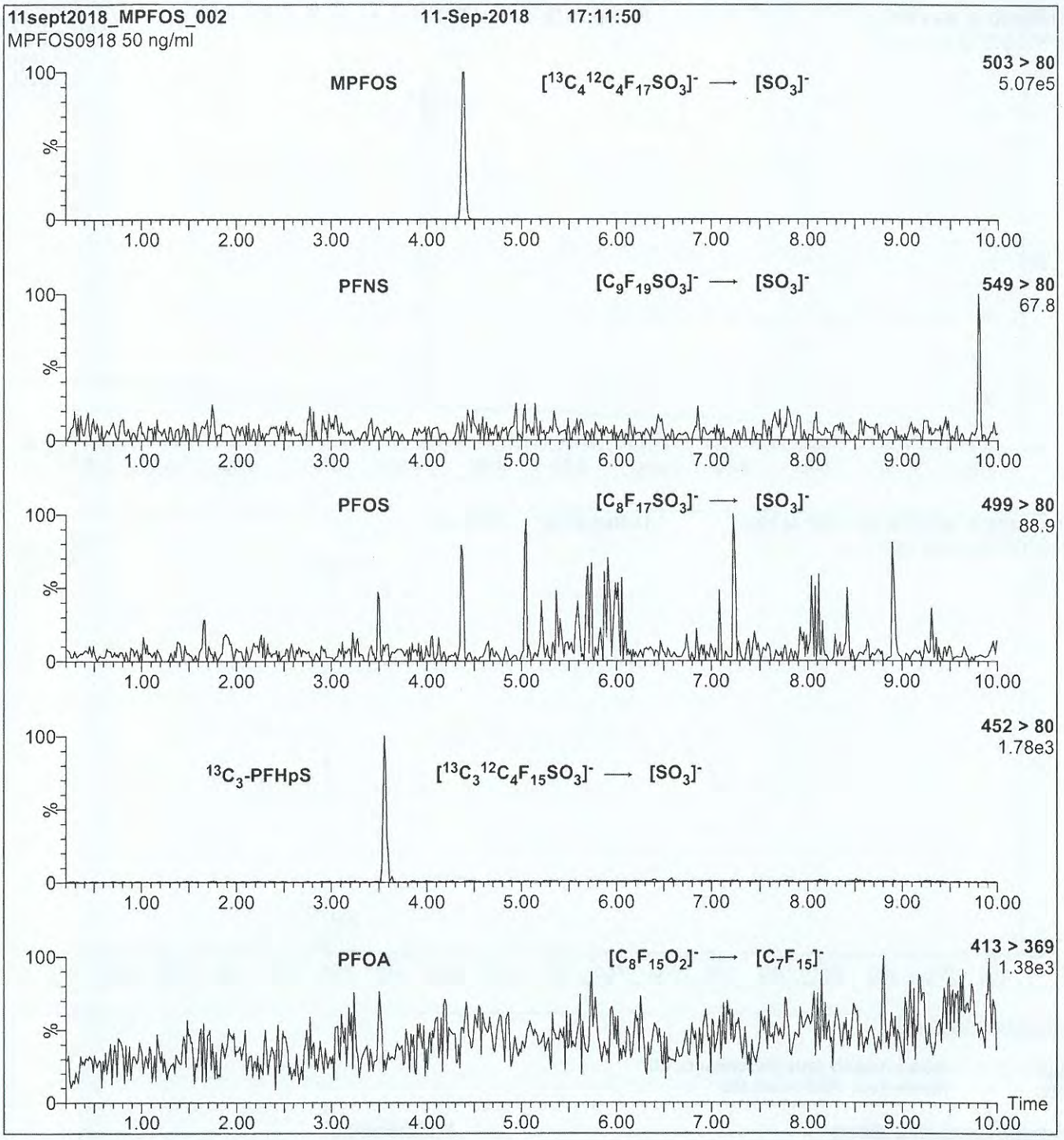
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 1000

1812028

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFOS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 2.99e-3
Collision Energy (eV) = 42

1812029

WELLINGTON LABORATORIES

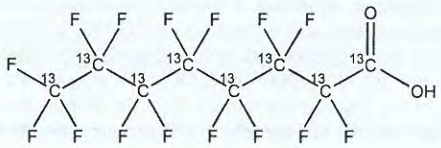
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8PFOA
COMPOUND: Perfluoro-n-[$^{13}C_8$]octanoic acid

LOT NUMBER: M8PFOA0618

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_8HF_{15}O_2$
MOLECULAR WEIGHT: 422.01
CONCENTRATION: 49 ± 2.45 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: 97.9% (M8PFOA)
2.1% (MPFOA [M+4])
ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy) 06/29/2018
EXPIRY DATE: (mm/dd/yyyy) 06/29/2023
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 < 0.1% of native perfluoro-n-octanoic acid (PFOA) and ~ 1.9% of [M+4] perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/03/2018 (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

1812029

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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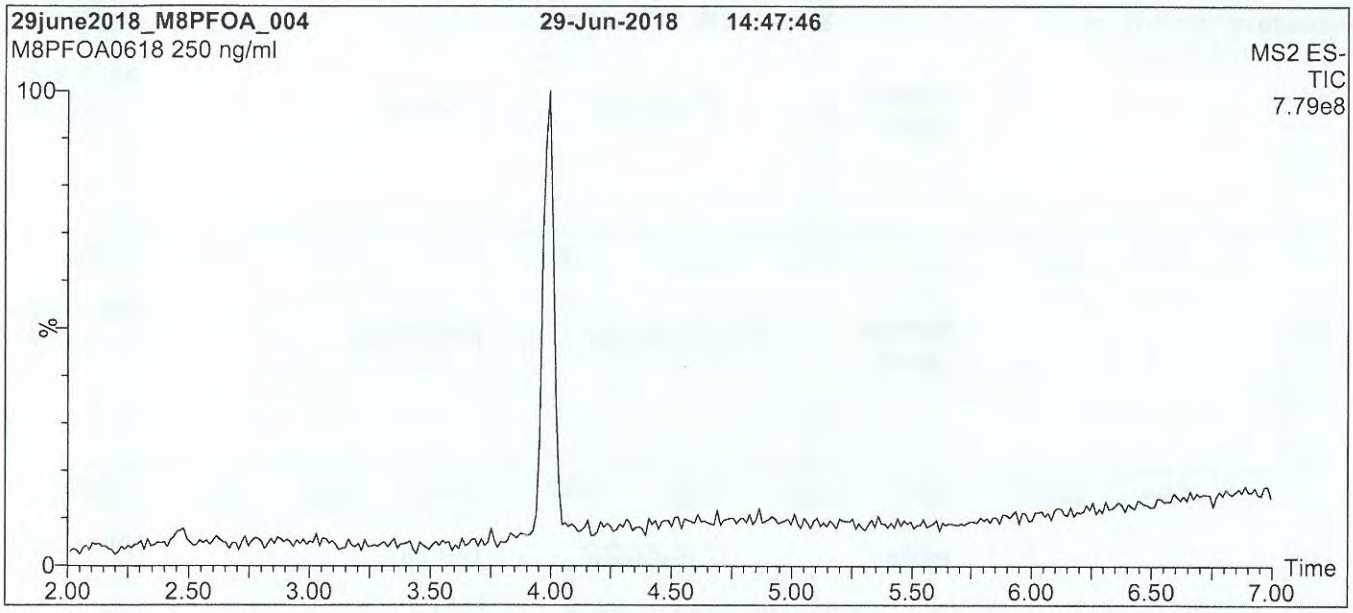
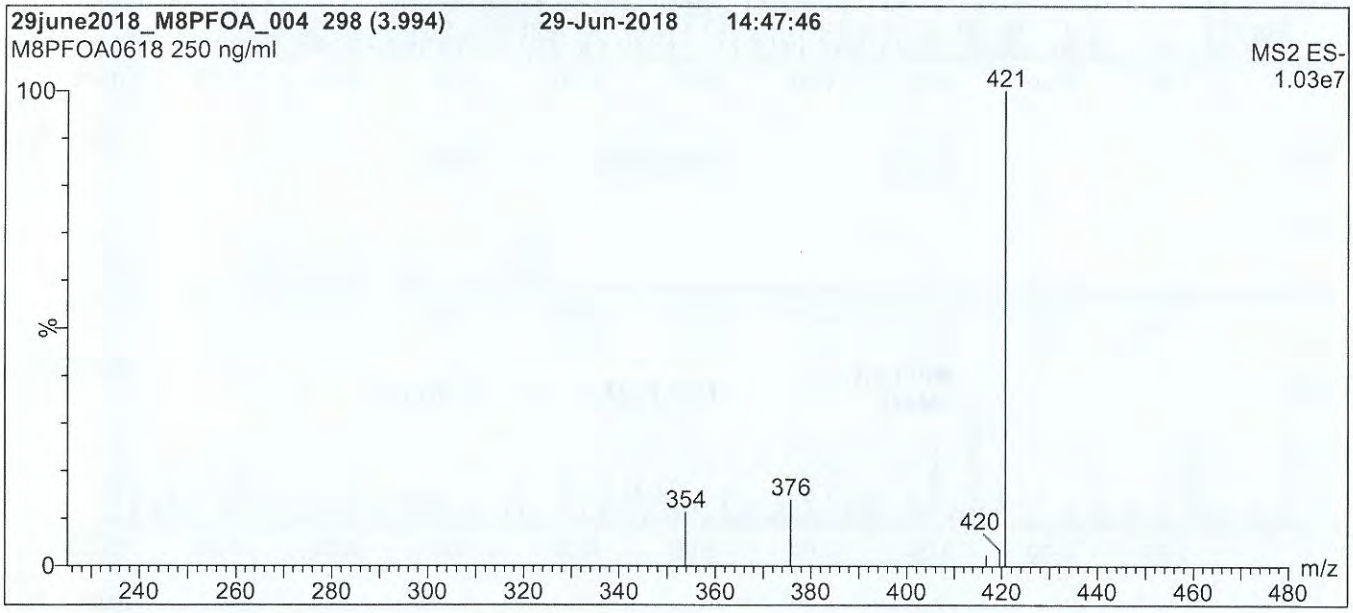
1812029

Figure 1: **M8PFOA; 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 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

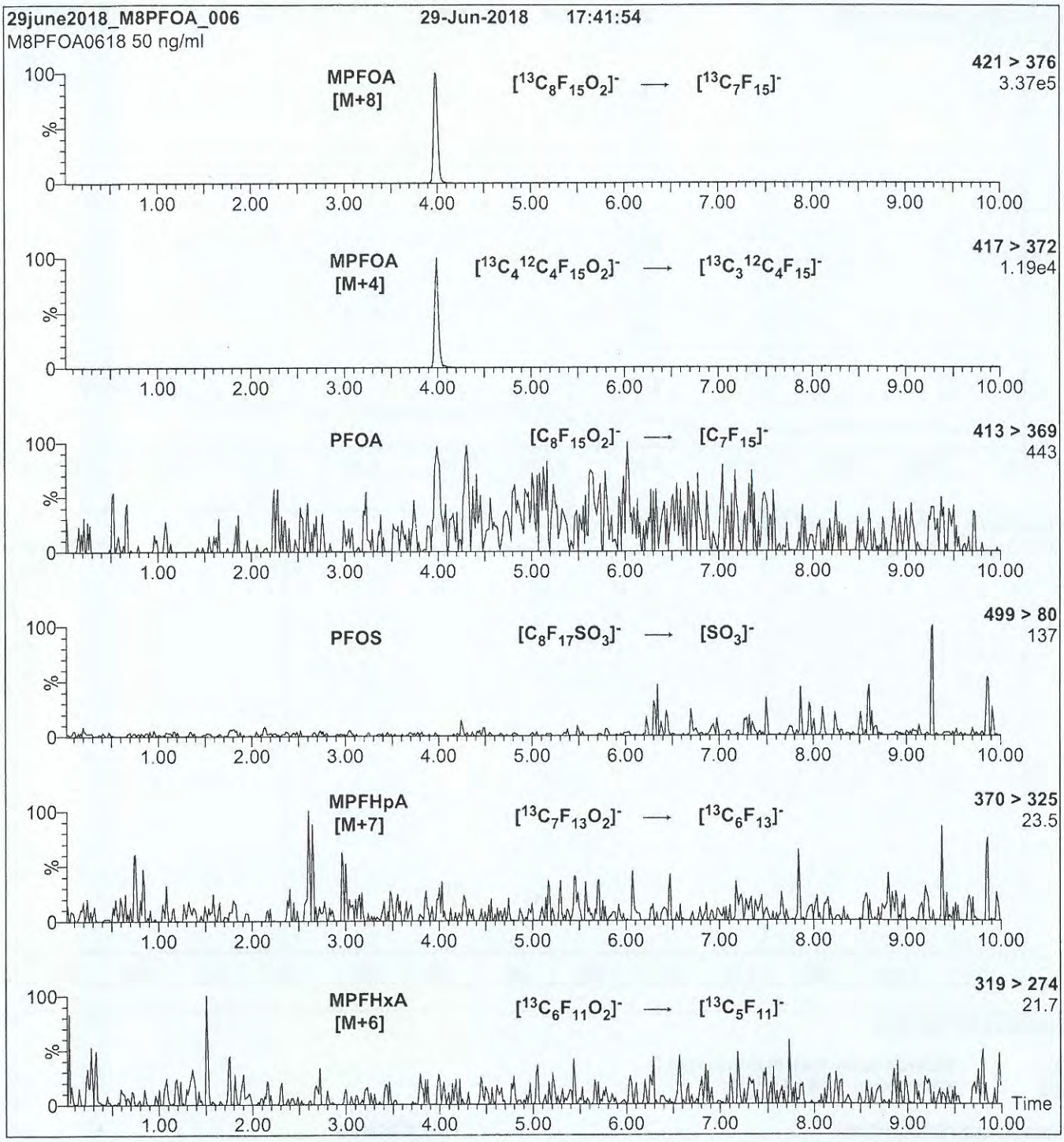
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 14.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

1812029

Figure 2: **M8PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (M8PFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 8

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PFUnA","85.0","%R","","","CRDL","","IS","85.0","","","CRDL","",""
"FRB-07022019","537 MOD","RES","1901922-01","Vista","13C2-PFDoA","13C2-
PFDoA","75.1","%R","","","CRDL","","IS","75.1","","","CRDL","",""
"FRB-07022019","537 MOD","RES","1901922-01","Vista","13C2-PFTeDA","13C2-

PFTeDA","83.9","%R","","","CRDL","","IS","83.9","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","375-73-
5","PFBS","0.0233","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","307-24-
4","PFHxA","0.0807","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","375-85-
9","PFHpA","0.0191","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","355-46-
4","PFHxS","0.259","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","335-67-
1","PFOA","0.0776","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","375-95-
1","PFNA","0.0712","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","1763-23-
1","PFOS","0.168","ug/L","","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","335-76-
2","PFDA","0.00366","ug/L","J","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","2355-31-
9","NMeFOSAA","0.00413","ug/L","U","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","2991-50-
6","NEtFOSAA","0.00413","ug/L","U","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","2058-94-
8","PFUnA","0.00490","ug/L","J","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","307-55-
1","PFDoA","0.00413","ug/L","U","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","72629-94-
8","PFTrDA","0.00413","ug/L","U","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","376-06-
7","PFTeDA","0.00413","ug/L","U","0.00413","CRDL","","TRG","","","0.00830","CRDL","YES","0.00284"
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C3-PFBS","13C3-
PFBS","94.8","%R","","","CRDL","","IS","94.8","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFHxA","13C2-
PFHxA","100","%R","","","CRDL","","IS","100","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C4-PFHpA","13C4-
PFHpA","96.5","%R","","","CRDL","","IS","96.5","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C3-PFHxS","13C3-
PFHxS","86.2","%R","","","CRDL","","IS","86.2","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFOA","13C2-
PFOA","102","%R","","","CRDL","","IS","102","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C5-PFNA","13C5-
PFNA","92.7","%R","","","CRDL","","IS","92.7","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C8-PFOS","13C8-
PFOS","103","%R","","","CRDL","","IS","103","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFDA","13C2-
PFDA","86.3","%R","","","CRDL","","IS","86.3","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","d3-MeFOSAA","d3-
MeFOSAA","59.1","%R","","","CRDL","","IS","59.1","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","d5-EtFOSAA","d5-
EtFOSAA","80.6","%R","","","CRDL","","IS","80.6","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFUnA","13C2-
PFUnA","80.4","%R","","","CRDL","","IS","80.4","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFDoA","13C2-
PFDoA","65.9","%R","","","CRDL","","IS","65.9","","","CRDL","",""
"CAOA-B02-GW","537 MOD","RES","1901922-02","Vista","13C2-PFTeDA","13C2-

PFTeDA","75.5","%R","","","CRDL","","IS","75.5","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","375-73-
5","PFBS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","307-24-
4","PFHxA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","375-85-
9","PFHpA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","355-46-
4","PFHxS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","335-67-
1","PFOA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","375-95-
1","PFNA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","1763-23-
1","PFOS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","335-76-
2","PFDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","2355-31-
9","NMeFOSAA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","2991-50-
6","NEtFOSAA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","2058-94-
8","PFUnA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","307-55-
1","PFDoA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","72629-94-
8","PFTrDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","376-06-
7","PFTeDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C3-PFBS","13C3-
PFBS","103","%R","","","CRDL","","IS","103","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFHxA","13C2-
PFHxA","93.3","%R","","","CRDL","","IS","93.3","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C4-PFHpA","13C4-
PFHpA","86.3","%R","","","CRDL","","IS","86.3","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C3-PFHxS","13C3-
PFHxS","95.6","%R","","","CRDL","","IS","95.6","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFOA","13C2-
PFOA","78.8","%R","","","CRDL","","IS","78.8","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C5-PFNA","13C5-
PFNA","77.7","%R","","","CRDL","","IS","77.7","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C8-PFOS","13C8-
PFOS","73.5","%R","","","CRDL","","IS","73.5","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFDA","13C2-
PFDA","70.1","%R","","","CRDL","","IS","70.1","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","d3-MeFOSAA","d3-
MeFOSAA","63.6","%R","","","CRDL","","IS","63.6","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","d5-EtFOSAA","d5-
EtFOSAA","65.1","%R","","","CRDL","","IS","65.1","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFUnA","13C2-
PFUnA","71.1","%R","","","CRDL","","IS","71.1","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFDoA","13C2-
PFDoA","59.6","%R","","","CRDL","","IS","59.6","","","CRDL","",""
"B9G0062-BLK1","537 MOD","RES","B9G0062-BLK1","Vista","13C2-PFTeDA","13C2-

PFTeDA","46.6","%R","H","","CRDL","","IS","46.6","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","375-73-
5","PFBS","0.0806","ug/L","","0.00400","CRDL","","SPK","101","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","307-24-
4","PFHxA","0.0850","ug/L","","0.00400","CRDL","","SPK","106","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","375-85-
9","PFHpA","0.0930","ug/L","","0.00400","CRDL","","SPK","116","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","355-46-
4","PFHxS","0.0995","ug/L","","0.00400","CRDL","","SPK","124","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","335-67-
1","PFOA","0.0870","ug/L","","0.00400","CRDL","","SPK","109","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","375-95-
1","PFNA","0.0840","ug/L","","0.00400","CRDL","","SPK","105","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","1763-23-
1","PFOS","0.0880","ug/L","","0.00400","CRDL","","SPK","110","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","335-76-
2","PFDA","0.0844","ug/L","","0.00400","CRDL","","SPK","106","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","2355-31-
9","NMeFOSAA","0.103","ug/L","","0.00400","CRDL","","SPK","129","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","2991-50-
6","NEtFOSAA","0.0901","ug/L","","0.00400","CRDL","","SPK","113","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","2058-94-
8","PFUnA","0.0827","ug/L","","0.00400","CRDL","","SPK","103","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","307-55-
1","PFDoA","0.0925","ug/L","","0.00400","CRDL","","SPK","116","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","72629-94-
8","PFTrDA","0.0869","ug/L","","0.00400","CRDL","","SPK","109","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","376-06-
7","PFTeDA","0.0906","ug/L","","0.00400","CRDL","","SPK","113","","0.00800","CRDL","YES","0.00274"
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C3-PFBS","13C3-
PFBS","95.8","%R","","","CRDL","","IS","95.8","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFHxA","13C2-
PFHxA","97.5","%R","","","CRDL","","IS","97.5","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C4-PFHpA","13C4-
PFHpA","85.1","%R","","","CRDL","","IS","85.1","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C3-PFHxS","13C3-
PFHxS","82.4","%R","","","CRDL","","IS","82.4","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFOA","13C2-
PFOA","82.8","%R","","","CRDL","","IS","82.8","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C5-PFNA","13C5-
PFNA","78.9","%R","","","CRDL","","IS","78.9","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C8-PFOS","13C8-
PFOS","67.8","%R","","","CRDL","","IS","67.8","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFDA","13C2-
PFDA","70.9","%R","","","CRDL","","IS","70.9","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","d3-MeFOSAA","d3-
MeFOSAA","60.3","%R","","","CRDL","","IS","60.3","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","d5-EtFOSAA","d5-
EtFOSAA","69.6","%R","","","CRDL","","IS","69.6","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFUnA","13C2-
PFUnA","63.0","%R","","","CRDL","","IS","63.0","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFDoA","13C2-
PFDoA","52.5","%R","","","CRDL","","IS","52.5","","","CRDL","",""
"B9G0062-BS1","537 MOD","RES","B9G0062-BS1","Vista","13C2-PFTeDA","13C2-

PFTeDA","52.0","%R","","","CRDL","","IS","52.0","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","375-73-
5","PFBS","0.0817","ug/L","","0.00400","CRDL","","SPK","102","1.31","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","307-24-
4","PFHxA","0.0890","ug/L","","0.00400","CRDL","","SPK","111","4.67","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","375-85-
9","PFHpA","0.0834","ug/L","","0.00400","CRDL","","SPK","104","10.9","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","355-46-
4","PFHxS","0.0894","ug/L","","0.00400","CRDL","","SPK","112","10.7","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","335-67-
1","PFOA","0.0846","ug/L","","0.00400","CRDL","","SPK","106","2.89","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","375-95-
1","PFNA","0.0831","ug/L","","0.00400","CRDL","","SPK","104","1.12","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","1763-23-
1","PFOS","0.0817","ug/L","","0.00400","CRDL","","SPK","102","7.33","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","335-76-
2","PFDA","0.0808","ug/L","","0.00400","CRDL","","SPK","101","4.37","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","2355-31-
9","NMeFOSAA","0.0845","ug/L","","0.00400","CRDL","","SPK","106","19.8","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","2991-50-
6","NEtFOSAA","0.0910","ug/L","","0.00400","CRDL","","SPK","114","1.06","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","2058-94-
8","PFUnA","0.0860","ug/L","","0.00400","CRDL","","SPK","108","4.01","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","307-55-
1","PFDoA","0.0862","ug/L","","0.00400","CRDL","","SPK","108","7.04","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","72629-94-
8","PFTrDA","0.0817","ug/L","","0.00400","CRDL","","SPK","102","6.11","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","376-06-
7","PFTeDA","0.0883","ug/L","","0.00400","CRDL","","SPK","110","2.54","0.00800","CRDL","YES","0.00274"
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C3-PFBS","13C3-
PFBS","100","%R","","","CRDL","","IS","100","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFHxA","13C2-
PFHxA","100","%R","","","CRDL","","IS","100","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C4-PFHpA","13C4-
PFHpA","97.7","%R","","","CRDL","","IS","97.7","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C3-PFHxS","13C3-
PFHxS","84.2","%R","","","CRDL","","IS","84.2","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFOA","13C2-
PFOA","80.0","%R","","","CRDL","","IS","80.0","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C5-PFNA","13C5-
PFNA","71.0","%R","","","CRDL","","IS","71.0","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C8-PFOS","13C8-
PFOS","72.8","%R","","","CRDL","","IS","72.8","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFDA","13C2-
PFDA","67.0","%R","","","CRDL","","IS","67.0","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","d3-MeFOSAA","d3-
MeFOSAA","68.3","%R","","","CRDL","","IS","68.3","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","d5-EtFOSAA","d5-
EtFOSAA","59.3","%R","","","CRDL","","IS","59.3","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFUnA","13C2-
PFUnA","59.0","%R","","","CRDL","","IS","59.0","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFDoA","13C2-
PFDoA","45.8","%R","H","","CRDL","","IS","45.8","","","CRDL","",""
"B9G0062-BSD1","537 MOD","RES","B9G0062-BSD1","Vista","13C2-PFTeDA","13C2-

PFTeDA","41.4","%R","H","","CRDL","","IS","41.4","","","CRDL","",""
"4663.3803","CTO 17F3803 Yuma","FRB-07022019","07/02/2019 12:30","AQ","1901922-01","","","","537 MOD","Gen Prep","RES","07/10/2019 06:42","07/12/2019 03:48","Vista","COA","","","1","","","","","B9G0062","B9G0062","S9G0025","S9G0025","1901922","07/03/2019 09:10","07/16/2019 00:00"
"4663.3803","CTO 17F3803 Yuma","CAOA-B02-GW","07/02/2019 13:15","AQ","1901922-02","","","","537 MOD","Gen Prep","RES","07/10/2019 06:42","07/12/2019 03:59","Vista","COA","","","1","","","","","B9G0062","B9G0062","S9G0025","S9G0025","1901922","07/03/2019 09:10","07/16/2019 00:00"
"4663.3803","CTO 17F3803 Yuma","B9G0062-BLK1","","AQ","B9G0062-BLK1","MB","","","537 MOD","Gen Prep","RES","07/10/2019 06:42","07/12/2019 03:38","Vista","COA","","","1","","","","","B9G0062","B9G0062","S9G0025","S9G0025","1901922","","07/16/2019 00:00"
"4663.3803","CTO 17F3803 Yuma","B9G0062-BS1","","AQ","B9G0062-BS1","LCS","","","537 MOD","Gen Prep","RES","07/10/2019 06:42","07/12/2019 03:16","Vista","COA","","","1","","","","","B9G0062","B9G0062","S9G0025","S9G0025","1901922","","07/16/2019 00:00"
"4663.3803","CTO 17F3803 Yuma","B9G0062-BSD1","","AQ","B9G0062-BSD1","LCSD","","","537 MOD","Gen Prep","RES","07/10/2019 06:42","07/12/2019 03:27","Vista","COA","","","1","","","","","B9G0062","B9G0062","S9G0025","S9G0025","1901922","","07/16/2019 00:00"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
ATTN: Ms. Lisa Bienkowski
Lisa.Bienkowski@tetratech.com

August 22, 2019

SUBJECT: Revised MCAS Yuma, CTO 17F3803, Data Validation

Dear Ms. Bienkowski,

Enclosed are the revised validation reports for the fraction listed below. These SDGs were received on July 23, 2019. Attachment 1 is a summary of the samples that were reviewed for each analysis.

- A: Updated the validation references. Corrected the LCS/OPR section.
- B: Updated the validation references. Removed the PFTrDA OPR qualifier since the compound recovered within laboratory limits.
- C: Updated the validation references. Corrected the LCS/OPR section. Corrected the 13C2-PFTeDA concentration listed in the "Labeled Compounds" section.
- D: Updated the validation references. Added the field blank qualifier to sample SAOA-B08-GW for PFDA. Corrected the LCS/OPR section.
- E: Updated the validation references.

LDC Project #45580_RV1:

SDG #	**Fraction**
1901705, 1901766, 1901857 1901920, 1901922	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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona; May 2019,
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017
- USEPA National Functional Guidelines for Superfund Organic Methods Data Review; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Christina Rink
crink@lab-data.com
Project Manager/Senior Chemist

Stage 4

LDC #45580 (Tetra Tech-EC, Inc.-Irvine, CA / MCAS Yuma, CTO 3803)

PO# 1164819

LDC	SDG#	DATE REC'D	(3) DATE DUE	PFAs (537)																																	
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	W	S
A	1901705	07/23/19	08/13/19	6	13																																
B	1901766	07/23/19	08/13/19	7	3																																
C	1901857	07/23/19	08/13/19	7	5																																
D	1901920	07/23/19	08/13/19	11	9																																
E	1901922	07/23/19	08/13/19	2	0																																
Total	T/CR			33	30	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	0	63

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation).

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: August 22, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1901705

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
NAOA-B05-SO	1901705-01	Soil	06/18/19
FRB-06182019	1901705-02	Water	06/18/19
NAOA-B10-SO-20-20.5	1901705-03	Soil	06/19/19
NAOA-B10-SO-0.5-1	1901705-04	Soil	06/19/19
NAOA-B11-SO-0.5-1	1901705-05	Soil	06/19/19
NAOA-B11-SO-20-20.5	1901705-06	Soil	06/19/19
NAOA-B15-SO-0.5-1	1901705-07	Soil	06/19/19
EB-06192019	1901705-08	Water	06/19/19
NAOA-B15-SO-20-20.5	1901705-09	Soil	06/19/19
NAOA-B12-SO-0.5-1	1901705-10	Soil	06/20/19
NAOA-B12-SO-20-20.5	1901705-11	Soil	06/20/19
NAOA-B13-SO-0.5-1	1901705-12	Soil	06/20/19
NAOA-B13-SO-20-20.5	1901705-13	Soil	06/20/19
NAOA-B14-SO-0.5-1	1901705-14	Soil	06/20/19
NAOA-B14-SO-20-20.5	1901705-15	Soil	06/20/19
FRB-06192019	1901705-16	Water	06/19/19
EB-06202019	1901705-17	Water	06/20/19
FRB-06202019	1901705-18	Water	06/20/19
NAOA-B07-GW	1901705-19	Water	06/20/19

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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona (May 2019), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). 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 method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified

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 method.

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.

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

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.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB-GW-06202019 (from SDG 1901766), EB-06192019, and EB-06202019 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples In This SDG
EB-06202019	06/20/19	PFOS	0.0582 ug/L	NAOA-B12-SO-0.5-1 NAOA-B13-SO-0.5-1 NAOA-B14-SO-0.5-1

Samples FRB-06182019, FRB-06192019, and FRB-06202019 were identified as field reagent blanks. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X for contaminants) than the concentrations found in the associated field blanks.

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/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
B9F0278-BS1/BSD1 (All soil samples in SDG 1901705)	PFTrDA	-	131 (60-130)	NA	-

NA (Not Applicable): The percent recovery demonstrates a high bias and the affected compound was not detected in the associated samples. Sample qualification was not necessary.

Relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

OPR ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
B9F0253-BS1	PFTrDA	56.4 (60-130)	All water samples in SDG 1901705	UJ (all non-detects)	P

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
NAOA-B05-SO	13C2-PFDoA	44.9 (50-150)	PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects)	P
NAOA-B10-SO-20-20.5	d5-EtFOSAA 13C2-PFUnA 13C2-PFDoA	49.1 (50-150) 47.8 (50-150) 46.9 (50-150)	EtFOSAA PFUnA PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
NAOA-B12-SO-20-20.5	13C5-PFNA 13C2-PFDA d3-MeFOSAA d5-EtFOSAA 13C2-PFUnA 13C2-PFDoA 13C2-PFTeDA	47.6 (50-150) 38.0 (50-150) 40.7 (50-150) 41.4 (50-150) 33.4 (50-150) 33.8 (50-150) 40.3 (50-150)	PFNA PFDA MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
NAOA-B11-SO-0.5-1	d3-MeFOSAA d5-EtFOSAA 13C2-PFUnA 13C2-PFDoA	43.3 (50-150) 47.5 (50-150) 45.9 (50-150) 40.9 (50-150)	MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
NAOA-B14-SO-0.5-1	d3-MeFOSAA	49.2 (50-150)	MeFOSAA	UJ (all non-detects)	P
NAOA-B07-GW	13C2-PFTeDA	25.8 (50-150)	PFTeDA	UJ (all non-detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
NAOA-B10-SO-20-20.5 NAOA-B10-SO-0.5-1 NAOA-B11-SO-20-20.5 NAOA-B15-SO-0.5-1 NAOA-B15-SO-20-20.5 NAOA-B12-SO-0.5-1 NAOA-B12-SO-20-20.5 NAOA-B13-SO-0.5-1	All compounds reported below the LOQ.	J (all detects)	A

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 method. No results were rejected in this SDG.

Due to OPR %R, labeled compound %R, and results below the LOQ, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1901705

Sample	Compound	Flag	A or P	Reason
FRB-06182019 EB-06192019 FRB-06192019 EB-06202019 FRB-06202019 NAOA-B07-GW	PFTrDA	UJ (all non-detects)	P	Ongoing precision and recovery (%R)
NAOA-B05-SO	PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B10-SO-20-20.5	EtFOSAA PFUnA PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B12-SO-20-20.5	PFNA PFDA MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B11-SO-0.5-1	MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B14-SO-0.5-1	MeFOSAA	UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B07-GW	PFTeDA	UJ (all non-detects)	P	Labeled compounds (%R)
NAOA-B10-SO-20-20.5 NAOA-B10-SO-0.5-1 NAOA-B11-SO-20-20.5 NAOA-B15-SO-0.5-1 NAOA-B15-SO-20-20.5 NAOA-B12-SO-0.5-1 NAOA-B12-SO-20-20.5 NAOA-B13-SO-0.5-1	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1901705

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1901705

No Sample Data Qualified in this SDG

LDC #: 45580A96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901705 Stage 4 Page: 1 of 2
Laboratory: Vista Analytical Laboratory Reviewer: SVG
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)(M)

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	✓ Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	*FRB = 2, 16, 18 EB = *8, 17, *EB-GW-06202019 (1901766)
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	SW	LCS/D, OPR
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
XI.	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:
FRB = Field Reagent Blank

	Client ID	Lab ID	Matrix	Date
1	NAOA-B05-SO	1901705-01	Soil	06/18/19
2	FRB-06182019	1901705-02	Water	06/18/19
3	NAOA-B10-SO-20-20.5	1901705-03	Soil	06/19/19
4	NAOA-B10-SO-0.5-1	1901705-04	Soil	06/19/19
5	NAOA-B11-SO-0.5-1	1901705-05	Soil	06/19/19
6	NAOA-B11-SO-20-20.5	1901705-06	Soil	06/19/19
7	NAOA-B15-SO-0.5-1	1901705-07	Soil	06/19/19
8	EB-06192019	1901705-08	Water	06/19/19
9	NAOA-B15-SO-20-20.5	1901705-09	Soil	06/19/19
10	NAOA-B12-SO-0.5-1	1901705-10	Soil	06/20/19
11	NAOA-B12-SO-20-20.5	1901705-11	Soil	06/20/19
12	NAOA-B13-SO-0.5-1	1901705-12	Soil	06/20/19
13	NAOA-B13-SO-20-20.5	1901705-13	Soil	06/20/19
14	NAOA-B14-SO-0.5-1	1901705-14	Soil	06/20/19
15	NAOA-B14-SO-20-20.5	1901705-15	Soil	06/20/19

1x/5x
1x/5x

LDC #: 45580A96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901705 Stage 4 Page: 2 of 2
Laboratory: Vista Analytical Laboratory Reviewer: SV6
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

	Client ID	Lab ID	Matrix	Date
16	FRB-06192019	1901705-16	Water	06/19/19
17	EB-06202019	1901705-17	Water	06/20/19
18	FRB-06202019	1901705-18	Water	06/20/19
19	NAOA-B07-GW	1901705-19	Water	06/20/19
20				
21				
22				
23				
24				

Notes:

1	BQF0278-BLK1						
2	BQF0253- ↓						

LDC #: 45580 A96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard except the lowest point (50-150%)?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 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?	✓			
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzedin this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch in this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

LDC #: 45580A96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?.			✓	
XI. Labeled Compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓			
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 quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Was m/z 499 to m/z 80 transition used as the quantitation transition for PFOS?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Perfluorinated Alkyl Acids (EPA Method 537)

A. PFBA	375-22-4
B. PFPeA	2706-90-3
C. PFBS	375-73-5
D. PFHxA	307-24-4
E. PFHpA	375-85-9
F. PFHxS	355-46-4
G. PFOA	335-67-1
H. PFHpS	375-92-8
I. PFNA	375-95-1
J. PFOSA	754-91-6
K. PFOS	1763-23-1
L. PFDA	335-76-2
M. PFUnA	2058-94-8
N. PFDS	335-77-3
O. PFDoA	307-55-1
P. MeFOSA	31506-32-8
Q. PFTrDA	72629-94-8
R. PFTeDA	376-06-7
S. EtFOSA	4151-50-2
T. MeFOSE	24448-09-7
U. EtFOSE	1691-99-2
V. MeFOSAA	2355-31-9
W. EtFOSAA	2991-50-6

Notes: _____

LDC #: 45580A96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537)

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/kg

Sampling date: 06/20/19

Field blank type: (circle one) Trip Blank/Field Blank / Rinsate / Other: EB Associated Samples: ~~10~~ ~~15~~ 19 (>5x) 10,12,14

Compound	Blank ID	Sample Identification								
	17	(5x)		~~19~~						
>LOQ K	0.0582	0.291		~~0.118~~ J						

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

LDC #: 45580A96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: JVG
2nd Reviewer: Q

METHOD: LC/MS PFCs (EPA Method 537)

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
	B9F0278-BS1/BSD1	Q	( )	131 (~~70-130~~ 60)	( )	All S, MB1 (ND)	J det/p
	B9F0253-BS1 (ORR)	Q	56.4 (~~70-130~~ 60)	( )	( )	All W, MB2 (ND)	J/UJ/p

LDC #: 45380 A96

VALIDATION FINDINGS WORKSHEET
Labeled Compound

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compounds within -50 to +150% of the associated calibration standard?

#	Date	Sample ID	Labeled Compound	%R	Limits (%)	Qualifications
		1 (ND)	13C2-O	44.9	50-150	J/UJ/P (qual O, R) Q
		3 (ND)	d5-W	49.1		W
			13C2-M	47.8		M
			13C2-O	46.9		O, Q
		11 (ND)	13C5-I	47.6		I
			13C2-L	38.0		L
			d3-V	40.7		V
			d5-W	41.4		W
			13C2-M	33.4		M
			13C2-O	33.8		O, Q
			13C2-R	40.3		R, R
		5 (ND)	d3-V	43.3		V
			d5-W	47.5		W
			13C2-M	45.9		M
			13C2-O	40.9		O, Q
		14 (ND)	d3-V	49.2		V
		19	13C2-R	25.8		R, R

LDC#: 45580A96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/1/2019	SCN945	PFOA	0.25	0.03318	3.125
			0.5	0.05895	6.250
	190701M1-CRV		1	0.11824	12.500
		13C2-PFOA	2	0.21986	25.000
			5	0.57756	62.500
			10	1.11263	125.000
			50	5.66807	625.000
			100	11.64186	1250.000
			250	27.00102	3125.000
			500	58.36004	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.117761	0.031497
Std Err of Y Est		
R Squared	0.999111	0.998858
Degrees of Freedom		
X Coefficient(s)	0.00922723	1.425390
Std Err of Coef.		
Correlation Coefficient	0.999555	
Coefficient of Determination (r^2)	0.999111	0.998858

LDC #_45580A96_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/1/2019	SCN945	PFOS	0.25	0.0123	0.02	0.00040
			0.5	0.0295	0.04	0.0016
	190701M1-CRV	13C8-PFOS	1	0.0651	0.08	0.0064
			2	0.1540	0.16	0.0256
			5	0.3969	0.40	0.1600
			10	0.9108	0.80	0.6400
			50	4.3887	4.00	16.0000
			100	9.6322	8.00	64.0000
			250	22.4459	20.00	400.0000
			500	45.9623	40.00	1600.0000

Regression Output	**Calculated**		***Reported WQR***	
Constant	*c*	*0.00905*	*c*	*-0.0827669*
Std Err of Y Est				
R Squared		*0.9998336*		*0.9992030*
Degrees of Freedom				
	m1	*m2*	*m1*	*m2*
X Coefficient(s)	*1.1286105*	*0.0004752*	*1.0321200*	*0.00169096*
Std Err of Coef.				
Correlation Coefficient		*0.999917*		
Coefficient of Determination (r^2)		*0.999834*		

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/8/2019	SCN945	PFOA	0.25	0.03026	3.125
			0.5	0.05635	6.250
	190707M2-CRV		1	0.12819	12.500
		13C2-PFOA	2	0.23652	25.000
			5	0.56342	62.500
			10	1.13496	125.000
			50	5.69897	625.000
			100	11.70763	1250.000
			250	27.83374	3125.000
			500	58.24964	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.064747	0.024985
Std Err of Y Est		
R Squared	0.999685	0.999567
Degrees of Freedom		
X Coefficient(s)	0.00925494	1.437000
Std Err of Coef.		
Correlation Coefficient	0.999843	
Coefficient of Determination (r^2)	0.999685	0.999567

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/8/2019	SCN945	PFOS	0.25	0.01762	3.125
			0.5	0.03271	6.250
			1	0.07312	12.500
	190707M2-CRV	13C8-PFOS	2	0.16106	25.000
			5	0.42655	62.500
			10	0.82050	125.000
			50	4.47916	625.000
			100	9.43586	1250.000
			250	20.96613	3125.000
			500	47.95613	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.206548	-0.104113
Std Err of Y Est		
R Squared	0.997431	0.996565
Degrees of Freedom		
X Coefficient(s)	0.00752625	1.149010
Std Err of Coef.		
Correlation Coefficient	0.998715	
Coefficient of Determination (r^2)	0.997431	0.996565

LDC #: 45580A96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG

2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 89F0278-BS1/BSD1

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	10.0	10.0	10.7	10.9	107	107	109	109	1.95	1.85
PFOS	↓	↓								

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC # 45580A96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

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 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration 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	Recalculated	Reported % R	Recalculated % R
1	190702M2-4 ISC	7/2/2019	PFOA	(13C2-PFOA)	1.000	0.960	0.960	96.0	96.0
			PFOS	(13C8-PFOS)	1.000	0.936	0.936	93.6	93.6
2	190707M2-14 ICV	7/7/2019	PFOA	(13C2-PFOA)	10.000	7.882	7.882	78.8	78.8
			PFOS	(13C8-PFOS)	9.240	7.150	7.150	77.4	77.4

LDC #: 45580#96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?

(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 4, PFOS:

Conc. = $\frac{\left[\left(\left(\frac{9800}{2100}\right)(12.5)\right)-(-0.104113)\right](1\ mL)}{(1.14901)(1.07\ g)(0.946)}$

= 50.24 ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration ( )	Qualification
			50.2		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: August 22, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1901766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-GW-06202019	1901766-01	Water	06/20/19
SAOA-B06-GW	1901766-02	Water	06/24/19
FRB-06242019	1901766-03	Water	06/24/19
SAOA-B07-GW	1901766-04	Water	06/25/19
SAOA-B04-SO-5-5.5	1901766-05	Soil	06/25/19
SAOA-B04-SO-20-20.5	1901766-06	Soil	06/25/19
SAOA-B04-SO-47-47.5	1901766-07	Soil	06/25/19
SAOA-B04-GW	1901766-08	Water	06/25/19
EB-06252019	1901766-09	Water	06/25/19
FRB-06252019	1901766-10	Water	06/25/19
SAOA-B06-GWMS	1901766-02MS	Water	06/24/19
SAOA-B06-GWMSD	1901766-02MSD	Water	06/24/19
SAOA-B04-SO-5-5.5MS	1901766-05MS	Soil	06/25/19
SAOA-B04-SO-5-5.5MSD	1901766-05MSD	Soil	06/25/19

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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona (May 2019), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). 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 method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified

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 method.

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.

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

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.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB-GW-06202019 and EB-06252019 were identified as equipment blanks. No contaminants were found.

Samples FRB-06242019 and FRB-06252019 were identified as field reagent 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
SAOA-B04-SO-5-5.5MS/MSD (SAOA-B04-SO-5-5.5)	PFHxA	139 (70-130)	-	J (all detects)	A
	PFHpA	140 (70-130)	-	J (all detects)	
	PFHxS	152 (70-130)	-	J (all detects)	
	PFOA	140 (70-130)	-	J (all detects)	

For SAOA-B04-SO-5-5.5MS/MSD, no data were qualified for PFOS percent recoveries (%R) and relative percent differences (RPD) outside the QC limits since the MS/MSD was analyzed at greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
SAOA-B04-SO-5-5.5MS/MSD (SAOA-B04-SO-5-5.5)	PFHxA	59.2 (≤30)	J (all detects)	A
	PFHpA	45.1 (≤30)	J (all detects)	
	PFHxS	68.3 (≤30)	J (all detects)	
	PFOA	38.2 (≤30)	J (all detects)	

VIII. Laboratory Control Samples/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) 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
SAOA-B06-GW	13C2-PFTeDA	38.4 (50-150)	PFTeDA	UJ (all non-detects)	P
SAOA-B04-SO-20-20.5	13C2-PFDA d3-MeFOSAA d5-EtFOSAA 13C2-PFUnA 13C2-PFDoA 13C2-PFTeDA	48.6 (50-150) 48.2 (50-150) 46.7 (50-150) 41.1 (50-150) 41.0 (50-150) 36.6 (50-150)	PFDA MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
SAOA-B04-GW	13C2-PFTeDA	26.5 (50-150)	PFTeDA	UJ (all non-detects)	P
FRB-06252019	d3-MeFOSAA	43.8 (50-150)	MeFOSAA	UJ (all non-detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
SAOA-B07-GW SAOA-B04-SO-5-5.5 SAOA-B04-SO-20-20.5 SAOA-B04-GW	All compounds reported below the LOQ.	J (all detects)	A

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 method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, labeled compound %R, and results below the LOQ, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1901766

Sample	Compound	Flag	A or P	Reason
SAOA-B04-SO-5-5.5	PFHxA PFHpA PFHxS PFOA	J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
SAOA-B04-SO-5-5.5	PFHxA PFHpA PFHxS PFOA	J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD)
SAOA-B06-GW	PFTeDA	UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B04-SO-20-20.5	PFDA MeFOSAA EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B04-GW	PFTeDA	UJ (all non-detects)	P	Labeled compounds (%R)
FRB-06252019	MeFOSAA	UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B07-GW SAOA-B04-SO-5-5.5 SAOA-B04-SO-20-20.5 SAOA-B04-GW	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1901766

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1901766

No Sample Data Qualified in this SDG

LDC #: 45580B96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901766 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M)

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 Individual ≤30% ICV≤30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 1, 9 FRB = 3, 10
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	ASW	LCS/D, OPR
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
XI.	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: FRB= Field Reagent Blank

	Client ID	Lab ID	Matrix	Date
1	EB-GW-06202019	1901766-01	Water	06/20/19
2	SAOA-B06-GW	1901766-02	Water	06/24/19
3	FRB-06242019	1901766-03	Water	06/24/19
4	SAOA-B07-GW	1901766-04	Water	06/25/19
5	SAOA-B04-SO-5-5.5	1901766-05	Soil	06/25/19
6	SAOA-B04-SO-20-20.5	1901766-06	Soil	06/25/19
7	SAOA-B04-SO-47-47.5	1901766-07	Soil	06/25/19
8	SAOA-B04-GW	1901766-08	Water	06/25/19
9	EB-06252019	1901766-09	Water	06/25/19
10	FRB-06252019	1901766-10	Water	06/25/19
11	SAOA-B06-GWMS	1901766-02MS	Water	06/24/19
12	SAOA-B06-GWMSD	1901766-02MSD	Water	06/24/19
13	SAOA-B04-SO-5-5.5MS	1901766-05MS	Soil	06/25/19
14	SAOA-B04-SO-5-5.5MSD	1901766-05MSD	Soil	06/25/19
15	B9F0253-BLK1			
-2	B9F0280-BLK1			

LDC #: 45580 B96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard except the lowest point (50-150%)?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 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?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzedin this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch in this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

Validation Area	Yes	No	NA	Findings/Comments
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?.			✓	
XI. Labeled Compounds				
Were labeled compound percent recoveries (%R) within the QC limits?	✓			
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓			
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 quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Was m/z 499 to m/z 80 transition used as the quantitation transition for PFOS?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Perfluorinated Alkyl Acids (EPA Method 537)

A. PFBA	375-22-4
B. PFPeA	2706-90-3
C. PFBS	375-73-5
D. PFHxA	307-24-4
E. PFHpA	375-85-9
F. PFHxS	355-46-4
G. PFOA	335-67-1
H. PFHpS	375-92-8
I. PFNA	375-95-1
J. PFOSA	754-91-6
K. PFOS	1763-23-1
L. PFDA	335-76-2
M. PFUnA	2058-94-8
N. PFDS	335-77-3
O. PFDoA	307-55-1
P. MeFOSA	31506-32-8
Q. PFTrDA	72629-94-8
R. PFTeDA	376-06-7
S. EtFOSA	4151-50-2
T. MeFOSE	24448-09-7
U. EtFOSE	1691-99-2
V. MeFOSAA	2355-31-9
W. EtFOSAA	2991-50-6

Notes:_____

LDC #: 45580 B96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537M)

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 in this SDG?

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
		13/14	D	139 (70-130)	( )	( )	5 (det)	J det/A
			E	140 ( )	( )	( )		
			F	152 ( )	( )	( )		
			G	140 ( )	( )	( )		
	(5X)		K	321 ( )	-98.5 (70-130)	( )		NA (dil)
			D	( )	( )	59.2 (30)	(det)	J det/A
			E	( )	( )	45.1 ( )		
			F	( )	( )	68.3 ( )		
			G	( )	( )	38.2 ( )		
			K	( )	( )	271 ( )		NA (dil)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 45580 B96

VALIDATION FINDINGS WORKSHEET
Labeled Compound

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compounds within -50 to +150% of the associated calibration standard?

#	Date	Sample ID	Labeled Compound	%R	Limits (%)	Qualifications
		2 (ND)	13C2 - R	38.4	50 - 150	J / UJ / P (qual R)
		6 (ND)	13C2 - L	48.6		(qual L)
			d3 - V	48.2		V
			d5 - W	46.7		W
			13C2 - M	41.1		M
			13C2 - O	41.0		O, Q
			13C2 - R	36.6		R
		8 (ND)	13C2 - R	26.5		(qual R)
		10 (ND)	d3 - V	43.8		(qual V)
		11	13C2 - R	25.7		NQ (QC)
		12	13C2 - R	33.4		

LDC#: 45580B96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/1/2019	SCN945	PFOA	0.25	0.03318	3.125
			0.5	0.05895	6.250
	190701M1-CRV		1	0.11824	12.500
		13C2-PFOA	2	0.21986	25.000
			5	0.57756	62.500
			10	1.11263	125.000
			50	5.66807	625.000
			100	11.64186	1250.000
			250	27.00102	3125.000
			500	58.36004	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.117761	0.031497
Std Err of Y Est		
R Squared	0.999111	0.998858
Degrees of Freedom		
X Coefficient(s)	0.00922723	1.425390
Std Err of Coef.		
Correlation Coefficient	0.999555	
Coefficient of Determination (r^2)	0.999111	0.998858

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
7/1/2019	SCN945	PFOS	0.25	0.0123	0.02	0.00040
			0.5	0.0295	0.04	0.0016
	190701M1-CRV	13C8-PFOS	1	0.0651	0.08	0.0064
			2	0.1540	0.16	0.0256
			5	0.3969	0.40	0.1600
			10	0.9108	0.80	0.6400
			50	4.3887	4.00	16.0000
			100	9.6322	8.00	64.0000
			250	22.4459	20.00	400.0000
			500	45.9623	40.00	1600.0000

Regression Output	**Calculated**		***Reported WQR***	
Constant	*c*	*0.00905*	*c*	*-0.0827669*
Std Err of Y Est				
R Squared		*0.9998336*		*0.9992030*
Degrees of Freedom				
	m1	*m2*	*m1*	*m2*
X Coefficient(s)	*1.1286105*	*0.0004752*	*1.0321200*	*0.00169096*
Std Err of Coef.				
Correlation Coefficient		*0.999917*		
Coefficient of Determination (r^2)		*0.999834*		

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/10/2019	SCN945	PFOA	0.25	0.04424	3.125
			0.5	0.06626	6.250
			1	0.16054	12.500
		13C2-PFOA	2	0.28982	25.000
			5	0.76540	62.500
			10	1.42501	125.000
			50	7.42635	625.000
			100	14.79889	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.001555	0.038532
Std Err of Y Est		
R Squared	0.999983	0.999749
Degrees of Freedom		
X Coefficient(s)	0.01184661	1.848290
Std Err of Coef.		
Correlation Coefficient	0.999992	
Coefficient of Determination (r^2)	0.999983	0.999749

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/10/2019	SCN945	PFOS	0.25	0.00818	3.125
			0.5	0.03295	6.250
	190710M2-CRV		1	0.10211	12.500
		13C8-PFOS	2	0.14330	25.000
			5	0.43202	62.500
			10	0.82840	125.000
			50	5.02607	625.000
			100	10.45259	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.076994	-0.175183
Std Err of Y Est		
R Squared	0.999354	0.995937
Degrees of Freedom		
X Coefficient(s)	0.00836341	1.269460
Std Err of Coef.		
Correlation Coefficient	0.999677	
Coefficient of Determination (r^2)	0.999354	0.995937

LDC # 45580B96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

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 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration 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	Recalculated	Reported % R	Recalculated % R
1	190702M2-4 ISC	7/2/2019	PFOA	(13C2-PFOA)	1.000	0.960	0.960	96.0	96.0
			PFOS	(13C8-PFOS)	1.000	0.936	0.936	93.6	93.6
2	190710M2-17 ICV	7/10/2019	PFOA	(13C2-PFOA)	10.000	7.241	7.241	72.4	72.4
			PFOS	(13C8-PFOS)	9.240	7.763	7.763	84.0	84.0
3	090712M1-2	7/12/2019	PFOA	(13C2-PFOA)	1.000	0.909	0.909	90.9	90.9
			PFOS	(13C8-PFOS)	1.000	0.983	0.983	98.3	98.3

LDC #: 45580 B96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: LC/MS PFAS (EPA Method 537Mod)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 11/12

Compound	Spike Added (ng/L)		Sample Conc (ng/L)	Spiked Sample Concentration (ng/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
PFOA	0.0847	0.0876	0.177	0.276	0.290	117	117	129	129	9.76	9.76
PFOS	↓	↓	0.0677	0.159	0.165	108	108	112	112	3.64	3.64

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

% RPD based on % R

LDC #: 45580 B96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: B9F0280-BS1

Compound	Spike Added (ng/kg)		Spike Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	10.0	NA	10.3	NA	103	103				
PFOS	↓	↓	10.5	↓	105	105				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45580 B96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 5 , PFOS :

Conc. = $\frac{\left[\left(\frac{11500}{1190} \times 12.5\right) - (-0.175183)\right](1ml)}{(1.26996)\ (1.08g)\ (0.967)}$

= 91.1 ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration ( )	Qualification
			91.1		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: August 22, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1901857

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SAOA-B05-GW	1901857-01	Water	06/26/19
SAOA-B09-SO-1-1.5	1901857-02	Soil	06/26/19
SAOA-B09-SO-20-20.5	1901857-03	Soil	06/26/19
SAOA-B09-GW	1901857-04	Water	06/26/19
FRB-06262019	1901857-05	Water	06/26/19
EB-06262019	1901857-06	Water	06/26/19
SAOA-B11-SO-1-1.5	1901857-07	Soil	06/27/19
SAOA-B11-SO-20-20.5	1901857-08	Soil	06/27/19
SAOA-B11-GW	1901857-09	Water	06/27/19
SAOA-B08-SO-1-1.5	1901857-10	Soil	06/27/19
EB-06272019	1901857-11	Water	06/27/19
FRB-06272019	1901857-12	Water	06/27/19

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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona (May 2019), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). 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 method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified

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 method.

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.

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

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.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB-06272019-GW (from SDG 1901920), EB-06262019, and EB-06272019 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples In This SDG
EB-06272019-GW	06/27/19	PFOS PFDA	0.0103 ug/L 0.00428 ug/L	SAOA-B11-GW

Samples FRB-06262019 and FRB-06272019 were identified as field reagent blanks. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X for contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
SAOA-B11-GW	PFOS	0.00941 ug/L	0.00941J ug/L

Sample results were qualified as follows:

- If sample concentration was < 5X the blank concentration and the sample was <limit of quantitation (LOQ), the sample result was qualified as nondetect (U).
- If sample concentration was < 5X the blank concentration and the sample was >LOQ, the sample result was qualified as estimated (J).

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/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

OPR ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
B9G0116-BS1	EtFOSAA	137 (70-130)	SAOA-B09-SO-1-1.5 SAOA-B09-SO-20-20.5 SAOA-B11-SO-1-1.5 SAOA-B11-SO-20-20.5 SAOA-B08-SO-1-1.5	NA	-

NA (Not Applicable): The percent recovery demonstrates a high bias and the affected compound was not detected in the associated samples. Sample qualification was not necessary.

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
SAOA-B05-GW	d5-EtFOSAA 13C2-PFUnA 13C2-PFDoA 13C2-PFTeDA	49.4 (50-150) 43.1 (50-150) 35.9 (50-150) 17.0 (50-150)	EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
SAOA-B11-GW	13C2-PFTeDA	47.2 (50-150)	PFTeDA	UJ (all non-detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
SAOA-B09-SO-1-1.5 SAOA-B09-GW SAOA-B11-SO-1-1.5 SAOA-B11-GW SAOA-B08-SO-1-1.5	All compounds reported below the LOQ.	J (all detects)	A

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 method. No results were rejected in this SDG.

Due to labeled compound %R and results below the LOQ, data were qualified as estimated in six samples.

Due to equipment blank contamination, 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 Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1901857

Sample	Compound	Flag	A or P	Reason
SAOA-B05-GW	EtFOSAA PFUnA PFDoA PFTrDA PFTeDA	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B11-GW	PFTeDA	UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B09-SO-1-1.5 SAOA-B09-GW SAOA-B11-SO-1-1.5 SAOA-B11-GW SAOA-B08-SO-1-1.5	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1901857

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1901857

Sample	Compound	Modified Final Concentration	A or P
SAOA-B11-GW	PFOS	0.00941J ug/L	A

LDC #: 45580C96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901857 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JV6
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537(M))

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 Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	*FRB = 5, 12 EB = *6, *11, EB-06272019-GW (1901920)
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	SW	LCS/D, OPR
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
XI.	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: FRB = Field Reagent Blank

	Client ID	Lab ID	Matrix	Date
1	SAOA-B05-GW	1901857-01	Water	06/26/19
2	SAOA-B09-SO-1-1.5	1901857-02	Soil	06/26/19
3	SAOA-B09-SO-20-20.5	1901857-03	Soil	06/26/19
4	SAOA-B09-GW	1901857-04	Water	06/26/19
5	FRB-06262019	1901857-05	Water	06/26/19
6	EB-06262019	1901857-06	Water	06/26/19
7	SAOA-B11-SO-1-1.5	1901857-07	Soil	06/27/19
8	SAOA-B11-SO-20-20.5	1901857-08	Soil	06/27/19
9	SAOA-B11-GW	1901857-09	Water	06/27/19
10	SAOA-B08-SO-1-1.5	1901857-10	Soil	06/27/19
11	EB-06272019	1901857-11	Water	06/27/19
12	FRB-06272019	1901857-12	Water	06/27/19
13				
14	1. B9G0050-BLK1			
15	2. B9G0116-1			

LDC #: 45580C96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard except the lowest point (50-150%)?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 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?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzedin this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch in this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

LDC #: 45580C96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?.			✓	
XI. Labeled Compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓			
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 quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Was m/z 499 to m/z 80 transition used as the quantitation transition for PFOS?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Perfluorinated Alkyl Acids (EPA Method 537)

A. PFBA	375-22-4
B. PFPeA	2706-90-3
C. PFBS	375-73-5
D. PFHxA	307-24-4
E. PFHpA	375-85-9
F. PFHxS	355-46-4
G. PFOA	335-67-1
H. PFHpS	375-92-8
I. PFNA	375-95-1
J. PFOSA	754-91-6
K. PFOS	1763-23-1
L. PFDA	335-76-2
M. PFUnA	2058-94-8
N. PFDS	335-77-3
O. PFDoA	307-55-1
P. MeFOSA	31506-32-8
Q. PFTrDA	72629-94-8
R. PFTeDA	376-06-7
S. EtFOSA	4151-50-2
T. MeFOSE	24448-09-7
U. EtFOSE	1691-99-2
V. MeFOSAA	2355-31-9
W. EtFOSAA	2991-50-6

Notes: _____

LDC #: 45580 C96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: LC/MS PFAS (EPA Method 537M)

(Y) N N/A Were field blanks identified in this SDG?
Y/N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ng/L
Sampling date: 06/27/19
Field blank type: (circle one) Trip Blank/Field Blank / Rinsate / Other: _____ Associated Samples: 9

Compound	Blank ID	Sample Identification								
EB-06272019-GW		9								
>LOQ K	0.0103		0.00941 J							
<LOQ L	0.00428									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

LDC #: 45580C96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537)

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
	BG0116-BS1 (COPR)	W	137 (70-130)	( )	( )	2,3,7,8,16, MB2 (ND)	J dets / p
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45580 C96

VALIDATION FINDINGS WORKSHEET
Labeled Compound

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all labeled compounds within -50 to +150% of the associated calibration standard?

#	Date	Sample ID	Labeled Compound	%R	Limits (%)	Qualifications
		1 (ND)	d5-N	99.4	50-150	J/UJ/P (qual N)
		↓	13C2-M	43.1	↓	M
			13C2-O	35.9		O,Q
			13C2-R	17.0		R,
		9 (ND)	13C2-R	47.2		R,
		BG0050-BLK1	13C2-R	39.8		R
		BG0116-BLK1	13C2-R	47.3	↓	R

LDC#: 45580C96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/8/2019	SCN945	PFOA	0.25	0.03026	3.125
			0.5	0.05635	6.250
			1	0.12819	12.500
		13C2-PFOA	2	0.23652	25.000
			5	0.56342	62.500
			10	1.13496	125.000
			50	5.69897	625.000
			100	11.70763	1250.000
			250	27.83374	3125.000
			500	58.24964	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.064747	0.024985
Std Err of Y Est		
R Squared	0.999685	0.999567
Degrees of Freedom		
X Coefficient(s)	0.00925494	1.437000
Std Err of Coef.		
Correlation Coefficient	0.999843	
Coefficient of Determination (r^2)	0.999685	0.999567

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/8/2019	SCN945	PFOS	0.25	0.01762	3.125
			0.5	0.03271	6.250
			1	0.07312	12.500
		13C8-PFOS	2	0.16106	25.000
			5	0.42655	62.500
			10	0.82050	125.000
			50	4.47916	625.000
			100	9.43586	1250.000
			250	20.96613	3125.000
			500	47.95613	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.206548	-0.104113
Std Err of Y Est		
R Squared	0.997431	0.996565
Degrees of Freedom		
X Coefficient(s)	0.00752625	1.149010
Std Err of Coef.		
Correlation Coefficient	0.998715	
Coefficient of Determination (r^2)	0.997431	0.996565

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/12/2019	SCN945	PFOA	0.25	0.03226	3.125
			0.5	0.06127	6.250
			1	0.11149	12.500
		13C2-PFOA	2	0.22345	25.000
			5	0.55250	62.500
			10	1.13393	125.000
			50	5.63506	625.000
			100	10.95602	1250.000
			250	26.97489	3125.000
			500	54.69562	6250.000

Regression Output	Calculated	Reported WLR
Constant	0.014494	0.073917
Std Err of Y Est		
R Squared	0.999962	0.999890
Degrees of Freedom		
X Coefficient(s)	0.00872764	1.364860
Std Err of Coef.		
Correlation Coefficient	0.999981	
Coefficient of Determination (r^2)	0.999962	0.999890

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/12/2019	SCN945	PFOS	0.25	0.02715	3.125
			0.5	0.02748	6.250
			1	0.07680	12.500
		13C8-PFOS	2	0.14878	25.000
			5	0.44086	62.500
			10	0.85959	125.000
			50	4.21093	625.000
			100	8.30061	1250.000
			250	22.46399	3125.000
			500	45.30008	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.133686	-0.160592
Std Err of Y Est		
R Squared	0.999751	0.999099
Degrees of Freedom		
X Coefficient(s)	0.00724403	1.115200
Std Err of Coef.		
Correlation Coefficient	0.999876	
Coefficient of Determination (r^2)	0.999751	0.999099

LDC # 45580C96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

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 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration 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	Recalculated	Reported % R	Recalculated % R
1	090708M3_2	7/8/2020	PFOA	(13C2-PFOA)	1.000	1.033	1.033	103.3	103.3
			PFOS	(13C8-PFOS)	1.000	0.998	0.998	99.8	99.8
2	190712M2_17 ICV	7/12/2019	PFOA	(13C2-PFOA)	10.000	7.535	7.535	75.3	75.3
			PFOS	(13C8-PFOS)	9.240	6.554	6.554	70.9	70.9

LDC #: 45580 C96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: B9G0050-BS1/BSD1

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.040	0.040	0.0418	0.0425	104	104	106	106	1.84	1.7
PFOS	↓	↓	0.0378	0.0434	94.4	94.4	109	109	13.9	13.6

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45580C96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, PFOS:

Conc. $= \frac{\left[\left(\left(\frac{5630}{2550}\right)(12.5)\right) - (-0.160592)\right]}{(1.1152)} = 16.10$

final conc. $= \frac{(16.10)(1\ mL)}{(1.0\ g)(0.995)}$

$= 16.0\ ug/kg$

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration ( )	Qualification
			16.0		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: August 22, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1901920

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SAOA-B08-SO-30-30.5	1901920-01	Soil	06/27/19
SAOA-B08-GW	1901920-02	Water	06/27/19
EB-06272019-GW	1901920-03	Water	06/27/19
FRB-06282019	1901920-04	Water	06/28/19
SAOA-B12-GW	1901920-05	Water	06/28/19
SAOA-B12-GW-D	1901920-06	Water	06/28/19
NAOA-B08-SO-1-1.5	1901920-07	Soil	07/01/19
NAOA-B08-SO-20-20.5	1901920-08	Soil	07/01/19
NAOA-B09-SO-1-1.5	1901920-09	Soil	07/01/19
NAOA-B09-SO-20-20.5	1901920-10	Soil	07/01/19
NAOA-B02-GW	1901920-11	Water	07/01/19
EB-07012019	1901920-12	Water	07/01/19
NAOA-B01-SO-1-1.5	1901920-13	Soil	07/01/19
FRB-07012019	1901920-14	Water	07/01/19
NAOA-B01-SO-20-20.5	1901920-15	Soil	07/01/19
NAOA-B01-GW	1901920-16	Water	07/02/19
NAOA-B01-GW-D	1901920-17	Water	07/02/19
CAOA-B02-SO-0.5-1	1901920-18	Soil	07/02/19
CAOA-B02-SO-20-20.5	1901920-19	Soil	07/02/19
EB-07022019	1901920-20	Water	07/02/19
CAOA-B02-SO-0.5-1MS	1901920-18MS	Soil	07/02/19
CAOA-B02-SO-0.5-1MSD	1901920-18MSD	Soil	07/02/19

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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona (May 2019), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). 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 method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified

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 method.

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.

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

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.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB-06272019-GW, EB-07012019, and EB-07022019 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples in this SDG
EB-06272019-GW	06/27/19	PFOS PFDA	0.0103 ug/L 0.00428 ug/L	SAOA-B08-GW

Samples FRB-06272019 (from SDG 1901857), FRB-06282019, and FRB-07012019 were identified as field reagent blanks. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X for contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
SAOA-B08-GW	PFDA	0.00298 ug/L	0.00298U ug/L

Sample results were qualified as follows:

- If sample concentration was < 5X the blank concentration and the sample was <limit of quantitation (LOQ), the sample result was qualified as nondetect (U).
- If sample concentration was < 5X the blank concentration and the sample was >LOQ, the sample result was qualified as estimated (J).

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
CAOA-B02-SO-0.5-1MS/MSD (CAOA-B02-SO-0.5-1)	PFHxA	-	138 (70-130)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

OPR ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
B9G0116-BS1	EtFOSAA	134 (70-130)	SAOA-B08-SO-30-30.5 NAOA-B08-SO-1-1.5 NAOA-B08-SO-20-20.5 NAOA-B09-SO-1-1.5 NAOA-B09-SO-20-20.5 NAOA-B01-SO-1-1.5 NAOA-B01-SO-20-20.5 CAOA-B02-SO-0.5-1 CAOA-B02-SO-20-20.5	NA	-

NA (Not Applicable): The percent recovery demonstrates a high bias and the affected compound was not detected in the associated samples. Sample qualification was not necessary.

IX. Field Duplicates

Samples SAOA-B12-GW and SAOA-B12-GW-D and samples NAOA-B01-GW and NAOA-B01-GW-D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	SAOA-B12-GW	SAOA-B12-GW-D			
PFBS	0.00758	0.00664	Not calculable	-	-
PFHxA	0.0178	0.0203	Not calculable	-	-
PFHpA	0.00410U	0.00361	Not calculable	-	-
PFHxS	0.00478	0.0157	Not calculable	-	-
PFOA	0.00410U	0.00635	Not calculable	-	-
PFNA	0.00410U	0.00302	Not calculable	-	-
PFOS	0.0127	0.0904	Not calculable	-	-
PFDA	0.00410U	0.00407	Not calculable	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	NAOA-B01-GW	NAOA-B01-GW-D			
PFBS	0.0823	0.170	70 (≤30)	J (all detects)	A
PFHxA	0.176	0.613	111 (≤30)	J (all detects)	A
PFHpA	0.0307	0.0573	60 (≤30)	J (all detects)	A

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	NAOA-B01-GW	NAOA-B01-GW-D			
PFHxS	0.167	0.120	33 (≤30)	J (all detects)	A
PFOA	0.00628	0.00362U	Not calculable	-	-
PFOS	0.0664	0.0447	39 (≤30)	J (all detects)	A

Not calculable = One or both results were less than 5x the limit of quantitation.

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
SAOA-B08-GW	13C2-PFTeDA	44.1 (50-150)	PFTeDA	UJ (all non-detects)	P
SAOA-B12-GW-D	13C2-PFTeDA	30.7 (50-150)	PFTeDA	UJ (all non-detects)	P
NAOA-B02-GW	13C2-PFTeDA	45.7 (50-150)	PFTeDA	UJ (all non-detects)	P
NAOA-B01-GW	13C2-PFTeDA	47.7 (50-150)	PFTeDA	UJ (all non-detects)	P
NAOA-B01-GW-D	13C2-PFTeDA	39.8 (50-150)	PFTeDA	UJ (all non-detects)	P
CAOA-B02-SO-20-20.5	13C2-PFDoA	46.3 (50-150)	PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
SAOA-B08-GW EB-06272019-GW SAOA-B12-GW SAOA-B12-GW-D NAOA-B09-SO-1-1.5 NAOA-B02-GW NAOA-B01-SO-1-1.5 NAOA-B01-GW CAOA-B02-SO-0.5-1 CAOA-B02-SO-20-20.5	All compounds reported below the LOQ.	J (all detects)	A

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 method. No results were rejected in this SDG.

Due to MS/MSD %R, field duplicate RPD, labeled compound %R, and results below the LOQ, data were qualified as estimated in eleven samples.

Due to equipment blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1901920

Sample	Compound	Flag	A or P	Reason
CAOA-B02-SO-0.5-1	PFHxA	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
NAOA-B01-GW NAOA-B01-GW-D	PFBS PFHxA PFHpA PFHxS PFOS	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)
SAOA-B08-GW SAOA-B12-GW-D NAOA-B02-GW NAOA-B01-GW NAOA-B01-GW-D	PFTeDA	UJ (all non-detects)	P	Labeled compounds (%R)
CAOA-B02-SO-20-20.5	PFDoA PFTrDA	UJ (all non-detects) UJ (all non-detects)	P	Labeled compounds (%R)
SAOA-B08-GW EB-06272019-GW SAOA-B12-GW SAOA-B12-GW-D NAOA-B09-SO-1-1.5 NAOA-B02-GW NAOA-B01-SO-1-1.5 NAOA-B01-GW CAOA-B02-SO-0.5-1 CAOA-B02-SO-20-20.5	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1901920

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1901920

Sample	Compound	Modified Final Concentration	A or P
SAOA-B08-GW	PFDA	0.00298U ug/L	A

LDC #: 45580D96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901920 Stage 4 Page: 1 of 2
Laboratory: Vista Analytical Laboratory Reviewer: SVG
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537M)

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	Vr Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	EB = 3, 12*, 20 FRB = 4, 14*, FRB-06272019 (1901857)
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	SW	D = 16/17, 5/6
X.	Labeled Compounds	SW	
XI.	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: FRB = Field Reagent Blank

	Client ID	Lab ID	Matrix	Date
1	SAOA-B08-SO-30-30.5	1901920-01	Soil	06/27/19
2	SAOA-B08-GW	1901920-02	Water	06/27/19
3	EB-06272019-GW	1901920-03	Water	06/27/19
4	FRB-06282019	1901920-04	Water	06/28/19
5	SAOA-B12-GW D	1901920-05	Water	06/28/19
6	SAOA-B12-GW-D D	1901920-06	Water	06/28/19
7	NAOA-B08-SO-1-1.5	1901920-07	Soil	07/01/19
8	NAOA-B08-SO-20-20.5	1901920-08	Soil	07/01/19
9	NAOA-B09-SO-1-1.5	1901920-09	Soil	07/01/19
10	NAOA-B09-SO-20-20.5	1901920-10	Soil	07/01/19
11	NAOA-B02-GW	1901920-11	Water	07/01/19
12	EB-07012019	1901920-12	Water	07/01/19
13	NAOA-B01-SO-1-1.5	1901920-13	Soil	07/01/19
14	FRB-07012019	1901920-14	Water	07/01/19
15	NAOA-B01-SO-20-20.5	1901920-15	Soil	07/01/19

LDC #: 45580D96 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/12/19
SDG #: 1901920 Stage 4 Page: 2 of 2
Laboratory: Vista Analytical Laboratory Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

	Client ID	Lab ID	Matrix	Date
16	NAOA-B01-GW	1901920-16	Water	07/02/19
17	NAOA-B01-GW-D	1901920-17	Water	07/02/19
18	CAOA-B02-SO-0.5-1	1901920-18	Soil	07/02/19
19	CAOA-B02-SO-20-20.5	1901920-19	Soil	07/02/19
20	EB-07022019	1901920-20	Water	07/02/19
21	CAOA-B02-SO-0.5-1MS	1901920-18MS	Soil	07/02/19
22	CAOA-B02-SO-0.5-1MSD	1901920-18MSD	Soil	07/02/19
23				
24				
25				
26				
27				

Notes:

1	BQG0116-BLK1						
2	BQG0062-1						

LDC #: 45580 D96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard except the lowest point (50-150%)?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 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?	✓			
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzedin this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch in this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

Validation Area	Yes	No	NA	Findings/Comments
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?.	✓			
XI. Labeled Compounds				
Were labeled compound percent recoveries (%R) within the QC limits?		✓		
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓	-		
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 quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Was m/z 499 to m/z 80 transition used as the quantitation transition for PFOS?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Perfluorinated Alkyl Acids (EPA Method 537)

A. PFBA	375-22-4
B. PFPeA	2706-90-3
C. PFBS	375-73-5
D. PFHxA	307-24-4
E. PFHpA	375-85-9
F. PFHxS	355-46-4
G. PFOA	335-67-1
H. PFHpS	375-92-8
I. PFNA	375-95-1
J. PFOSA	754-91-6
K. PFOS	1763-23-1
L. PFDA	335-76-2
M. PFUnA	2058-94-8
N. PFDS	335-77-3
O. PFDoA	307-55-1
P. MeFOSA	31506-32-8
Q. PFTrDA	72629-94-8
R. PFTeDA	376-06-7
S. EtFOSA	4151-50-2
T. MeFOSE	24448-09-7
U. EtFOSE	1691-99-2
V. MeFOSAA	2355-31-9
W. EtFOSAA	2991-50-6

Notes:_____

LDC #: 45580 D9G

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537)

(Y) N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ng/L **Associated sample units:** ng/L

>5x or <LOQ

Sampling date: 06/27/19

Field blank type: (circle one) Trip Blank/Field Blank / Rinsate / Other: EB Associated Samples: 2 (either < or > 5x)

Compound	Blank ID	Sample Identification								
	3		32							
>LOQ K	0.0103		0.144 J a							
<LOQ L	0.00428		0.00298 U							

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

LDC #: 45580D 96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: O

METHOD: LC/MS PFCs (EPA Method 537M)

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 in this SDG?

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
		21/22	D	( )	138 (70-130)	( )	18 (Det)	J dets/A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 45580 D96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537)

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
	B9G0116-BS1 (OPR)	W	134 (70-130)	( )	( )	1, 7-10, 13, 15, 18, 19, MB 1 (ND)	J dets/P
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		

LDC#: 45580D96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LCMS PFAS (EPA Method 537M)
Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤30%)	Qualifications (Parent only)
	5	6		
C	0.00758	0.00664	NC	
D	0.0178	0.0203	NC	
E	0.00410U	0.00361	NC	
F	0.00478	0.0157	NC	
G	0.00410U	0.00635	NC	
I	0.00410U	0.00302	NC	
K	0.0127	0.0904	NC	
L	0.00410U	0.00407	NC	

Compound	Concentration (ug/L)		RPD (≤30%)	Qualifications (Parent only)
	16	17		
C	0.0823	0.170	70	Jdets/A
D	0.176	0.613	111	Jdets/A
E	0.0307	0.0573	60	Jdets/A
F	0.167	0.120	33	Jdets/A
G	0.00628	0.00362U	NC	
K	0.0664	0.0447	39	Jdets/A

NC (<5XLOQ)

V:\Josephine\FIELD DUPLICATES\45580D96 ttech yuma1.wpd

LDC #: 45580B96

VALIDATION FINDINGS WORKSHEET
Labeled Compound

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all labeled compounds within -50 to +150% of the associated calibration standard?

#	Date	Sample ID	Labeled Compound	%R	Limits (%)	Qualifications
		2 (ND)	13C2-R	44.1	50-150	J/UJ (all R)
		6		30.7		
		11		45.7		
		16		47.7		
		17		39.8		
		19	13C2-O	46.3		(all O, R)
		BG0062-BLK1	13C2-R	46.6		R
		BG0116-BLK1	d5-W	47.3		W

LDC#: 45580D96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/10/2019	SCN945	PFOA	0.25	0.04424	3.125
			0.5	0.06626	6.250
			1	0.16054	12.500
		13C2-PFOA	2	0.28982	25.000
			5	0.76540	62.500
			10	1.42501	125.000
			50	7.42635	625.000
			100	14.79889	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.001555	0.038532
Std Err of Y Est		
R Squared	0.999983	0.999749
Degrees of Freedom		
X Coefficient(s)	0.01184661	1.848290
Std Err of Coef.		
Correlation Coefficient	0.999992	
Coefficient of Determination (r^2)	0.999983	0.999749

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/10/2019	SCN945	PFOS	0.25	0.00818	3.125
			0.5	0.03295	6.250
	190710M2-CRV		1	0.10211	12.500
		13C8-PFOS	2	0.14330	25.000
			5	0.43202	62.500
			10	0.82840	125.000
			50	5.02607	625.000
			100	10.45259	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.076994	-0.175183
Std Err of Y Est		
R Squared	0.999354	0.995937
Degrees of Freedom		
X Coefficient(s)	0.00836341	1.269460
Std Err of Coef.		
Correlation Coefficient	0.999677	
Coefficient of Determination (r^2)	0.999354	0.995937

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/12/2019	SCN945	PFOA	0.25	0.03226	3.125
			0.5	0.06127	6.250
	190712M-CRV		1	0.11149	12.500
		13C2-PFOA	2	0.22345	25.000
			5	0.55250	62.500
			10	1.13393	125.000
			50	5.63506	625.000
			100	10.95602	1250.000
			250	26.97489	3125.000
			500	54.69562	6250.000

Regression Output	Calculated	Reported WLR
Constant	0.014494	0.073917
Std Err of Y Est		
R Squared	0.999962	0.999890
Degrees of Freedom		
X Coefficient(s)	0.00872764	1.364860
Std Err of Coef.		
Correlation Coefficient	0.999981	
Coefficient of Determination (r^2)	0.999962	0.999890

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/12/2019	SCN945	PFOS	0.25	0.02715	3.125
			0.5	0.02748	6.250
			1	0.07680	12.500
	190712M-CRV	13C8-PFOS	2	0.14878	25.000
			5	0.44086	62.500
			10	0.85959	125.000
			50	4.21093	625.000
			100	8.30061	1250.000
			250	22.46399	3125.000
			500	45.30008	6250.000

Regression Output	Calculated	Reported WLR
Constant	-0.133686	-0.160592
Std Err of Y Est		
R Squared	0.999751	0.999099
Degrees of Freedom		
X Coefficient(s)	0.00724403	1.115200
Std Err of Coef.		
Correlation Coefficient	0.999876	
Coefficient of Determination (r^2)	0.999751	0.999099

LDC # 45580D96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

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 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration 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	Recalculated	Reported % R	Recalculated % R
1	190711M3-32	7/12/2019	PFOA	(13C2-PFOA)	1.000	0.937	0.937	93.7	93.7
			PFOS	(13C8-PFOS)	1.000	1.090	1.090	109.0	109.0
2	190712M2-17 ICV	7/12/2019	PFOA	(13C2-PFOA)	10.000	7.535	7.535	75.3	75.3
			PFOS	(13C8-PFOS)	9.240	6.554	6.554	70.9	70.9
3	190712M2-35 CCV	7/12/2019	PFOA	(13C2-PFOA)	10.000	10.172	10.172	101.7	101.7
			PFOS	(13C8-PFOS)	10.000	9.410	9.410	94.1	94.1

LDC #: 45580 D96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537Mod)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 21/22

Compound	Spike Added (ng/kg)		Sample Conc (ng/kg)	Spiked Sample Concentration (ng/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
PFOA	9.97	9.73	1.56	13.7	12.7	122	122	115	115	5.91	5.91
PFOS	↓	↓	8.16	19.2	19.1	111	111	112	112	0.89%	0.90

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

% RPD based on %R

LDC #: 45580 D96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 890116-BS1

Compound	Spike Added (ng/kg)		Spike Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	10.0	NA	10.8	NA	108	108				
PFOS	"	"	10.5	"	105	105				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45580 D96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #7 , PFOS :

Conc. = $\frac{\left[\left(\left(\frac{6780}{2770}\right)(12.5)\right) - (-0.160592)\right](1\,ml)}{(1.1152)(1.03g)(0.985)}$

= 27.2 ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration ( )	Qualification
			27.2		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: August 22, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1901922

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
FRB-07022019	1901922-01	Water	07/02/19
CAOA-B02-GW	1901922-02	Water	07/02/19

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 (Field Sampling Plan and Quality Assurance Project Plan), Site Inspection for Per- and Polyfluoroalkyl Substances, Marine Corps Air Station Yuma, Arizona (May 2019), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). 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 method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537 Modified

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 method.

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.

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

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.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample FRB-07022019 was identified as a field reagent 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 method. 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.

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
CAOA-B02-GW	All compounds reported below the LOQ.	J (all detects)	A

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 method. No results were rejected in this SDG.

Due to results below the LOQ, 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 Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1901922

Sample	Compound	Flag	A or P	Reason
CAOA-B02-GW	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1901922

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1901922

No Sample Data Qualified in this SDG

LDC #: 45580E96 **VALIDATION COMPLETENESS WORKSHEET** Date: 08/12/19
SDG #: 1901922 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JV6
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

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	rr Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FRB = 1
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Labeled Compounds	SW	
XI.	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: FRB= Field Reagent Blank

	Client ID	Lab ID	Matrix	Date
1	FRB-07022019	1901922-01	Water	07/02/19
2	CAOA-B02-GW	1901922-02	Water	07/02/19
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

	890062-blk1						

LDC #: 45580E96

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVG
2nd Reviewer:

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard except the lowest point (50-150%)?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 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?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzedin this SDG?		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch in this SDG?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?.			✓	
XI. Labeled Compounds				
Were labeled compound percent recoveries (%R) within the QC limits?	✓	✓		
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓			
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 quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Was m/z 499 to m/z 80 transition used as the quantitation transition for PFOS?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 45580 E96

VALIDATION FINDINGS WORKSHEET
Labeled Compound

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all labeled compounds within -50 to +150% of the associated calibration standard?

#	Date	Sample ID	Labeled Compound	%R	Limits (%)	Qualifications
		B9G0062-BLK1	13C2-PFTeDA	46.6	50-150	J/UJ/P

Labeled cpd.wpd

LDC#: 45580E96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
711/19	SCN945	PFOA	0.25	0.04424	3.125
			0.5	0.06626	6.250
			1	0.16054	12.500
		13C2-PFOA	2	0.28982	25.000
			5	0.76540	62.500
			10	1.42501	125.000
			50	7.42635	625.000
			100	14.79889	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.001555	0.038532
Std Err of Y Est		
R Squared	0.999983	0.999749
Degrees of Freedom		
X Coefficient(s)	0.01184661	1.848290
Std Err of Coef.		
Correlation Coefficient	0.999992	
Coefficient of Determination (r^2)	0.999983	0.999749

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
7/11/2019	SCN945	PFOS	0.25	0.00818	3.125
			0.5	0.03295	6.250
			1	0.10211	12.500
		13C8-PFOS	2	0.14330	25.000
			5	0.43202	62.500
			10	0.82840	125.000
			50	5.02607	625.000
			100	10.45259	1250.000

Regression Output	Calculated	Reported WLR
Constant	-0.076994	-0.175183
Std Err of Y Est		
R Squared	0.999354	0.995937
Degrees of Freedom		
X Coefficient(s)	0.00836341	1.269460
Std Err of Coef.		
Correlation Coefficient	0.999677	
Coefficient of Determination (r^2)	0.999354	0.995937

LDC # 45580E96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

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 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration 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	Recalculated	Reported % R	Recalculated % R
1	190711M3_32	7/11/2019	PFOA (13C2-PFOA)	10.000	10.329	10.329	103.3	103.3
			PFOS (13C8-PFOS)	10.000	10.227	10.227	102.3	102.3

LDC #: 45580E96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: BJG0062-BS1/BSD1

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
PFOA	0.080	0.080	~~0.0887~~ 0.0880	0.0846	109	109	106	106	2.89	2.80
PFOS	1	1	0.0880	0.0817	110	110	102	102	7.33	7.42

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45580 E96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 7, PFOS:

Conc. = $\frac{\left[\left(\frac{2550}{1250}\right)(12.5) - (-0.17518)\right]}{(1.26946)} = 20.225$

final conc. = $\frac{(20.225)(12)}{(0.1205)(1000)} = 0.1678$

≈ 0.168 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
			0.168		

LOCATION-NAME	SITE_NAME	INSTALLATION_ID	LOCATION_TYPE	LOCATION_TYPE_DESC	SDG	COORD_X	COORD_Y	ANALYTICAL_METHOD_GRP_DESC	SAMPLE_NAME	SAMPLE_MATRIX	SAMPLE_MATRIC_DESC	COLLECT_DATE
CAOA-B02	SITE 00019	YUMA_MCAS	BH	BOREHOLE	1901922	439173.035	602642.793	Perfluoroalkyl Compounds	CAOA-B02-GW	WG	GROUNDWATER	7/2/2019