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Automated Report

Technical Report for

AECOM, INC.

N6274223F0104 RH Fire Suppression System

60697810

SGS Job Number: FC3110

Sampling Dates: 02/28/23 - 03/01/23



Report to:

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Total number of pages in report: 651



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001)
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Test results relate only to samples analyzed.

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Sample Summary

AECOM, INC.

Job No: FC3110

N6274223F0104 RH Fire Suppression System
Project No: 60697810

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FC3110-1	02/28/23	10:15 OS	03/02/23	AQ	Ground Water	AF-HDMW225303-WGN01LF-2302W4
FC3110-2	03/01/23	11:50 GA	03/02/23	AQ	Ground Water	AF-RHMW225401-WGN01B-2302W4
FC3110-3	02/28/23	12:25 OS	03/02/23	AQ	Ground Water	AF-RHMW10-WGN01LF-2302W4

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: AECOM, INC.

Job No: FC3110

Site: N6274223F0104 RH Fire Suppression System

Report Date: 3/9/2023 10:04:11 AM

On 03/02/2023, 3 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc - Orlando. at a maximum corrected temperature of 2.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. - Orlando Job Number of FC3110 was assigned to the project.

Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section. Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Semi-volatiles By Method EPA DRAFT 1633

Matrix: AQ

Batch ID: OP95719

Sample(s) FC3096-1MS, FC3096-2DUP were used as the QC samples indicated.

SGS North America Inc. - Orlando certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc.- Orlando is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

Kim Benham, Client Services (*Signature on File*)

Summary of Hits

Job Number: FC3110
Account: AECOM, INC.
Project: N6274223F0104 RH Fire Suppression System
Collected: 02/28/23 thru 03/01/23



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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FC3110-1 AF-HDMW225303-WGN01LF-2302W4

No hits reported in this sample.

FC3110-2 AF-RHMW225401-WGN01B-2302W4

Perfluoropentanoic acid	1.7 J	9.3	1.9	ng/l	EPA DRAFT 1633
Perfluorohexanoic acid	1.2 J	4.7	0.93	ng/l	EPA DRAFT 1633
Perfluoroheptanoic acid	1.4 J	4.7	0.93	ng/l	EPA DRAFT 1633
Perfluorooctanoic acid	1.0 J	4.7	0.93	ng/l	EPA DRAFT 1633
Perfluorobutanesulfonic acid	0.77 J	4.7	0.93	ng/l	EPA DRAFT 1633
Perfluorohexanesulfonic acid	1.3 J	4.7	1.9	ng/l	EPA DRAFT 1633

FC3110-3 AF-RHMW10-WGN01LF-2302W4

No hits reported in this sample.

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

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Client Sample ID:	AF-HDMW225303-WGN01LF-2302W4		
Lab Sample ID:	FC3110-1	Date Sampled:	02/28/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q41717.D	1	03/06/23 20:05	MV	03/03/23 15:45	OP95719	S4Q597
Run #2							

Run #	Initial Volume	Final Volume
Run #1	525 ml	5.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	3.8 U	19	3.8	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	1.9 U	9.5	1.9	0.90	ng/l	
307-24-4	Perfluorohexanoic acid	0.95 U	4.8	0.95	0.48	ng/l	
375-85-9	Perfluoroheptanoic acid	0.95 U	4.8	0.95	0.48	ng/l	
335-67-1	Perfluorooctanoic acid	0.95 U	4.8	0.95	0.48	ng/l	
375-95-1	Perfluorononanoic acid	1.9 U	4.8	1.9	0.58	ng/l	
335-76-2	Perfluorodecanoic acid	0.95 U	4.8	0.95	0.48	ng/l	
2058-94-8	Perfluoroundecanoic acid	1.9 U	4.8	1.9	0.57	ng/l	
307-55-1	Perfluorododecanoic acid	1.9 U	4.8	1.9	0.57	ng/l	
72629-94-8	Perfluorotridecanoic acid	1.9 U	4.8	1.9	0.80	ng/l	
376-06-7	Perfluorotetradecanoic acid	0.95 U	4.8	0.95	0.48	ng/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.95 U	4.8	0.95	0.48	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	3.8 U	4.8	3.8	1.1	ng/l	
355-46-4	Perfluorohexanesulfonic acid	1.9 U	4.8	1.9	0.67	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	0.95 U	4.8	0.95	0.48	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1.9 U	4.8	1.9	0.51	ng/l	
68259-12-1	Perfluorononanesulfonic acid	1.9 U	4.8	1.9	0.54	ng/l	
335-77-3	Perfluorodecanesulfonic acid	1.9 U	4.8	1.9	0.61	ng/l	
79780-39-5	Perfluorododecanesulfonic aci	3.8 U	4.8	3.8	1.1	ng/l	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	7.6 U	19	7.6	3.1	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	7.6 U	19	7.6	3.3	ng/l	
39108-34-4	8:2 Fluorotelomer sulfonate	7.6 U	19	7.6	3.9	ng/l	

PERFLUOROOCCTANE SULFONAMIDES

754-91-6	PFOSA	1.9 U	4.8	1.9	0.64	ng/l	
31506-32-8	MeFOSA	1.9 U	4.8	1.9	0.95	ng/l	
4151-50-2	EtFOSA	1.9 U	4.8	1.9	0.95	ng/l	

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-HDMW225303-WGN01LF-2302W4		
Lab Sample ID:	FC3110-1	Date Sampled:	02/28/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
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PERFLUOROOCCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	3.8 U	4.8	3.8	0.95	ng/l	
2991-50-6	EtFOSAA	3.8 U	4.8	3.8	1.3	ng/l	

PERFLUOROOCCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	9.5 U	48	9.5	4.2	ng/l	
1691-99-2	EtFOSE	19 U	48	19	7.1	ng/l	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	3.8 U	19	3.8	0.95	ng/l	
919005-14-4	ADONA	3.8 U	19	3.8	1.8	ng/l	
377-73-1	PFMPA	1.9 U	9.5	1.9	0.95	ng/l	
863090-89-5	PFMBA	3.8 U	9.5	3.8	1.1	ng/l	
151772-58-6	NFDHA	3.8 U	9.5	3.8	1.1	ng/l	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	3.8 U	19	3.8	1.3	ng/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	3.8 U	19	3.8	1.7	ng/l	
113507-82-7	PFEESA	1.9 U	9.5	1.9	0.74	ng/l	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	9.5 U	24	9.5	4.3	ng/l	
914637-49-3	5:3 Fluorotelomer carboxylate	19 U	120	19	8.3	ng/l	
812-70-4	7:3 Fluorotelomer carboxylate	19 U	120	19	7.5	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFBA	99%		20-150%
	13C5-PFPeA	94%		20-150%
	13C5-PFHxA	100%		20-150%
	13C4-PFHpA	94%		20-150%
	13C8-PFOA	93%		20-150%
	13C9-PFNA	91%		20-150%
	13C6-PFDA	91%		20-150%
	13C7-PFUnDA	86%		20-150%
	13C2-PFDoDA	76%		20-150%
	13C2-PFTeDA	77%		20-150%
	13C3-PFBS	93%		20-150%
	13C3-PFHxS	92%		20-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-HDMW225303-WGN01LF-2302W4		
Lab Sample ID:	FC3110-1	Date Sampled:	02/28/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	74%		20-150%
	13C8-FOSA	79%		20-150%
	d3-MeFOSA	75%		20-150%
	d5-EtFOSA	79%		20-150%
	d3-MeFOSAA	75%		20-150%
	d5-EtFOSAA	71%		20-150%
	d7-MeFOSE	68%		20-150%
	d9-EtFOSE	74%		20-150%
	13C2-4:2FTS	93%		20-150%
	13C2-6:2FTS	83%		20-150%
	13C2-8:2FTS	89%		20-150%
	13C3-HFPO-DA	114%		20-150%

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 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

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Client Sample ID:	AF-RHMW225401-WGN01B-2302W4		
Lab Sample ID:	FC3110-2	Date Sampled:	03/01/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q41718.D	1	03/06/23 20:19	MV	03/03/23 15:45	OP95719	S4Q597
Run #2							

Run #	Initial Volume	Final Volume
Run #1	535 ml	5.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS							
375-22-4	Perfluorobutanoic acid	3.7 U	19	3.7	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	1.7	9.3	1.9	0.88	ng/l	J
307-24-4	Perfluorohexanoic acid	1.2	4.7	0.93	0.47	ng/l	J
375-85-9	Perfluoroheptanoic acid	1.4	4.7	0.93	0.47	ng/l	J
335-67-1	Perfluorooctanoic acid	1.0	4.7	0.93	0.47	ng/l	J
375-95-1	Perfluorononanoic acid	1.9 U	4.7	1.9	0.57	ng/l	
335-76-2	Perfluorodecanoic acid	0.93 U	4.7	0.93	0.47	ng/l	
2058-94-8	Perfluoroundecanoic acid	1.9 U	4.7	1.9	0.56	ng/l	
307-55-1	Perfluorododecanoic acid	1.9 U	4.7	1.9	0.56	ng/l	
72629-94-8	Perfluorotridecanoic acid	1.9 U	4.7	1.9	0.79	ng/l	
376-06-7	Perfluorotetradecanoic acid	0.93 U	4.7	0.93	0.47	ng/l	
PERFLUOROALKYL SULFONIC ACIDS							
375-73-5	Perfluorobutanesulfonic acid	0.77	4.7	0.93	0.47	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	3.7 U	4.7	3.7	1.0	ng/l	
355-46-4	Perfluorohexanesulfonic acid	1.3	4.7	1.9	0.65	ng/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.93 U	4.7	0.93	0.47	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1.9 U	4.7	1.9	0.50	ng/l	
68259-12-1	Perfluorononanesulfonic acid	1.9 U	4.7	1.9	0.53	ng/l	
335-77-3	Perfluorodecanesulfonic acid	1.9 U	4.7	1.9	0.60	ng/l	
79780-39-5	Perfluorododecanesulfonic aci	3.7 U	4.7	3.7	1.1	ng/l	
FLUOROTELOMER SULFONIC ACIDS							
757124-72-4	4:2 Fluorotelomer sulfonate	7.5 U	19	7.5	3.0	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	7.5 U	19	7.5	3.2	ng/l	
39108-34-4	8:2 Fluorotelomer sulfonate	7.5 U	19	7.5	3.8	ng/l	
PERFLUOROOCCTANE SULFONAMIDES							
754-91-6	PFOSA	1.9 U	4.7	1.9	0.63	ng/l	
31506-32-8	MeFOSA	1.9 U	4.7	1.9	0.93	ng/l	
4151-50-2	EtFOSA	1.9 U	4.7	1.9	0.93	ng/l	

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-RHMW225401-WGN01B-2302W4		
Lab Sample ID:	FC3110-2	Date Sampled:	03/01/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
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PERFLUOROOCCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	3.7 U	4.7	3.7	0.93	ng/l	
2991-50-6	EtFOSAA	3.7 U	4.7	3.7	1.2	ng/l	

PERFLUOROOCCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	9.3 U	47	9.3	4.1	ng/l	
1691-99-2	EtFOSE	19 U	47	19	6.9	ng/l	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	3.7 U	19	3.7	0.93	ng/l	
919005-14-4	ADONA	3.7 U	19	3.7	1.7	ng/l	
377-73-1	PFMPA	1.9 U	9.3	1.9	0.93	ng/l	
863090-89-5	PFMBA	3.7 U	9.3	3.7	1.1	ng/l	
151772-58-6	NFDHA	3.7 U	9.3	3.7	1.1	ng/l	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	3.7 U	19	3.7	1.3	ng/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	3.7 U	19	3.7	1.6	ng/l	
113507-82-7	PFEESA	1.9 U	9.3	1.9	0.73	ng/l	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	9.3 U	23	9.3	4.2	ng/l	
914637-49-3	5:3 Fluorotelomer carboxylate	19 U	120	19	8.2	ng/l	
812-70-4	7:3 Fluorotelomer carboxylate	19 U	120	19	7.3	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFBA	98%		20-150%
	13C5-PFPeA	91%		20-150%
	13C5-PFHxA	94%		20-150%
	13C4-PFHpA	92%		20-150%
	13C8-PFOA	94%		20-150%
	13C9-PFNA	89%		20-150%
	13C6-PFDA	91%		20-150%
	13C7-PFUnDA	91%		20-150%
	13C2-PFDoDA	86%		20-150%
	13C2-PFTeDA	84%		20-150%
	13C3-PFBS	96%		20-150%
	13C3-PFHxS	99%		20-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-RHMW225401-WGN01B-2302W4	
Lab Sample ID:	FC3110-2	Date Sampled: 03/01/23
Matrix:	AQ - Ground Water	Date Received: 03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids: n/a
Project:	N6274223F0104 RH Fire Suppression System	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	81%		20-150%
	13C8-FOSA	87%		20-150%
	d3-MeFOSA	91%		20-150%
	d5-EtFOSA	88%		20-150%
	d3-MeFOSAA	82%		20-150%
	d5-EtFOSAA	83%		20-150%
	d7-MeFOSE	80%		20-150%
	d9-EtFOSE	91%		20-150%
	13C2-4:2FTS	89%		20-150%
	13C2-6:2FTS	87%		20-150%
	13C2-8:2FTS	88%		20-150%
	13C3-HFPO-DA	111%		20-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

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Client Sample ID:	AF-RHMW10-WGN01LF-2302W4		
Lab Sample ID:	FC3110-3	Date Sampled:	02/28/23
Matrix:	AQ - Ground Water	Date Received:	03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	n/a
Project:	N6274223F0104 RH Fire Suppression System		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q41721.D	1	03/06/23 21:02	MV	03/03/23 15:45	OP95719	S4Q597
Run #2							

Run #	Initial Volume	Final Volume
Run #1	565 ml	5.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS							
375-22-4	Perfluorobutanoic acid	3.5 U	18	3.5	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	1.8 U	8.8	1.8	0.83	ng/l	
307-24-4	Perfluorohexanoic acid	0.88 U	4.4	0.88	0.44	ng/l	
375-85-9	Perfluoroheptanoic acid	0.88 U	4.4	0.88	0.44	ng/l	
335-67-1	Perfluorooctanoic acid	0.88 U	4.4	0.88	0.44	ng/l	
375-95-1	Perfluorononanoic acid	1.8 U	4.4	1.8	0.54	ng/l	
335-76-2	Perfluorodecanoic acid	0.88 U	4.4	0.88	0.44	ng/l	
2058-94-8	Perfluoroundecanoic acid	1.8 U	4.4	1.8	0.53	ng/l	
307-55-1	Perfluorododecanoic acid	1.8 U	4.4	1.8	0.53	ng/l	
72629-94-8	Perfluorotridecanoic acid	1.8 U	4.4	1.8	0.74	ng/l	
376-06-7	Perfluorotetradecanoic acid	0.88 U	4.4	0.88	0.44	ng/l	
PERFLUOROALKYL SULFONIC ACIDS							
375-73-5	Perfluorobutanesulfonic acid	0.88 U	4.4	0.88	0.44	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	3.5 U	4.4	3.5	0.99	ng/l	
355-46-4	Perfluorohexanesulfonic acid	1.8 U	4.4	1.8	0.62	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	0.88 U	4.4	0.88	0.44	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1.8 U	4.4	1.8	0.48	ng/l	
68259-12-1	Perfluorononanesulfonic acid	1.8 U	4.4	1.8	0.50	ng/l	
335-77-3	Perfluorodecanesulfonic acid	1.8 U	4.4	1.8	0.57	ng/l	
79780-39-5	Perfluorododecanesulfonic aci	3.5 U	4.4	3.5	1.0	ng/l	
FLUOROTELOMER SULFONIC ACIDS							
757124-72-4	4:2 Fluorotelomer sulfonate	7.1 U	18	7.1	2.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	7.1 U	18	7.1	3.1	ng/l	
39108-34-4	8:2 Fluorotelomer sulfonate	7.1 U	18	7.1	3.6	ng/l	
PERFLUOROOCCTANE SULFONAMIDES							
754-91-6	PFOSA	1.8 U	4.4	1.8	0.59	ng/l	
31506-32-8	MeFOSA	1.8 U	4.4	1.8	0.88	ng/l	
4151-50-2	EtFOSA	1.8 U	4.4	1.8	0.88	ng/l	

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-RHMW10-WGN01LF-2302W4		Date Sampled:	02/28/23
Lab Sample ID:	FC3110-3	Date Received:	03/02/23	
Matrix:	AQ - Ground Water	Percent Solids:	n/a	
Method:	EPA DRAFT 1633 EPA 1633 DRAFT			
Project:	N6274223F0104 RH Fire Suppression System			

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
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PERFLUOROOCCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	3.5 U	4.4	3.5	0.88	ng/l	
2991-50-6	EtFOSAA	3.5 U	4.4	3.5	1.2	ng/l	

PERFLUOROOCCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	8.8 U	44	8.8	3.9	ng/l	
1691-99-2	EtFOSE	18 U	44	18	6.6	ng/l	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	3.5 U	18	3.5	0.88	ng/l	
919005-14-4	ADONA	3.5 U	18	3.5	1.6	ng/l	
377-73-1	PFMPA	1.8 U	8.8	1.8	0.88	ng/l	
863090-89-5	PFMBA	3.5 U	8.8	3.5	1.0	ng/l	
151772-58-6	NFDHA	3.5 U	8.8	3.5	1.1	ng/l	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	3.5 U	18	3.5	1.2	ng/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	3.5 U	18	3.5	1.5	ng/l	
113507-82-7	PFEESA	1.8 U	8.8	1.8	0.69	ng/l	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	8.8 U	22	8.8	4.0	ng/l	
914637-49-3	5:3 Fluorotelomer carboxylate	18 U	110	18	7.7	ng/l	
812-70-4	7:3 Fluorotelomer carboxylate	18 U	110	18	6.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFBA	99%		20-150%
	13C5-PFPeA	92%		20-150%
	13C5-PFHxA	99%		20-150%
	13C4-PFHpA	98%		20-150%
	13C8-PFOA	92%		20-150%
	13C9-PFNA	95%		20-150%
	13C6-PFDA	91%		20-150%
	13C7-PFUnDA	94%		20-150%
	13C2-PFDoDA	85%		20-150%
	13C2-PFTeDA	83%		20-150%
	13C3-PFBS	94%		20-150%
	13C3-PFHxS	97%		20-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AF-RHMW10-WGN01LF-2302W4	
Lab Sample ID:	FC3110-3	Date Sampled: 02/28/23
Matrix:	AQ - Ground Water	Date Received: 03/02/23
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids: n/a
Project:	N6274223F0104 RH Fire Suppression System	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	90%		20-150%
	13C8-FOSA	88%		20-150%
	d3-MeFOSA	91%		20-150%
	d5-EtFOSA	92%		20-150%
	d3-MeFOSAA	85%		20-150%
	d5-EtFOSAA	82%		20-150%
	d7-MeFOSE	83%		20-150%
	d9-EtFOSE	91%		20-150%
	13C2-4:2FTS	98%		20-150%
	13C2-6:2FTS	98%		20-150%
	13C2-8:2FTS	95%		20-150%
	13C3-HFPO-DA	117%		20-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

SGS Sample Receipt Summary

Job Number: FC3110

Client: AECOM

Project: N6274223F0104 RH Fire Suppression System

Date / Time Received: 3/2/2023 2:00:00 PM

Delivery Method: United Cargo/Airspace

Airbill #'s: United Cargo AWB #: 016-12909061

Therm ID: IR 1;

Therm CF: 0.2;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.2);

Cooler Information

Y or N

- | | | |
|-----------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification | IR Gun | |
| 5. Cooler media | Ice (Bag) | |

Sample Information

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Samples preserved properly | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Condition of sample | Intact | | |
| 5. Sample recvd within HT | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 6. Dates/Times/IDs on COC match Sample Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 7. VOCs have headspace | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 9. Compositing instructions clear | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Trip Blank Information

Y or N N/A

- | | | | |
|--------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

W or S N/A

- | | | | |
|------------------------|--------------------------|--------------------------|-------------------------------------|
| 3. Type Of TB Received | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|------------------------|--------------------------|--------------------------|-------------------------------------|

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____
 Test Strip Lot #s: pH 0-3 _____ 230315 _____ pH 10-12 _____ 219813A _____ Other: (Specify) _____
 Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: NATHANS

Date: 3/2/2023 2:00:00 PM

Reviewer: CD

Date: 3/3/2023

FC3110: Chain of Custody

Page 4 of 4

QC Evaluation: DOD QSM5.x Limits

Job Number: FC3110
Account: AECOM, INC.
Project: N6274223F0104 RH Fire Suppression System
Collected: 02/28/23 thru 03/01/23

QC Sample ID	CAS#	Analyte	Sample Result Type	Result Type	Units	Limits
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No DOD QSM5.x Limits found for methods in this job.

* Sample used for QC is not from job FC3110

5.2
5

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Injection Standard Area Summaries
- TDCA Retention Time Checks
- Ion Ratio Summaries
- Isotope Dilution Standard Recovery Summaries
- Initial and Continuing Calibration Summaries
- Run Sequence Reports

Instrument Blank

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q597-IBLK	4Q41706.D	1	03/06/23	MV	n/a	n/a	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.020	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.010	0.00094	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0050	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0050	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0050	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0050	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0050	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0050	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0050	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0050	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0050	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0050	0.00050	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0050	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0050	0.00070	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0050	0.00050	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0050	0.00054	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0050	0.00057	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0050	0.00064	ug/l	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.0050	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.020	0.0032	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0050	0.00067	ug/l	
31506-32-8	MeFOSA	ND	0.0050	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0050	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0050	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0050	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.050	0.0044	ug/l	
1691-99-2	EtFOSE	ND	0.050	0.0074	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0010	ug/l	
919005-14-4	ADONA	ND	0.020	0.0019	ug/l	
377-73-1	PFMPA	ND	0.010	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.010	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.010	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.020	0.0014	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.020	0.0018	ug/l	

Instrument Blank

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q597-IBLK	4Q41706.D	1	03/06/23	MV	n/a	n/a	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.010	0.00078	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.025	0.0045	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.13	0.0087	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.13	0.0079	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	104%	20-150%
	13C5-PFPeA	99%	20-150%
	13C5-PFHxA	106%	20-150%
	13C4-PFHpA	100%	20-150%
	13C8-PFOA	100%	20-150%
	13C9-PFNA	102%	20-150%
	13C6-PFDA	103%	20-150%
	13C7-PFUnDA	100%	20-150%
	13C2-PFDoDA	97%	20-150%
	13C2-PFTeDA	100%	20-150%
	13C3-PFBS	91%	20-150%
	13C3-PFHxS	102%	20-150%
	13C8-PFOS	99%	20-150%
	13C8-FOSA	103%	20-150%
	d3-MeFOSA	112%	20-150%
	d5-EtFOSA	116%	20-150%
	d3-MeFOSAA	90%	20-150%
	d5-EtFOSAA	88%	20-150%
	d7-MeFOSE	94%	20-150%
	d9-EtFOSE	106%	20-150%
	13C2-4:2FTS	86%	20-150%
	13C2-6:2FTS	84%	20-150%
	13C2-8:2FTS	91%	20-150%
	13C3-HFPO-DA	124%	20-150%

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Continuing Calibration Blank

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q597-ICCB	4Q41720.D	1	03/06/23	MV	n/a	n/a	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.020	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.010	0.00094	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0050	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0050	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0050	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0050	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0050	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0050	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0050	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0050	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0050	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0050	0.00050	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0050	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0050	0.00070	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0050	0.00050	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0050	0.00054	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0050	0.00057	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0050	0.00064	ug/l	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.0050	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.020	0.0032	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0050	0.00067	ug/l	
31506-32-8	MeFOSA	ND	0.0050	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0050	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0050	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0050	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.050	0.0044	ug/l	
1691-99-2	EtFOSE	ND	0.050	0.0074	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0010	ug/l	
919005-14-4	ADONA	ND	0.020	0.0019	ug/l	
377-73-1	PFMPA	ND	0.010	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.010	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.010	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.020	0.0014	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.020	0.0018	ug/l	

Continuing Calibration Blank

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q597-ICCB	4Q41720.D	1	03/06/23	MV	n/a	n/a	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.010	0.00078	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.025	0.0045	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.13	0.0087	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.13	0.0079	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	105% 20-150%
	13C5-PFPeA	97% 20-150%
	13C5-PFHxA	104% 20-150%
	13C4-PFHpA	100% 20-150%
	13C8-PFOA	96% 20-150%
	13C9-PFNA	100% 20-150%
	13C6-PFDA	101% 20-150%
	13C7-PFUnDA	106% 20-150%
	13C2-PFDoDA	98% 20-150%
	13C2-PFTeDA	94% 20-150%
	13C3-PFBS	101% 20-150%
	13C3-PFHxS	104% 20-150%
	13C8-PFOS	106% 20-150%
	13C8-FOSA	108% 20-150%
	d3-MeFOSA	115% 20-150%
	d5-EtFOSA	116% 20-150%
	d3-MeFOSAA	97% 20-150%
	d5-EtFOSAA	103% 20-150%
	d7-MeFOSE	99% 20-150%
	d9-EtFOSE	110% 20-150%
	13C2-4:2FTS	104% 20-150%
	13C2-6:2FTS	104% 20-150%
	13C2-8:2FTS	106% 20-150%
	13C3-HFPO-DA	122% 20-150%

Method Blank Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-MB	4Q41711.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.020	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.010	0.00094	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0050	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0050	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0050	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0050	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0050	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0050	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0050	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0050	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0050	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0050	0.00050	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0050	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0050	0.00070	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0050	0.00050	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0050	0.00054	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0050	0.00057	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0050	0.00064	ug/l	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.0050	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.020	0.0032	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0050	0.00067	ug/l	
31506-32-8	MeFOSA	ND	0.0050	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0050	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0050	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0050	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.050	0.0044	ug/l	
1691-99-2	EtFOSE	ND	0.050	0.0074	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0010	ug/l	
919005-14-4	ADONA	ND	0.020	0.0019	ug/l	
377-73-1	PFMPA	ND	0.010	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.010	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.010	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.020	0.0014	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.020	0.0018	ug/l	

Method Blank Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-MB	4Q41711.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.010	0.00078	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.025	0.0045	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.13	0.0087	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.13	0.0079	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	107% 20-150%
	13C5-PFPeA	100% 20-150%
	13C5-PFHxA	104% 20-150%
	13C4-PFHpA	102% 20-150%
	13C8-PFOA	98% 20-150%
	13C9-PFNA	99% 20-150%
	13C6-PFDA	106% 20-150%
	13C7-PFUnDA	102% 20-150%
	13C2-PFDoDA	96% 20-150%
	13C2-PFTeDA	96% 20-150%
	13C3-PFBS	102% 20-150%
	13C3-PFHxS	108% 20-150%
	13C8-PFOS	89% 20-150%
	13C8-FOSA	89% 20-150%
	d3-MeFOSA	91% 20-150%
	d5-EtFOSA	93% 20-150%
	d3-MeFOSAA	85% 20-150%
	d5-EtFOSAA	85% 20-150%
	d7-MeFOSE	84% 20-150%
	d9-EtFOSE	94% 20-150%
	13C2-4:2FTS	101% 20-150%
	13C2-6:2FTS	99% 20-150%
	13C2-8:2FTS	100% 20-150%
	13C3-HFPO-DA	117% 20-150%

Blank Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-LLBS	4Q41710.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.04	0.0442	111	40-150
2706-90-3	Perfluoropentanoic acid	0.02	0.0234	117	40-150
307-24-4	Perfluorohexanoic acid	0.01	0.0110	110	40-150
375-85-9	Perfluoroheptanoic acid	0.01	0.0110	110	40-150
335-67-1	Perfluorooctanoic acid	0.01	0.0112	112	40-150
375-95-1	Perfluorononanoic acid	0.01	0.0108	108	40-150
335-76-2	Perfluorodecanoic acid	0.01	0.0123	123	40-150
2058-94-8	Perfluoroundecanoic acid	0.01	0.0114	114	40-150
307-55-1	Perfluorododecanoic acid	0.01	0.0115	115	40-150
72629-94-8	Perfluorotridecanoic acid	0.01	0.0112	112	40-150
376-06-7	Perfluorotetradecanoic acid	0.01	0.0109	109	40-150
375-73-5	Perfluorobutanesulfonic acid	0.00887	0.0107	121	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.00941	0.0098	104	40-150
355-46-4	Perfluorohexanesulfonic acid	0.00914	0.0097	106	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.00953	0.0097	102	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.00928	0.0101	109	40-150
68259-12-1	Perfluorononanesulfonic acid	0.00962	0.0123	128	40-150
335-77-3	Perfluorodecanesulfonic acid	0.00965	0.0105	109	40-150
79780-39-5	Perfluorododecanesulfonic aci	0.0097	0.0112	115	40-150
757124-72-44:2	Fluorotelomer sulfonate	0.0375	0.0398	106	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	0.038	0.0448	118	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	0.0384	0.0450	117	40-150
754-91-6	PFOSA	0.01	0.0106	106	40-150
31506-32-8	MeFOSA	0.01	0.0101	101	40-150
4151-50-2	EtFOSA	0.01	0.0103	103	40-150
2355-31-9	MeFOSAA	0.01	0.0105	105	40-150
2991-50-6	EtFOSAA	0.01	0.0112	112	40-150
24448-09-7	MeFOSE	0.1	0.110	110	40-150
1691-99-2	EtFOSE	0.1	0.111	111	40-150
13252-13-6	HFPO-DA (GenX)	0.04	0.0412	103	40-150
919005-14-4	ADONA	0.0378	0.0381	101	40-150
377-73-1	PFMPA	0.02	0.0242	121	40-150
863090-89-5	PFMBA	0.02	0.0235	118	40-150
151772-58-6	NFDHA	0.02	0.0274	137	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0374	0.0367	98	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0378	0.0367	97	40-150

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-LLBS	4Q41710.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
113507-82-7	PFEESA	0.0178	0.0194	109	40-150
356-02-5	3:3 Fluorotelomer carboxylate	0.05	0.0576	115	40-150
914637-49-35:3	Fluorotelomer carboxylate	0.25	0.283	113	40-150
812-70-4	7:3 Fluorotelomer carboxylate	0.25	0.278	111	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	110%	20-150%
	13C5-PFPeA	103%	20-150%
	13C5-PFHxA	108%	20-150%
	13C4-PFHpA	105%	20-150%
	13C8-PFOA	105%	20-150%
	13C9-PFNA	108%	20-150%
	13C6-PFDA	103%	20-150%
	13C7-PFUnDA	98%	20-150%
	13C2-PFDoDA	95%	20-150%
	13C2-PFTeDA	93%	20-150%
	13C3-PFBS	97%	20-150%
	13C3-PFHxS	105%	20-150%
	13C8-PFOS	89%	20-150%
	13C8-FOSA	91%	20-150%
	d3-MeFOSA	90%	20-150%
	d5-EtFOSA	95%	20-150%
	d3-MeFOSAA	84%	20-150%
	d5-EtFOSAA	83%	20-150%
	d7-MeFOSE	88%	20-150%
	d9-EtFOSE	95%	20-150%
	13C2-4:2FTS	97%	20-150%
	13C2-6:2FTS	92%	20-150%
	13C2-8:2FTS	90%	20-150%
	13C3-HFPO-DA	127%	20-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-BS	4Q41709.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.1	0.123	123	40-150
2706-90-3	Perfluoropentanoic acid	0.05	0.0674	135	40-150
307-24-4	Perfluorohexanoic acid	0.025	0.0309	124	40-150
375-85-9	Perfluoroheptanoic acid	0.025	0.0317	127	40-150
335-67-1	Perfluorooctanoic acid	0.025	0.0329	132	40-150
375-95-1	Perfluorononanoic acid	0.025	0.0323	129	40-150
335-76-2	Perfluorodecanoic acid	0.025	0.0324	130	40-150
2058-94-8	Perfluoroundecanoic acid	0.025	0.0315	126	40-150
307-55-1	Perfluorododecanoic acid	0.025	0.0324	130	40-150
72629-94-8	Perfluorotridecanoic acid	0.025	0.0316	126	40-150
376-06-7	Perfluorotetradecanoic acid	0.025	0.0318	127	40-150
375-73-5	Perfluorobutanesulfonic acid	0.0222	0.0302	136	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.0235	0.0272	116	40-150
355-46-4	Perfluorohexanesulfonic acid	0.0229	0.0284	124	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.0238	0.0296	124	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.0232	0.0248	107	40-150
68259-12-1	Perfluorononanesulfonic acid	0.0241	0.0311	129	40-150
335-77-3	Perfluorodecanesulfonic acid	0.0241	0.0295	122	40-150
79780-39-5	Perfluorododecanesulfonic aci	0.0243	0.0285	118	40-150
757124-72-44:2	Fluorotelomer sulfonate	0.0938	0.109	116	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	0.095	0.126	133	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	0.096	0.115	120	40-150
754-91-6	PFOSA	0.025	0.0306	122	40-150
31506-32-8	MeFOSA	0.025	0.0268	107	40-150
4151-50-2	EtFOSA	0.025	0.0283	113	40-150
2355-31-9	MeFOSAA	0.025	0.0302	121	40-150
2991-50-6	EtFOSAA	0.025	0.0282	113	40-150
24448-09-7	MeFOSE	0.25	0.307	123	40-150
1691-99-2	EtFOSE	0.25	0.305	122	40-150
13252-13-6	HFPO-DA (GenX)	0.1	0.129	129	40-150
919005-14-4	ADONA	0.0945	0.111	117	40-150
377-73-1	PFMPA	0.05	0.0513	103	40-150
863090-89-5	PFMBA	0.05	0.0690	138	40-150
151772-58-6	NFDHA	0.05	0.0727	145	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0935	0.110	118	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0945	0.106	112	40-150

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-BS	4Q41709.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
113507-82-7	PFEESA	0.0445	0.0562	126	40-150
356-02-5	3:3 Fluorotelomer carboxylate	0.125	0.173	138	40-150
914637-49-35:3	Fluorotelomer carboxylate	0.625	0.800	128	40-150
812-70-4	7:3 Fluorotelomer carboxylate	0.625	0.807	129	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	38%	20-150%
	13C5-PFPeA	95%	20-150%
	13C5-PFHxA	101%	20-150%
	13C4-PFHpA	100%	20-150%
	13C8-PFOA	91%	20-150%
	13C9-PFNA	95%	20-150%
	13C6-PFDA	102%	20-150%
	13C7-PFUnDA	99%	20-150%
	13C2-PFDoDA	94%	20-150%
	13C2-PFTeDA	93%	20-150%
	13C3-PFBS	93%	20-150%
	13C3-PFHxS	99%	20-150%
	13C8-PFOS	86%	20-150%
	13C8-FOSA	88%	20-150%
	d3-MeFOSA	93%	20-150%
	d5-EtFOSA	93%	20-150%
	d3-MeFOSAA	82%	20-150%
	d5-EtFOSAA	81%	20-150%
	d7-MeFOSE	81%	20-150%
	d9-EtFOSE	90%	20-150%
	13C2-4:2FTS	92%	20-150%
	13C2-6:2FTS	83%	20-150%
	13C2-8:2FTS	91%	20-150%
	13C3-HFPO-DA	117%	20-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-MS	4Q41713.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597
FC3096-1	4Q41712.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	FC3096-1 ug/l	Spike Q	MS ug/l	MS %	Limits	
375-22-4	Perfluorobutanoic acid	0.018 U		0.0893	0.111	124	40-150
2706-90-3	Perfluoropentanoic acid	0.0055 J		0.0446	0.0647	133	40-150
307-24-4	Perfluorohexanoic acid	0.0016 J		0.0223	0.0289	122	40-150
375-85-9	Perfluoroheptanoic acid	0.0045 U		0.0223	0.0288	129	40-150
335-67-1	Perfluorooctanoic acid	0.0045 U		0.0223	0.0274	123	40-150
375-95-1	Perfluorononanoic acid	0.0045 U		0.0223	0.0277	124	40-150
335-76-2	Perfluorodecanoic acid	0.0045 U		0.0223	0.0286	128	40-150
2058-94-8	Perfluoroundecanoic acid	0.0045 U		0.0223	0.0274	123	40-150
307-55-1	Perfluorododecanoic acid	0.0045 U		0.0223	0.0268	120	40-150
72629-94-8	Perfluorotridecanoic acid	0.0045 U		0.0223	0.0277	124	40-150
376-06-7	Perfluorotetradecanoic acid	0.0045 U		0.0223	0.0284	127	40-150
375-73-5	Perfluorobutanesulfonic acid	0.0045 U		0.0198	0.0258	130	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.0045 U		0.021	0.0248	118	40-150
355-46-4	Perfluorohexanesulfonic acid	0.0045 U		0.0204	0.0255	125	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.0045 U		0.0213	0.0272	128	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.0045 U		0.0207	0.0244	118	40-150
68259-12-1	Perfluorononanesulfonic acid	0.0045 U		0.0215	0.0278	129	40-150
335-77-3	Perfluorodecanesulfonic acid	0.0045 U		0.0215	0.0258	120	40-150
79780-39-5	Perfluorododecanesulfonic aci	0.0045 U		0.0217	0.0257	119	40-150
757124-72-44:2	Fluorotelomer sulfonate	0.018 U		0.0837	0.105	125	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	0.018 U		0.0848	0.103	121	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	0.018 U		0.0857	0.101	118	40-150
754-91-6	PFOSA	0.0045 U		0.0223	0.0271	121	40-150
31506-32-8	MeFOSA	0.0045 U		0.0223	0.0241	108	40-150
4151-50-2	EtFOSA	0.0045 U		0.0223	0.0242	108	40-150
2355-31-9	MeFOSAA	0.0045 U		0.0223	0.0302	135	40-150
2991-50-6	EtFOSAA	0.0045 U		0.0223	0.0255	114	40-150
24448-09-7	MeFOSE	0.045 U		0.223	0.277	124	40-150
1691-99-2	EtFOSE	0.045 U		0.223	0.274	123	40-150
13252-13-6	HFPO-DA (GenX)	0.018 U		0.0893	0.110	123	40-150
919005-14-4	ADONA	0.018 U		0.0844	0.0976	116	40-150
377-73-1	PFMPA	0.0089 U		0.0446	0.0449	101	40-150
863090-89-5	PFMBA	0.0089 U		0.0446	0.0608	136	40-150
151772-58-6	NFDHA	0.0089 U		0.0446	0.0656	147	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.018 U		0.0835	0.0902	108	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.018 U		0.0844	0.0877	104	40-150

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-MS	4Q41713.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597
FC3096-1	4Q41712.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	FC3096-1 ug/l	Spike Q	MS ug/l	MS %	Limits
113507-82-7	PFEESA	0.0089 U	0.0397	0.0505	127	40-150
356-02-5	3:3 Fluorotelomer carboxylate	0.022 U	0.112	0.151	135	40-150
914637-49-35:3	Fluorotelomer carboxylate	0.11 U	0.558	0.729	131	40-150
812-70-4	7:3 Fluorotelomer carboxylate	0.11 U	0.558	0.720	129	40-150

CAS No.	ID Standard Recoveries	MS	FC3096-1	Limits
	13C4-PFBA	27%	43%	20-150%
	13C5-PFPeA	94%	91%	20-150%
	13C5-PFHxA	98%	99%	20-150%
	13C4-PFHpA	97%	93%	20-150%
	13C8-PFOA	94%	88%	20-150%
	13C9-PFNA	93%	90%	20-150%
	13C6-PFDA	93%	91%	20-150%
	13C7-PFUnDA	88%	84%	20-150%
	13C2-PFDoDA	85%	77%	20-150%
	13C2-PFTeDA	80%	76%	20-150%
	13C3-PFBS	98%	94%	20-150%
	13C3-PFHxS	102%	103%	20-150%
	13C8-PFOS	84%	85%	20-150%
	13C8-FOSA	87%	82%	20-150%
	d3-MeFOSA	90%	75%	20-150%
	d5-EtFOSA	90%	73%	20-150%
	d3-MeFOSAA	73%	71%	20-150%
	d5-EtFOSAA	75%	70%	20-150%
	d7-MeFOSE	75%	68%	20-150%
	d9-EtFOSE	83%	71%	20-150%
	13C2-4:2FTS	88%	88%	20-150%
	13C2-6:2FTS	89%	80%	20-150%
	13C2-8:2FTS	93%	88%	20-150%
	13C3-HFPO-DA	116%	112%	20-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-DUP	4Q41715.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597
FC3096-2	4Q41714.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	FC3096-2 ug/l	DUP Q ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.018 U	ND		nc	30
2706-90-3	Perfluoropentanoic acid	0.0050 J	0.0052 J	J	4	30
307-24-4	Perfluorohexanoic acid	0.0014 J	0.0016 J	J	13	30
375-85-9	Perfluoroheptanoic acid	0.0045 U	ND		nc	30
335-67-1	Perfluorooctanoic acid	0.0045 U	ND		nc	30
375-95-1	Perfluorononanoic acid	0.0045 U	ND		nc	30
335-76-2	Perfluorodecanoic acid	0.0045 U	ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.0045 U	ND		nc	30
307-55-1	Perfluorododecanoic acid	0.0045 U	ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.0045 U	ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.0045 U	ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0045 U	ND		nc	30
2706-91-4	Perfluoropentanesulfonic acid	0.0045 U	ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0045 U	ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	0.0045 U	ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0045 U	ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	0.0045 U	ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	0.0045 U	ND		nc	30
79780-39-5	Perfluorododecanesulfonic aci	0.0045 U	ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	0.018 U	ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.018 U	ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.018 U	ND		nc	30
754-91-6	PFOSA	0.0045 U	ND		nc	30
31506-32-8	MeFOSA	0.0045 U	ND		nc	30
4151-50-2	EtFOSA	0.0045 U	ND		nc	30
2355-31-9	MeFOSAA	0.0045 U	ND		nc	30
2991-50-6	EtFOSAA	0.0045 U	ND		nc	30
24448-09-7	MeFOSE	0.045 U	ND		nc	30
1691-99-2	EtFOSE	0.045 U	ND		nc	30
13252-13-6	HFPO-DA (GenX)	0.018 U	ND		nc	30
919005-14-4	ADONA	0.018 U	ND		nc	30
377-73-1	PFMPA	0.0089 U	ND		nc	30
863090-89-5	PFMBA	0.0089 U	ND		nc	30
151772-58-6	NFDHA	0.0089 U	ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	0.018 U	ND		nc	30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.018 U	ND		nc	30

* = Outside of Control Limits.

Duplicate Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP95719-DUP	4Q41715.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597
FC3096-2	4Q41714.D	1	03/06/23	MV	03/03/23	OP95719	S4Q597

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC3110-1, FC3110-2, FC3110-3

CAS No.	Compound	FC3096-2 ug/l	DUP Q ug/l	Q RPD	Limits
113507-82-7	PFEESA	0.0089 U	ND	nc	30
356-02-5	3:3 Fluorotelomer carboxylate	0.022 U	ND	nc	30
914637-49-35:3	Fluorotelomer carboxylate	0.11 U	ND	nc	30
812-70-4	7:3 Fluorotelomer carboxylate	0.11 U	ND	nc	30

CAS No.	ID Standard Recoveries	DUP	FC3096-2	Limits
	13C4-PFBA	48%	46%	20-150%
	13C5-PFPeA	94%	95%	20-150%
	13C5-PFHxA	98%	102%	20-150%
	13C4-PFHpA	95%	98%	20-150%
	13C8-PFOA	96%	92%	20-150%
	13C9-PFNA	90%	94%	20-150%
	13C6-PFDA	103%	96%	20-150%
	13C7-PFUnDA	99%	86%	20-150%
	13C2-PFDoDA	84%	75%	20-150%
	13C2-PFTeDA	85%	76%	20-150%
	13C3-PFBS	93%	93%	20-150%
	13C3-PFHxS	94%	99%	20-150%
	13C8-PFOS	88%	82%	20-150%
	13C8-FOSA	90%	90%	20-150%
	d3-MeFOSA	88%	84%	20-150%
	d5-EtFOSA	92%	80%	20-150%
	d3-MeFOSAA	77%	76%	20-150%
	d5-EtFOSAA	78%	71%	20-150%
	d7-MeFOSE	78%	71%	20-150%
	d9-EtFOSE	86%	76%	20-150%
	13C2-4:2FTS	86%	90%	20-150%
	13C2-6:2FTS	81%	83%	20-150%
	13C2-8:2FTS	91%	82%	20-150%
	13C3-HFPO-DA	115%	117%	20-150%

* = Outside of Control Limits.

Injection Standard Area Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Check Std:	S4Q597-CC596	Injection Date:	03/06/23
Lab File ID:	4Q41707.D	Injection Time:	17:45
Instrument ID:	GCMS4Q	Method:	EPA DRAFT 1633

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Initial Cal ^b	83327	3.24	62515	5.52	47878	6.95	24840	7.50	18400	7.97
Check Std ^c	90495	3.12	67476	5.50	54370	7.00	26864	7.52	19978	8.00
Upper Limit ^d	166654	3.52	125030	5.90	95756	7.40	49680	7.92	36800	8.40
Lower Limit ^e	24998	2.72	18755	5.10	14363	6.60	7452	7.12	5520	7.60

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT	DF ^a
OP95719-BS	76133	3.18	51567	5.50	41397	7.01	20716	7.53	15274	8.00	1
OP95719-LLBS	74767	3.17	51886	5.50	40627	7.01	20722	7.53	16055	8.00	1
OP95719-MB	75649	3.18	51533	5.51	42436	7.01	20934	7.53	15342	8.02	1
FC3096-1	82121	3.18	55877	5.51	46221	7.01	23085	7.55	17137	8.02	1
OP95719-MS	77594	3.18	52363	5.51	43499	7.01	21553	7.55	16139	8.02	1
FC3096-2	81185	3.19	54732	5.51	44803	7.01	22326	7.53	16939	8.02	1
OP95719-DUP	78522	3.17	54271	5.51	43550	7.03	22050	7.55	15697	8.02	1
ZZZZZZ	77356	3.14	53664	5.51	42467	7.03	21452	7.55	16123	8.02	1
FC3110-1	77235	3.15	53248	5.52	43203	7.03	22036	7.55	16153	8.03	1
FC3110-2	76823	3.15	54006	5.52	42611	7.03	22323	7.55	16281	8.03	1

- IS 1 = 13C3-PFBA
- IS 2 = 13C2-PFHxA
- IS 3 = 13C4-PFOA
- IS 4 = 13C5-PFNA
- IS 5 = 13C2-PFDA

- (a) Sample areas corrected for dilution where applicable.
- (b) Initial Cal is: S4Q596-ICC596 4Q41651.D 03/03/23 18:28. Area is AVERAGE of initial cal points.
- (c) Check Std Limit = -70 to +100% of initial cal area.
- (d) Upper Limit = +100% of initial standard area; Retention time +0.4 minutes of check standard.
- (e) Lower Limit = -70% of initial standard area; Retention time -0.4 minutes of check standard.

6.5.1
6

Injection Standard Area Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Check Std:	S4Q597-CC596	Injection Date:	03/06/23
Lab File ID:	4Q41707.D	Injection Time:	17:45
Instrument ID:	GCMS4Q	Method:	EPA DRAFT 1633

	IS 6 AREA	RT	IS 7 AREA	RT
Initial Cal ^b	6228	7.06	11821	8.12
Check Std ^c	6815	7.12	14783	8.15
Upper Limit ^d	12456	7.52	23642	8.55
Lower Limit ^e	1868	6.72	3546	7.75

Lab Sample ID	IS 6 AREA	RT	IS 7 AREA	RT	DF ^a
OP95719-BS	5411	7.12	11611	8.15	1
OP95719-LLBS	5425	7.12	11731	8.15	1
OP95719-MB	5299	7.12	11734	8.17	1
FC3096-1	5554	7.13	12604	8.17	1
OP95719-MS	5196	7.13	11325	8.17	1
FC3096-2	5830	7.13	11943	8.17	1
OP95719-DUP	5716	7.13	11581	8.17	1
ZZZZZZ	5367	7.13	11649	8.17	1
FC3110-1	5543	7.13	11696	8.18	1
FC3110-2	5273	7.13	11457	8.18	1

IS 6 = 18O2-PFHXS
 IS 7 = 13C4-PFOS

- (a) Sample areas corrected for dilution where applicable.
- (b) Initial Cal is: S4Q596-ICC596 4Q41651.D 03/03/23 18:28. Area is AVERAGE of initial cal points.
- (c) Check Std Limit = -70 to +100% of initial cal area.
- (d) Upper Limit = +100% of initial standard area; Retention time +0.4 minutes of check standard.
- (e) Lower Limit = -70% of initial standard area; Retention time -0.4 minutes of check standard.

6.5.1
6

Injection Standard Area Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Check Std:	S4Q597-CC596	Injection Date:	03/06/23
Lab File ID:	4Q41719.D	Injection Time:	20:33
Instrument ID:	GCMS4Q	Method:	EPA DRAFT 1633

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Initial Cal ^b	83327	3.24	62515	5.52	47878	6.95	24840	7.50	18400	7.97
Check Std ^c	93092	3.10	68361	5.51	56133	7.03	28121	7.55	20248	8.03
Upper Limit ^d	166654	3.50	125030	5.91	95756	7.43	49680	7.95	36800	8.43
Lower Limit ^e	24998	2.70	18755	5.11	14363	6.63	7452	7.15	5520	7.63

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT	DF ^a
S4Q597-ICCB	74805	3.17	52793	5.52	42110	7.03	21793	7.55	16113	8.03	1
FC3110-3	80935	3.15	55350	5.52	45032	7.03	22976	7.55	17489	8.00	1
OP95718-LBS	79580	3.18	55098	5.52	43160	7.03	22091	7.56	17046	8.03	1
OP95718-LLBS	80720	3.17	55183	5.52	44393	7.03	22813	7.56	16838	8.03	1
OP95718-LB	77226	3.18	52412	5.51	42911	7.03	21555	7.55	15256	8.03	1

- IS 1 = 13C3-PFBA
- IS 2 = 13C2-PFHxA
- IS 3 = 13C4-PFOA
- IS 4 = 13C5-PFNA
- IS 5 = 13C2-PFDA

- (a) Sample areas corrected for dilution where applicable.
- (b) Initial Cal is: S4Q596-ICC596 4Q41651.D 03/03/23 18:28. Area is AVERAGE of initial cal points.
- (c) Check Std Limit = -70 to +100% of initial cal area.
- (d) Upper Limit = +100% of initial standard area; Retention time +0.4 minutes of check standard.
- (e) Lower Limit = -70% of initial standard area; Retention time -0.4 minutes of check standard.

6.5.2
6

Injection Standard Area Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Check Std:	S4Q597-CC596	Injection Date:	03/06/23
Lab File ID:	4Q41719.D	Injection Time:	20:33
Instrument ID:	GCMS4Q	Method:	EPA DRAFT 1633

	IS 6 AREA	RT	IS 7 AREA	RT
Initial Cal ^b	6228	7.06	11821	8.12
Check Std ^c	6970	7.13	14033	8.17
Upper Limit ^d	12456	7.53	23642	8.57
Lower Limit ^e	1868	6.73	3546	7.77

Lab Sample ID	IS 6 AREA	RT	IS 7 AREA	RT	DF ^a
S4Q597-ICCB	5328	7.13	10424	8.17	1
FC3110-3	5915	7.14	11919	8.17	1
OP95718-LBS	5542	7.14	12068	8.18	1
OP95718-LLBS	5619	7.14	12053	8.18	1
OP95718-LB	5424	7.13	10740	8.18	1

IS 6 = 18O2-PFHXS
 IS 7 = 13C4-PFOS

- (a) Sample areas corrected for dilution where applicable.
- (b) Initial Cal is: S4Q596-ICC596 4Q41651.D 03/03/23 18:28. Area is AVERAGE of initial cal points.
- (c) Check Std Limit = -70 to +100% of initial cal area.
- (d) Upper Limit = +100% of initial standard area; Retention time +0.4 minutes of check standard.
- (e) Lower Limit = -70% of initial standard area; Retention time -0.4 minutes of check standard.

6.5.2
6

TDCA Retention Time Check

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample:	S4Q596-RT	Injection Date:	03/03/23
Lab File ID:	4Q41645.D	Injection Time:	17:04
Instrument ID:	GCMS4Q		

Compound	RT (min)	RT Difference	Low Limit
PFOS	8.082	--	--
TDCA	6.698	1.384	1.000
TCDCA	6.536	1.546	1.000
TUDCA	5.680	2.402	1.000

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
S4Q596-IC596	4Q41647.D	03/03/23	17:32	00:28	Mass Calibration Verification
S4Q596-IC596	4Q41648.D	03/03/23	17:46	00:42	Initial cal 1
S4Q596-IC596	4Q41649.D	03/03/23	18:00	00:56	Initial cal 2
S4Q596-IC596	4Q41650.D	03/03/23	18:14	01:10	Initial cal 3
S4Q596-ICC596	4Q41651.D	03/03/23	18:28	01:24	Initial cal 4
S4Q596-IC596	4Q41652.D	03/03/23	18:42	01:38	Initial cal 5
S4Q596-IC596	4Q41653.D	03/03/23	18:56	01:52	Initial cal 6
S4Q596-IC596	4Q41654.D	03/03/23	19:10	02:06	Initial cal 7
S4Q596-IC596	4Q41655.D	03/03/23	19:24	02:20	Initial cal 8
S4Q596-IBLK	4Q41656.D	03/03/23	19:38	02:34	Instrument Blank
S4Q596-IBLK	4Q41656.D	03/03/23	19:38	02:34	Instrument Blank
S4Q596-ICV596	4Q41657.D	03/03/23	19:52	02:48	Initial cal verification 4
S4Q596-ICV596	4Q41658.D	03/03/23	20:06	03:02	Initial cal verification 20
S4Q596-CC596	4Q41659.D	03/03/23	20:21	03:17	Continuing cal 4
OP95702-BS	4Q41661.D	03/03/23	20:49	03:45	Blank Spike
OP95702-LLBS	4Q41662.D	03/03/23	21:03	03:59	Blank Spike
OP95702-MB	4Q41663.D	03/03/23	21:17	04:13	Method Blank
JD60940-16	4Q41664.D	03/03/23	21:31	04:27	(used for QC only; not part of job FC3110)
OP95702-MS	4Q41665.D	03/03/23	21:45	04:41	Matrix Spike
JD60940-17	4Q41666.D	03/03/23	21:59	04:55	(used for QC only; not part of job FC3110)
OP95702-DUP	4Q41667.D	03/03/23	22:13	05:09	Duplicate
S4Q596-CC596	4Q41668.D	03/03/23	22:27	05:23	Continuing cal 4
S4Q596-ICCB	4Q41669.D	03/03/23	22:41	05:37	Continuing Calibration Blank
OP95676-BS	4Q41670.D	03/03/23	22:55	05:51	Blank Spike
OP95676-LLBS	4Q41671.D	03/03/23	23:09	06:05	Blank Spike
OP95676-MB	4Q41672.D	03/03/23	23:23	06:19	Method Blank
ZZZZZZ	4Q41673.D	03/03/23	23:37	06:33	(unrelated sample)
JD60842-2	4Q41674.D	03/03/23	23:51	06:47	(used for QC only; not part of job FC3110)
OP95676-MS	4Q41675.D	03/04/23	00:05	07:01	Matrix Spike
OP95676-MSD	4Q41676.D	03/04/23	00:19	07:15	Matrix Spike Duplicate
ZZZZZZ	4Q41677.D	03/04/23	00:33	07:29	(unrelated sample)
ZZZZZZ	4Q41678.D	03/04/23	00:47	07:43	(unrelated sample)
ZZZZZZ	4Q41679.D	03/04/23	01:01	07:57	(unrelated sample)
S4Q596-CC596	4Q41680.D	03/04/23	01:15	08:11	Continuing cal 4

TDCA Retention Time Check

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample:	S4Q596-RT	Injection Date:	03/03/23
Lab File ID:	4Q41645.D	Injection Time:	17:04
Instrument ID:	GCMS4Q		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
S4Q596-ICCB	4Q41681.D	03/04/23	01:29	08:25	Continuing Calibration Blank
ZZZZZZ	4Q41682.D	03/04/23	01:43	08:39	(unrelated sample)
ZZZZZZ	4Q41683.D	03/04/23	01:57	08:53	(unrelated sample)
ZZZZZZ	4Q41684.D	03/04/23	02:12	09:08	(unrelated sample)
ZZZZZZ	4Q41685.D	03/04/23	02:26	09:22	(unrelated sample)
ZZZZZZ	4Q41686.D	03/04/23	02:40	09:36	(unrelated sample)
ZZZZZZ	4Q41687.D	03/04/23	02:54	09:50	(unrelated sample)
ZZZZZZ	4Q41688.D	03/04/23	03:08	10:04	(unrelated sample)
ZZZZZZ	4Q41689.D	03/04/23	03:22	10:18	(unrelated sample)
ZZZZZZ	4Q41690.D	03/04/23	03:36	10:32	(unrelated sample)
ZZZZZZ	4Q41691.D	03/04/23	03:50	10:46	(unrelated sample)
S4Q596-CC596	4Q41692.D	03/04/23	04:04	11:00	Continuing cal 4
S4Q596-ICCB	4Q41693.D	03/04/23	04:18	11:14	Continuing Calibration Blank
ZZZZZZ	4Q41694.D	03/04/23	04:32	11:28	(unrelated sample)
ZZZZZZ	4Q41695.D	03/04/23	04:46	11:42	(unrelated sample)
ZZZZZZ	4Q41696.D	03/04/23	05:00	11:56	(unrelated sample)
S4Q596-ECC596	4Q41697.D	03/04/23	05:14	12:10	Ending cal 4
S4Q596-ICCB	4Q41698.D	03/04/23	05:28	12:24	Continuing Calibration Blank

6.6.1
6

TDCA Retention Time Check

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample:	S4Q597-RT	Injection Date:	03/06/23
Lab File ID:	4Q41703.D	Injection Time:	16:49
Instrument ID:	GCMS4Q		

Compound	RT (min)	RT Difference	Low Limit
PFOS	8.143	--	--
TDCA	6.698	1.445	1.000
TCDCA	6.536	1.607	1.000
TUDCA	5.705	2.438	1.000

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
S4Q597-IBLK	4Q41706.D	03/06/23	17:31	00:42	Instrument Blank
S4Q597-IBLK	4Q41706.D	03/06/23	17:31	00:42	Instrument Blank
S4Q597-CC596	4Q41707.D	03/06/23	17:45	00:56	Continuing cal 4
S4Q597-CC596	4Q41708.D	03/06/23	17:59	01:10	Continuing cal 1.0LL
OP95719-BS	4Q41709.D	03/06/23	18:13	01:24	Blank Spike
OP95719-LLBS	4Q41710.D	03/06/23	18:27	01:38	Blank Spike
OP95719-MB	4Q41711.D	03/06/23	18:41	01:52	Method Blank
FC3096-1	4Q41712.D	03/06/23	18:55	02:06	(used for QC only; not part of job FC3110)
OP95719-MS	4Q41713.D	03/06/23	19:09	02:20	Matrix Spike
FC3096-2	4Q41714.D	03/06/23	19:23	02:34	(used for QC only; not part of job FC3110)
OP95719-DUP	4Q41715.D	03/06/23	19:37	02:48	Duplicate
ZZZZZ	4Q41716.D	03/06/23	19:51	03:02	(unrelated sample)
FC3110-1	4Q41717.D	03/06/23	20:05	03:16	AF-HDMW225303-WGN01LF-2302W4
FC3110-2	4Q41718.D	03/06/23	20:19	03:30	AF-RHMW225401-WGN01B-2302W4
S4Q597-CC596	4Q41719.D	03/06/23	20:33	03:44	Continuing cal 4
S4Q597-ICCB	4Q41720.D	03/06/23	20:48	03:59	Continuing Calibration Blank
FC3110-3	4Q41721.D	03/06/23	21:02	04:13	AF-RHMW10-WGN01LF-2302W4
OP95718-LBS	4Q41722.D	03/06/23	21:16	04:27	Blank Spike
OP95718-LLBS	4Q41723.D	03/06/23	21:30	04:41	Blank Spike
OP95718-LB	4Q41724.D	03/06/23	21:44	04:55	Leachate Blank
S4Q597-CC596	4Q41731.D	03/06/23	23:22	06:33	Continuing cal 4
S4Q597-ICCB	4Q41732.D	03/06/23	23:36	06:47	Continuing Calibration Blank
S4Q597-ICCB	4Q41732.D	03/06/23	23:36	06:47	Continuing Calibration Blank
OP95718-MS	4Q41734.D	03/07/23	00:04	07:15	Matrix Spike
OP95718-DUP	4Q41737.D	03/07/23	00:46	07:57	Duplicate
ZZZZZ	4Q41740.D	03/07/23	01:29	08:40	(unrelated sample)
ZZZZZ	4Q41741.D	03/07/23	01:43	08:54	(unrelated sample)
S4Q597-CC596	4Q41742.D	03/07/23	01:57	09:08	Continuing cal 4
S4Q597-ICCB	4Q41743.D	03/07/23	02:11	09:22	Continuing Calibration Blank
S4Q597-ICCB	4Q41743.D	03/07/23	02:11	09:22	Continuing Calibration Blank
OP95720-BS	4Q41744.D	03/07/23	02:25	09:36	Blank Spike
OP95720-LLBS	4Q41745.D	03/07/23	02:39	09:50	Blank Spike
OP95720-MB	4Q41746.D	03/07/23	02:53	10:04	Method Blank
FC3074-1	4Q41747.D	03/07/23	03:07	10:18	(used for QC only; not part of job FC3110)

TDCA Retention Time Check

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample:	S4Q597-RT	Injection Date:	03/06/23
Lab File ID:	4Q41703.D	Injection Time:	16:49
Instrument ID:	GCMS4Q		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
OP95720-MS	4Q41748.D	03/07/23	03:21	10:32	Matrix Spike
FC3074-2	4Q41749.D	03/07/23	03:35	10:46	(used for QC only; not part of job FC3110)
OP95720-DUP	4Q41750.D	03/07/23	03:49	11:00	Duplicate
ZZZZZZ	4Q41751.D	03/07/23	04:03	11:14	(unrelated sample)
ZZZZZZ	4Q41752.D	03/07/23	04:17	11:28	(unrelated sample)
ZZZZZZ	4Q41753.D	03/07/23	04:31	11:42	(unrelated sample)
S4Q597-CC596	4Q41754.D	03/07/23	04:45	11:56	Continuing cal 4
S4Q597-ICCB	4Q41755.D	03/07/23	04:59	12:10	Continuing Calibration Blank
ZZZZZZ	4Q41756.D	03/07/23	05:13	12:24	(unrelated sample)
ZZZZZZ	4Q41757.D	03/07/23	05:27	12:38	(unrelated sample)
ZZZZZZ	4Q41758.D	03/07/23	05:41	12:52	(unrelated sample)
ZZZZZZ	4Q41759.D	03/07/23	05:56	13:07	(unrelated sample)
S4Q597-ECC596	4Q41760.D	03/07/23	06:10	13:21	Ending cal 4
S4Q597-ICCB	4Q41761.D	03/07/23	06:24	13:35	Continuing Calibration Blank

6.6.2
 9

Ion Ratio Summary

Job Number: FC3110
Account: AECOMCOD AECOM, INC.
Project: N6274223F0104 RH Fire Suppression System

Run ID: S4Q597 Method: EPA DRAFT 1633

Lab Sample ID	Lab File ID	Ion Ratios					
		PFPeA	PFHxA	PFHpA	PFOA	PFBS	PFHxS
S4Q596-ICC596	4Q41651.D	0	3	17.9	20.7	37.7	48.3
FC3110-1	4Q41717.D						
FC3110-2	4Q41718.D	0	4	12.3	19.5	53.6	45.3
FC3110-3	4Q41721.D						

6.7.1

6

Isotope Dilution Standard Recovery Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Method: EPA DRAFT 1633	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6	S7	S8
FC3110-1	4Q41717.D	99	94	100	94	93	91	91	86
FC3110-2	4Q41718.D	98	91	94	92	94	89	91	91
FC3110-3	4Q41721.D	99	92	99	98	92	95	91	94
OP95719-BS	4Q41709.D	38	95	101	100	91	95	102	99
OP95719-DUP	4Q41715.D	48	94	98	95	96	90	103	99
OP95719-LLBS	4Q41710.D	110	103	108	105	105	108	103	98
OP95719-MB	4Q41711.D	107	100	104	102	98	99	106	102
OP95719-MS	4Q41713.D	27	94	98	97	94	93	93	88
S4Q597-IBLK	4Q41706.D	104	99	106	100	100	102	103	100
S4Q597-ICCB	4Q41720.D	105	97	104	100	96	100	101	106

Isotope Dilution Standards

Recovery Limits

S1 = 13C4-PFBA	20-150%
S2 = 13C5-PFPeA	20-150%
S3 = 13C5-PFHxA	20-150%
S4 = 13C4-PFHpA	20-150%
S5 = 13C8-PFOA	20-150%
S6 = 13C9-PFNA	20-150%
S7 = 13C6-PFDA	20-150%
S8 = 13C7-PFUnDA	20-150%

Isotope Dilution Standard Recovery Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Method: EPA DRAFT 1633	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S9	S10	S11	S12	S13	S14	S15	S16
FC3110-1	4Q41717.D	76	77	93	92	74	79	75	79
FC3110-2	4Q41718.D	86	84	96	99	81	87	91	88
FC3110-3	4Q41721.D	85	83	94	97	90	88	91	92
OP95719-BS	4Q41709.D	94	93	93	99	86	88	93	93
OP95719-DUP	4Q41715.D	84	85	93	94	88	90	88	92
OP95719-LLBS	4Q41710.D	95	93	97	105	89	91	90	95
OP95719-MB	4Q41711.D	96	96	102	108	89	89	91	93
OP95719-MS	4Q41713.D	85	80	98	102	84	87	90	90
S4Q597-IBLK	4Q41706.D	97	100	91	102	99	103	112	116
S4Q597-ICCB	4Q41720.D	98	94	101	104	106	108	115	116

Isotope Dilution Standards **Recovery Limits**

S9 = 13C2-PFDoDA	20-150%
S10 = 13C2-PFTeDA	20-150%
S11 = 13C3-PFBS	20-150%
S12 = 13C3-PFHxS	20-150%
S13 = 13C8-PFOS	20-150%
S14 = 13C8-FOSA	20-150%
S15 = d3-MeFOSA	20-150%
S16 = d5-EtFOSA	20-150%

6.8.1
6

Isotope Dilution Standard Recovery Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Method: EPA DRAFT 1633	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S17	S18	S19	S20	S21	S22	S23	S24
FC3110-1	4Q41717.D	75	71	68	74	93	83	89	114
FC3110-2	4Q41718.D	82	83	80	91	89	87	88	111
FC3110-3	4Q41721.D	85	82	83	91	98	98	95	117
OP95719-BS	4Q41709.D	82	81	81	90	92	83	91	117
OP95719-DUP	4Q41715.D	77	78	78	86	86	81	91	115
OP95719-LLBS	4Q41710.D	84	83	88	95	97	92	90	127
OP95719-MB	4Q41711.D	85	85	84	94	101	99	100	117
OP95719-MS	4Q41713.D	73	75	75	83	88	89	93	116
S4Q597-IBLK	4Q41706.D	90	88	94	106	86	84	91	124
S4Q597-ICCB	4Q41720.D	97	103	99	110	104	104	106	122

Isotope Dilution Standards **Recovery Limits**

S17 = d3-MeFOSAA	20-150%
S18 = d5-EtFOSAA	20-150%
S19 = d7-MeFOSE	20-150%
S20 = d9-EtFOSE	20-150%
S21 = 13C2-4:2FTS	20-150%
S22 = 13C2-6:2FTS	20-150%
S23 = 13C2-8:2FTS	20-150%
S24 = 13C3-HFPO-DA	20-150%

6.8.1

6

Initial Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICC596
 Lab FileID: 4Q41651.D

Initial Calibration Report

Method Path	Method File	Batch Name	Last Calib Update	Calibration Files	Level Name	1	2	3	4	5	6	7	8	Avg RF	%RSD
D:\MassHunter\methods	1633_030323_S4Q596.quantmethod.xml	D:\MassHunter\Data\030323_1633_S4Q596	3/6/2023 1:26:13 PM	D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d	1	0.2164	0.1878	0.2027	0.2131	0.2179	0.2232	0.2337	0.2279	0.2153	6.779
D:\MassHunter\Data\030323_1633_S4Q596	1633_S4Q596\4Q41649.d	D:\MassHunter\Data\030323_1633_S4Q596	3/6/2023 1:26:13 PM	D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d	2	0.4470	0.3893	0.4155	0.4466	0.4699	0.4811	0.5361	0.5127	0.4623	10.469
D:\MassHunter\Data\030323_1633_S4Q596	1633_S4Q596\4Q41651.d	D:\MassHunter\Data\030323_1633_S4Q596	3/6/2023 1:26:13 PM	D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d	3	0.0476	0.0453	0.0466	0.0486	0.0513	0.0543	0.0596	0.0607	0.0517	11.416
D:\MassHunter\Data\030323_1633_S4Q596	1633_S4Q596\4Q41653.d	D:\MassHunter\Data\030323_1633_S4Q596	3/6/2023 1:26:13 PM	D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d	4	0.9795	0.8168	0.8826	0.9461	0.9798	1.0108	1.0557	0.9980	0.9587	7.950
D:\MassHunter\Data\030323_1633_S4Q596	1633_S4Q596\4Q41655.d	D:\MassHunter\Data\030323_1633_S4Q596	3/6/2023 1:26:13 PM	D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d	5	0.5147	0.4611	0.4847	0.5317	0.5512	0.5717	0.6038	0.5802	0.5374	9.104
I M4-PFBA	T PFBA				Compound										
I M5-PFPeA	T PFMPA														
T 3:3FTCA	T PFPeA														
T PFMBa															
I M5-PFHxA	T NFDHA														
T PFHxA	T PFEEA														
T 5:3FTCA	T 7:3FTCA														
I M4-PFHpA	T PFHpA														
I M8-PFOA	T PFOA														
I M9-PFNA	T PFNA														
I M6-PFDA	T PFDA														
I M7-PFUDA	T PFUDA														
I M2-PFDODA															

Initial Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICC596
 Lab FileID: 4Q41651.D

Initial Calibration Report

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
T PFDoDA	Avg RF	0.7610	0.7625	0.7631	0.7979	0.8481	0.8644	0.8664	0.8372	0.8126	5.749
T PFTfDA	Avg RF	0.9335	0.8636	0.9261	1.0043	1.0619	1.0211	1.0276	0.9472	0.9732	6.791
I M2-PFTeDA	Avg RF	0.8509	0.6840	0.8366	0.8686	0.9095	0.9355	0.9505	0.9020	0.8672	9.685
T PFTeDA	Avg RF	0.8457	0.8390	0.8647	0.8756	0.9073	0.9387	0.9890	0.9428	0.9004	5.908
I M8-FOSA	Avg RF	0.8551	0.7851	0.8482	0.9216	0.9230	0.9261	0.9701	0.9267	0.8945	6.676
T PFBs	Avg RF	0.7972	0.7829	0.7790	0.8429	0.8894	0.8354	0.9290	0.8696	0.8407	6.369
I M3-PFHxS	Avg RF	1.1585	0.8557	0.7986	0.8581	0.8425	0.8702	0.9744	0.9364	0.9118	12.488
T PFHs	Avg RF	0.6866	0.6362	0.6558	0.6547	0.6964	0.7446	0.7076	0.6827	0.6831	5.046
I M8-PFOS	Avg RF	1.3494	1.1035	0.9790	0.9833	1.0159	1.0568	0.9854	0.9845	1.0572	11.925
T PFHs	Avg RF	0.4207	0.3403	0.3331	0.3912	0.3837	0.4386	0.4203	0.4419	0.3962	10.609
I M3-PFOS	Avg RF	0.5250	0.4551	0.5005	0.5159	0.5512	0.5623	0.5510	0.5573	0.5273	6.922
T PFOS	Avg RF	0.3824	0.4022	0.4301	0.4490	0.4644	0.5011	0.4769	0.4678	0.4467	8.882
I M2-4:2FTS	Avg RF	6.8328	5.8769	6.6699	6.3850	7.0745	7.4325	7.2274	6.9752	6.8093	7.302
T 4:2FTS	Avg RF	4.2911	3.1795	3.4211	3.7463	3.5385	3.7066	3.9944	3.0806	3.6198	11.174
I M2-6:2FTS	Avg RF	1.9706	2.2272	2.0577	2.3335	2.3640	2.3796	2.4272	2.2453	2.2506	7.199
T 6:2FTS	Avg RF	0.7409	0.5694	0.7143	0.6629	0.6727	0.6697	0.7082	0.7569	0.6869	8.509
I M2-8:2FTS	Avg RF	0.7265	0.6997	0.7240	0.8328	0.8034	0.8213	0.8705	0.8189	0.7871	7.856
T 8:2FTS	Avg RF	6.4484	5.9087	6.2270	6.9129	6.6112	6.6881	7.0690	6.6906	6.5695	5.656
I M3-MeFOSAA	Avg RF	3.2456	2.8728	3.1751	3.6870	3.5355	3.5564	3.6372	3.2569	3.3708	8.297
T MeFOSAA	Avg RF	2.9085	2.6466	2.6846	3.1151	2.9903	2.9824	2.9577	2.5209	2.8508	7.255
I M3-HFO-DA	Avg RF	0.8514	0.7757	0.6996	0.7295	0.7871	0.8222	0.8511	0.9146	0.8039	8.740
T HFO-DA	Avg RF	0.9287	0.8346	0.9149	0.9653	0.9950	1.0152	1.0049	0.9776	0.9545	6.277
I M7-MeFOSE	Avg RF	0.8882	0.7755	0.8499	0.8939	0.8946	0.9448	0.9611	0.8756	0.8854	6.457
T MeFOSE	Avg RF	0.8882	0.7755	0.8499	0.8939	0.8946	0.9448	0.9611	0.8756	0.8854	6.457

Generated at 1:26 PM on 3/6/2023

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Initial Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICC596
 Lab FileID: 4Q41651.D

Initial Calibration Report

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
I M5-EFOSA											
T EtFOSA	Avg RF	0.9989	0.8801	0.9685	1.0501	1.0070	1.0627	1.1355	1.0686	1.0214	7.515
I M3-MeFOSA											
T MeFOSA	Avg RF	0.8645	0.8768	0.9013	0.9170	0.8972	0.9550	0.9197	0.8862	0.9022	3.150
I 13C4-PFOS											
S d3-MeFOSAA	Linear	0.7060	0.7021	0.6822	0.7264	0.6990	0.7115	0.7008	0.6573	0.6982	2.957
S 13C8-PFOS	Linear	1.0200	0.9735	0.9485	1.0288	0.9325	0.9546	1.0336	0.9872	0.9848	3.960
S d5-EFOSAA	Linear	0.5882	0.5849	0.5721	0.6057	0.5513	0.5802	0.5743	0.5026	0.5699	5.488
S 13C8-FOSA	Linear	1.4033	1.3615	1.3553	1.4712	1.3740	1.3619	1.3504	1.4462	1.3905	3.281
S d7-MeFOSE	Linear	0.5654	0.5465	0.5236	0.5554	0.5267	0.5123	0.5331	0.4967	0.5325	4.265
S d3-MeFOSA	Linear	0.7066	0.6815	0.6407	0.6974	0.6862	0.6921	0.7591	0.7995	0.7079	6.973
S d9-EFOSE	Linear	0.6113	0.5982	0.5768	0.6077	0.5977	0.5957	0.5931	0.5788	0.5949	2.052
S d5-EFOSA	Linear	0.7176	0.7341	0.7054	0.7155	0.7378	0.7599	0.7757	0.8316	0.7472	5.538
I 13C3-PFBA											
S 13C4-PFBA	Linear	0.8631	0.8617	0.8545	0.8621	0.8606	0.8578	0.8581	0.8575	0.8594	0.341
I 1802-PFHxS											
S 13C2-4:2FTS	Linear	0.1327	0.1473	0.1553	0.1589	0.1384	0.1275	0.1272	0.0977	0.1356	14.350
S 13C3-PFBS	Linear	2.2233	2.2405	2.4150	2.3676	2.3187	2.3943	2.4855	2.1652	2.3263	4.695
S 13C2-6:2FTS	Linear	0.1969	0.2107	0.2113	0.2017	0.2151	0.1849	0.1668	0.1495	0.1921	12.233
S 13C3-PFHxS	Linear	1.3109	1.4034	1.4065	1.3404	1.3185	1.4137	1.3891	1.2957	1.3598	3.562
S 13C2-8:2FTS	Linear	0.3063	0.3251	0.3279	0.3211	0.3061	0.2907	0.2935	0.2211	0.2990	11.502
I 13C4-PFOA											
S 13C8-PFOA	Linear	0.8557	0.8434	0.8026	0.8280	0.8096	0.8192	0.8230	0.8329	0.8268	2.098
I 13C2-PFDA											
S 13C6-PFDA	Linear	1.0495	1.0539	1.0540	1.0656	1.0806	1.0610	1.0852	1.1173	1.0709	2.121
S 13C7-PFUnDA	Linear	1.1185	1.1024	1.1053	1.1791	1.1020	1.1573	1.0898	1.0168	1.1089	4.352
S 13C2-PFDODA	Linear	1.3246	1.2863	1.3082	1.3371	1.3195	1.3088	1.3355	1.3524	1.3216	1.562
S 13C2-PFTeDA	Linear	1.0976	1.1142	1.0742	1.1069	1.0951	1.0917	1.0476	1.0998	1.0909	1.927
I 13C5-PFNA											
S 13C9-PFNA	Linear	0.8720	0.8623	0.8928	0.8961	0.8403	0.8753	0.8690	0.8862	0.8743	2.070
I 13C2-PFHxA											
S 13C5-PPeA	Linear	0.6857	0.7013	0.7010	0.6903	0.6765	0.6816	0.6672	0.6559	0.6824	2.314
S 13C5-PFHxA	Linear	1.0877	1.0872	1.1192	1.0692	1.0615	1.1096	1.0630	1.0821	1.0849	1.934
S 13C3-HPOD-A	Linear	0.1281	0.1256	0.1290	0.1208	0.1278	0.1311	0.1264	0.1237	0.1266	2.537
S 13C4-PFHpA	Linear	0.5962	0.5997	0.5925	0.5891	0.5886	0.5958	0.5984	0.5854	0.5932	0.863

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICC596
 Lab FileID: 4Q41651.D

Initial Calibration Report

Compounds with Curve fitting not using Avg Response Factor:

Compound	Curve Fit	Curve Fit Formula	%RSE
S 13C4-PBBA	Linear	y = 0.859423 * x	
S 13C5-PFPeA	Linear	y = 0.682446 * x	
S 13C2-4:2FTS	Linear	y = 0.135615 * x	
S 13C3-PFBS	Linear	y = 2.326271 * x	
S 13C5-PFHxA	Linear	y = 1.084938 * x	
S 13C3-HFPO-DA	Linear	y = 0.126576 * x	
S 13C4-PFHpA	Linear	y = 0.593195 * x	
S 13C2-6:2FTS	Linear	y = 0.192108 * x	
S 13C8-PFOA	Linear	y = 0.826799 * x	
S 13C3-PFHxS	Linear	y = 1.359770 * x	
S 13C9-PFNA	Linear	y = 0.874262 * x	
S 13C2-8:2FTS	Linear	y = 0.298983 * x	
S 13C6-PEDA	Linear	y = 1.070887 * x	
S d3-MeFOSAA	Linear	y = 0.698175 * x	
S 13C8-PFOS	Linear	y = 0.984846 * x	
S d5-EFOSAA	Linear	y = 0.569900 * x	
S 13C7-PFUInDA	Linear	y = 1.108902 * x	
S 13C2-PFDODA	Linear	y = 1.321564 * x	
S 13C2-PFTeDA	Linear	y = 1.090898 * x	
S 13C8-FOSA	Linear	y = 1.390470 * x	
S d7-MeFOSE	Linear	y = 0.532451 * x	
S d3-MeFOSA	Linear	y = 0.707876 * x	
S d9-EFOSE	Linear	y = 0.594903 * x	
S d5-EFOSA	Linear	y = 0.747210 * x	

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Verification

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICV596
 Lab FileID: 4Q41657.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030323_1633_S4Q596\s4q596.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41657
 Type : QC
 Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	5.449	9.0	109.0
13C2-6:2FTS	5.000	5.534	10.7	110.7
13C2-8:2FTS	5.000	5.565	11.3	111.3
13C2-PFDoDA	1.250	1.246	-0.3	99.7
13C2-PFTeDA	1.250	1.322	5.8	105.8
13C3-PFBS	2.500	2.701	8.0	108.0
13C3-PFHxS	2.500	2.557	2.3	102.3
13C4-PFBA	10.000	9.888	-1.1	98.9
13C4-PFHpA	2.500	2.511	0.4	100.4
13C5-PFHxA	2.500	2.493	-0.3	99.7
13C5-PFPeA	5.000	5.022	0.4	100.4
13C6-PFDA	1.250	1.273	1.8	101.8
13C7-PFUnDA	1.250	1.299	3.9	103.9
13C8-FOSA	2.500	2.598	3.9	103.9
13C8-PFOA	2.500	2.492	-0.3	99.7
13C8-PFOS	2.500	2.511	0.4	100.4
13C9-PFNA	1.250	1.259	0.7	100.7
4:2FTS	9.375	9.965	6.3	106.3
6:2FTS	9.500	10.005	5.3	105.3
8:2FTS	9.600	10.070	4.9	104.9
d3-MeFOSAA	5.000	5.262	5.2	105.2
EtFOSAA	2.500	2.314	-7.4	92.6
FOSA	2.500	2.453	-1.9	98.1
MeFOSAA	2.500	2.314	-7.5	92.5
PFBA	10.000	9.793	-2.1	97.9
PFBS	2.218	2.211	-0.3	99.7
PFDA	2.500	2.492	-0.3	99.7
PFDoDA	2.500	2.567	2.7	102.7
PFDS	2.413	2.398	-0.6	99.4
PFHpA	2.500	2.452	-1.9	98.1
PFHpS	2.383	2.188	-8.2	91.8
PFHxA	2.500	2.374	-5.0	95.0
PFHxS	2.285	2.163	-5.3	94.7
PFNA	2.500	2.360	-5.6	94.4
PFNS	2.405	2.406	0.1	100.1
PFOA	2.500	2.357	-5.7	94.3
PFOS	2.320	2.216	-4.5	95.5

Initial Calibration Verification

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICV596
 Lab FileID: 4Q41657.D

PFPeA	5.000	4.903	-1.9	98.1
PFPeS	2.353	2.347	-0.3	99.7
PFTeDA	2.500	2.489	-0.4	99.6
PFTTrDA	2.500	2.662	6.5	106.5
PFUnDA	2.500	2.455	-1.8	98.2
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11Cl-PF3OUdS	9.450	10.464	10.7	110.7
13C3-HFPO-DA	10.000	9.709	-2.9	97.1
9C1-PF3ONS	9.350	9.661	3.3	103.3
ADONA	9.450	9.620	1.8	101.8
HFPO-DA	10.000	10.397	4.0	104.0
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	12.480	11.776	-5.6	94.4
5:3FTCA	62.400	62.855	0.7	100.7
7:3FTCA	62.400	63.422	1.6	101.6
d3-MeFOSA	2.500	2.454	-1.8	98.2
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	2.500	2.417	-3.3	96.7
EtFOSE	25.000	25.274	1.1	101.1
MeFOSA	2.500	2.422	-3.1	96.9
MeFOSE	25.000	24.626	-1.5	98.5
PFDoDS	2.425	2.498	3.0	103.0
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	5.274	5.5	105.5
d7-MeFOSE	25.000	25.982	3.9	103.9
d9-EtFOSE	25.000	25.724	2.9	102.9
d5-EtFOSA	2.500	2.523	0.9	100.9
NFDHA	5.000	5.412	8.2	108.2
PFMBA	5.000	4.888	-2.2	97.8
PFMPA	5.000	4.770	-4.6	95.4
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEEESA	4.450	4.237	-4.8	95.2

CC Criteria: +/- 30%

Initial Calibration Verification

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICV596
 Lab FileID: 4Q41658.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030323_1633_S4Q596\s4q596.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41658
 Type : QC
 Level : 20

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	5.383	7.7	107.7
13C2-6:2FTS	5.000	5.023	0.5	100.5
13C2-8:2FTS	5.000	5.685	13.7	113.7
13C2-PFDoDA	1.250	1.323	5.8	105.8
13C2-PFTeDA	1.250	1.280	2.4	102.4
13C3-PFBS	2.500	2.591	3.6	103.6
13C3-PFHxS	2.500	2.458	-1.7	98.3
13C4-PFBA	10.000	9.884	-1.2	98.8
13C4-PFHpA	2.500	2.528	1.1	101.1
13C5-PFHxA	2.500	2.507	0.3	100.3
13C5-PFPeA	5.000	5.165	3.3	103.3
13C6-PFDA	1.250	1.318	5.4	105.4
13C7-PFUnDA	1.250	1.293	3.5	103.5
13C8-FOSA	2.500	2.687	7.5	107.5
13C8-PFOA	2.500	2.493	-0.3	99.7
13C8-PFOS	2.500	2.707	8.3	108.3
13C9-PFNA	1.250	1.206	-3.5	96.5
4:2FTS	20.000	20.637	3.2	103.2
6:2FTS	20.000	22.203	11.0	111.0
8:2FTS	20.000	20.101	0.5	100.5
d3-MeFOSAA	5.000	5.614	12.3	112.3
EtFOSAA	20.000	21.139	5.7	105.7
FOSA	20.000	21.089	5.4	105.4
MeFOSAA	20.000	19.077	-4.6	95.4
PFBA	20.000	19.814	-0.9	99.1
PFBS	20.000	21.349	6.7	106.7
PFDA	20.000	21.555	7.8	107.8
PFDoDA	20.000	18.112	-9.4	90.6
PFDS	20.000	19.733	-1.3	98.7
PFHpA	20.000	20.526	2.6	102.6
PFHpS	20.000	20.159	0.8	100.8
PFHxA	20.000	21.201	6.0	106.0
PFHxS	20.000	20.987	4.9	104.9
PFNA	20.000	22.661	13.3	113.3
PFNS	20.000	19.975	-0.1	99.9
PFOA	20.000	20.395	2.0	102.0
PFOS	20.000	15.866	-20.7	79.3

Initial Calibration Verification

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q596-ICV596
 Lab FileID: 4Q41658.D

PFPeA	20.000	21.757	8.8	108.8
PFPeS	20.000	22.100	10.5	110.5
PFTeDA	20.000	22.409	12.0	112.0
PFTTrDA	20.000	19.232	-3.8	96.2
PFUnDA	20.000	20.443	2.2	102.2
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11C1-PF3OUdS	20.000	21.777	8.9	108.9
13C3-HFPO-DA	10.000	10.563	5.6	105.6
9C1-PF3ONS	20.000	20.494	2.5	102.5
ADONA	20.000	20.453	2.3	102.3
HFPO-DA	20.000	20.300	1.5	101.5
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	20.000	19.427	-2.9	97.1
5:3FTCA	20.000	21.285	6.4	106.4
7:3FTCA	20.000	19.366	-3.2	96.8
d3-MeFOSA	2.500	2.561	2.4	102.4
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	20.000	19.490	-2.5	97.5
EtFOSE	100.000	91.719	-8.3	91.7
MeFOSA	20.000	19.426	-2.9	97.1
MeFOSE	100.000	89.677	-10.3	89.7
PFDoDS	20.000	18.151	-9.2	90.8
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	5.080	1.6	101.6
d7-MeFOSE	25.000	26.077	4.3	104.3
d9-EtFOSE	25.000	26.513	6.1	106.1
d5-EtFOSA	2.500	2.639	5.5	105.5
NFDHA	20.000	22.053	10.3	110.3
PFMBA	20.000	20.093	0.5	100.5
PFMPA	20.000	19.969	-0.2	99.8
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEESA	20.000	17.883	-10.6	89.4

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41707.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030623_1633_S4Q597\s4q597.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41707
 Type : QC
 Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	4.227	-15.5	84.5
13C2-6:2FTS	5.000	3.870	-22.6	77.4
13C2-8:2FTS	5.000	4.593	-8.1	91.9
13C2-PFDoDA	1.250	1.222	-2.2	97.8
13C2-PFTeDA	1.250	1.254	0.3	100.3
13C3-PFBS	2.500	2.541	1.6	101.6
13C3-PFHxS	2.500	2.629	5.2	105.2
13C4-PFBA	10.000	10.029	0.3	100.3
13C4-PFHpA	2.500	2.516	0.6	100.6
13C5-PFHxA	2.500	2.524	1.0	101.0
13C5-PFPeA	5.000	4.783	-4.3	95.7
13C6-PFDA	1.250	1.319	5.5	105.5
13C7-PFUnDA	1.250	1.280	2.4	102.4
13C8-FOSA	2.500	2.224	-11.1	88.9
13C8-PFOA	2.500	2.421	-3.2	96.8
13C8-PFOS	2.500	2.283	-8.7	91.3
13C9-PFNA	1.250	1.191	-4.7	95.3
4:2FTS	9.375	9.116	-2.8	97.2
6:2FTS	9.500	10.627	11.9	111.9
8:2FTS	9.600	9.195	-4.2	95.8
d3-MeFOSAA	5.000	3.968	-20.6	79.4
EtFOSAA	2.500	2.276	-9.0	91.0
FOSA	2.500	2.455	-1.8	98.2
MeFOSAA	2.500	2.449	-2.0	98.0
PFBA	10.000	9.908	-0.9	99.1
PFBS	2.218	2.235	0.7	100.7
PFDA	2.500	2.447	-2.1	97.9
PFDoDA	2.500	2.403	-3.9	96.1
PFDS	2.413	2.380	-1.4	98.6
PFHpA	2.500	2.453	-1.9	98.1
PFHpS	2.383	2.192	-8.0	92.0
PFHxA	2.500	2.377	-4.9	95.1
PFHxS	2.285	2.126	-7.0	93.0
PFNA	2.500	2.571	2.9	102.9
PFNS	2.405	2.533	5.3	105.3
PFOA	2.500	2.507	0.3	100.3
PFOS	2.320	2.188	-5.7	94.3

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41707.D

PFPeA	5.000	5.194	3.9	103.9
PFPeS	2.353	2.283	-3.0	97.0
PFTeDA	2.500	2.453	-1.9	98.1
PFTTrDA	2.500	2.490	-0.4	99.6
PFUnDA	2.500	2.529	1.2	101.2
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11C1-PF3OUdS	9.450	8.936	-5.4	94.6
13C3-HFPO-DA	10.000	11.630	16.3	116.3
9C1-PF3ONS	9.350	9.064	-3.1	96.9
ADONA	9.450	8.811	-6.8	93.2
HFPO-DA	10.000	10.196	2.0	102.0
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	12.480	13.220	5.9	105.9
5:3FTCA	62.400	63.509	1.8	101.8
7:3FTCA	62.400	65.222	4.5	104.5
d3-MeFOSA	2.500	2.257	-9.7	90.3
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	2.500	2.687	7.5	107.5
EtFOSE	25.000	26.148	4.6	104.6
MeFOSA	2.500	2.467	-1.3	98.7
MeFOSE	25.000	25.234	0.9	100.9
PFDoDS	2.425	2.368	-2.3	97.7
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	4.144	-17.1	82.9
d7-MeFOSE	25.000	22.556	-9.8	90.2
d9-EtFOSE	25.000	22.815	-8.7	91.3
d5-EtFOSA	2.500	2.240	-10.4	89.6
NFDHA	5.000	5.807	16.1	116.1
PFMBA	5.000	5.415	8.3	108.3
PFMPA	5.000	5.417	8.3	108.3
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEEESA	4.450	4.474	0.5	100.5

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41708.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030623_1633_S4Q597\s4q597.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41708
 Type : QC
 Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	4.300	-14.0	86.0
13C2-6:2FTS	5.000	4.191	-16.2	83.8
13C2-8:2FTS	5.000	4.846	-3.1	96.9
13C2-PFDoDA	1.250	1.287	3.0	103.0
13C2-PFTeDA	1.250	1.249	-0.1	99.9
13C3-PFBS	2.500	2.594	3.8	103.8
13C3-PFHxS	2.500	2.587	3.5	103.5
13C4-PFBA	10.000	10.080	0.8	100.8
13C4-PFHpA	2.500	2.510	0.4	100.4
13C5-PFHxA	2.500	2.546	1.8	101.8
13C5-PFPeA	5.000	4.773	-4.5	95.5
13C6-PFDA	1.250	1.312	4.9	104.9
13C7-PFUnDA	1.250	1.324	5.9	105.9
13C8-FOSA	2.500	2.163	-13.5	86.5
13C8-PFOA	2.500	2.505	0.2	100.2
13C8-PFOS	2.500	2.352	-5.9	94.1
13C9-PFNA	1.250	1.241	-0.7	99.3
4:2FTS	0.750	0.742	-1.0	99.0
6:2FTS	0.760	0.828	8.9	108.9
8:2FTS	0.768	0.824	7.2	107.2
d3-MeFOSAA	5.000	4.439	-11.2	88.8
EtFOSAA	0.200	0.144	-27.8	72.2
FOSA	0.200	0.221	10.6	110.6
MeFOSAA	0.200	0.225	12.6	112.6
PFBA	0.800	0.774	-3.3	96.7
PFBS	0.177	0.182	2.9	102.9
PFDA	0.200	0.223	11.7	111.7
PFDoDA	0.200	0.191	-4.3	95.7
PFDS	0.193	0.209	8.4	108.4
PFHpA	0.200	0.186	-7.2	92.8
PFHpS	0.191	0.225	17.6	117.6
PFHxA	0.200	0.231	15.4	115.4
PFHxS	0.183	0.228	24.5	124.5
PFNA	0.200	0.206	3.1	103.1
PFNS	0.192	0.185	-3.6	96.4
PFOA	0.200	0.214	7.2	107.2
PFOS	0.186	0.241	29.6	129.6

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41708.D

PFPeA	0.400	0.407	1.8	101.8
PFPeS	0.188	0.162	-13.7	86.3
PFTeDA	0.200	0.204	2.0	102.0
PFTTrDA	0.200	0.219	9.4	109.4
PFUnDA	0.200	0.192	-4.2	95.8
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11C1-PF3OUdS	0.756	0.665	-12.0	88.0
13C3-HFPO-DA	10.000	11.563	15.6	115.6
9C1-PF3ONS	0.748	0.673	-10.0	90.0
ADONA	0.756	0.663	-12.3	87.7
HFPO-DA	0.800	0.716	-10.5	89.5
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	0.998	1.043	4.5	104.5
5:3FTCA	4.992	4.795	-3.9	96.1
7:3FTCA	4.992	5.095	2.1	102.1
d3-MeFOSA	2.500	2.221	-11.2	88.8
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	0.200	0.234	17.2	117.2
EtFOSE	2.000	2.020	1.0	101.0
MeFOSA	0.200	0.216	8.1	108.1
MeFOSE	2.000	2.043	2.1	102.1
PFDoDS	0.194	0.202	4.0	104.0
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	4.468	-10.6	89.4
d7-MeFOSE	25.000	23.199	-7.2	92.8
d9-EtFOSE	25.000	23.442	-6.2	93.8
d5-EtFOSA	2.500	2.228	-10.9	89.1
NFDHA	0.400	0.426	6.6	106.6
PFMBA	0.400	0.428	7.0	107.0
PFMPA	0.400	0.421	5.3	105.3
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEEESA	0.356	0.319	-10.5	89.5

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41719.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030623_1633_S4Q597\s4q597.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41719
 Type : QC
 Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	4.793	-4.1	95.9
13C2-6:2FTS	5.000	4.621	-7.6	92.4
13C2-8:2FTS	5.000	4.684	-6.3	93.7
13C2-PFDoDA	1.250	1.210	-3.2	96.8
13C2-PFTeDA	1.250	1.273	1.8	101.8
13C3-PFBS	2.500	2.509	0.3	100.3
13C3-PFHxS	2.500	2.479	-0.8	99.2
13C4-PFBA	10.000	10.009	0.1	100.1
13C4-PFHpA	2.500	2.522	0.9	100.9
13C5-PFHxA	2.500	2.539	1.6	101.6
13C5-PFPeA	5.000	4.771	-4.6	95.4
13C6-PFDA	1.250	1.369	9.5	109.5
13C7-PFUnDA	1.250	1.328	6.2	106.2
13C8-FOSA	2.500	2.302	-7.9	92.1
13C8-PFOA	2.500	2.450	-2.0	98.0
13C8-PFOS	2.500	2.452	-1.9	98.1
13C9-PFNA	1.250	1.261	0.9	100.9
4:2FTS	9.375	8.896	-5.1	94.9
6:2FTS	9.500	9.502	0.0	100.0
8:2FTS	9.600	9.934	3.5	103.5
d3-MeFOSAA	5.000	4.419	-11.6	88.4
EtFOSAA	2.500	2.416	-3.3	96.7
FOSA	2.500	2.543	1.7	101.7
MeFOSAA	2.500	2.471	-1.1	98.9
PFBA	10.000	9.888	-1.1	98.9
PFBS	2.218	2.262	2.0	102.0
PFDA	2.500	2.431	-2.8	97.2
PFDoDA	2.500	2.520	0.8	100.8
PFDS	2.413	2.388	-1.0	99.0
PFHpA	2.500	2.569	2.8	102.8
PFHpS	2.383	2.339	-1.8	98.2
PFHxA	2.500	2.451	-1.9	98.1
PFHxS	2.285	2.264	-0.9	99.1
PFNA	2.500	2.446	-2.2	97.8
PFNS	2.405	2.382	-0.9	99.1
PFOA	2.500	2.414	-3.4	96.6
PFOS	2.320	2.172	-6.4	93.6

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41719.D

PFPeA	5.000	5.259	5.2	105.2
PFPeS	2.353	2.244	-4.6	95.4
PFTeDA	2.500	2.455	-1.8	98.2
PFTTrDA	2.500	2.637	5.5	105.5
PFUnDA	2.500	2.367	-5.3	94.7
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11C1-PF3OUdS	9.450	9.092	-3.8	96.2
13C3-HFPO-DA	10.000	11.238	12.4	112.4
9C1-PF3ONS	9.350	9.026	-3.5	96.5
ADONA	9.450	9.195	-2.7	97.3
HFPO-DA	10.000	10.115	1.1	101.1
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	12.480	13.430	7.6	107.6
5:3FTCA	62.400	63.544	1.8	101.8
7:3FTCA	62.400	63.223	1.3	101.3
d3-MeFOSA	2.500	2.324	-7.0	93.0
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	2.500	2.641	5.7	105.7
EtFOSE	25.000	25.708	2.8	102.8
MeFOSA	2.500	2.443	-2.3	97.7
MeFOSE	25.000	25.110	0.4	100.4
PFDoDS	2.425	2.324	-4.1	95.9
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	4.699	-6.0	94.0
d7-MeFOSE	25.000	23.819	-4.7	95.3
d9-EtFOSE	25.000	24.383	-2.5	97.5
d5-EtFOSA	2.500	2.334	-6.6	93.4
NFDHA	5.000	5.694	13.9	113.9
PFMBA	5.000	5.326	6.5	106.5
PFMPA	5.000	5.477	9.5	109.5
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEEESA	4.450	4.366	-1.9	98.1

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41731.D

Continuing Calibration Report

Batch: D:\MassHunter\Data\030623_1633_S4Q597\s4q597.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\030323_1633_S4Q596\4Q41648.d
 2:D:\MassHunter\Data\030323_1633_S4Q596\4Q41649.d
 3:D:\MassHunter\Data\030323_1633_S4Q596\4Q41650.d
 4:D:\MassHunter\Data\030323_1633_S4Q596\4Q41651.d
 5:D:\MassHunter\Data\030323_1633_S4Q596\4Q41652.d
 6:D:\MassHunter\Data\030323_1633_S4Q596\4Q41653.d
 7:D:\MassHunter\Data\030323_1633_S4Q596\4Q41654.d
 8:D:\MassHunter\Data\030323_1633_S4Q596\4Q41655.d

Data File: 4Q41731
 Type : QC
 Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-4:2FTS	5.000	4.667	-6.7	93.3
13C2-6:2FTS	5.000	4.252	-15.0	85.0
13C2-8:2FTS	5.000	5.070	1.4	101.4
13C2-PFDoDA	1.250	1.232	-1.5	98.5
13C2-PFTeDA	1.250	1.202	-3.8	96.2
13C3-PFBS	2.500	2.313	-7.5	92.5
13C3-PFHxS	2.500	2.436	-2.6	97.4
13C4-PFBA	10.000	10.021	0.2	100.2
13C4-PFHpA	2.500	2.460	-1.6	98.4
13C5-PFHxA	2.500	2.498	-0.1	99.9
13C5-PFPeA	5.000	4.632	-7.4	92.6
13C6-PFDA	1.250	1.190	-4.8	95.2
13C7-PFUnDA	1.250	1.292	3.3	103.3
13C8-FOSA	2.500	2.278	-8.9	91.1
13C8-PFOA	2.500	2.541	1.6	101.6
13C8-PFOS	2.500	2.433	-2.7	97.3
13C9-PFNA	1.250	1.244	-0.5	99.5
4:2FTS	9.375	9.406	0.3	100.3
6:2FTS	9.500	10.457	10.1	110.1
8:2FTS	9.600	9.220	-4.0	96.0
d3-MeFOSAA	5.000	4.611	-7.8	92.2
EtFOSAA	2.500	2.456	-1.8	98.2
FOSA	2.500	2.512	0.5	100.5
MeFOSAA	2.500	2.517	0.7	100.7
PFBA	10.000	9.898	-1.0	99.0
PFBS	2.218	2.350	5.9	105.9
PFDA	2.500	2.688	7.5	107.5
PFDoDA	2.500	2.426	-3.0	97.0
PFDS	2.413	2.292	-5.0	95.0
PFHpA	2.500	2.516	0.6	100.6
PFHpS	2.383	2.228	-6.5	93.5
PFHxA	2.500	2.364	-5.5	94.5
PFHxS	2.285	2.313	1.2	101.2
PFNA	2.500	2.469	-1.2	98.8
PFNS	2.405	2.525	5.0	105.0
PFOA	2.500	2.353	-5.9	94.1
PFOS	2.320	2.105	-9.3	90.7

Continuing Calibration Summary

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Sample: S4Q597-CC596
 Lab FileID: 4Q41731.D

PFPeA	5.000	5.316	6.3	106.3
PFPeS	2.353	2.281	-3.1	96.9
PFTeDA	2.500	2.447	-2.1	97.9
PFTTrDA	2.500	2.500	0.0	100.0
PFUnDA	2.500	2.349	-6.1	93.9
M4-PFBA	---	--ISTD--		
M5-PFPeA	---	--ISTD--		
M5-PFHxA	---	--ISTD--		
M4-PFHpA	---	--ISTD--		
M8-PFOA	---	--ISTD--		
M9-PFNA	---	--ISTD--		
M6-PFDA	---	--ISTD--		
M7-PFUnDA	---	--ISTD--		
M2-PFDoDA	---	--ISTD--		
M2-PFTeDA	---	--ISTD--		
M8-FOSA	---	--ISTD--		
M3-PFBS	---	--ISTD--		
M3-PFHxS	---	--ISTD--		
M8-PFOS	---	--ISTD--		
M2-4:2FTS	---	--ISTD--		
M2-6:2FTS	---	--ISTD--		
M2-8:2FTS	---	--ISTD--		
M3-MeFOSAA	---	--ISTD--		
11C1-PF3OUdS	9.450	8.967	-5.1	94.9
13C3-HFPO-DA	10.000	11.148	11.5	111.5
9C1-PF3ONS	9.350	8.955	-4.2	95.8
ADONA	9.450	9.158	-3.1	96.9
HFPO-DA	10.000	10.445	4.5	104.5
M3-HFPO-DA	---	--ISTD--		
3:3FTCA	12.480	13.519	8.3	108.3
5:3FTCA	62.400	62.968	0.9	100.9
7:3FTCA	62.400	64.046	2.6	102.6
d3-MeFOSA	2.500	2.224	-11.1	88.9
M5-EtFOSAA	---	--ISTD--		
M7-MeFOSE	---	--ISTD--		
M9-EtFOSE	---	--ISTD--		
M5-EtFOSA	---	--ISTD--		
EtFOSA	2.500	2.529	1.2	101.2
EtFOSE	25.000	26.225	4.9	104.9
MeFOSA	2.500	2.589	3.6	103.6
MeFOSE	25.000	25.245	1.0	101.0
PFDoDS	2.425	2.446	0.9	100.9
M3-MeFOSA	---	--ISTD--		
d5-EtFOSAA	5.000	4.580	-8.4	91.6
d7-MeFOSE	25.000	22.988	-8.0	92.0
d9-EtFOSE	25.000	23.309	-6.8	93.2
d5-EtFOSA	2.500	2.366	-5.4	94.6
NFDHA	5.000	6.109	22.2	122.2
PFMBA	5.000	5.381	7.6	107.6
PFMPA	5.000	5.549	11.0	111.0
13C4-PFOS	---	--ISTD--		
13C3-PFBA	---	--ISTD--		
18O2-PFHxS	---	--ISTD--		
13C4-PFOA	---	--ISTD--		
13C2-PFDA	---	--ISTD--		
13C5-PFNA	---	--ISTD--		
13C2-PFHxA	---	--ISTD--		
PFEEESA	4.450	4.447	-0.1	99.9

CC Criteria: +/- 30%

Run Sequence Report

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Run ID: S4Q596	Method: EPA DRAFT 1633	Instrument ID: GCMS4Q
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Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
S4Q596-RT	4Q41645.D	03/03/23 17:04	n/a	Retention Time Marker
S4Q596-RT	4Q41646.D	03/03/23 17:18	n/a	Retention Time Marker
S4Q596-IC596	4Q41647.D	03/03/23 17:32	n/a	Mass Calibration Verification
S4Q596-IC596	4Q41648.D	03/03/23 17:46	n/a	Initial cal 1
S4Q596-IC596	4Q41649.D	03/03/23 18:00	n/a	Initial cal 2
S4Q596-IC596	4Q41650.D	03/03/23 18:14	n/a	Initial cal 3
S4Q596-ICC596	4Q41651.D	03/03/23 18:28	n/a	Initial cal 4
S4Q596-IC596	4Q41652.D	03/03/23 18:42	n/a	Initial cal 5
S4Q596-IC596	4Q41653.D	03/03/23 18:56	n/a	Initial cal 6
S4Q596-IC596	4Q41654.D	03/03/23 19:10	n/a	Initial cal 7
S4Q596-IC596	4Q41655.D	03/03/23 19:24	n/a	Initial cal 8
S4Q596-IBLK	4Q41656.D	03/03/23 19:38	n/a	Instrument Blank
S4Q596-IBLK	4Q41656.D	03/03/23 19:38	n/a	Instrument Blank
S4Q596-ICV596	4Q41657.D	03/03/23 19:52	n/a	Initial cal verification 4
S4Q596-ICV596	4Q41658.D	03/03/23 20:06	n/a	Initial cal verification 20
S4Q596-CC596	4Q41659.D	03/03/23 20:21	n/a	Continuing cal 4
S4Q596-CC596	4Q41660.D	03/03/23 20:35	n/a	Continuing cal 1.0LL
OP95702-BS	4Q41661.D	03/03/23 20:49	OP95702	Blank Spike
OP95702-LLBS	4Q41662.D	03/03/23 21:03	OP95702	Blank Spike
OP95702-MB	4Q41663.D	03/03/23 21:17	OP95702	Method Blank
JD60940-16	4Q41664.D	03/03/23 21:31	OP95702	(used for QC only; not part of job FC3110)
OP95702-MS	4Q41665.D	03/03/23 21:45	OP95702	Matrix Spike
JD60940-17	4Q41666.D	03/03/23 21:59	OP95702	(used for QC only; not part of job FC3110)
OP95702-DUP	4Q41667.D	03/03/23 22:13	OP95702	Duplicate
S4Q596-CC596	4Q41668.D	03/03/23 22:27	n/a	Continuing cal 4
S4Q596-ICCB	4Q41669.D	03/03/23 22:41	n/a	Continuing Calibration Blank
OP95676-BS	4Q41670.D	03/03/23 22:55	OP95676	Blank Spike
OP95676-LLBS	4Q41671.D	03/03/23 23:09	OP95676	Blank Spike
OP95676-MB	4Q41672.D	03/03/23 23:23	OP95676	Method Blank
ZZZZZZ	4Q41673.D	03/03/23 23:37	OP95676	(unrelated sample)
JD60842-2	4Q41674.D	03/03/23 23:51	OP95676	(used for QC only; not part of job FC3110)
OP95676-MS	4Q41675.D	03/04/23 00:05	OP95676	Matrix Spike
OP95676-MSD	4Q41676.D	03/04/23 00:19	OP95676	Matrix Spike Duplicate
ZZZZZZ	4Q41677.D	03/04/23 00:33	OP95676	(unrelated sample)
ZZZZZZ	4Q41678.D	03/04/23 00:47	OP95676	(unrelated sample)
ZZZZZZ	4Q41679.D	03/04/23 01:01	OP95676	(unrelated sample)
S4Q596-CC596	4Q41680.D	03/04/23 01:15	n/a	Continuing cal 4
S4Q596-ICCB	4Q41681.D	03/04/23 01:29	n/a	Continuing Calibration Blank
ZZZZZZ	4Q41682.D	03/04/23 01:43	OP95676	(unrelated sample)
ZZZZZZ	4Q41683.D	03/04/23 01:57	OP95676	(unrelated sample)
ZZZZZZ	4Q41684.D	03/04/23 02:12	OP95676	(unrelated sample)
ZZZZZZ	4Q41685.D	03/04/23 02:26	OP95676	(unrelated sample)
ZZZZZZ	4Q41686.D	03/04/23 02:40	OP95676	(unrelated sample)
ZZZZZZ	4Q41687.D	03/04/23 02:54	OP95676	(unrelated sample)
ZZZZZZ	4Q41688.D	03/04/23 03:08	OP95676	(unrelated sample)
ZZZZZZ	4Q41689.D	03/04/23 03:22	OP95676	(unrelated sample)

Run Sequence Report

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Run ID: S4Q596	Method: EPA DRAFT 1633	Instrument ID: GCMS4Q
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Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
ZZZZZZ	4Q41690.D	03/04/23 03:36	OP95676	(unrelated sample)
ZZZZZZ	4Q41691.D	03/04/23 03:50	OP95676	(unrelated sample)
S4Q596-CC596	4Q41692.D	03/04/23 04:04	n/a	Continuing cal 4
S4Q596-ICCB	4Q41693.D	03/04/23 04:18	n/a	Continuing Calibration Blank
ZZZZZZ	4Q41694.D	03/04/23 04:32	OP95676	(unrelated sample)
ZZZZZZ	4Q41695.D	03/04/23 04:46	OP95682	(unrelated sample)
ZZZZZZ	4Q41696.D	03/04/23 05:00	OP95682	(unrelated sample)
S4Q596-ECC596	4Q41697.D	03/04/23 05:14	n/a	Ending cal 4
S4Q596-ICCB	4Q41698.D	03/04/23 05:28	n/a	Continuing Calibration Blank

6.10.1

6

Run Sequence Report

Job Number: FC3110
 Account: AECOMCOD AECOM, INC.
 Project: N6274223F0104 RH Fire Suppression System

Run ID: S4Q597	Method: EPA DRAFT 1633	Instrument ID: GCMS4Q
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Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
S4Q597-RT	4Q41703.D	03/06/23 16:49	n/a	Retention Time Marker
S4Q597-RT	4Q41704.D	03/06/23 17:03	n/a	Retention Time Marker
S4Q597-IBLK	4Q41706.D	03/06/23 17:31	n/a	Instrument Blank
S4Q597-IBLK	4Q41706.D	03/06/23 17:31	n/a	Instrument Blank
S4Q597-CC596	4Q41707.D	03/06/23 17:45	n/a	Continuing cal 4
S4Q597-CC596	4Q41708.D	03/06/23 17:59	n/a	Continuing cal 1.0LL
OP95719-BS	4Q41709.D	03/06/23 18:13	OP95719	Blank Spike
OP95719-LLBS	4Q41710.D	03/06/23 18:27	OP95719	Blank Spike
OP95719-MB	4Q41711.D	03/06/23 18:41	OP95719	Method Blank
FC3096-1	4Q41712.D	03/06/23 18:55	OP95719	(used for QC only; not part of job FC3110)
OP95719-MS	4Q41713.D	03/06/23 19:09	OP95719	Matrix Spike
FC3096-2	4Q41714.D	03/06/23 19:23	OP95719	(used for QC only; not part of job FC3110)
OP95719-DUP	4Q41715.D	03/06/23 19:37	OP95719	Duplicate
ZZZZZZ	4Q41716.D	03/06/23 19:51	OP95719	(unrelated sample)
FC3110-1	4Q41717.D	03/06/23 20:05	OP95719	AF-HDMW225303-WGN01LF-2302W4
FC3110-2	4Q41718.D	03/06/23 20:19	OP95719	AF-RHMW225401-WGN01B-2302W4
S4Q597-CC596	4Q41719.D	03/06/23 20:33	n/a	Continuing cal 4
S4Q597-ICCB	4Q41720.D	03/06/23 20:48	n/a	Continuing Calibration Blank
FC3110-3	4Q41721.D	03/06/23 21:02	OP95719	AF-RHMW10-WGN01LF-2302W4
OP95718-LBS	4Q41722.D	03/06/23 21:16	OP95718	Blank Spike
OP95718-LLBS	4Q41723.D	03/06/23 21:30	OP95718	Blank Spike
OP95718-LB	4Q41724.D	03/06/23 21:44	OP95718	Leachate Blank
S4Q597-CC596	4Q41731.D	03/06/23 23:22	n/a	Continuing cal 4
S4Q597-ICCB	4Q41732.D	03/06/23 23:36	n/a	Continuing Calibration Blank
S4Q597-ICCB	4Q41732.D	03/06/23 23:36	n/a	Continuing Calibration Blank
OP95718-MS	4Q41734.D	03/07/23 00:04	OP95718	Matrix Spike
OP95718-DUP	4Q41737.D	03/07/23 00:46	OP95718	Duplicate
ZZZZZZ	4Q41740.D	03/07/23 01:29	OP95718	(unrelated sample)
ZZZZZZ	4Q41741.D	03/07/23 01:43	OP95718	(unrelated sample)
S4Q597-CC596	4Q41742.D	03/07/23 01:57	n/a	Continuing cal 4
S4Q597-ICCB	4Q41743.D	03/07/23 02:11	n/a	Continuing Calibration Blank
S4Q597-ICCB	4Q41743.D	03/07/23 02:11	n/a	Continuing Calibration Blank
OP95720-BS	4Q41744.D	03/07/23 02:25	OP95720	Blank Spike
OP95720-LLBS	4Q41745.D	03/07/23 02:39	OP95720	Blank Spike
OP95720-MB	4Q41746.D	03/07/23 02:53	OP95720	Method Blank
FC3074-1	4Q41747.D	03/07/23 03:07	OP95720	(used for QC only; not part of job FC3110)
OP95720-MS	4Q41748.D	03/07/23 03:21	OP95720	Matrix Spike
FC3074-2	4Q41749.D	03/07/23 03:35	OP95720	(used for QC only; not part of job FC3110)
OP95720-DUP	4Q41750.D	03/07/23 03:49	OP95720	Duplicate
ZZZZZZ	4Q41751.D	03/07/23 04:03	OP95720	(unrelated sample)
ZZZZZZ	4Q41752.D	03/07/23 04:17	OP95720	(unrelated sample)
ZZZZZZ	4Q41753.D	03/07/23 04:31	OP95720	(unrelated sample)
S4Q597-CC596	4Q41754.D	03/07/23 04:45	n/a	Continuing cal 4
S4Q597-ICCB	4Q41755.D	03/07/23 04:59	n/a	Continuing Calibration Blank
ZZZZZZ	4Q41756.D	03/07/23 05:13	OP95720	(unrelated sample)
ZZZZZZ	4Q41757.D	03/07/23 05:27	OP95720	(unrelated sample)

Run Sequence Report

Job Number: FC3110
Account: AECOMCOD AECOM, INC.
Project: N6274223F0104 RH Fire Suppression System

Run ID: S4Q597	Method: EPA DRAFT 1633	Instrument ID: GCMS4Q
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Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
ZZZZZZ	4Q41758.D	03/07/23 05:41	OP95720	(unrelated sample)
ZZZZZZ	4Q41759.D	03/07/23 05:56	OP95720	(unrelated sample)
S4Q597-ECC596	4Q41760.D	03/07/23 06:10	n/a	Ending cal 4
S4Q597-ICCB	4Q41761.D	03/07/23 06:24	n/a	Continuing Calibration Blank

6.10.2

6

MS Semi-volatiles

Raw Data

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41717.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 8:05:54 PM
 Sample Name : FC3110-1
 Vial : P6-A9
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,525,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	130780	10.00 µg/L	0.041
M5-PFPeA	4.487	268.3 -> 223.0	68297	5.00 µg/L	0.025
M5-PFHxA	5.522	318.0 -> 273.0	57758	2.50 µg/L	0.012
M4-PFHpA	6.380	367.1 -> 322.0	29705	2.50 µg/L	0.012
M8-PFOA	7.025	421.1 -> 376.0	33169	2.50 µg/L	0.000
M9-PFNA	7.546	472.1 -> 427.0	17588	1.25 µg/L	0.000
M6-PFDA	8.029	519.1 -> 474.1	15766	1.25 µg/L	0.000
M7-PFUnDA	8.473	570.0 -> 525.1	15362	1.25 µg/L	0.000
M2-PFDoDA	8.893	615.1 -> 570.0	16204	1.25 µg/L	-0.012
M2-PFTeDA	9.649	715.2 -> 670.0	13529	1.25 µg/L	-0.025
M8-FOSA	9.657	506.1 -> 77.8	12887	2.50 µg/L	0.000
M3-PFBS	5.464	302.1 -> 79.9	11976	2.50 µg/L	0.012
M3-PFHxS	7.129	402.1 -> 79.9	6938	2.50 µg/L	0.000
M8-PFOS	8.180	507.1 -> 79.9	8561	2.50 µg/L	0.000
M2-4:2FTS	5.235	329.1 -> 80.9	1395	5.00 µg/L	0.012
M2-6:2FTS	6.798	429.1 -> 80.9	1772	5.00 µg/L	0.012
M2-8:2FTS	7.816	529.1 -> 80.9	2949	5.00 µg/L	-0.012
M3-MeFOSAA	8.099	573.2 -> 419.0	12298	5.00 µg/L	0.000
M3-HFPO-DA	5.839	286.9 -> 168.9	30836	10.00 µg/L	0.000
M5-EtFOSAA	8.296	589.2 -> 419.0	9401	5.00 µg/L	0.000
M7-MeFOSE	10.586	623.2 -> 58.9	42554	25.00 µg/L	-0.050
M9-EtFOSE	10.896	639.2 -> 58.9	51835	25.00 µg/L	-0.062
M5-EtFOSA	10.998	531.1 -> 219.0	6942	2.50 µg/L	-0.075
M3-MeFOSA	10.702	515.0 -> 219.0	6210	2.50 µg/L	-0.050
13C4-PFOS	8.181	502.8 -> 79.9	11696	2.50 µg/L	0.000
13C3-PFBA	3.155	216.0 -> 172.0	77235	5.00 µg/L	0.040
18O2-PFHxS	7.128	403.0 -> 83.9	5543	2.50 µg/L	0.000
13C4-PFOA	7.025	417.1 -> 372.0	43203	2.50 µg/L	0.000
13C2-PFDA	8.029	515.1 -> 470.1	16153	1.25 µg/L	0.000
13C5-PFNA	7.547	468.0 -> 423.0	22036	1.25 µg/L	0.000
13C2-PFHxA	5.523	315.1 -> 270.0	53248	2.50 µg/L	0.012
System Monitoring Compounds					
13C2-4:2FTS	5.235	329.1 -> 80.9	1395	4.64 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 92.8%		
13C2-6:2FTS	6.798	429.1 -> 80.9	1772	4.16 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 83.2%		
13C2-8:2FTS	7.816	529.1 -> 80.9	2949	4.45 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 89.0%		
13C2-PFDoDA	8.893	615.1 -> 570.0	16204	0.95 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 75.9%		
13C2-PFTeDA	9.649	715.2 -> 670.0	13529	0.96 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 76.8%		
13C3-PFBS	5.464	302.1 -> 79.9	11976	2.32 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 92.9%		
13C3-PFHxS	7.129	402.1 -> 79.9	6938	2.30 µg/L	0.000

7.1.1
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.1%	
13C4-PFBA	3.152	216.8 -> 171.9	130780	9.85 µg/L	0.041
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 98.5%	
13C4-PFHpA	6.380	367.1 -> 322.0	29705	2.35 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.0%	
13C5-PFHxA	5.522	318.0 -> 273.0	57758	2.50 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.0%	
13C5-PFPeA	4.487	268.3 -> 223.0	68297	4.70 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 94.0%	
13C6-PFDA	8.029	519.1 -> 474.1	15766	1.14 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 91.1%	
13C7-PFUnDA	8.473	570.0 -> 525.1	15362	1.07 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 85.8%	
13C8-FOSA	9.657	506.1 -> 77.8	12887	1.98 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 79.2%	
13C8-PFOA	7.025	421.1 -> 376.0	33169	2.32 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.9%	
13C8-PFOS	8.180	507.1 -> 79.9	8561	1.86 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 74.3%	
13C9-PFNA	7.546	472.1 -> 427.0	17588	1.14 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 91.3%	
d3-MeFOSAA	8.099	573.2 -> 419.0	12298	3.77 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 75.3%	
13C3-HFPO-DA	5.839	286.9 -> 168.9	30836	11.44 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 114.4%	
d3-MeFOSA	10.702	515.0 -> 219.0	6210	1.88 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 75.0%	
d5-EtFOSAA	8.296	589.2 -> 419.0	9401	3.53 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 70.5%	
d7-MeFOSE	10.586	623.2 -> 58.9	42554	17.08 µg/L	-0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 68.3%	
d9-EtFOSE	10.896	639.2 -> 58.9	51835	18.62 µg/L	-0.062
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 74.5%	
d5-EtFOSA	10.998	531.1 -> 219.0	6942	1.99 µg/L	-0.075
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 79.4%	

Target Compounds

Compound	RT	Transition	Response	Conc. Units	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.	
		327.1 -> 80.9			
6:2FTS	-	427.1 -> 407.0	-	N.D.	
		427.1 -> 80.9			
8:2FTS	-	527.1 -> 507.0	-	N.D.	
		527.1 -> 80.8			
EtFOSAA	-	584.2 -> 419.1	-	N.D.	
		584.2 -> 526.0			
FOSA	-	498.1 -> 77.9	-	N.D.	
		498.1 -> 478.0			
MeFOSAA	-	570.1 -> 419.0	-	N.D.	
		570.1 -> 483.0			
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	-	298.7 -> 79.9	-	N.D.	
		298.7 -> 98.8			
PFDA	8.316	512.9 -> 469.0	0	µg/L m	1
		512.9 -> 219.0	0		
PFDODA	-	613.1 -> 569.0	-	N.D.	
		613.1 -> 319.0			
PFDS	-	599.0 -> 79.9	-	N.D.	

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	-	449.0 -> 98.9	-	N.D.		
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	-	N.D.		
		398.7 -> 79.9				
PFNA	-	398.7 -> 98.9	-	N.D.		
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	-	548.8 -> 98.9	-	N.D.		
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	-	N.D.		
		498.9 -> 79.9				
PFPeA	-	498.9 -> 98.8	-	N.D.		
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	8.767	663.0 -> 619.0	0	µg/L	m	1
		663.0 -> 168.9	0			
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

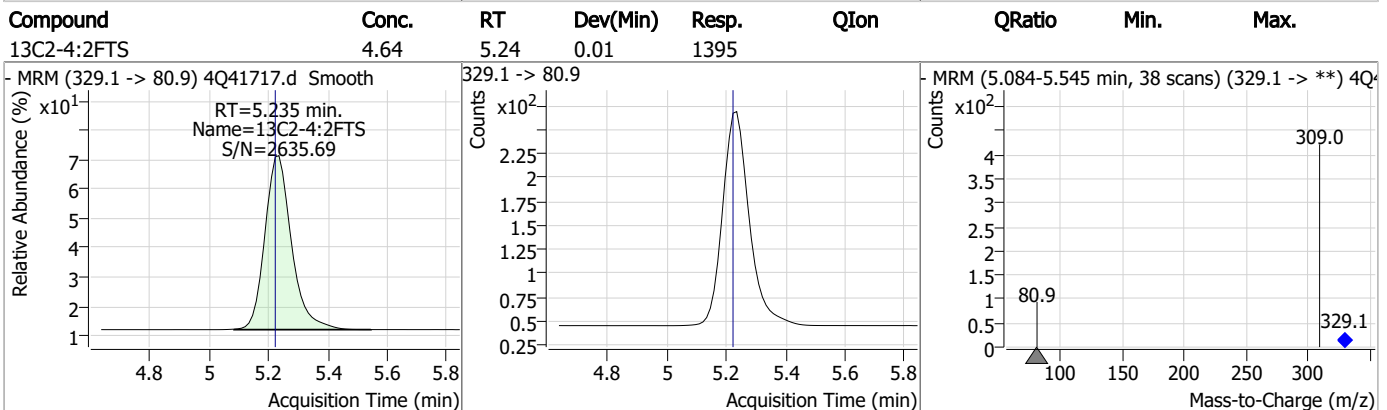
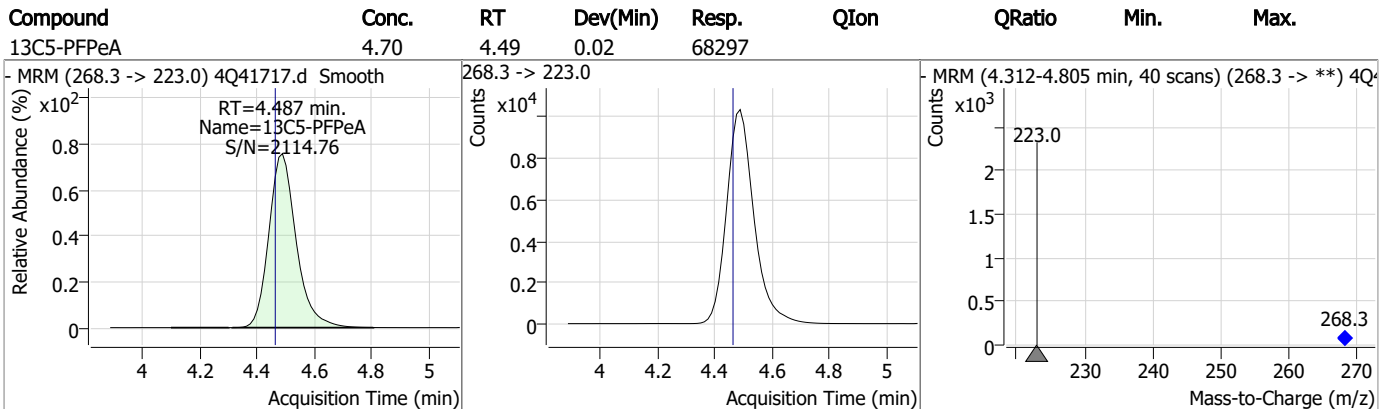
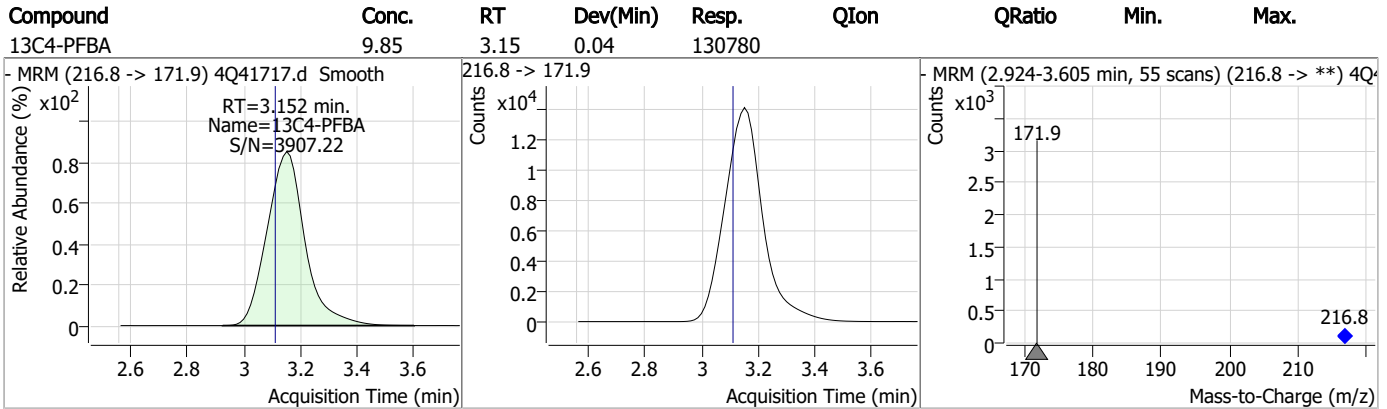
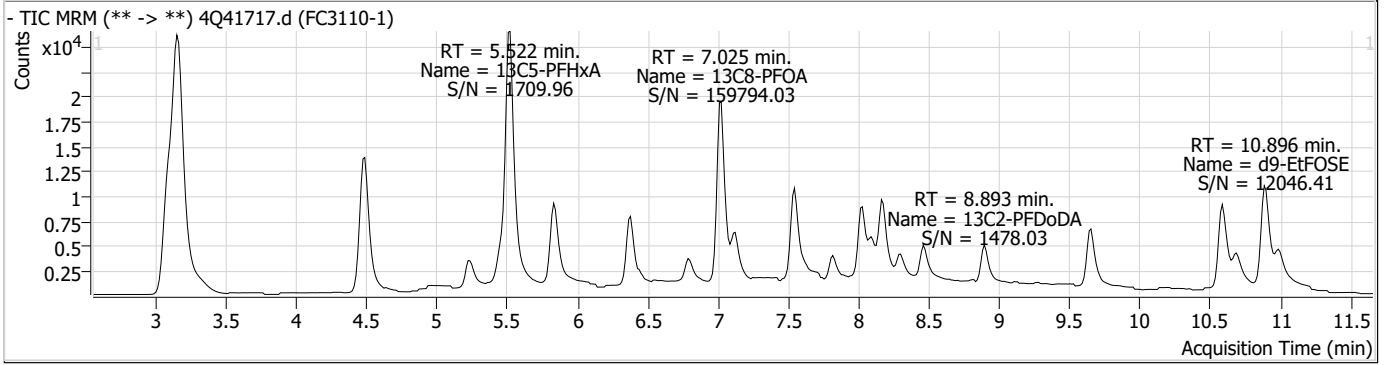
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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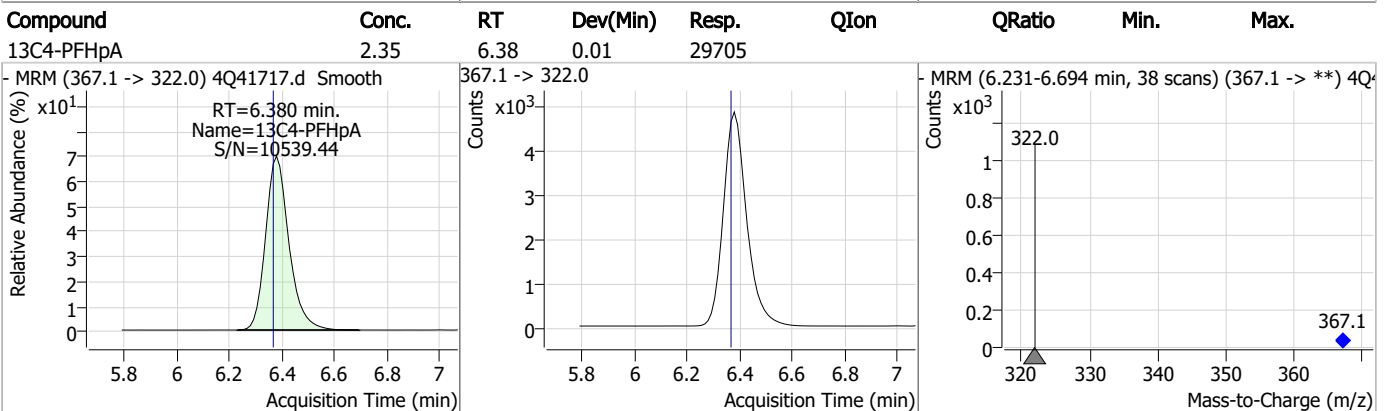
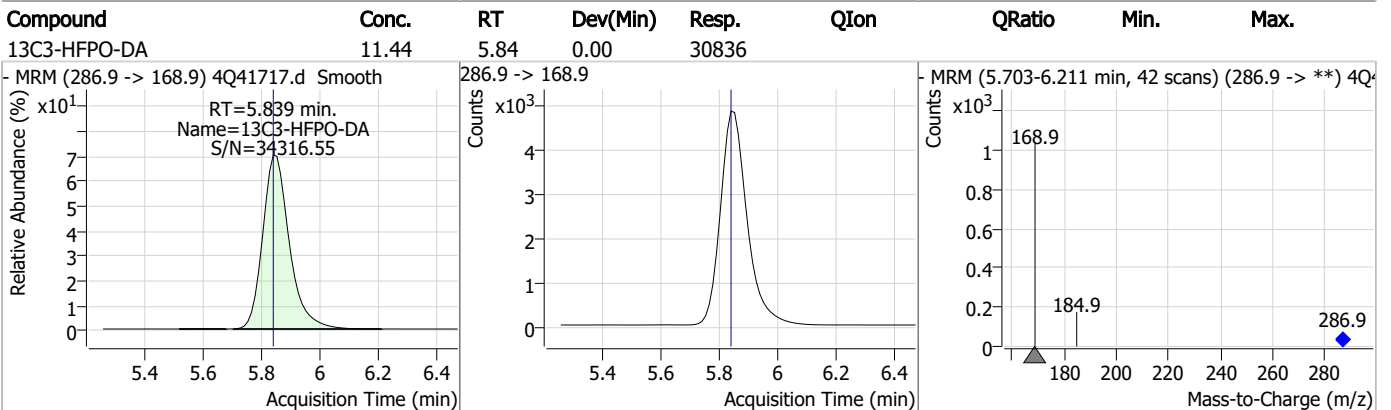
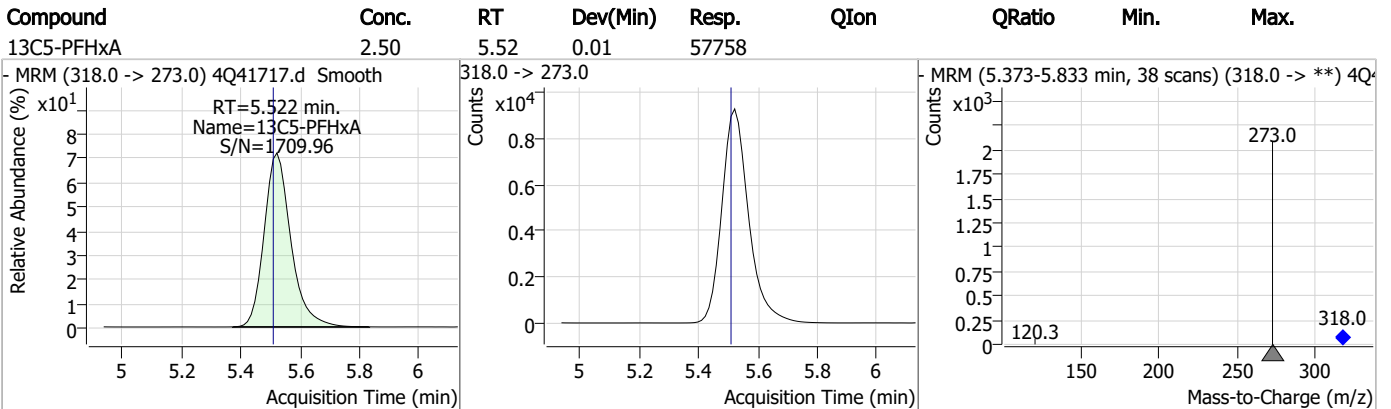
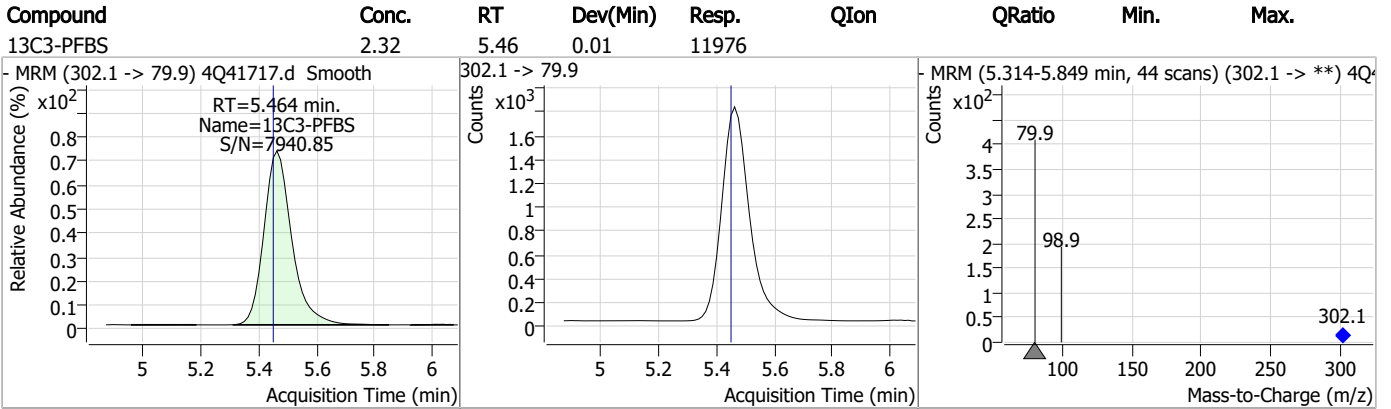
7.1.1
7



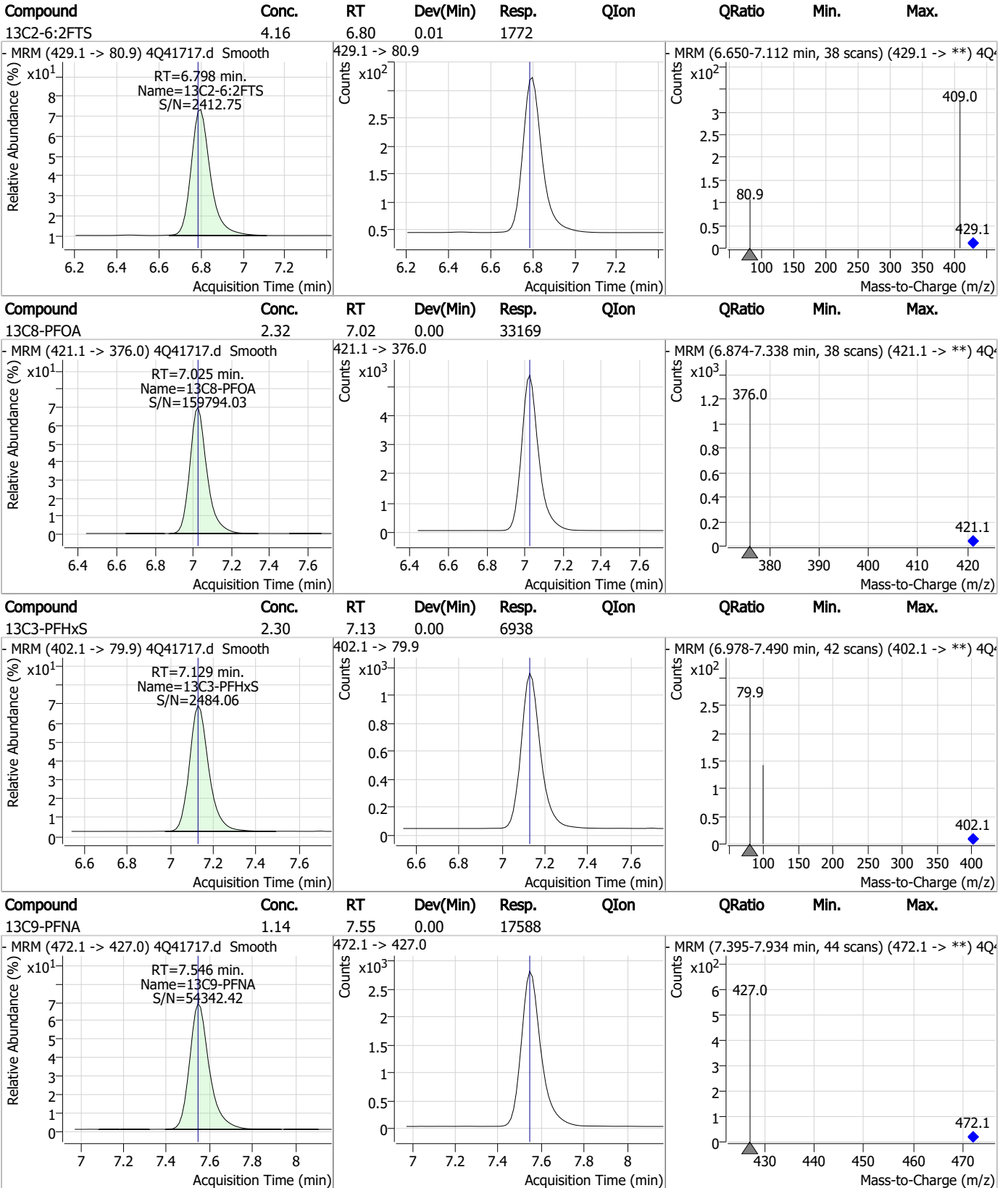
Perfluorinated Compounds by LC/MS/MS



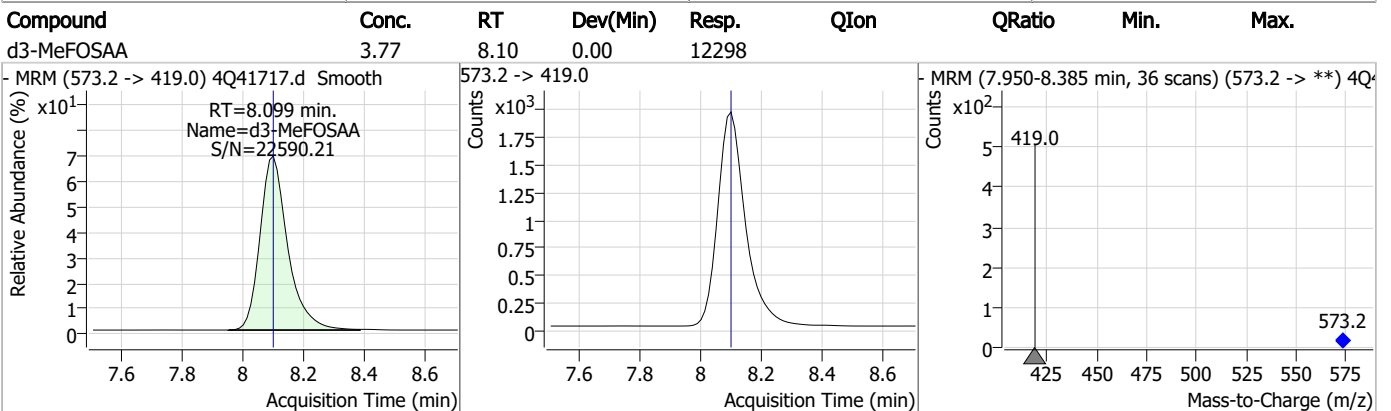
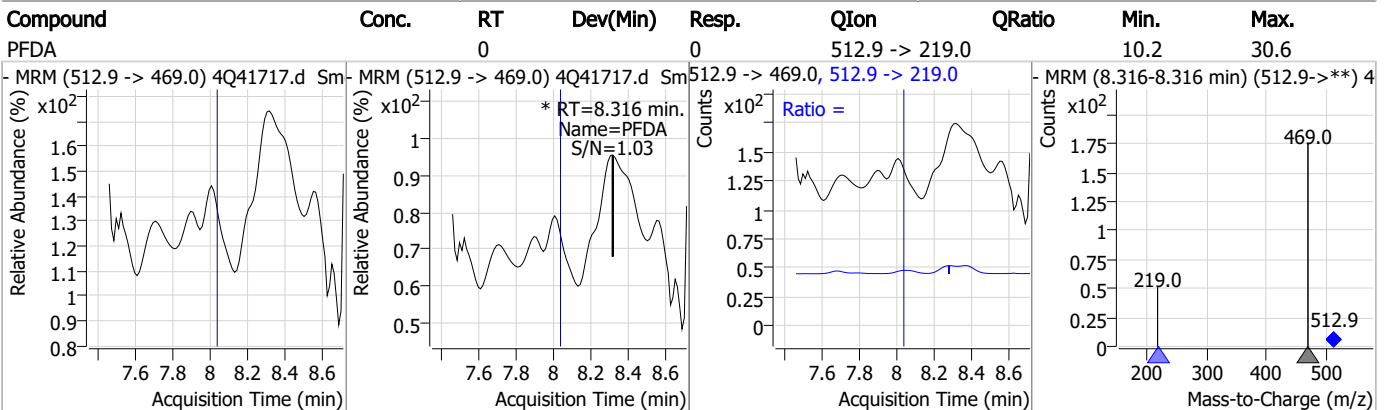
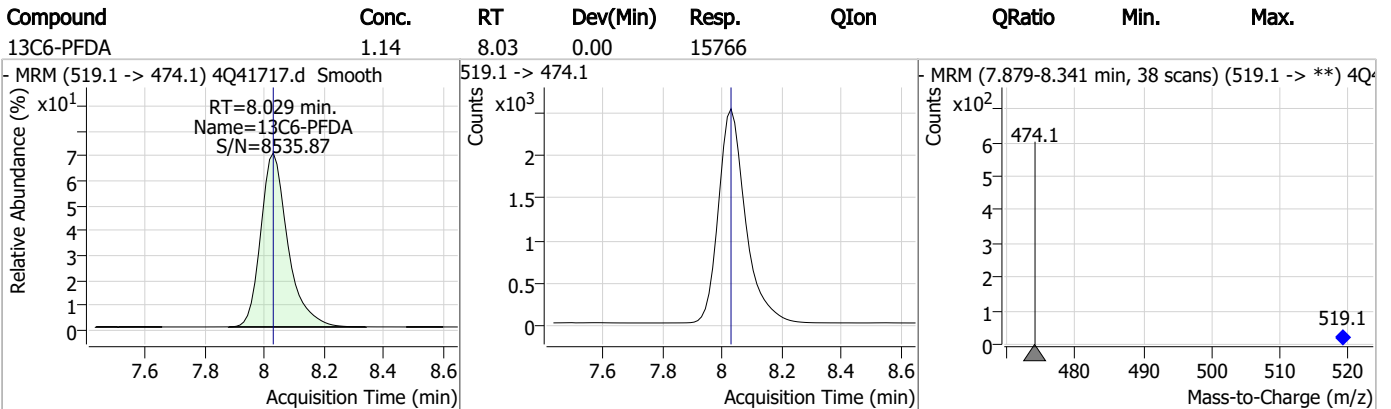
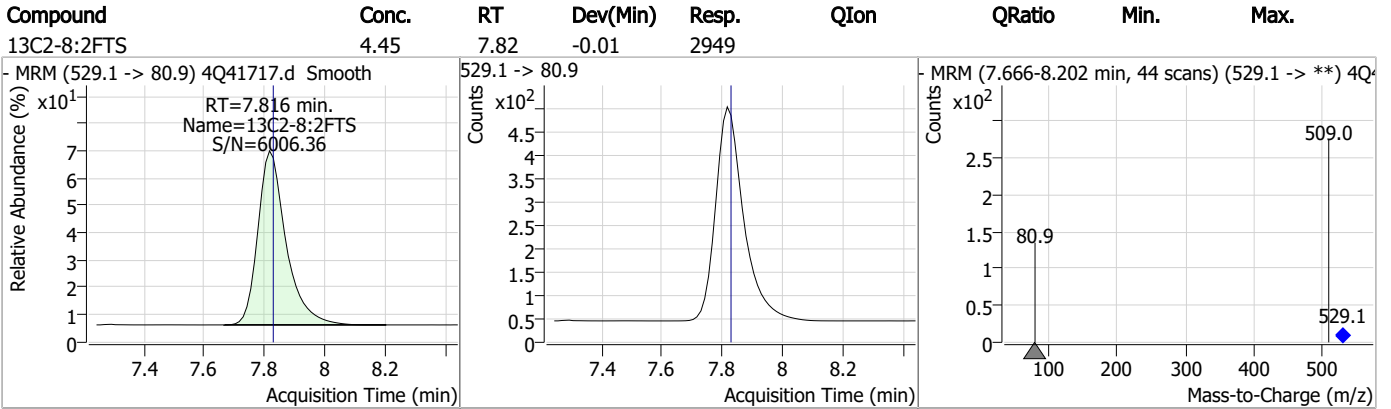
Perfluorinated Compounds by LC/MS/MS



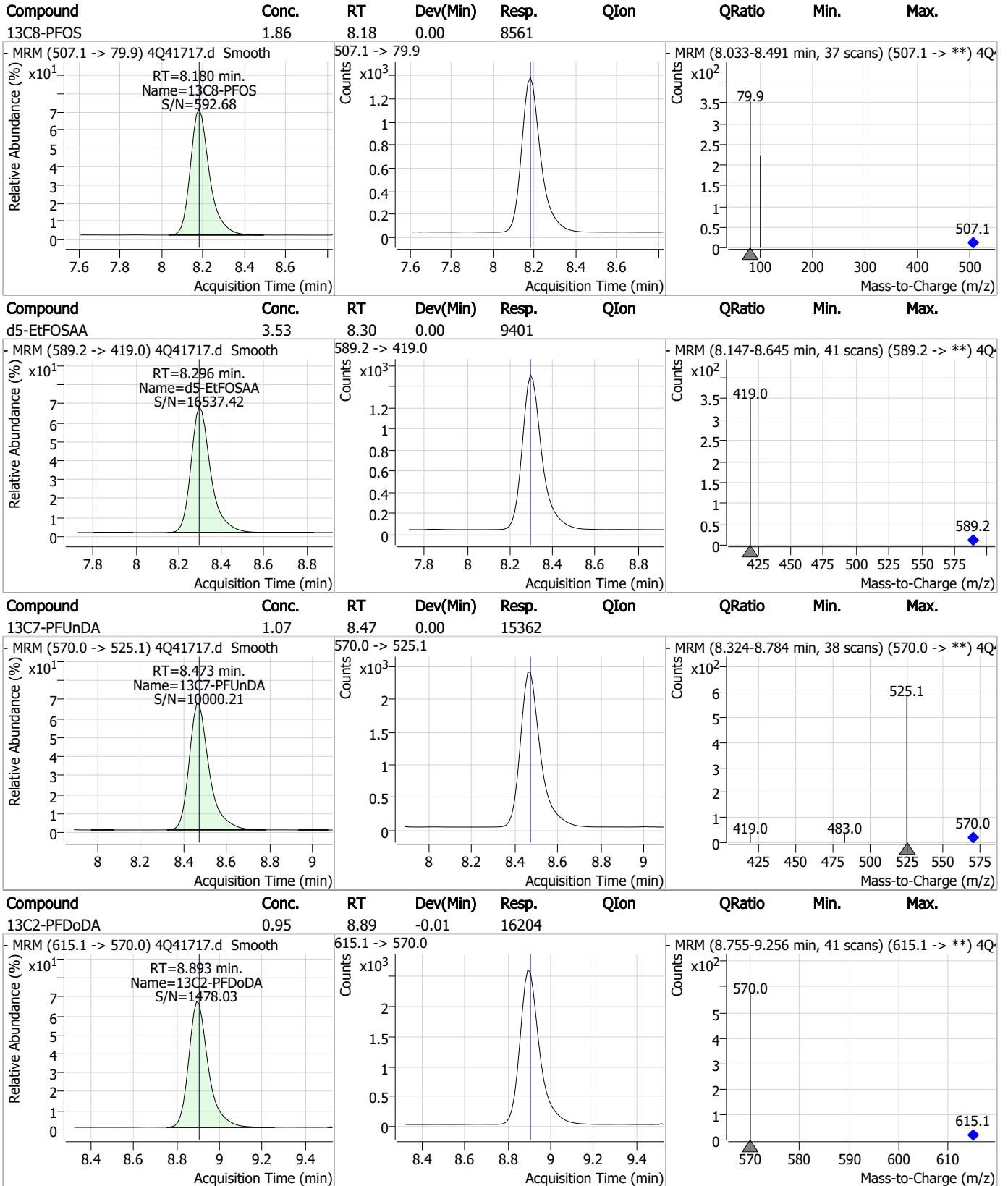
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

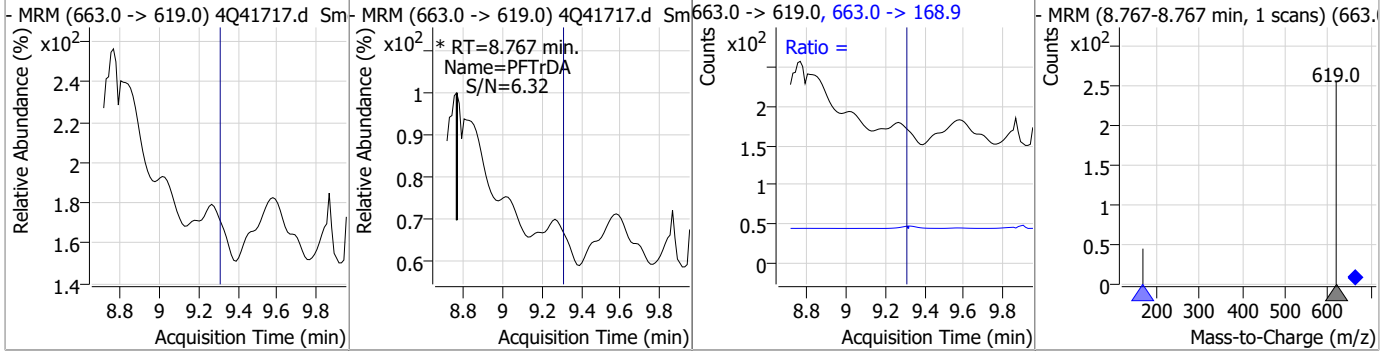


Perfluorinated Compounds by LC/MS/MS

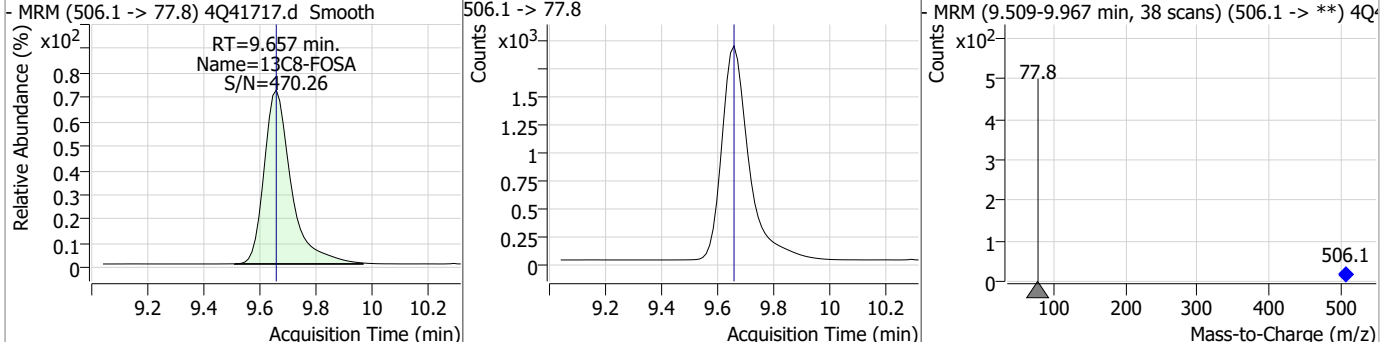


Perfluorinated Compounds by LC/MS/MS

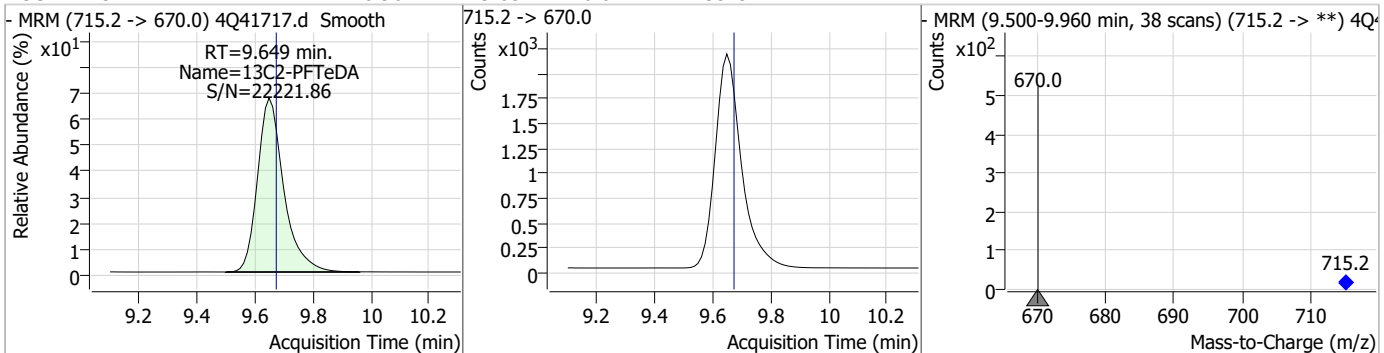
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	0			0	663.0 -> 168.9		5.1	15.4



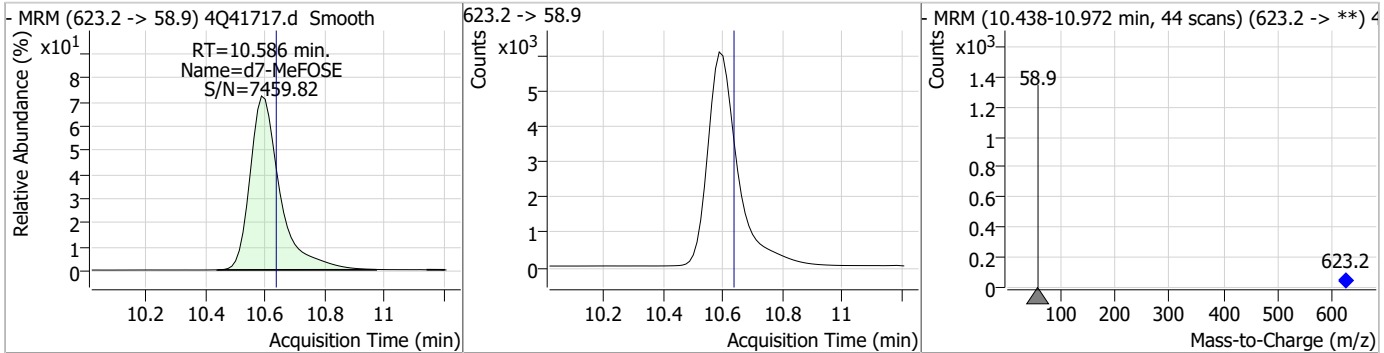
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C8-FOSA	1.98	9.66	0.00	12887				



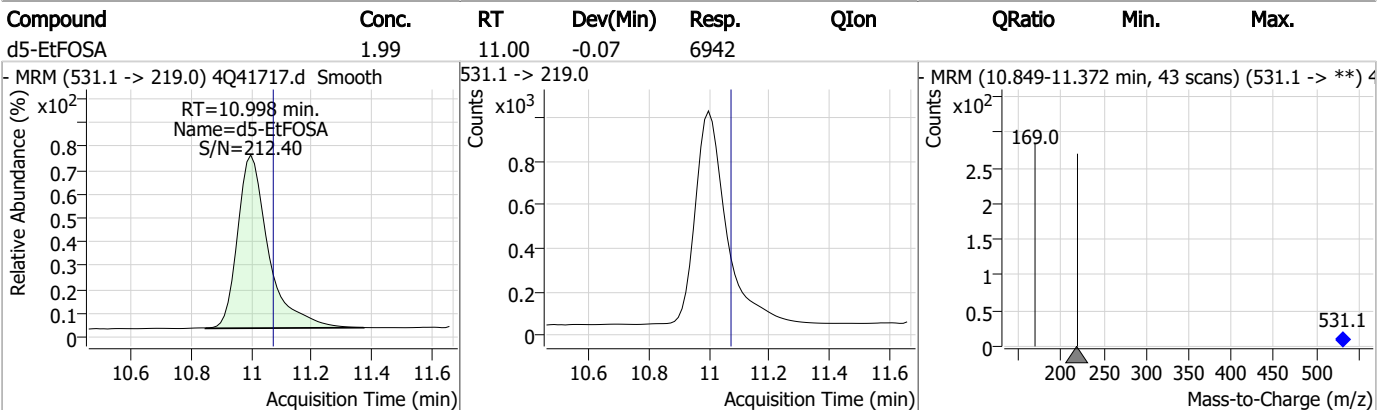
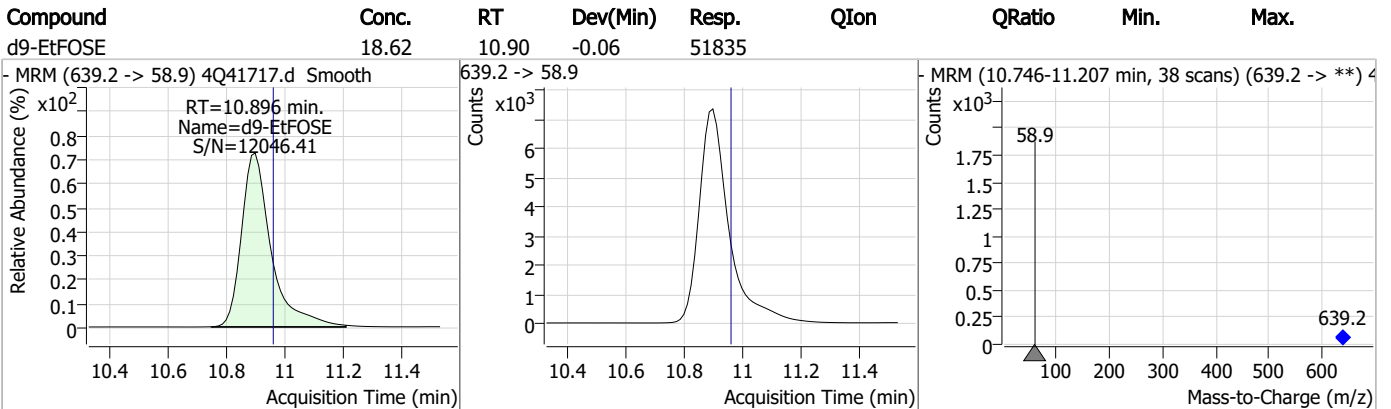
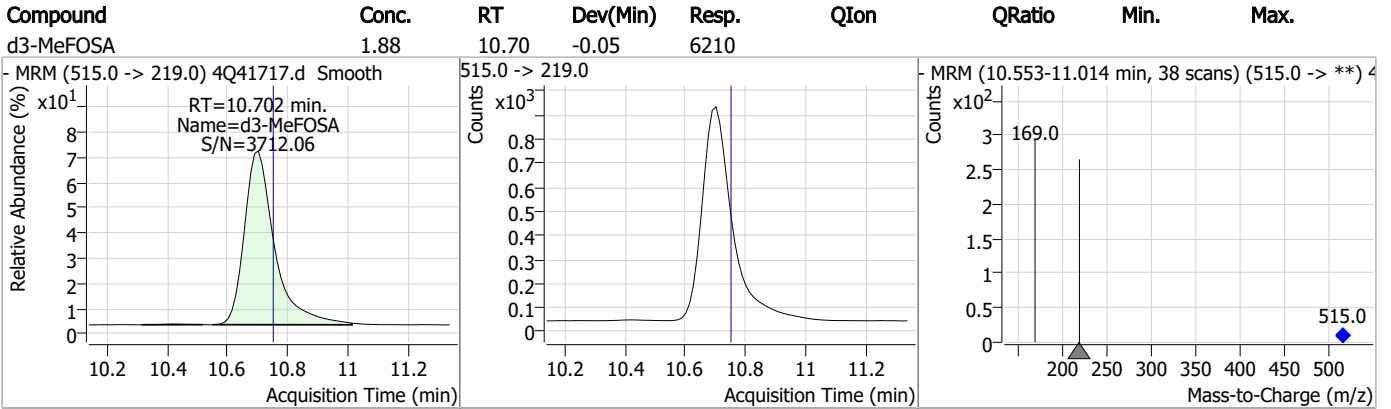
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFTeDA	0.96	9.65	-0.02	13529				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	17.08	10.59	-0.05	42554				



Perfluorinated Compounds by LC/MS/MS



7.1.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Natasha Gumtie
 03/08/23 11:27

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41718.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 8:19:57 PM
 Sample Name : FC3110-2
 Vial : P6-B1
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,535,,,5.0,1,water

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
Internal Standards						
M4-PFBA	3.164	216.8 -> 171.9	129421	10.00	µg/L	-0.075
M5-PFPeA	4.487	268.3 -> 223.0	66788	5.00	µg/L	-0.087
M5-PFHxA	5.522	318.0 -> 273.0	55166	2.50	µg/L	0.000
M4-PFHpA	6.380	367.1 -> 322.0	29509	2.50	µg/L	0.037
M8-PFOA	7.025	421.1 -> 376.0	33044	2.50	µg/L	0.076
M9-PFNA	7.546	472.1 -> 427.0	17415	1.25	µg/L	0.050
M6-PFDA	8.029	519.1 -> 474.1	15855	1.25	µg/L	0.062
M7-PFUnDA	8.473	570.0 -> 525.1	16347	1.25	µg/L	0.087
M2-PFDoDA	8.906	615.1 -> 570.0	18445	1.25	µg/L m	0.138
M2-PFTeDA	9.649	715.2 -> 670.0	14985	1.25	µg/L m	0.162
M8-FOSA	9.657	506.1 -> 77.8	13803	2.50	µg/L	0.149
M3-PFBS	5.464	302.1 -> 79.9	11742	2.50	µg/L	-0.025
M3-PFHxS	7.129	402.1 -> 79.9	7064	2.50	µg/L	0.064
M8-PFOS	8.180	507.1 -> 79.9	9153	2.50	µg/L	0.063
M2-4:2FTS	5.235	329.1 -> 80.9	1271	5.00	µg/L	-0.024
M2-6:2FTS	6.798	429.1 -> 80.9	1762	5.00	µg/L	0.074
M2-8:2FTS	7.816	529.1 -> 80.9	2786	5.00	µg/L	0.050
M3-MeFOSAA	8.099	573.2 -> 419.0	13177	5.00	µg/L	0.062
M3-HFPO-DA	5.839	286.9 -> 168.9	30216	10.00	µg/L	0.012
M5-EtFOSAA	8.308	589.2 -> 419.0	10825	5.00	µg/L	0.074
M7-MeFOSE	10.599	623.2 -> 58.9	48953	25.00	µg/L	0.186
M9-EtFOSE	10.896	639.2 -> 58.9	61752	25.00	µg/L	0.187
M5-EtFOSA	11.011	531.1 -> 219.0	7550	2.50	µg/L	0.199
M3-MeFOSA	10.702	515.0 -> 219.0	7354	2.50	µg/L	0.187
13C4-PFOS	8.181	502.8 -> 79.9	11457	2.50	µg/L	0.063
13C3-PFBA	3.155	216.0 -> 172.0	76823	5.00	µg/L	-0.087
18O2-PFHxS	7.128	403.0 -> 83.9	5273	2.50	µg/L	0.064
13C4-PFOA	7.025	417.1 -> 372.0	42611	2.50	µg/L	0.076
13C2-PFDA	8.029	515.1 -> 470.1	16281	1.25	µg/L	0.062
13C5-PFNA	7.547	468.0 -> 423.0	22323	1.25	µg/L	0.050
13C2-PFHxA	5.523	315.1 -> 270.0	54006	2.50	µg/L	0.000
System Monitoring Compounds						
13C2-4:2FTS	5.235	329.1 -> 80.9	1271	4.44	µg/L	-0.024
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 88.8%			
13C2-6:2FTS	6.798	429.1 -> 80.9	1762	4.35	µg/L	0.074
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 87.0%			
13C2-8:2FTS	7.816	529.1 -> 80.9	2786	4.42	µg/L	0.050
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 88.3%			
13C2-PFDoDA	8.906	615.1 -> 570.0	18445	1.07	µg/L m	0.138
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 85.7%			
13C2-PFTeDA	9.649	715.2 -> 670.0	14985	1.05	µg/L m	0.162
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 84.4%			
13C3-PFBS	5.464	302.1 -> 79.9	11742	2.39	µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 95.7%			
13C3-PFHxS	7.129	402.1 -> 79.9	7064	2.46	µg/L	0.064

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.5%	
13C4-PFBA	3.164	216.8 -> 171.9	129421	9.80 µg/L	-0.075
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 98.0%	
13C4-PFHpA	6.380	367.1 -> 322.0	29509	2.30 µg/L	0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.1%	
13C5-PFHxA	5.522	318.0 -> 273.0	55166	2.35 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.2%	
13C5-PFPeA	4.487	268.3 -> 223.0	66788	4.53 µg/L	-0.087
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 90.6%	
13C6-PFDA	8.029	519.1 -> 474.1	15855	1.14 µg/L	0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 90.9%	
13C7-PFUnDA	8.473	570.0 -> 525.1	16347	1.13 µg/L	0.087
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 90.5%	
13C8-FOSA	9.657	506.1 -> 77.8	13803	2.17 µg/L	0.149
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 86.6%	
13C8-PFOA	7.025	421.1 -> 376.0	33044	2.34 µg/L	0.076
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 93.8%	
13C8-PFOS	8.180	507.1 -> 79.9	9153	2.03 µg/L	0.063
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 81.1%	
13C9-PFNA	7.546	472.1 -> 427.0	17415	1.12 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 89.2%	
d3-MeFOSAA	8.099	573.2 -> 419.0	13177	4.12 µg/L	0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.4%	
13C3-HFPO-DA	5.839	286.9 -> 168.9	30216	11.05 µg/L	0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 110.5%	
d3-MeFOSA	10.702	515.0 -> 219.0	7354	2.27 µg/L	0.187
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.7%	
d5-EtFOSAA	8.308	589.2 -> 419.0	10825	4.14 µg/L	0.074
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.9%	
d7-MeFOSE	10.599	623.2 -> 58.9	48953	20.06 µg/L	0.186
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 80.2%	
d9-EtFOSE	10.896	639.2 -> 58.9	61752	22.65 µg/L	0.187
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 90.6%	
d5-EtFOSA	11.011	531.1 -> 219.0	7550	2.20 µg/L	0.199
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.2%	

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7

Target Compounds	RT	Transition	Response	Conc. Units	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.	
		327.1 -> 80.9			
6:2FTS	-	427.1 -> 407.0	-	N.D.	
		427.1 -> 80.9			
8:2FTS	-	527.1 -> 507.0	-	N.D.	
		527.1 -> 80.8			
EtFOSAA	-	584.2 -> 419.1	-	N.D.	
		584.2 -> 526.0			
FOSA	-	498.1 -> 77.9	-	N.D.	
		498.1 -> 478.0			
MeFOSAA	-	570.1 -> 419.0	-	N.D.	
		570.1 -> 483.0			
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	5.465	298.7 -> 79.9	348	0.08 µg/L	73
		298.7 -> 98.8	187		
PFDA	-	512.9 -> 469.0	-	N.D.	
		512.9 -> 219.0			
PFDODA	9.169	613.1 -> 569.0	0	µg/L m	1
		613.1 -> 319.0			
PFDS	-	599.0 -> 79.9	-	N.D.	



Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.380	599.0 -> 98.8				
		363.1 -> 319.0	2289	0.15 µg/L	m	87
PFHpS	-	363.1 -> 169.0	280			
		449.0 -> 79.9	-	N.D.		
PFHxA	5.512	449.0 -> 98.9				
		313.0 -> 269.0	2103	0.12 µg/L		97
PFHxS	7.130	313.0 -> 118.9	85			
		398.7 -> 79.9	364	0.14 µg/L	m	91
PFNA	-	398.7 -> 98.9	165			
		463.0 -> 419.0	-	N.D.		
PFNS	-	463.0 -> 219.0				
		548.8 -> 79.9	-	N.D.		
PFOA	7.026	548.8 -> 98.9				
		413.0 -> 369.0	1661	0.11 µg/L	m	97
PFOS	-	413.0 -> 169.0	324			
		498.9 -> 79.9	-	N.D.		
PFPeA	4.489	498.9 -> 98.8				
		263.0 -> 219.0	2361	0.18 µg/L		100
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	8.767	663.0 -> 619.0	0	µg/L	m	1
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0	-	N.D.		
MeFOSA	-	511.9 -> 169.0				
		616.1 -> 58.9	-	N.D.		
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9	-	N.D.		
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				
PFEESA	-					

= Qualifier out of range, m = manually integrated, + = Area summed

7.12
7

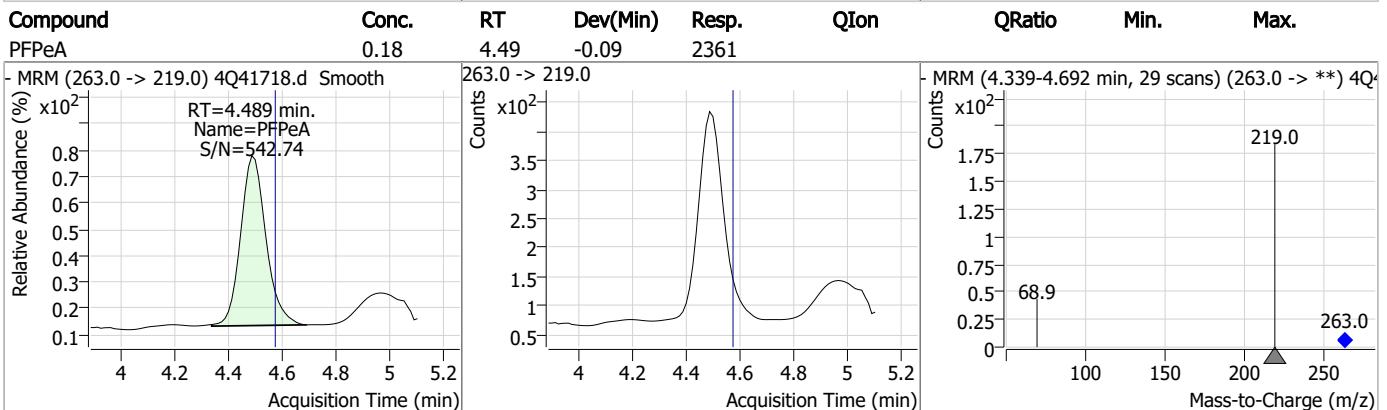
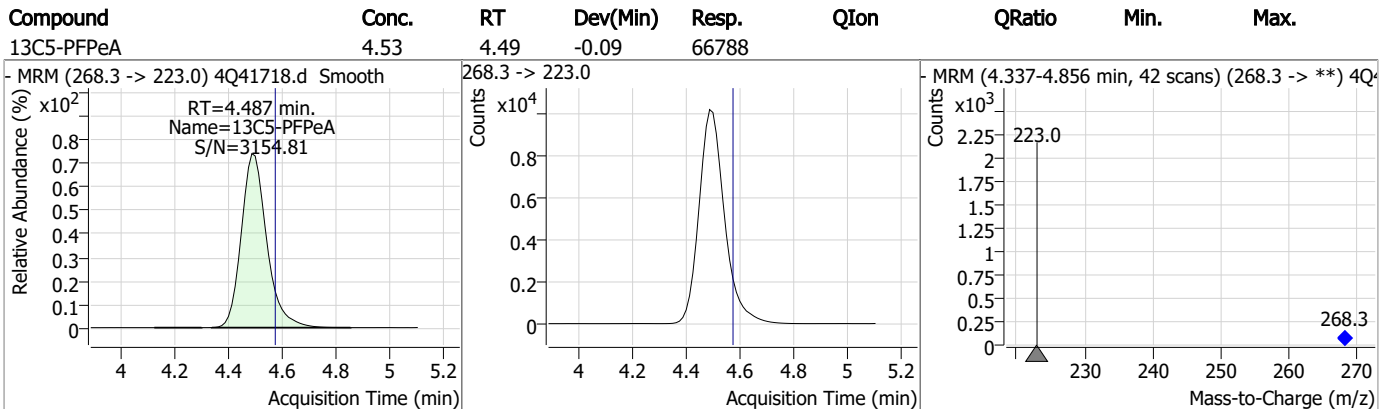
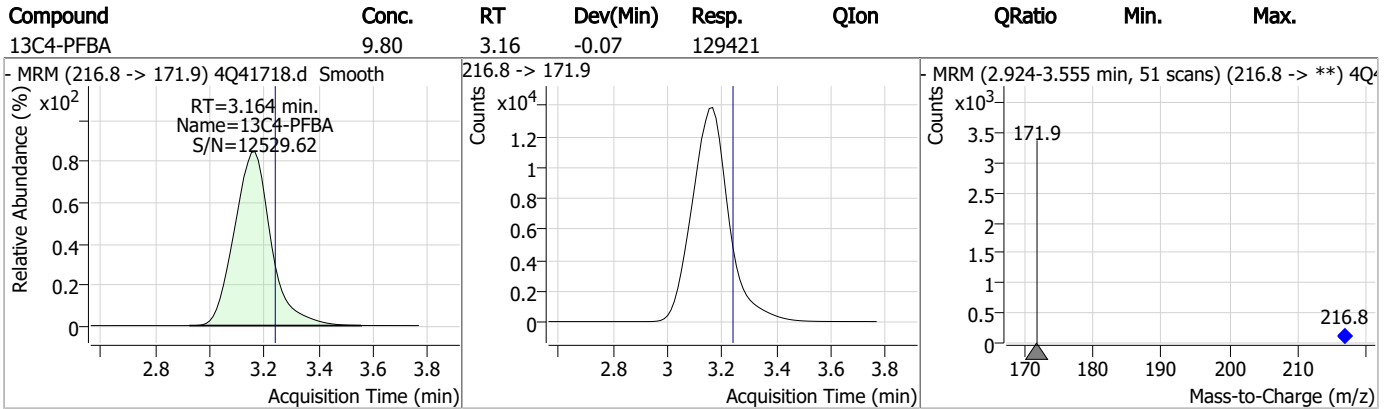
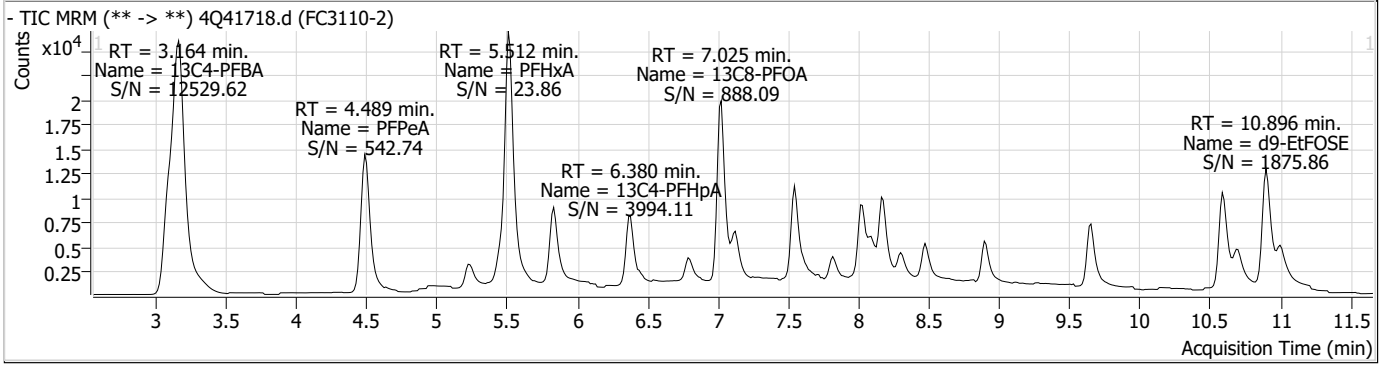
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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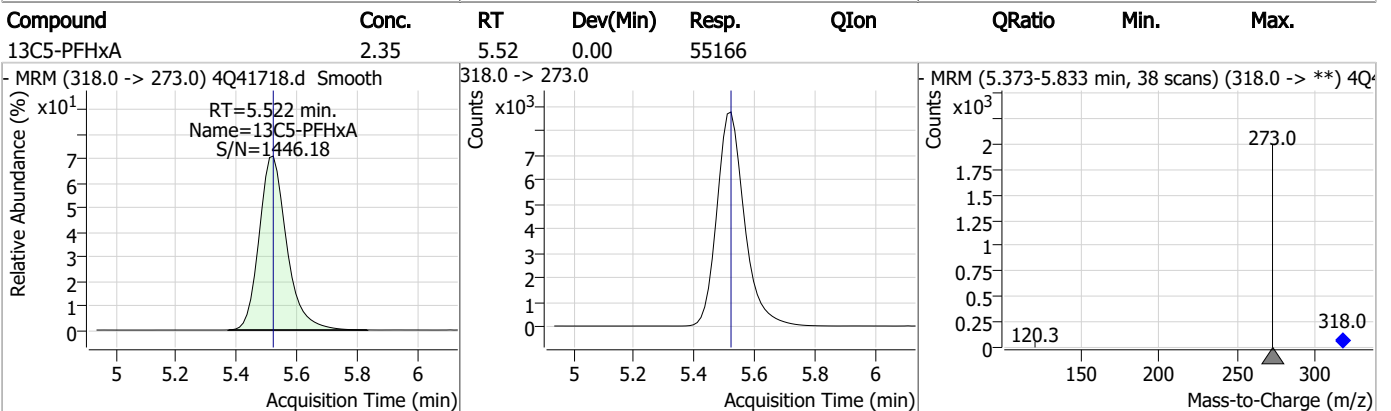
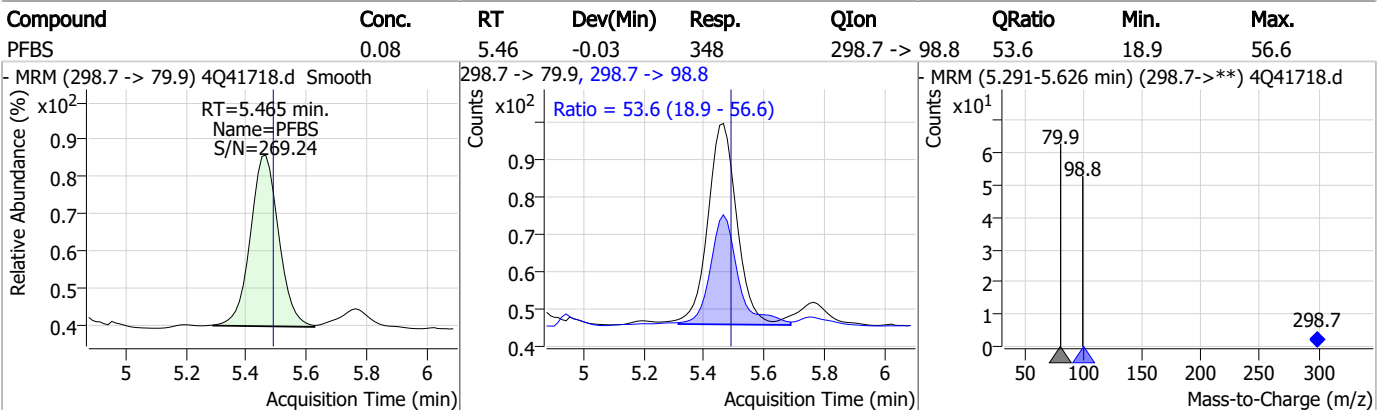
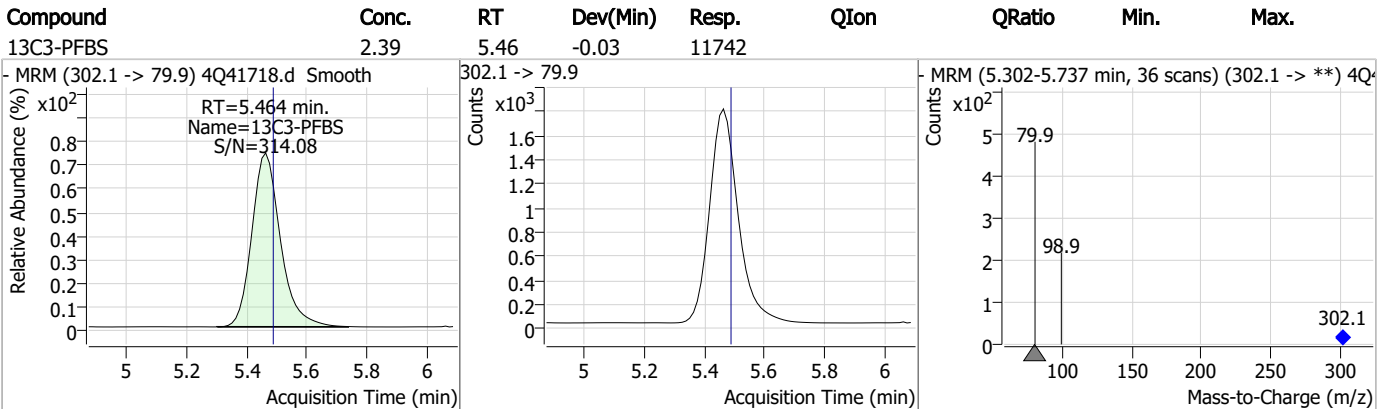
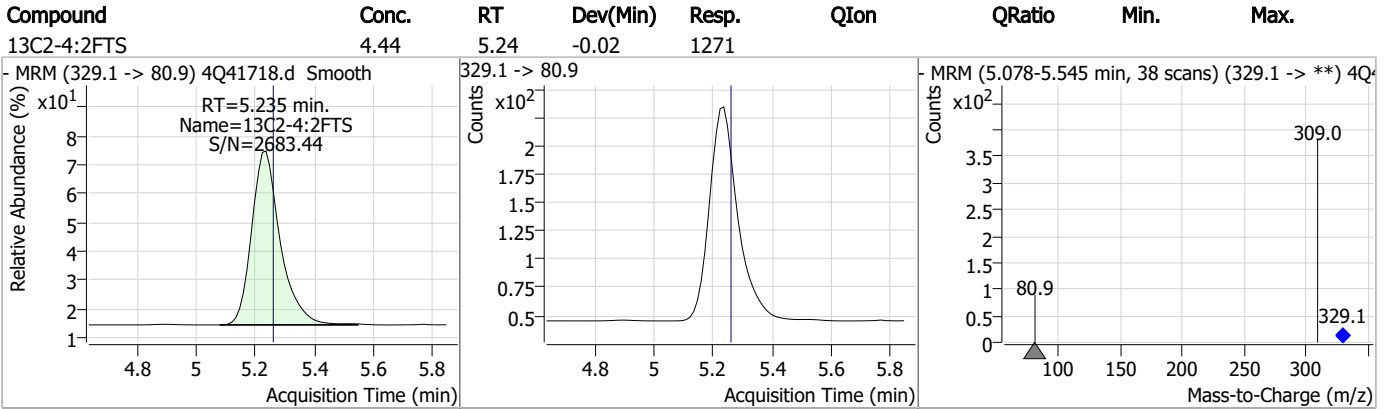
7.1.2
7



Perfluorinated Compounds by LC/MS/MS

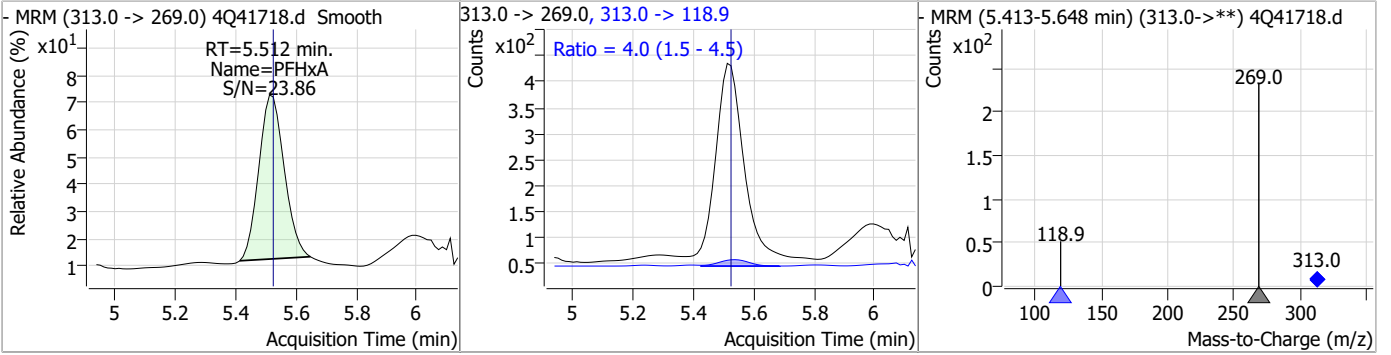


Perfluorinated Compounds by LC/MS/MS

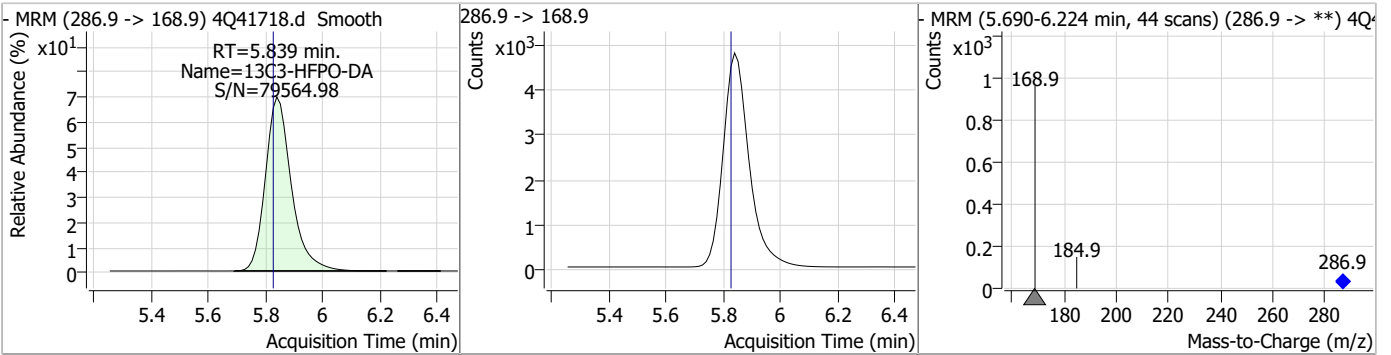


Perfluorinated Compounds by LC/MS/MS

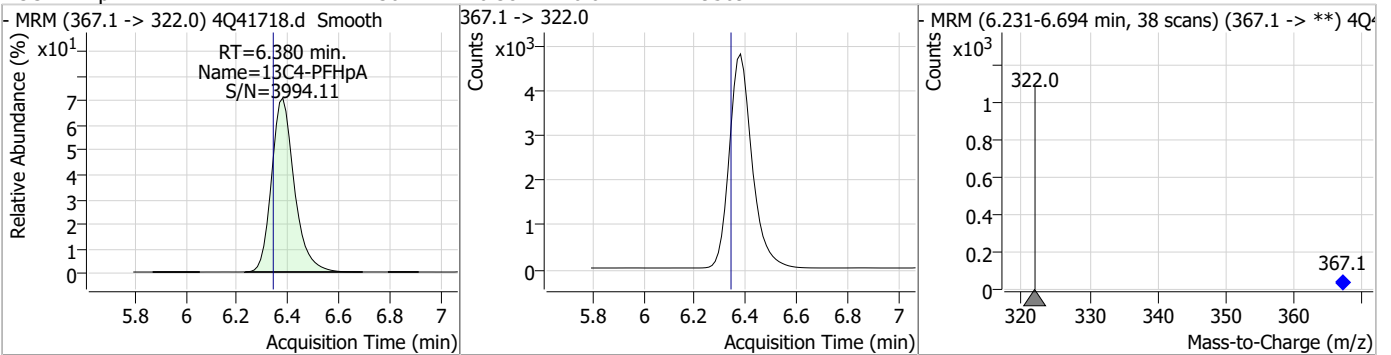
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	0.12	5.51	-0.01	2103	313.0 -> 118.9	4.0	1.5	4.5



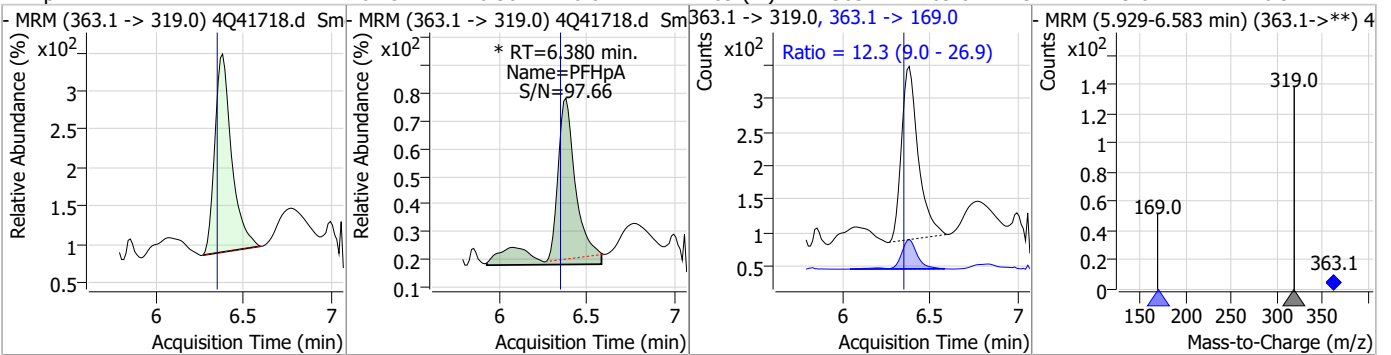
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	11.05	5.84	0.01	30216				



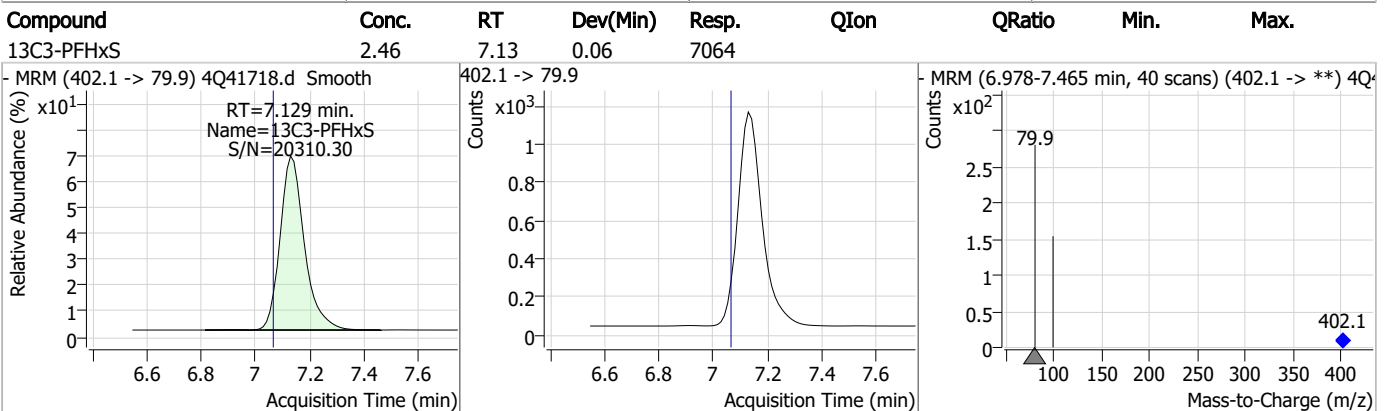
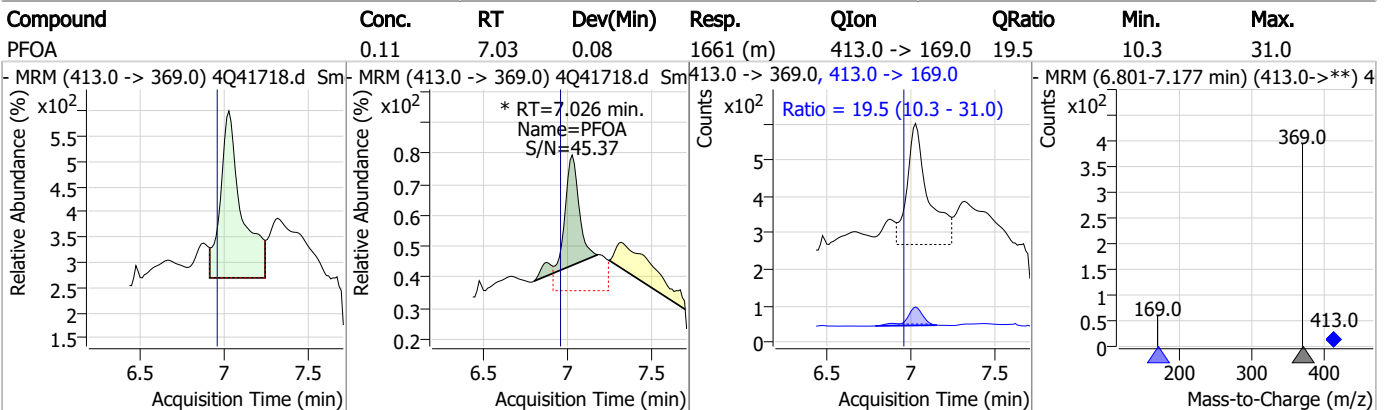
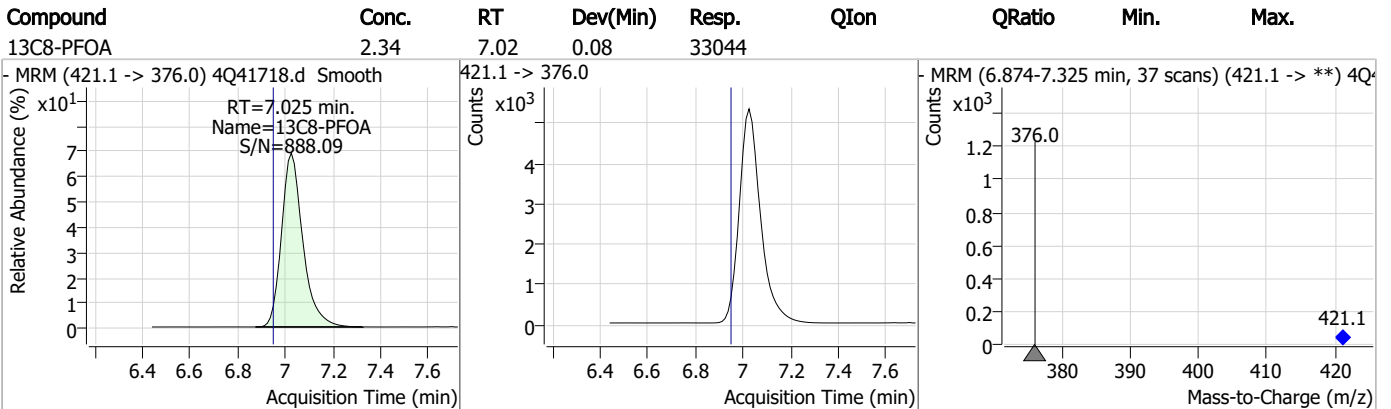
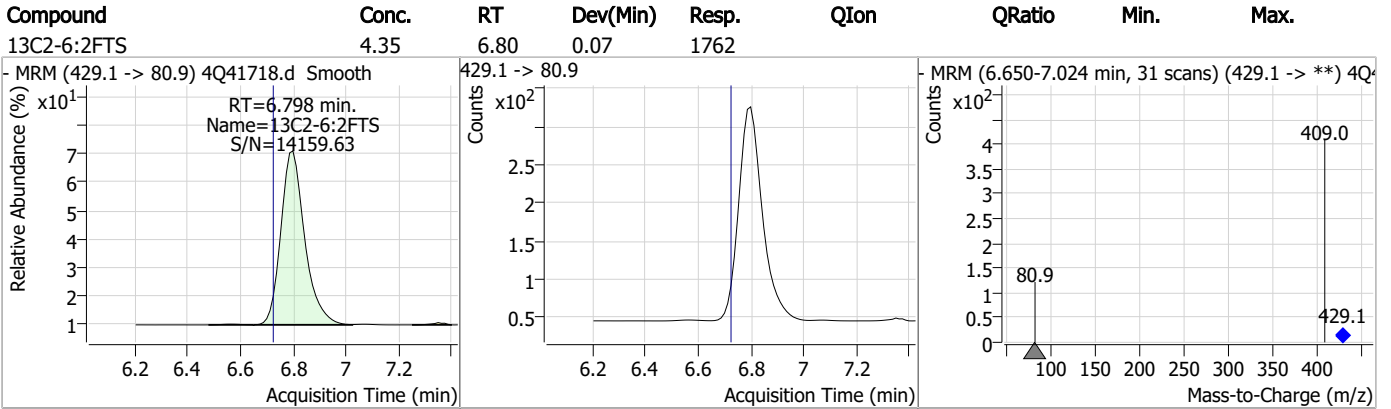
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C4-PFHpA	2.30	6.38	0.04	29509				



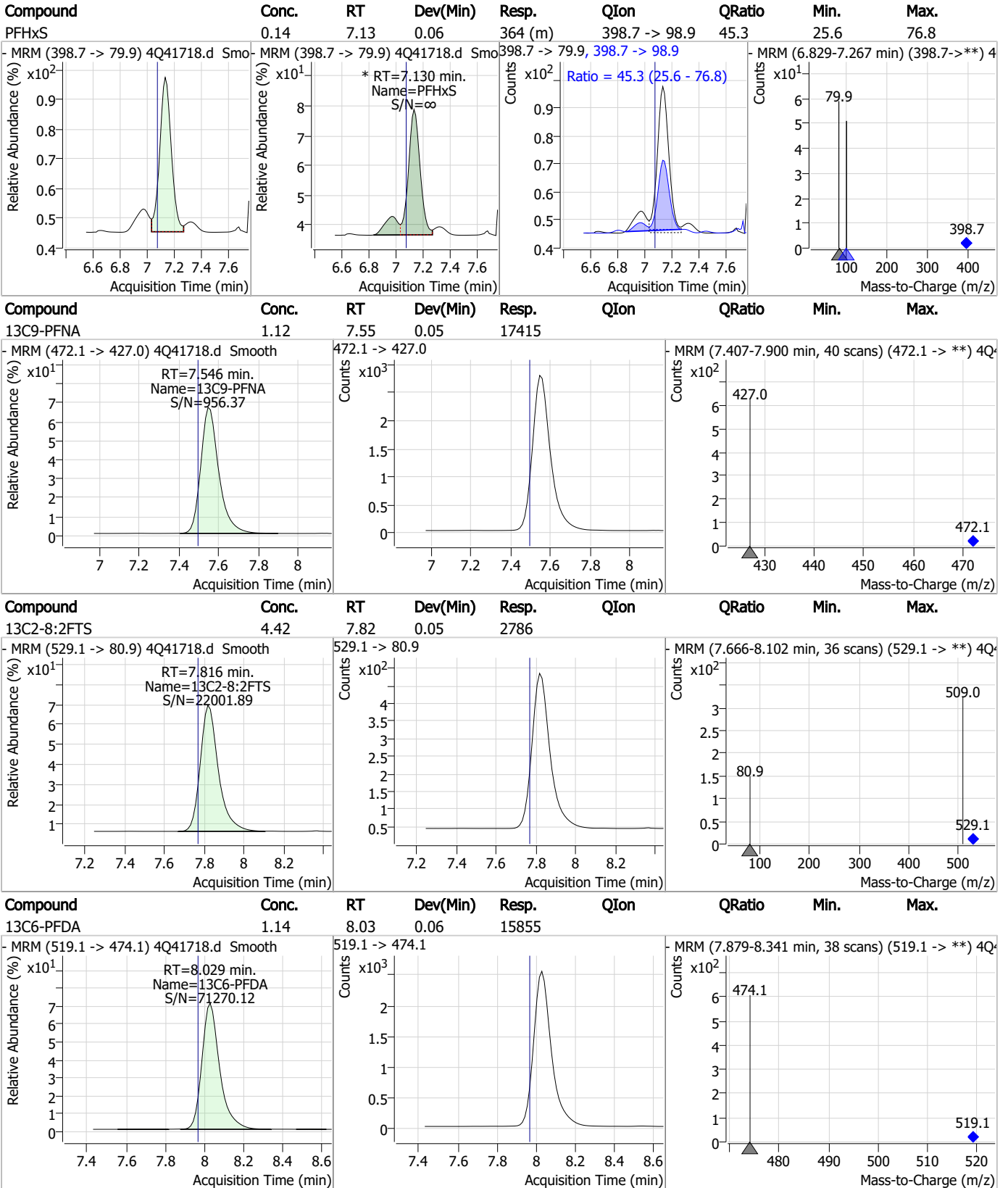
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	0.15	6.38	0.04	2289 (m)	363.1 -> 169.0	12.3	9.0	26.9



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

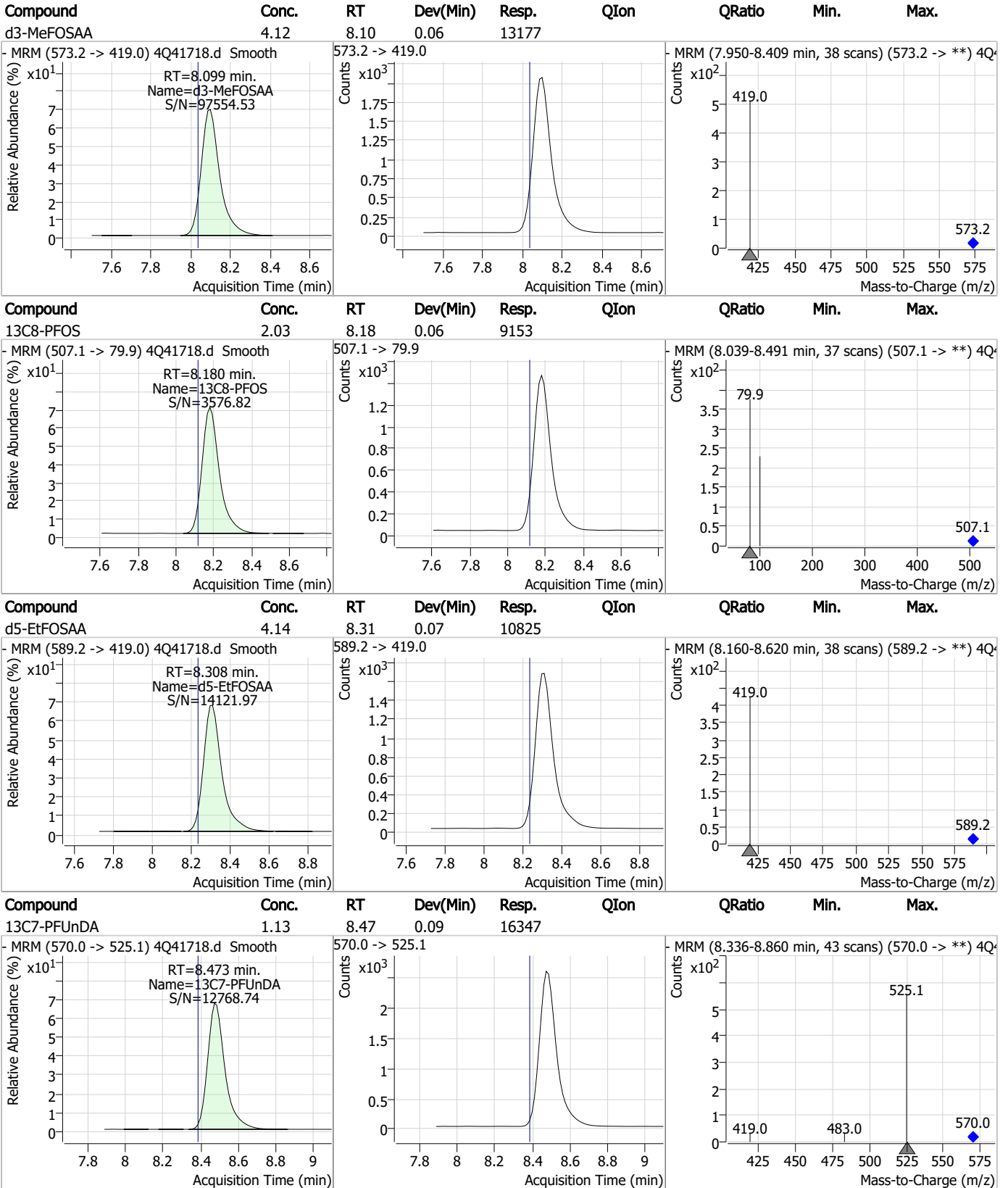


7.1.2

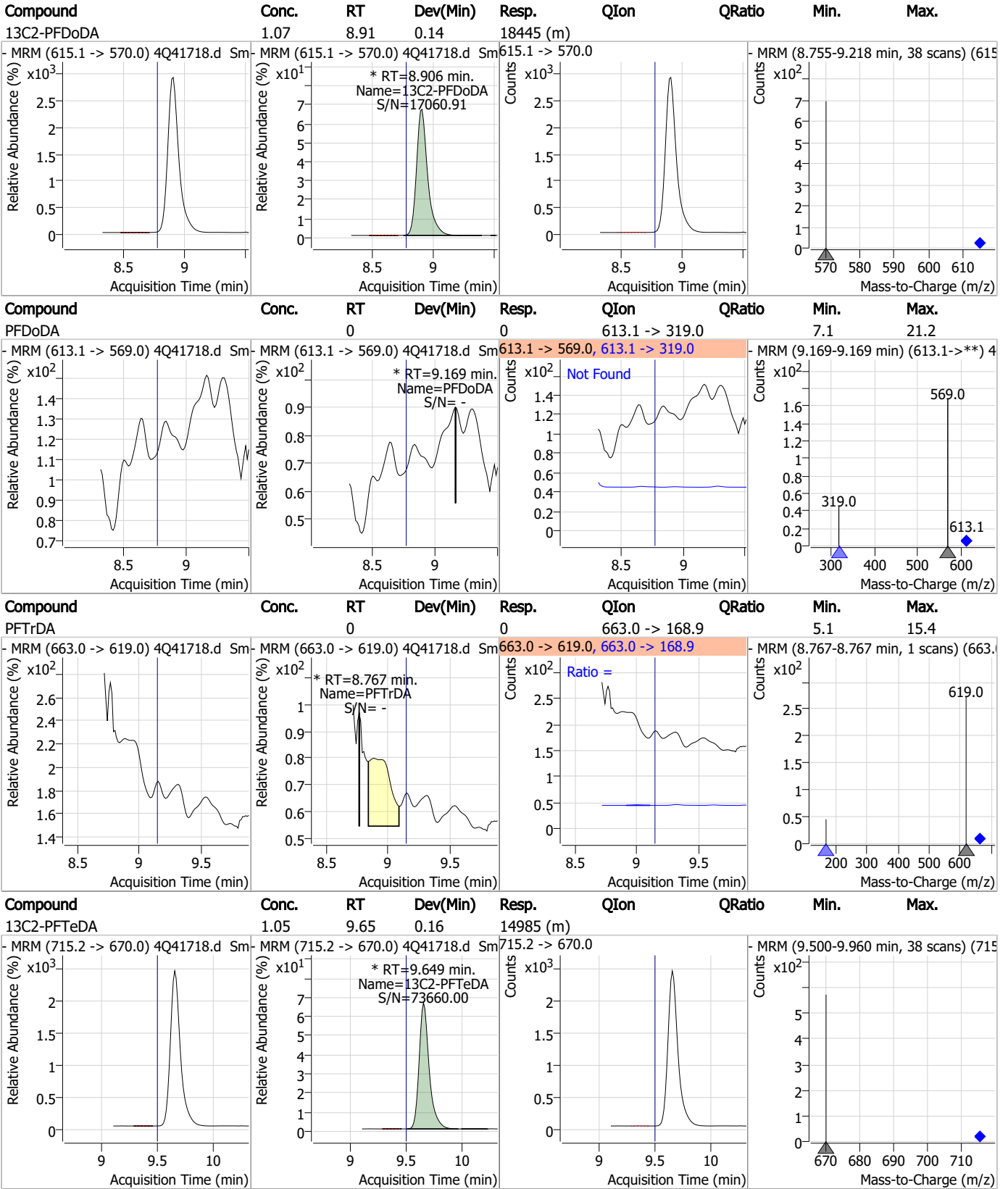
7



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

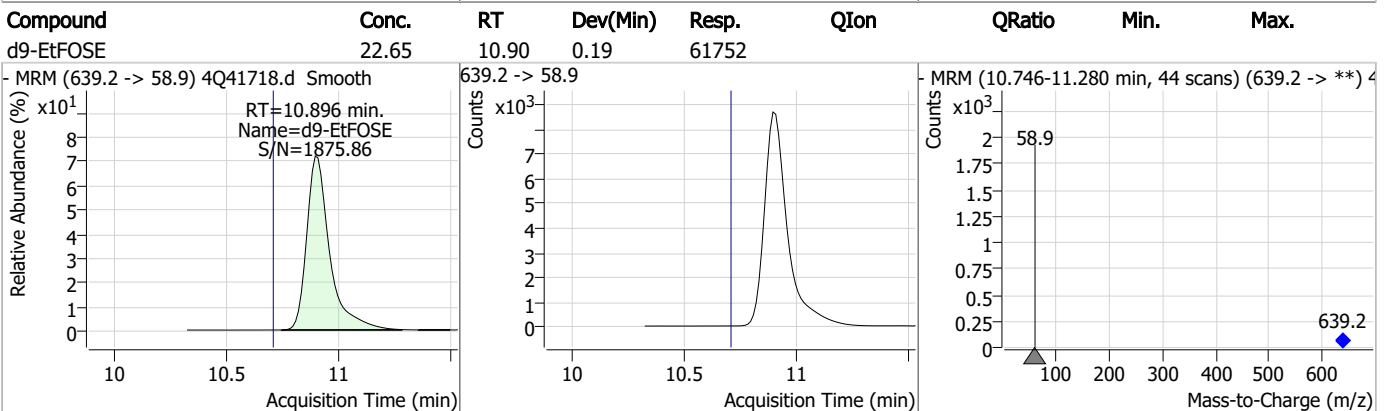
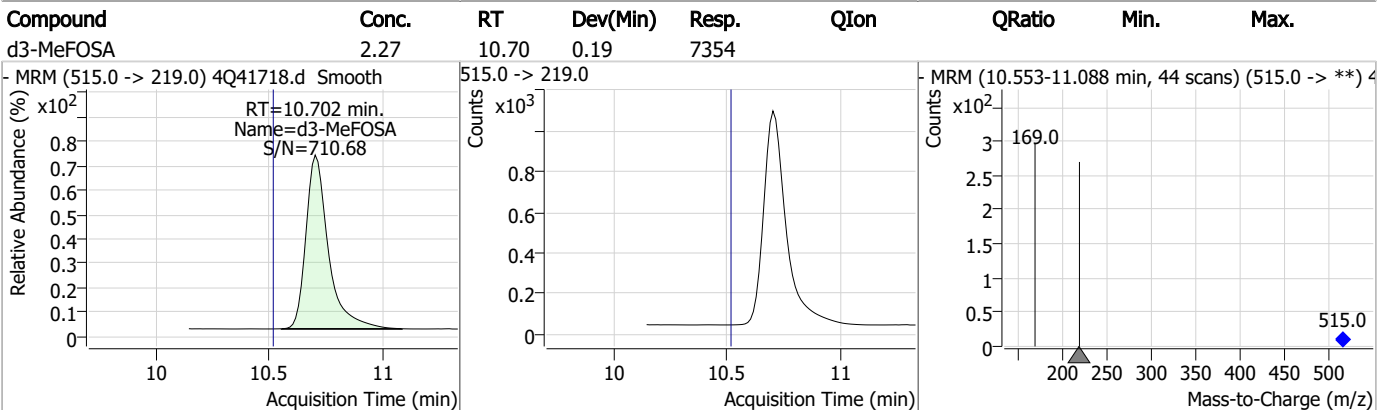
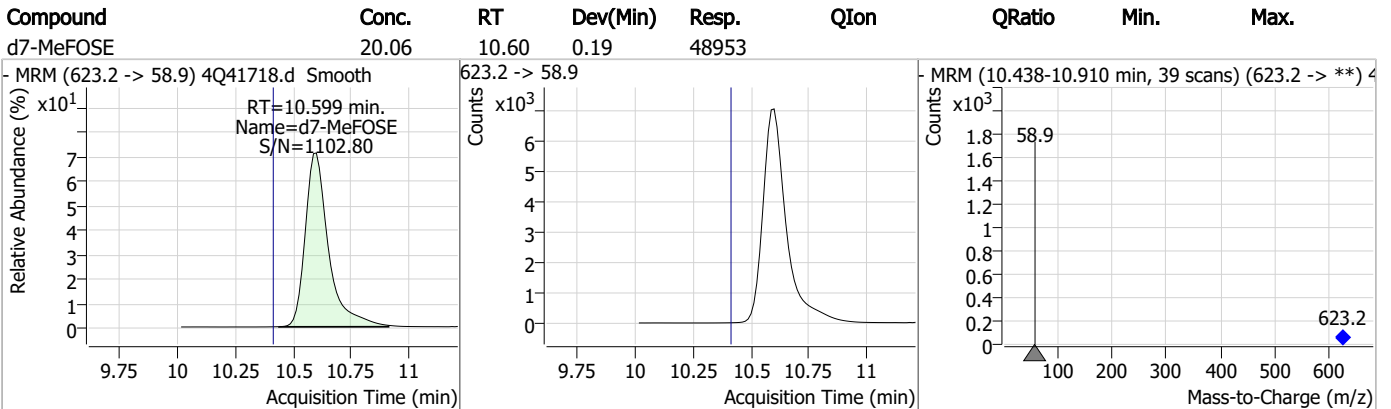
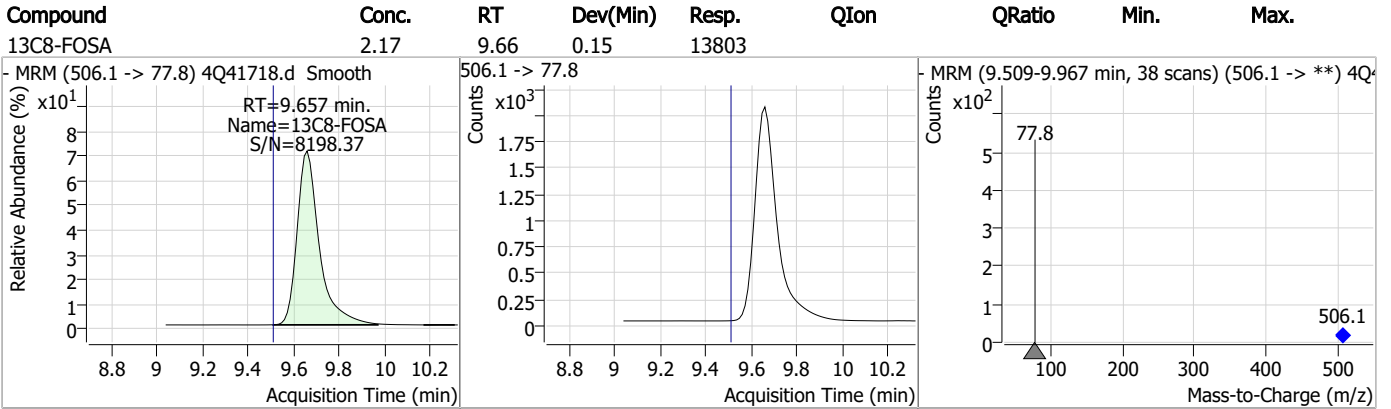


7.1.2

7

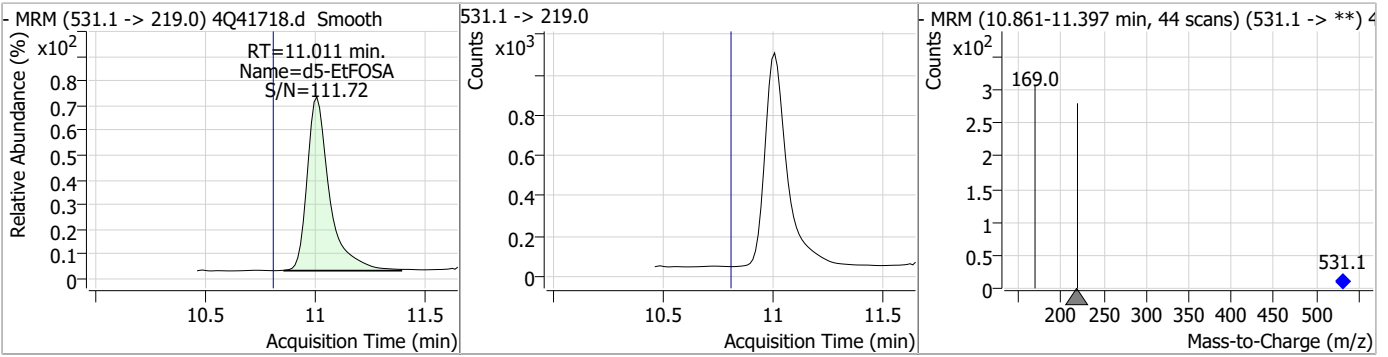


Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.20	11.01	0.20	7550				



7.1.2
7

Manual Integration Approval Summary

Sample Number: FC3110-2 Method: EPA DRAFT 1633
Lab FileID: 4Q41718.D Analyst approved: 03/08/23 11:25 Anna Ludwig
Injection Time: 03/06/23 20:19 Supervisor approved: 03/08/23 11:27 Natasha Gumtie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoroheptanoic acid	375-85-9		6.38	Split peak
Perfluorooctanoic acid	335-67-1		7.03	Split peak
Perfluorohexanesulfonic acid	355-46-4		7.13	Split peak
13C2-PFDoDA			8.91	Poor instrument integration
13C2-PFTeDA			9.65	Poor instrument integration

7.1.2.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41721.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 9:02:04 PM
 Sample Name : FC3110-3
 Vial : P6-B2
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,565,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	137661	10.00 µg/L	-0.087
M5-PFPeA	4.487	268.3 -> 223.0	69822	5.00 µg/L	-0.087
M5-PFHxA	5.522	318.0 -> 273.0	59479	2.50 µg/L	0.000
M4-PFHpA	6.392	367.1 -> 322.0	32113	2.50 µg/L	0.050
M8-PFOA	7.025	421.1 -> 376.0	34168	2.50 µg/L	0.076
M9-PFNA	7.546	472.1 -> 427.0	19056	1.25 µg/L	0.050
M6-PFDA	8.016	519.1 -> 474.1	17024	1.25 µg/L	0.049
M7-PFUnDA	8.461	570.0 -> 525.1	18165	1.25 µg/L	0.075
M2-PFDoDA	8.881	615.1 -> 570.0	19686	1.25 µg/L	0.113
M2-PFTeDA	9.637	715.2 -> 670.0	15770	1.25 µg/L	0.149
M8-FOSA	9.645	506.1 -> 77.8	14652	2.50 µg/L	0.136
M3-PFBS	5.464	302.1 -> 79.9	12929	2.50 µg/L	-0.025
M3-PFHxS	7.129	402.1 -> 79.9	7808	2.50 µg/L	0.064
M8-PFOS	8.167	507.1 -> 79.9	10559	2.50 µg/L	0.049
M2-4:2FTS	5.235	329.1 -> 80.9	1580	5.00 µg/L	-0.024
M2-6:2FTS	6.798	429.1 -> 80.9	2238	5.00 µg/L	0.074
M2-8:2FTS	7.803	529.1 -> 80.9	3363	5.00 µg/L	0.037
M3-MeFOSAA	8.074	573.2 -> 419.0	14209	5.00 µg/L	0.037
M3-HFPO-DA	5.852	286.9 -> 168.9	32676	10.00 µg/L	0.025
M5-EtFOSAA	8.283	589.2 -> 419.0	11180	5.00 µg/L	0.049
M7-MeFOSE	10.599	623.2 -> 58.9	52843	25.00 µg/L	0.186
M9-EtFOSE	10.908	639.2 -> 58.9	64546	25.00 µg/L	0.199
M5-EtFOSA	11.023	531.1 -> 219.0	8210	2.50 µg/L	0.211
M3-MeFOSA	10.715	515.0 -> 219.0	7651	2.50 µg/L	0.199
13C4-PFOS	8.167	502.8 -> 79.9	11919	2.50 µg/L	0.049
13C3-PFBA	3.155	216.0 -> 172.0	80935	5.00 µg/L	-0.087
18O2-PFHxS	7.141	403.0 -> 83.9	5915	2.50 µg/L	0.077
13C4-PFOA	7.025	417.1 -> 372.0	45032	2.50 µg/L	0.076
13C2-PFDA	8.004	515.1 -> 470.1	17489	1.25 µg/L	0.037
13C5-PFNA	7.547	468.0 -> 423.0	22976	1.25 µg/L	0.050
13C2-PFHxA	5.523	315.1 -> 270.0	55350	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.235	329.1 -> 80.9	1580	4.92 µg/L	-0.024
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 98.5%		
13C2-6:2FTS	6.798	429.1 -> 80.9	2238	4.92 µg/L	0.074
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 98.5%		
13C2-8:2FTS	7.803	529.1 -> 80.9	3363	4.75 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 95.1%		
13C2-PFDoDA	8.881	615.1 -> 570.0	19686	1.06 µg/L	0.113
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 85.2%		
13C2-PFTeDA	9.637	715.2 -> 670.0	15770	1.03 µg/L	0.149
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 82.7%		
13C3-PFBS	5.464	302.1 -> 79.9	12929	2.35 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 94.0%		
13C3-PFHxS	7.129	402.1 -> 79.9	7808	2.43 µg/L	0.064

7.1.3
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.1%	
13C4-PFBA	3.152	216.8 -> 171.9	137661	9.90 µg/L	-0.087
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.0%	
13C4-PFHpA	6.392	367.1 -> 322.0	32113	2.45 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.8%	
13C5-PFHxA	5.522	318.0 -> 273.0	59479	2.48 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.0%	
13C5-PFPeA	4.487	268.3 -> 223.0	69822	4.62 µg/L	-0.087
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 92.4%	
13C6-PFDA	8.016	519.1 -> 474.1	17024	1.14 µg/L	0.049
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 90.9%	
13C7-PFUnDA	8.461	570.0 -> 525.1	18165	1.17 µg/L	0.075
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 93.7%	
13C8-FOSA	9.645	506.1 -> 77.8	14652	2.21 µg/L	0.136
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.4%	
13C8-PFOA	7.025	421.1 -> 376.0	34168	2.29 µg/L	0.076
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 91.8%	
13C8-PFOS	8.167	507.1 -> 79.9	10559	2.25 µg/L	0.049
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.0%	
13C9-PFNA	7.546	472.1 -> 427.0	19056	1.19 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 94.9%	
d3-MeFOSAA	8.074	573.2 -> 419.0	14209	4.27 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 85.4%	
13C3-HFPO-DA	5.852	286.9 -> 168.9	32676	11.66 µg/L	0.025
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 116.6%	
d3-MeFOSA	10.715	515.0 -> 219.0	7651	2.27 µg/L	0.199
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.7%	
d5-EtFOSAA	8.283	589.2 -> 419.0	11180	4.11 µg/L	0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.3%	
d7-MeFOSE	10.599	623.2 -> 58.9	52843	20.82 µg/L	0.186
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 83.3%	
d9-EtFOSE	10.908	639.2 -> 58.9	64546	22.76 µg/L	0.199
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 91.0%	
d5-EtFOSA	11.023	531.1 -> 219.0	8210	2.30 µg/L	0.211
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.2%	

Target Compounds

QValue

4:2FTS	-	327.1 -> 307.0 327.1 -> 80.9	-	N.D.	
6:2FTS	-	427.1 -> 407.0 427.1 -> 80.9	-	N.D.	
8:2FTS	-	527.1 -> 507.0 527.1 -> 80.8	-	N.D.	
EtFOSAA	-	584.2 -> 419.1 584.2 -> 526.0	-	N.D.	
FOSA	-	498.1 -> 77.9 498.1 -> 478.0	-	N.D.	
MeFOSAA	-	570.1 -> 419.0 570.1 -> 483.0	-	N.D.	
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	-	298.7 -> 79.9 298.7 -> 98.8	-	N.D.	
PFDA	-	512.9 -> 469.0 512.9 -> 219.0	-	N.D.	
PFDODA	-	613.1 -> 569.0 613.1 -> 319.0	-	N.D.	
PFDS	-	599.0 -> 79.9	-	N.D.	

7.1.3
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	-	449.0 -> 98.9	-	N.D.		
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	-	N.D.		
		398.7 -> 79.9				
PFNA	-	398.7 -> 98.9	-	N.D.		
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	7.314	548.8 -> 98.9	0	µg/L	m	1
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	-	N.D.		
		498.9 -> 79.9				
PFPeA	-	498.9 -> 98.8	-	N.D.		
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	9.140	713.1 -> 669.0	0	µg/L	m	1
		713.1 -> 168.9				
PFTrDA	-	663.0 -> 619.0	-	N.D.		
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

7.1.3
7

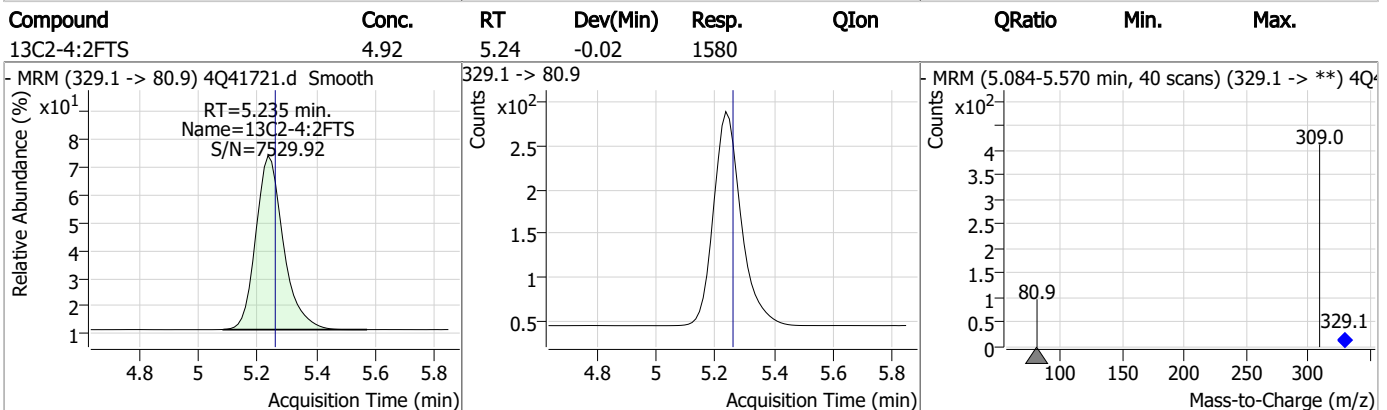
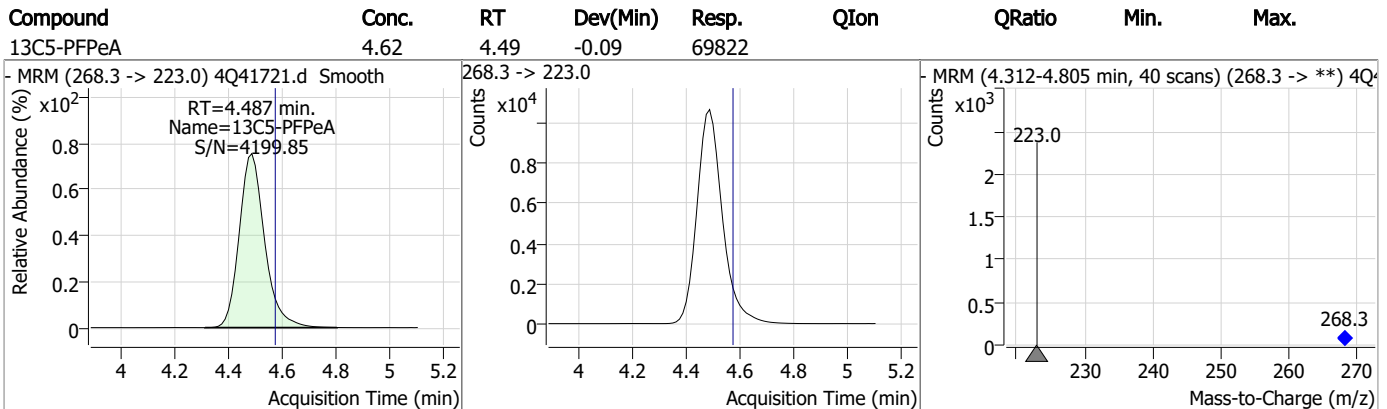
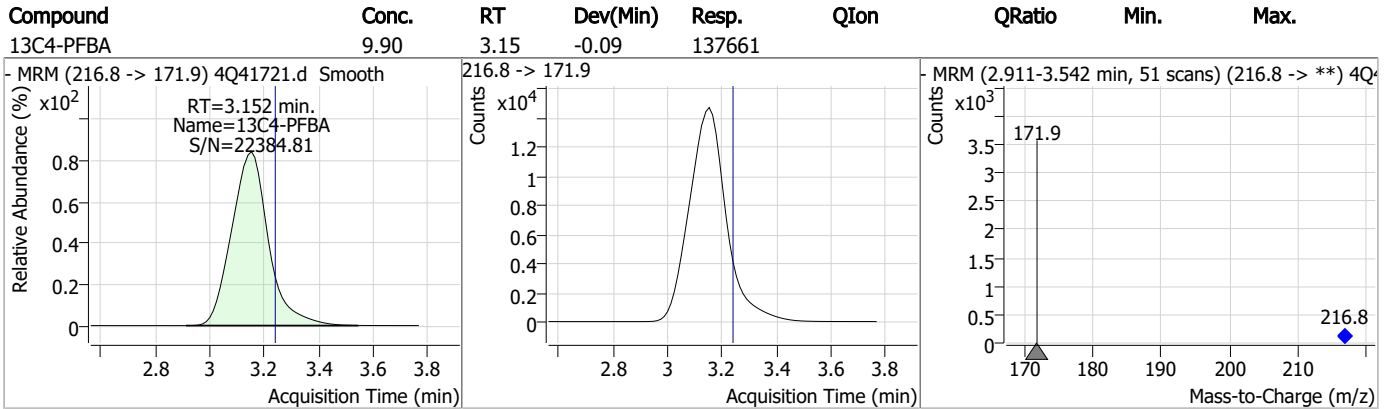
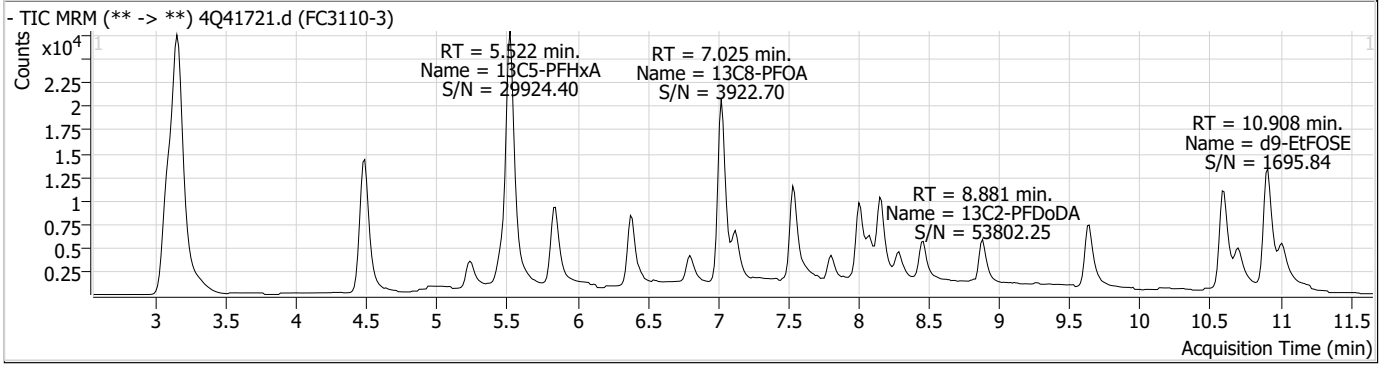
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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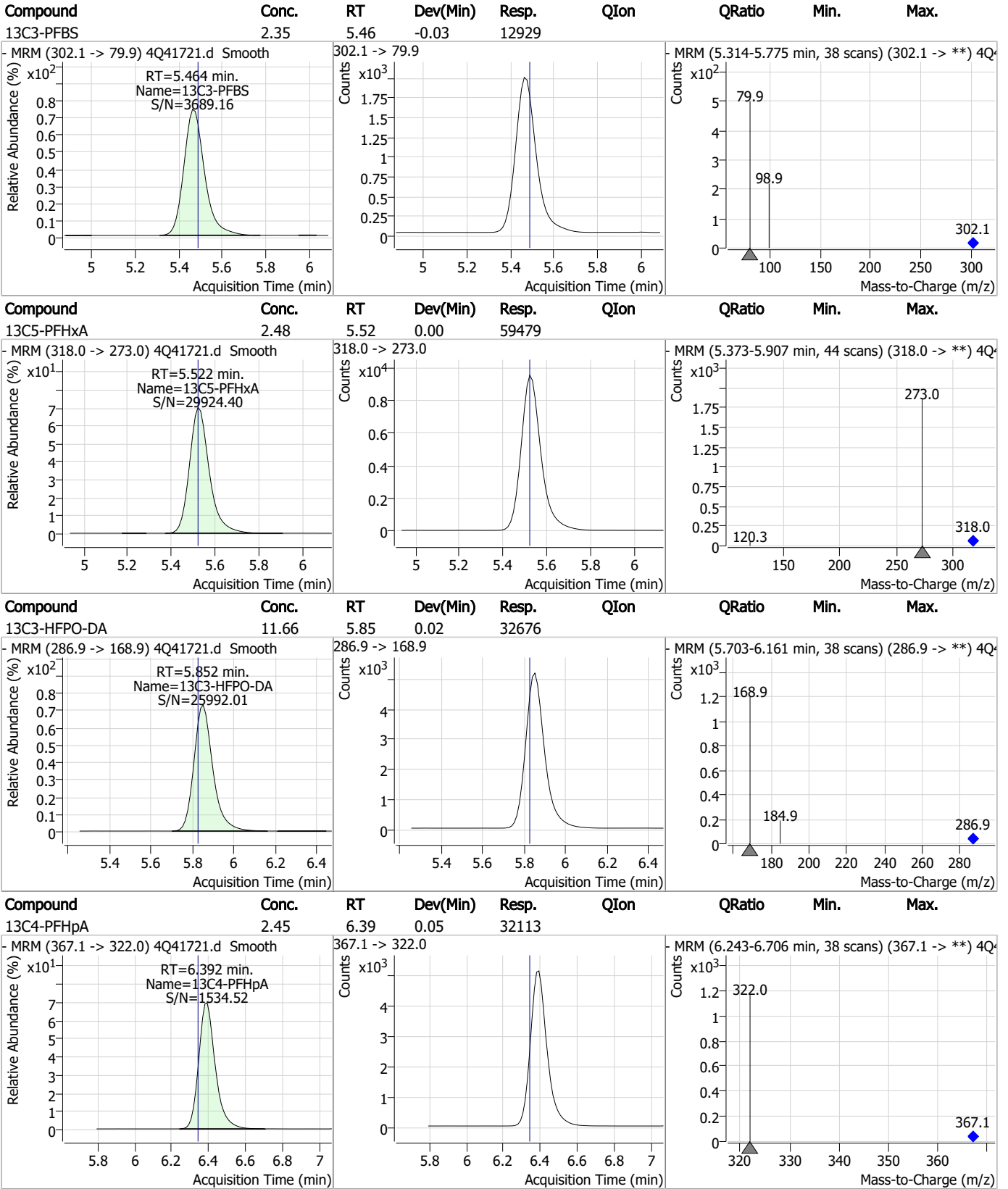
7.1.3
7



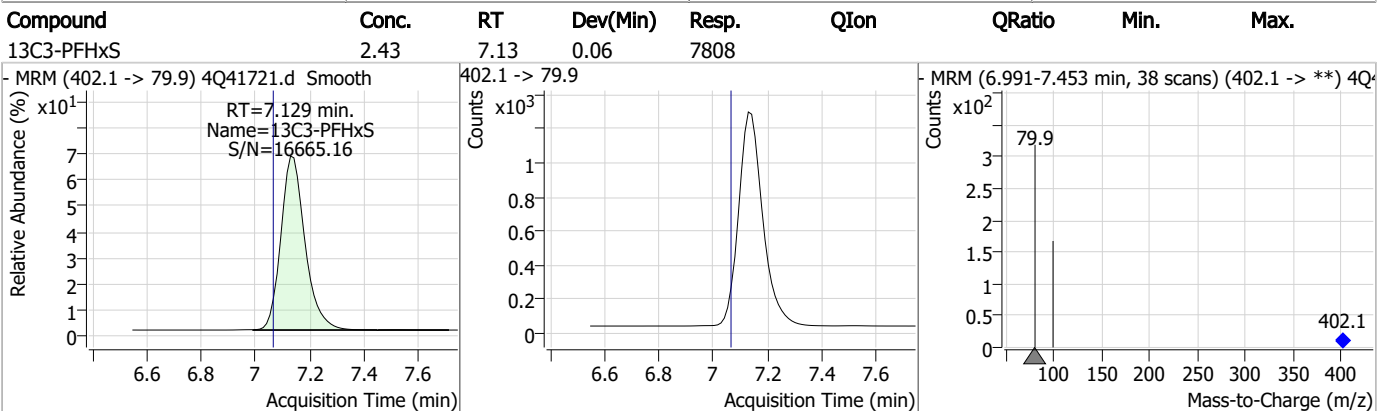
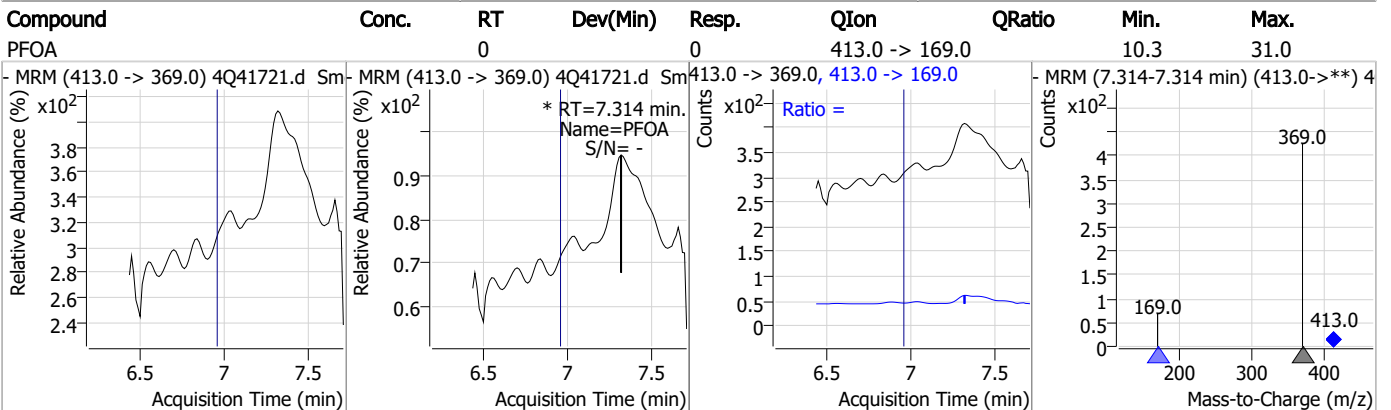
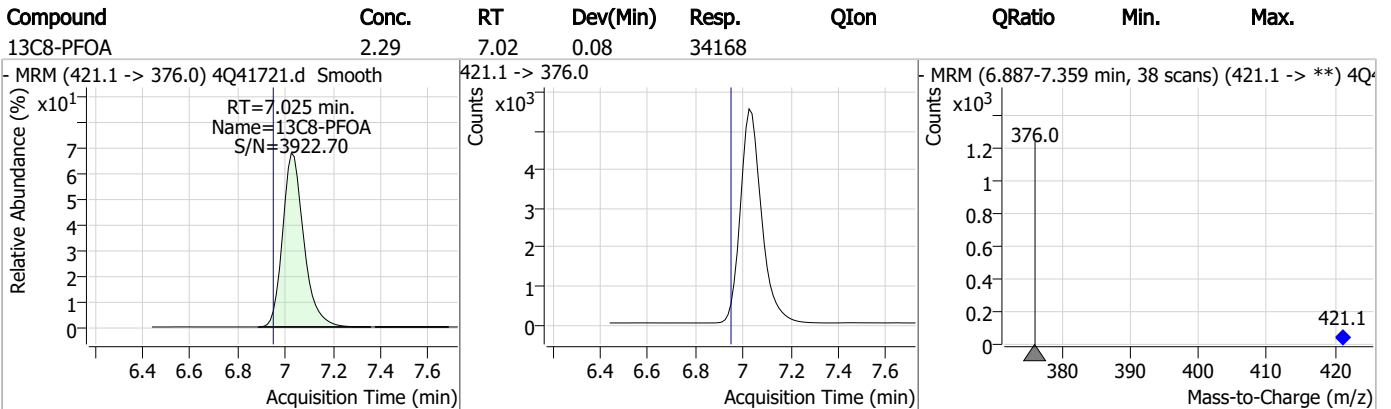
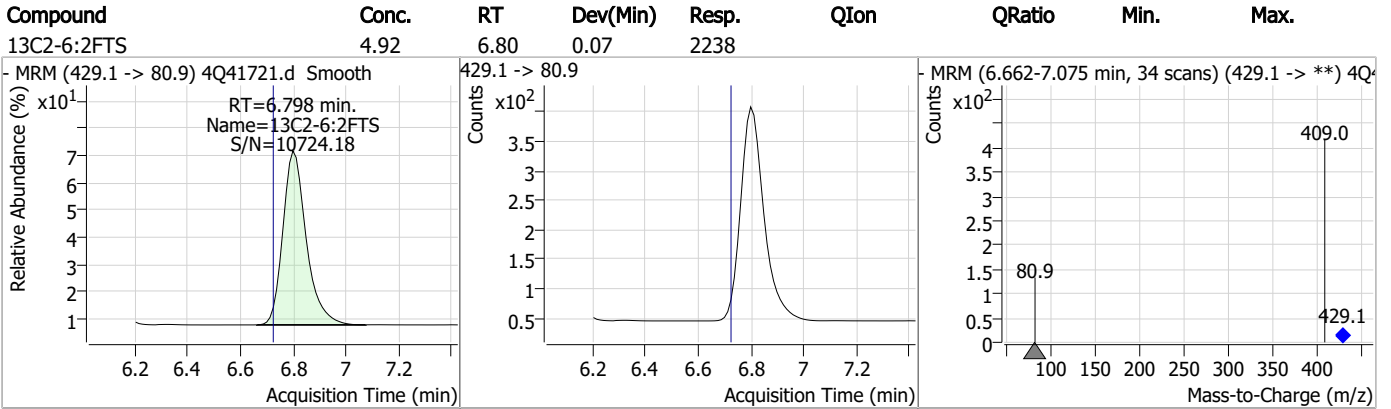
Perfluorinated Compounds by LC/MS/MS



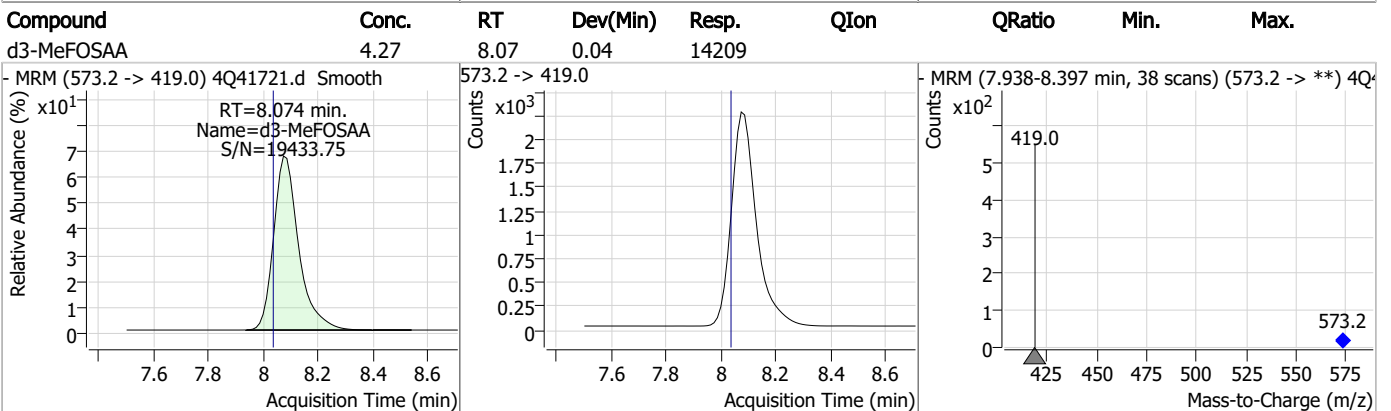
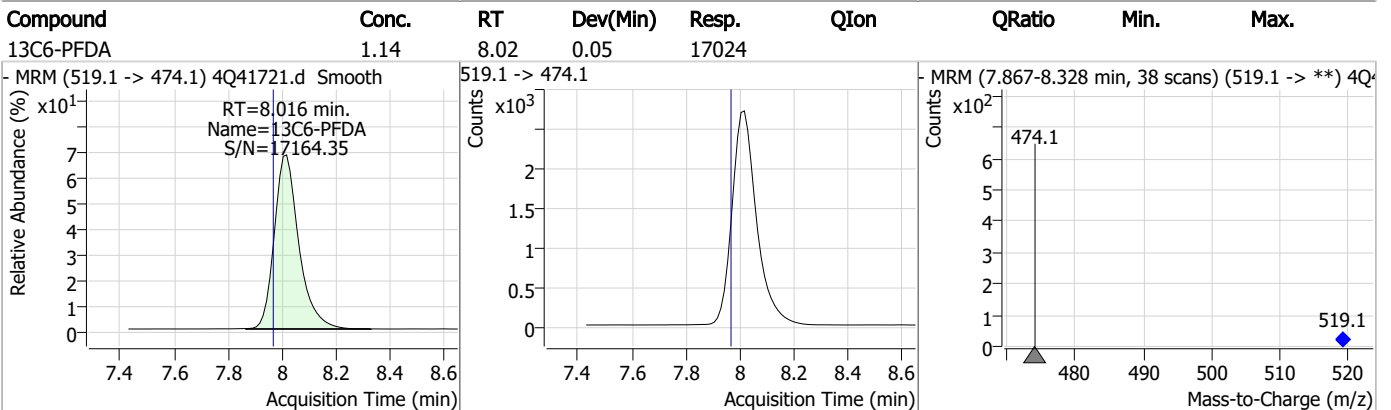
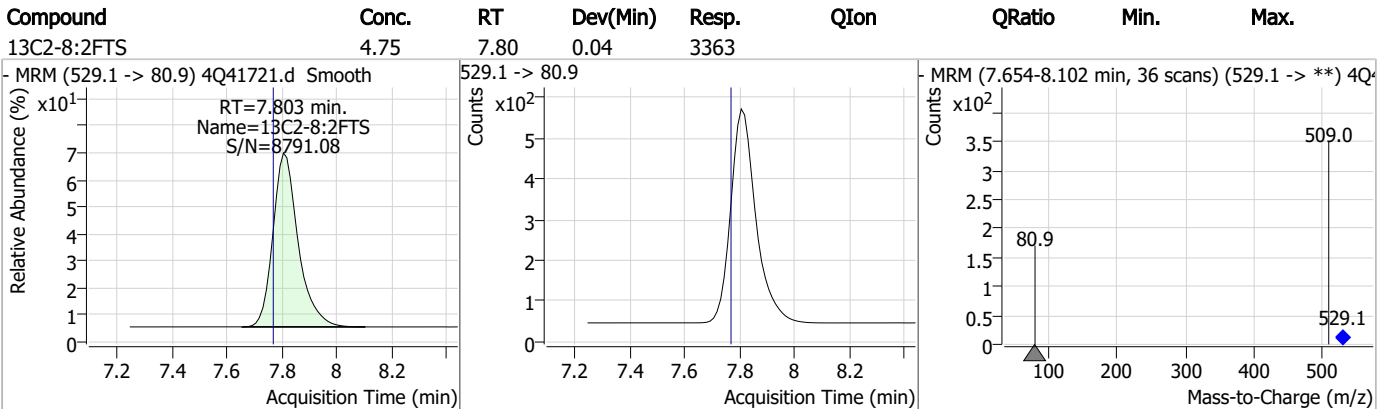
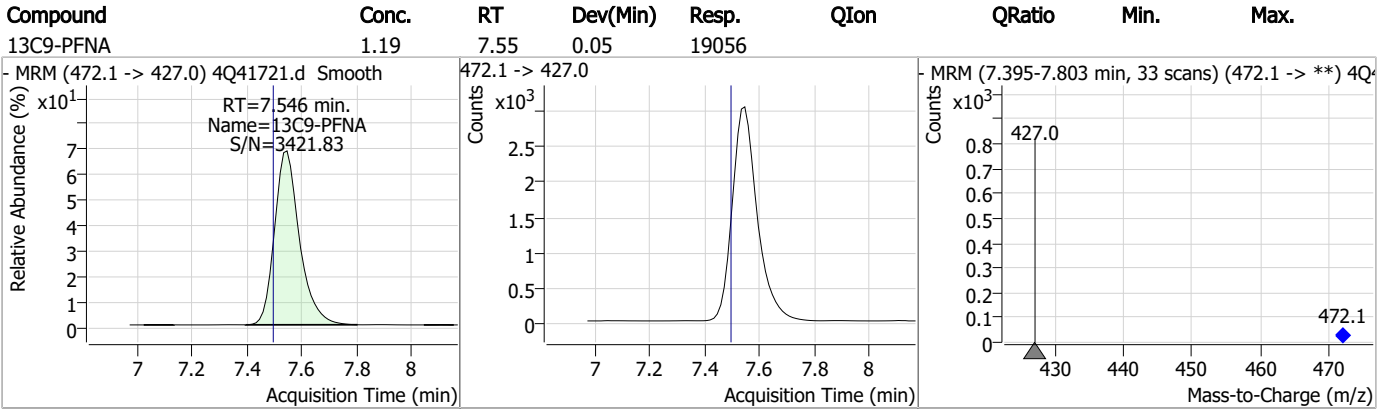
Perfluorinated Compounds by LC/MS/MS



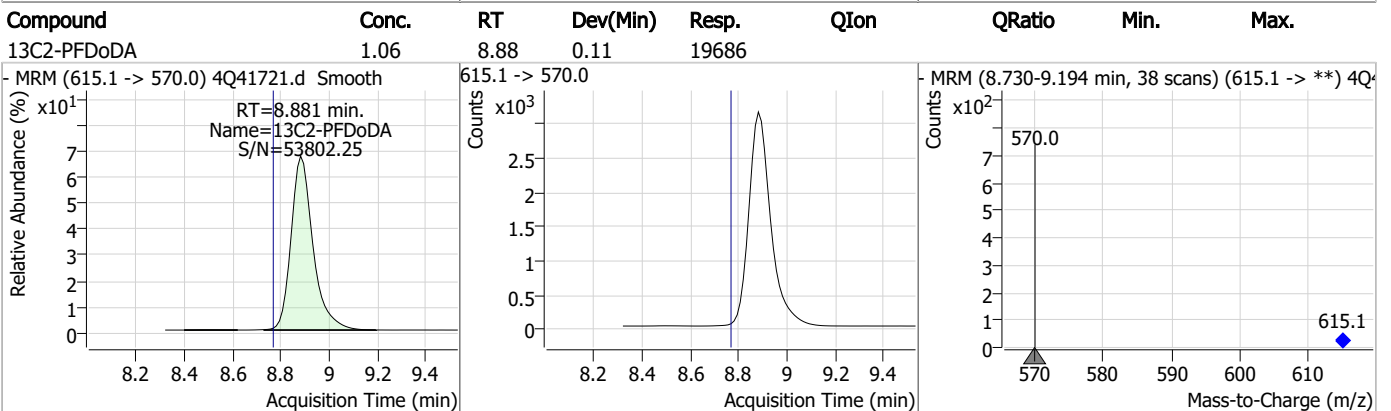
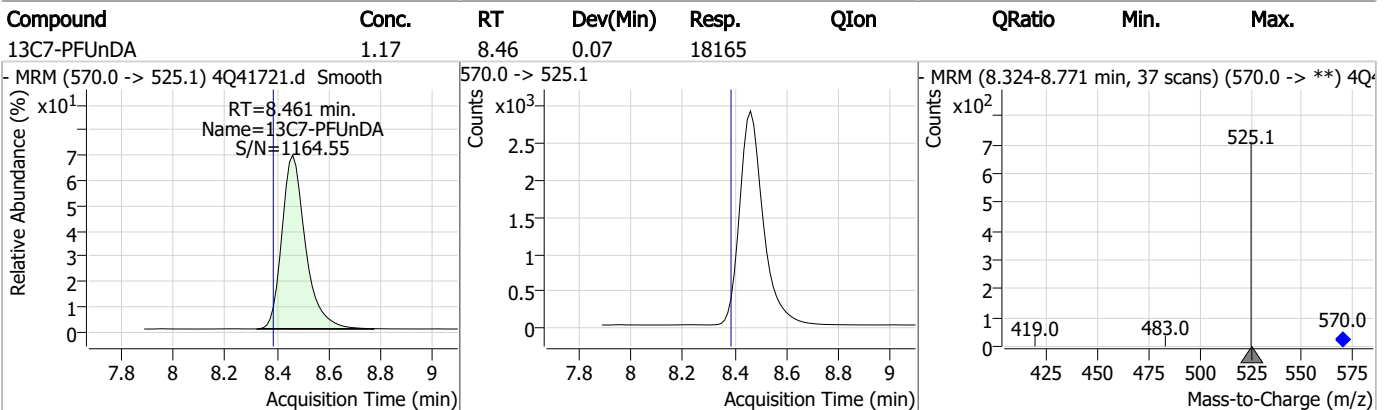
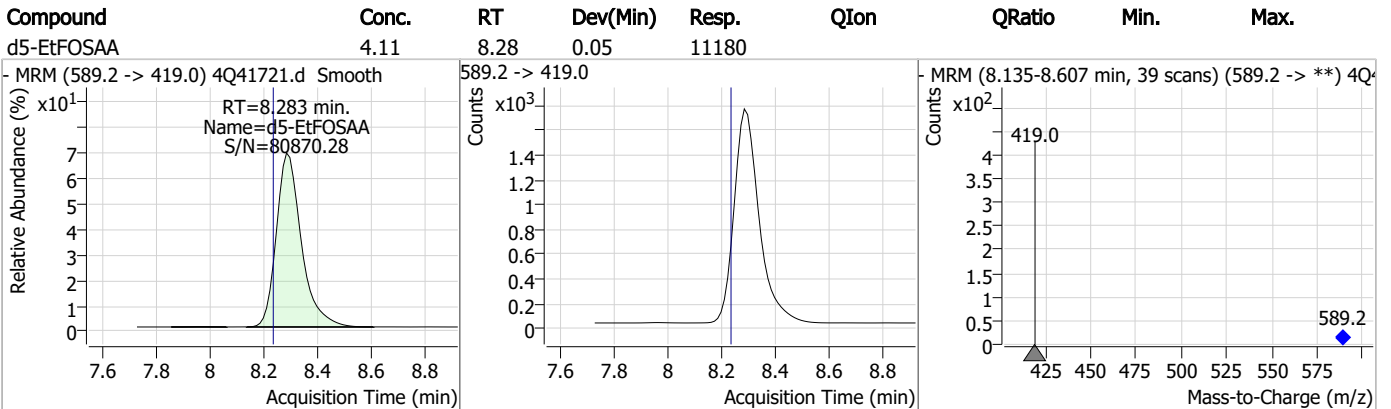
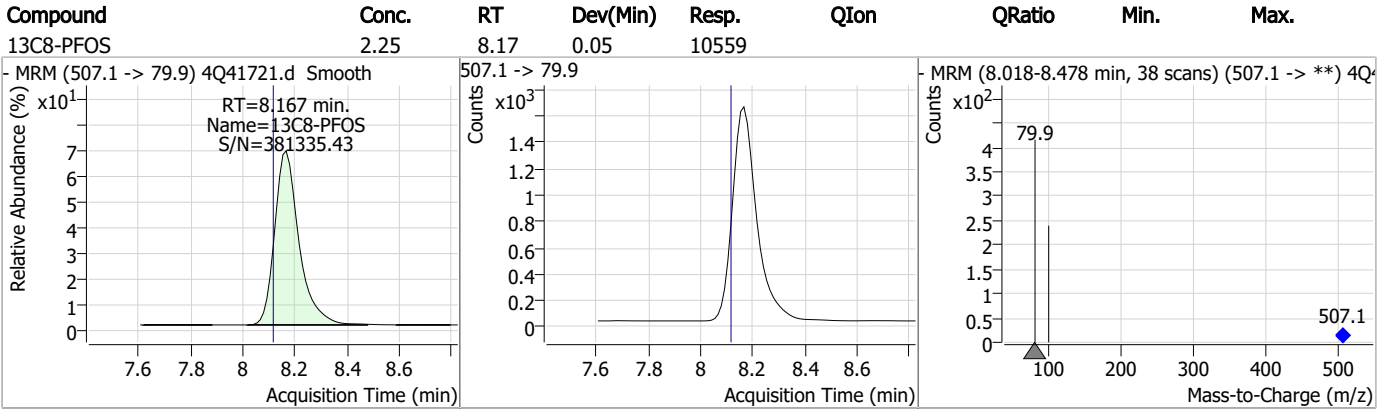
Perfluorinated Compounds by LC/MS/MS



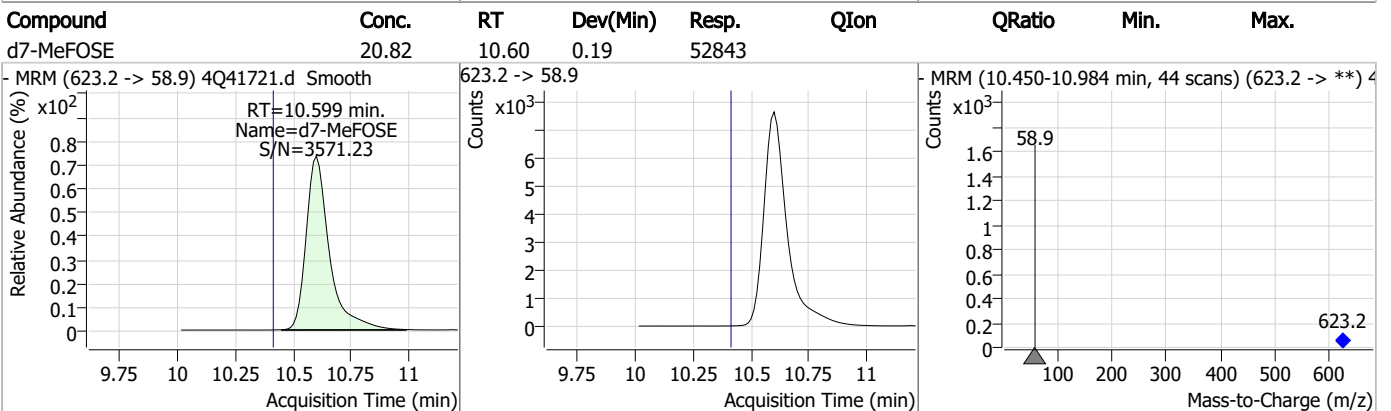
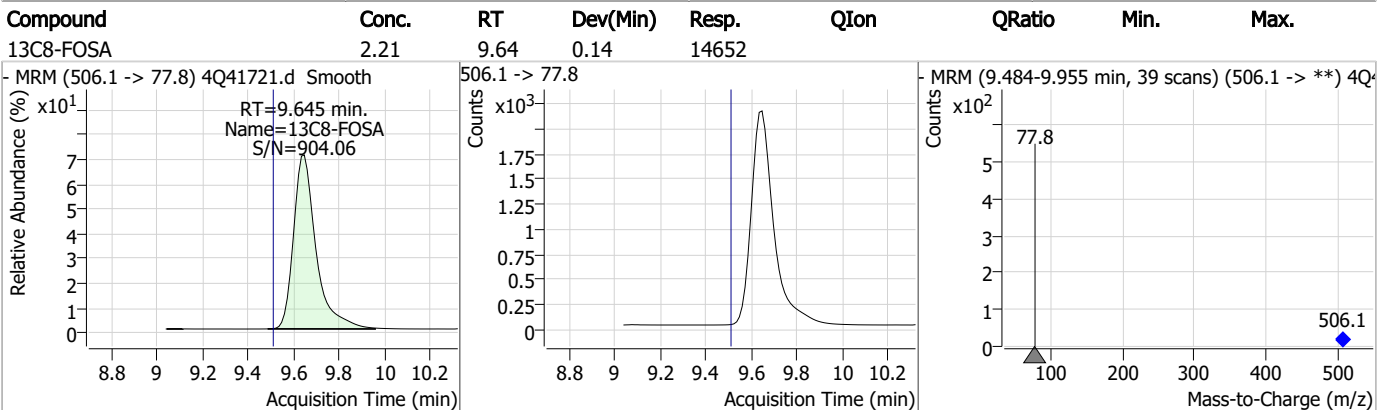
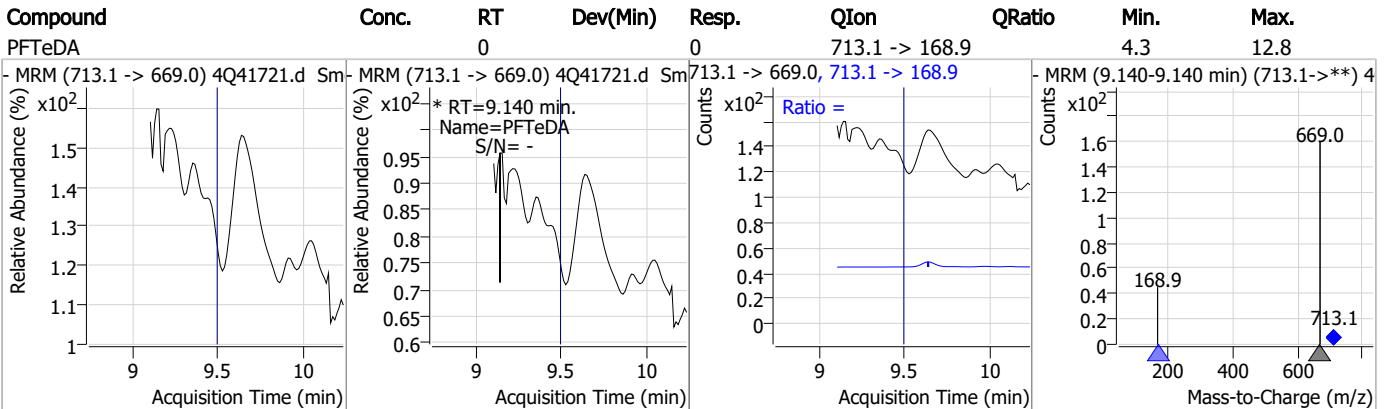
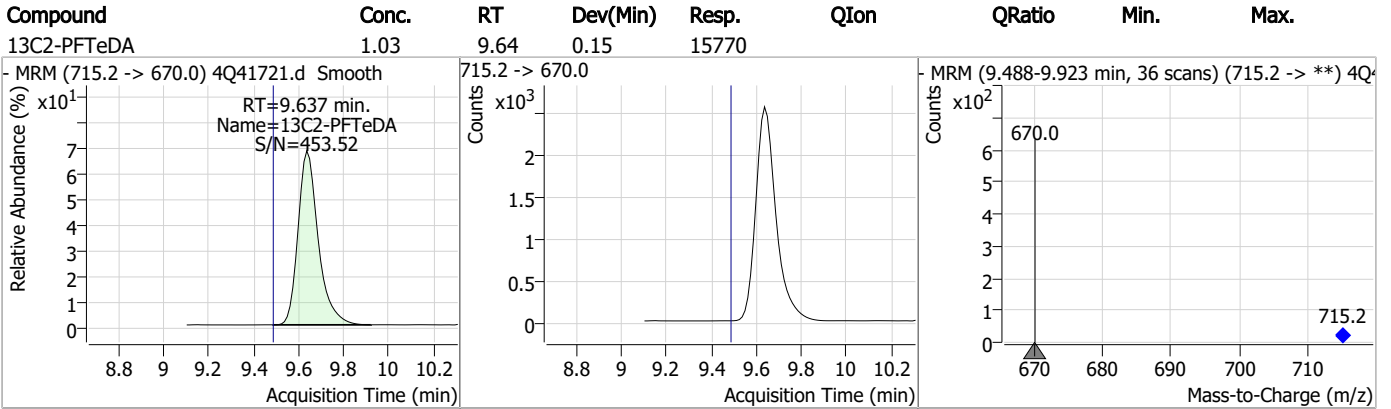
Perfluorinated Compounds by LC/MS/MS



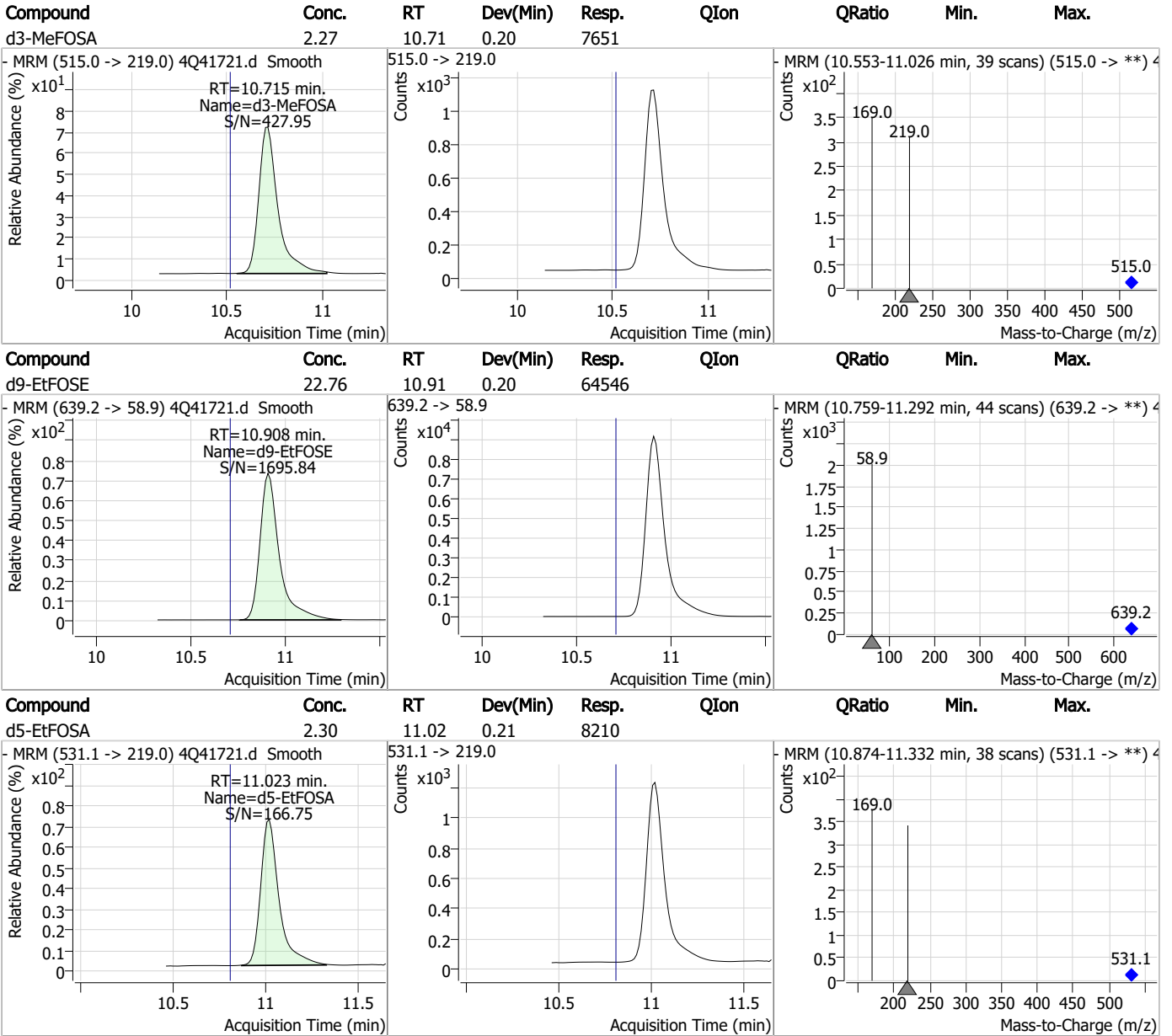
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41711.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 6:41:33 PM
 Sample Name : op95719-mb
 Vial : P6-A3
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.177	216.8 -> 171.9	139460	10.00 µg/L	0.066
M5-PFPeA	4.487	268.3 -> 223.0	70651	5.00 µg/L	0.025
M5-PFHxA	5.509	318.0 -> 273.0	58324	2.50 µg/L	0.000
M4-PFHpA	6.367	367.1 -> 322.0	31323	2.50 µg/L	0.000
M8-PFOA	7.012	421.1 -> 376.0	34209	2.50 µg/L	-0.012
M9-PFNA	7.534	472.1 -> 427.0	18158	1.25 µg/L	-0.012
M6-PFDA	8.016	519.1 -> 474.1	17426	1.25 µg/L	-0.012
M7-PFUnDA	8.448	570.0 -> 525.1	17422	1.25 µg/L	-0.025
M2-PFDoDA	8.868	615.1 -> 570.0	19376	1.25 µg/L	-0.037
M2-PFTeDA	9.637	715.2 -> 670.0	16122	1.25 µg/L	-0.037
M8-FOSA	9.632	506.1 -> 77.8	14518	2.50 µg/L	-0.025
M3-PFBS	5.451	302.1 -> 79.9	12571	2.50 µg/L	0.000
M3-PFHxS	7.117	402.1 -> 79.9	7773	2.50 µg/L	-0.013
M8-PFOS	8.167	507.1 -> 79.9	10291	2.50 µg/L	-0.013
M2-4:2FTS	5.223	329.1 -> 80.9	1445	5.00 µg/L	0.000
M2-6:2FTS	6.786	429.1 -> 80.9	2008	5.00 µg/L	0.000
M2-8:2FTS	7.803	529.1 -> 80.9	3153	5.00 µg/L	-0.025
M3-MeFOSAA	8.074	573.2 -> 419.0	13852	5.00 µg/L	-0.025
M3-HFPO-DA	5.827	286.9 -> 168.9	30571	10.00 µg/L	-0.012
M5-EtFOSAA	8.283	589.2 -> 419.0	11431	5.00 µg/L	-0.012
M7-MeFOSE	10.599	623.2 -> 58.9	52715	25.00 µg/L	-0.037
M9-EtFOSE	10.908	639.2 -> 58.9	65316	25.00 µg/L	-0.050
M5-EtFOSA	11.023	531.1 -> 219.0	8158	2.50 µg/L	-0.050
M3-MeFOSA	10.702	515.0 -> 219.0	7552	2.50 µg/L	-0.050
13C4-PFOS	8.167	502.8 -> 79.9	11734	2.50 µg/L	-0.013
13C3-PFBA	3.180	216.0 -> 172.0	75649	5.00 µg/L	0.065
18O2-PFHxS	7.116	403.0 -> 83.9	5299	2.50 µg/L	-0.013
13C4-PFOA	7.013	417.1 -> 372.0	42436	2.50 µg/L	-0.012
13C2-PFDA	8.017	515.1 -> 470.1	15342	1.25 µg/L	-0.012
13C5-PFNA	7.534	468.0 -> 423.0	20934	1.25 µg/L	-0.012
13C2-PFHxA	5.510	315.1 -> 270.0	51533	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1445	5.03 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 100.6%		
13C2-6:2FTS	6.786	429.1 -> 80.9	2008	4.93 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 98.6%		
13C2-8:2FTS	7.803	529.1 -> 80.9	3153	4.98 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 99.5%		
13C2-PFDoDA	8.868	615.1 -> 570.0	19376	1.19 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 95.6%		
13C2-PFTeDA	9.637	715.2 -> 670.0	16122	1.20 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.3%		
13C3-PFBS	5.451	302.1 -> 79.9	12571	2.55 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 102.0%		
13C3-PFHxS	7.117	402.1 -> 79.9	7773	2.70 µg/L	-0.013

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 107.9%	
13C4-PFBA	3.177	216.8 -> 171.9	139460	10.73 µg/L	0.066
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 107.3%	
13C4-PFHpA	6.367	367.1 -> 322.0	31323	2.56 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.5%	
13C5-PFHxA	5.509	318.0 -> 273.0	58324	2.61 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.3%	
13C5-PFPeA	4.487	268.3 -> 223.0	70651	5.02 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C6-PFDA	8.016	519.1 -> 474.1	17426	1.33 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 106.1%	
13C7-PFUnDA	8.448	570.0 -> 525.1	17422	1.28 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.4%	
13C8-FOSA	9.632	506.1 -> 77.8	14518	2.22 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.0%	
13C8-PFOA	7.012	421.1 -> 376.0	34209	2.44 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.5%	
13C8-PFOS	8.167	507.1 -> 79.9	10291	2.23 µg/L	-0.013
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.0%	
13C9-PFNA	7.534	472.1 -> 427.0	18158	1.24 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.2%	
d3-MeFOSAA	8.074	573.2 -> 419.0	13852	4.23 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 84.5%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	30571	11.72 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 117.2%	
d3-MeFOSA	10.702	515.0 -> 219.0	7552	2.27 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.9%	
d5-EtFOSAA	8.283	589.2 -> 419.0	11431	4.27 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 85.5%	
d7-MeFOSE	10.599	623.2 -> 58.9	52715	21.09 µg/L	-0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 84.4%	
d9-EtFOSE	10.908	639.2 -> 58.9	65316	23.39 µg/L	-0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 93.6%	
d5-EtFOSA	11.023	531.1 -> 219.0	8158	2.33 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 93.0%	

Target Compounds

Compound	RT	Transition	Response	Conc. Units	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.	
		327.1 -> 80.9			
6:2FTS	-	427.1 -> 407.0	-	N.D.	
		427.1 -> 80.9			
8:2FTS	-	527.1 -> 507.0	-	N.D.	
		527.1 -> 80.8			
EtFOSAA	-	584.2 -> 419.1	-	N.D.	
		584.2 -> 526.0			
FOSA	-	498.1 -> 77.9	-	N.D.	
		498.1 -> 478.0			
MeFOSAA	-	570.1 -> 419.0	-	N.D.	
		570.1 -> 483.0			
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	-	298.7 -> 79.9	-	N.D.	
		298.7 -> 98.8			
PFDA	7.880	512.9 -> 469.0	0	µg/L m	1
		512.9 -> 219.0	0		
PFDODA	-	613.1 -> 569.0	-	N.D.	
		613.1 -> 319.0			
PFDS	-	599.0 -> 79.9	-	N.D.	

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	5.512	449.0 -> 98.9	0		µg/L	m
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	0	N.D.		
		398.7 -> 79.9				
PFNA	-	398.7 -> 98.9	-	N.D.		
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	-	548.8 -> 98.9	-	N.D.		
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	-	N.D.		
		498.9 -> 79.9				
PFPeA	-	498.9 -> 98.8	-	N.D.		
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	8.854	663.0 -> 619.0	0		µg/L	m
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

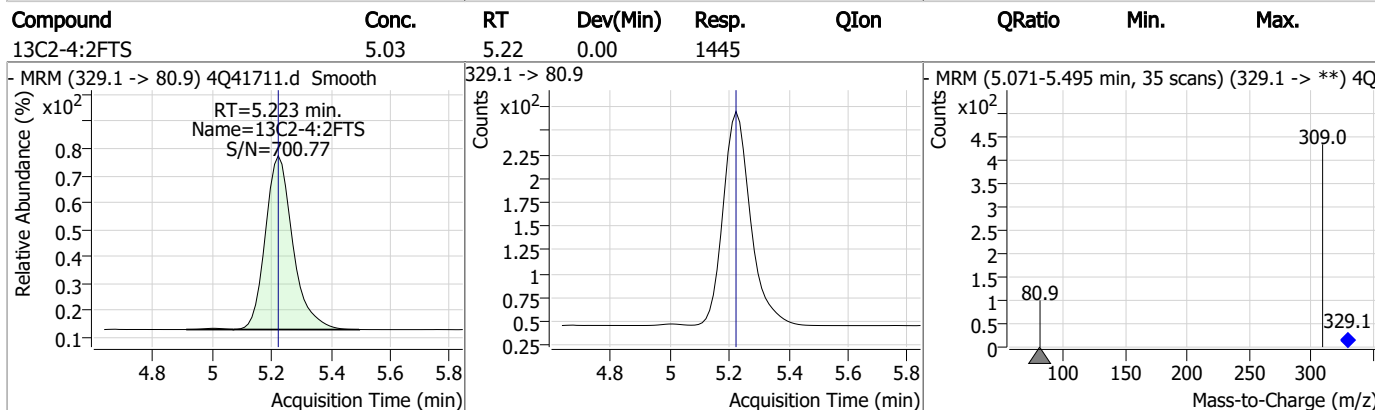
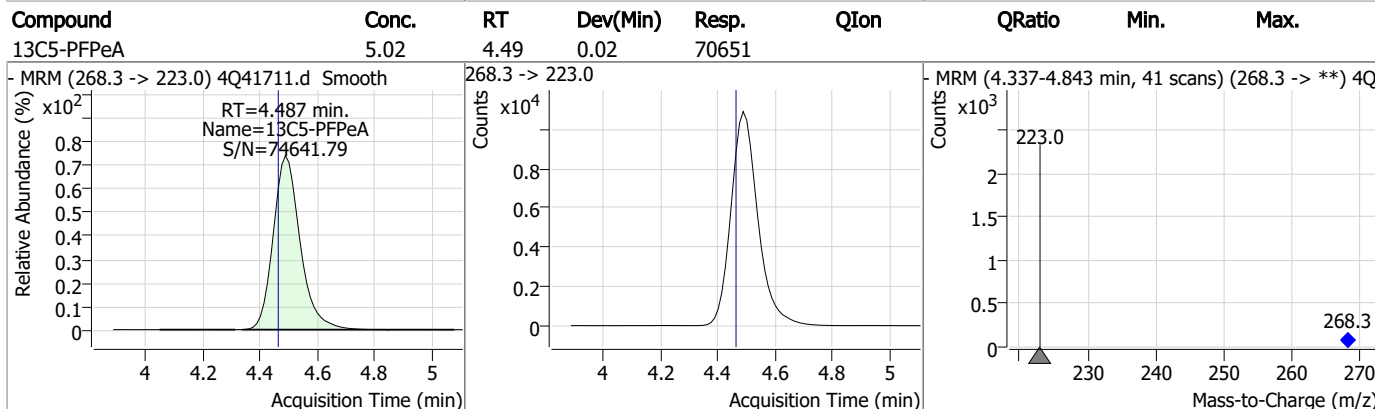
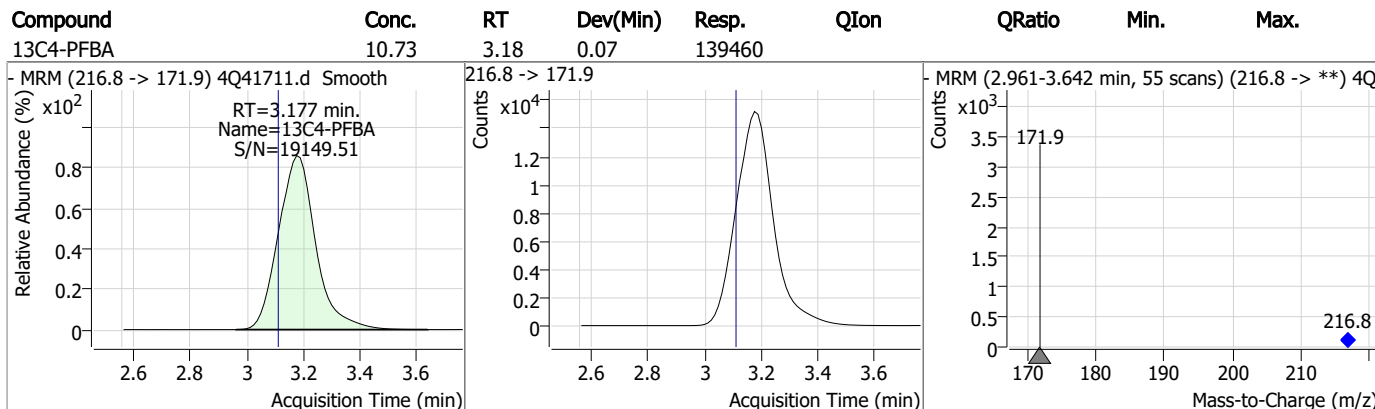
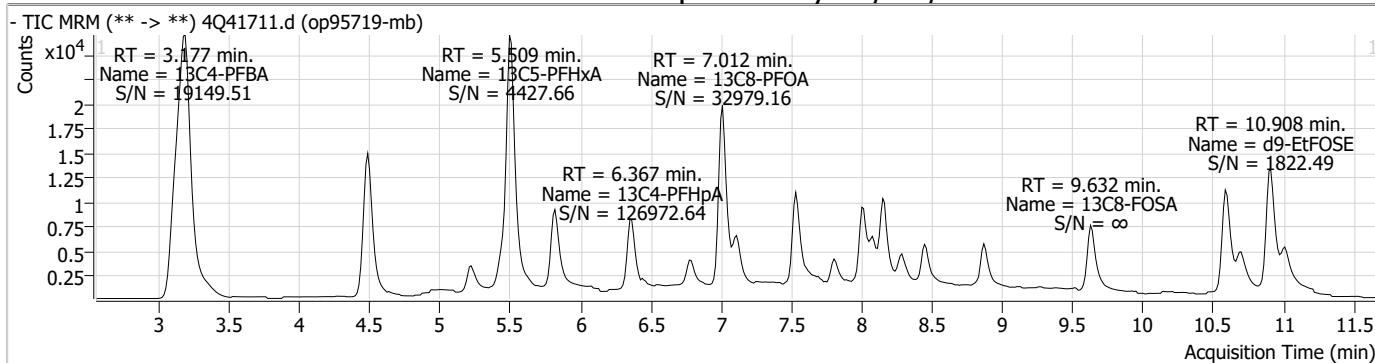
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.2.1

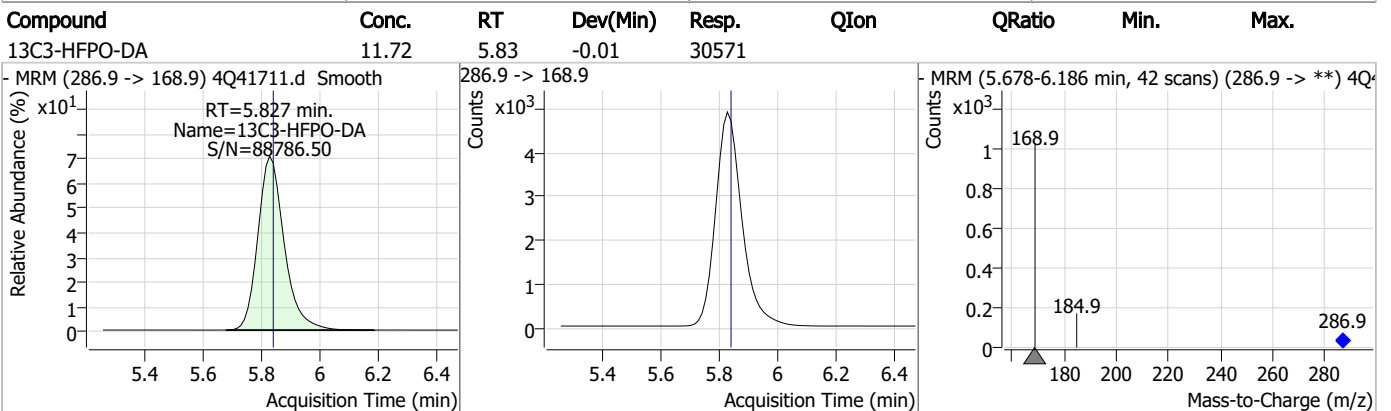
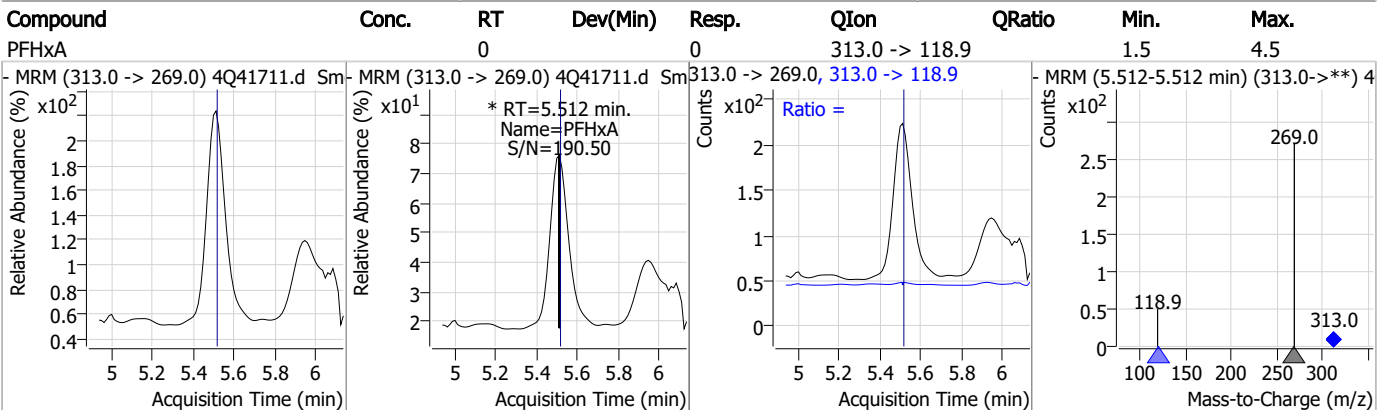
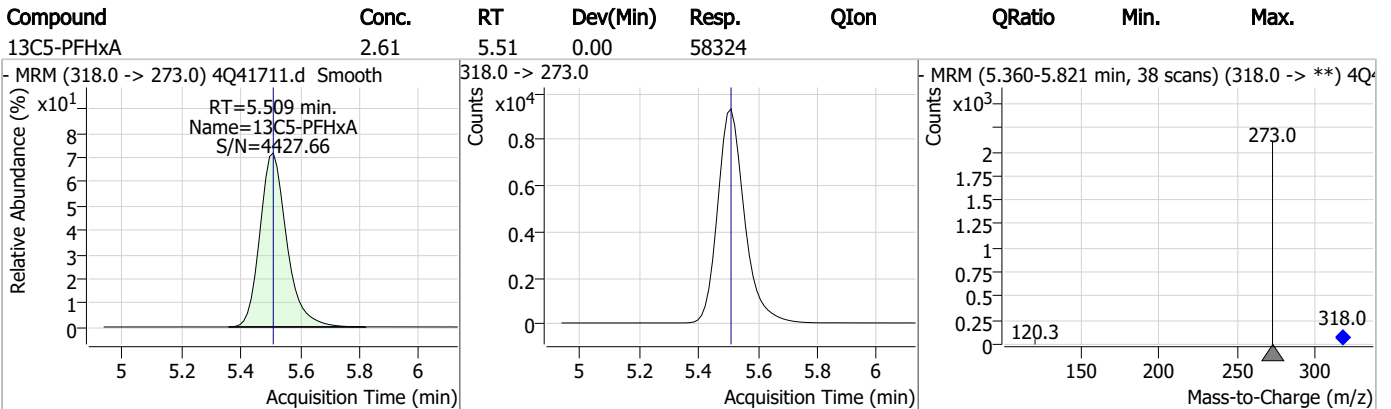
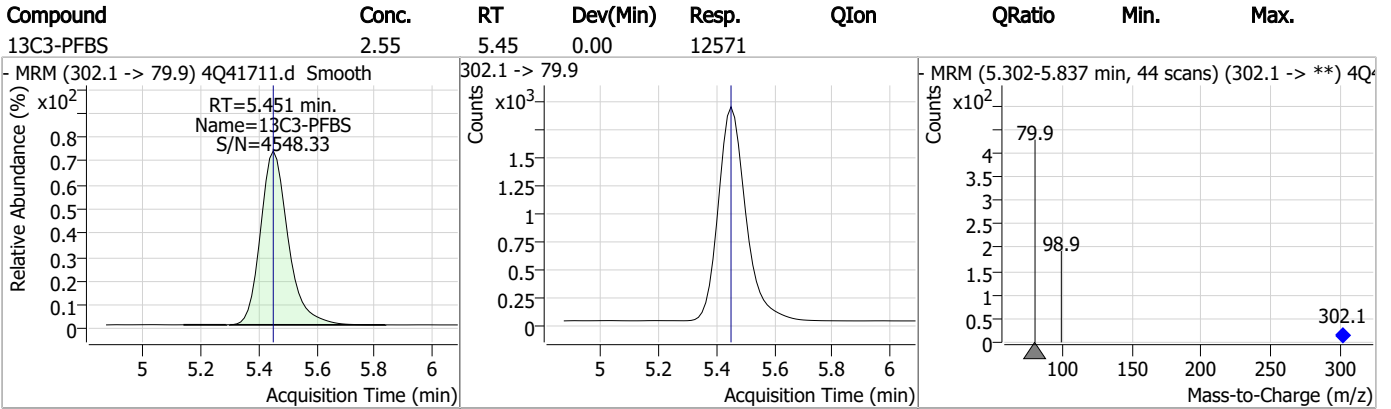
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Perfluorinated Compounds by LC/MS/MS



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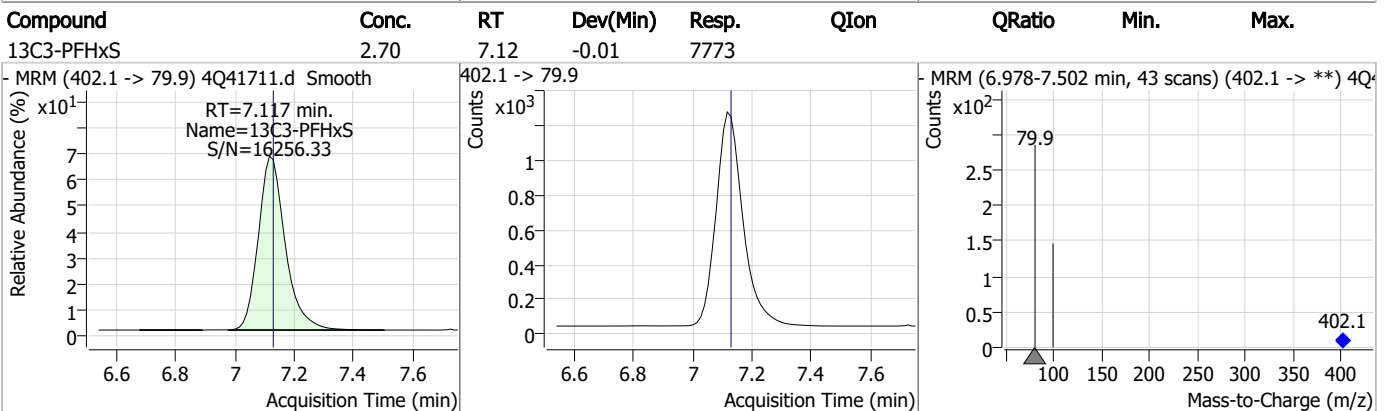
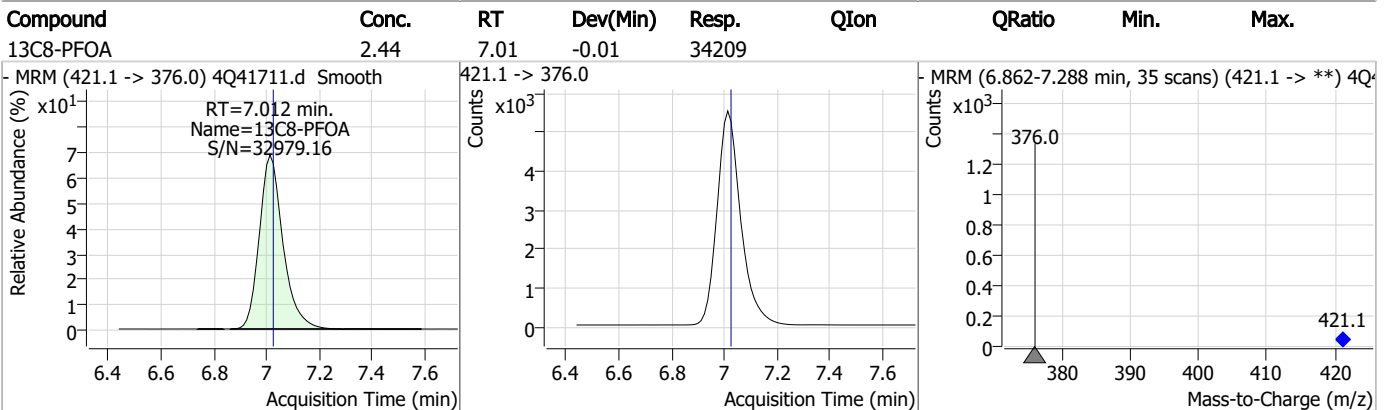
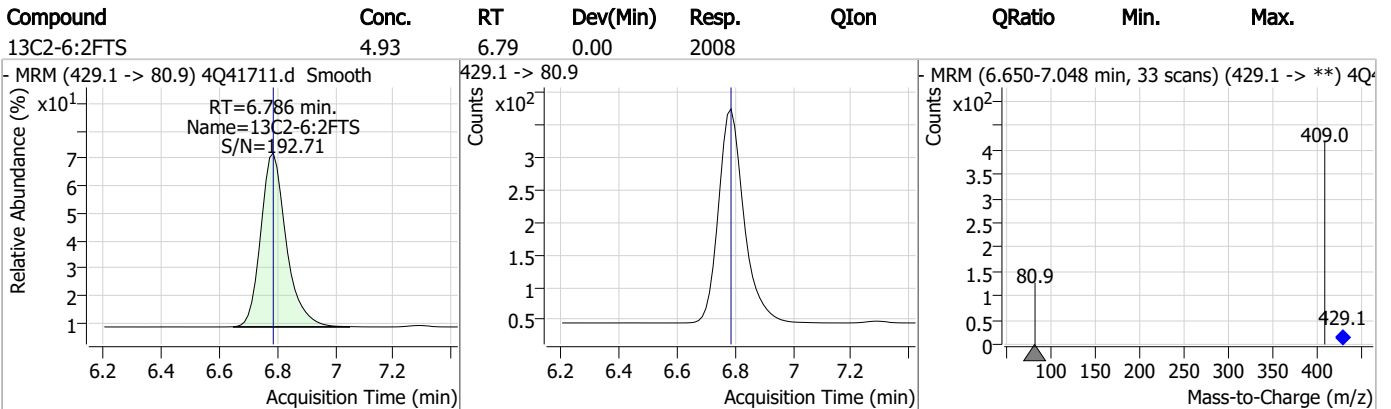
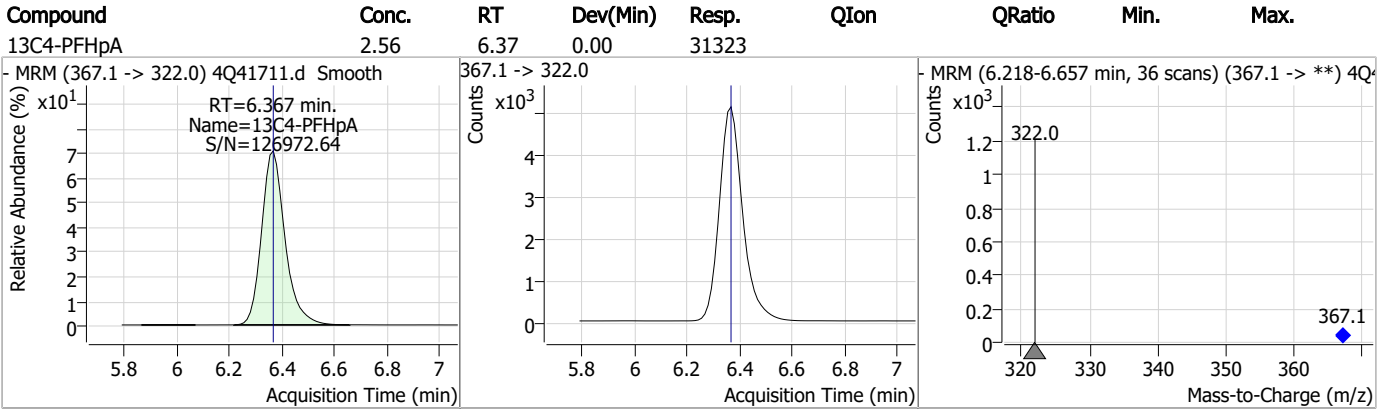
Perfluorinated Compounds by LC/MS/MS



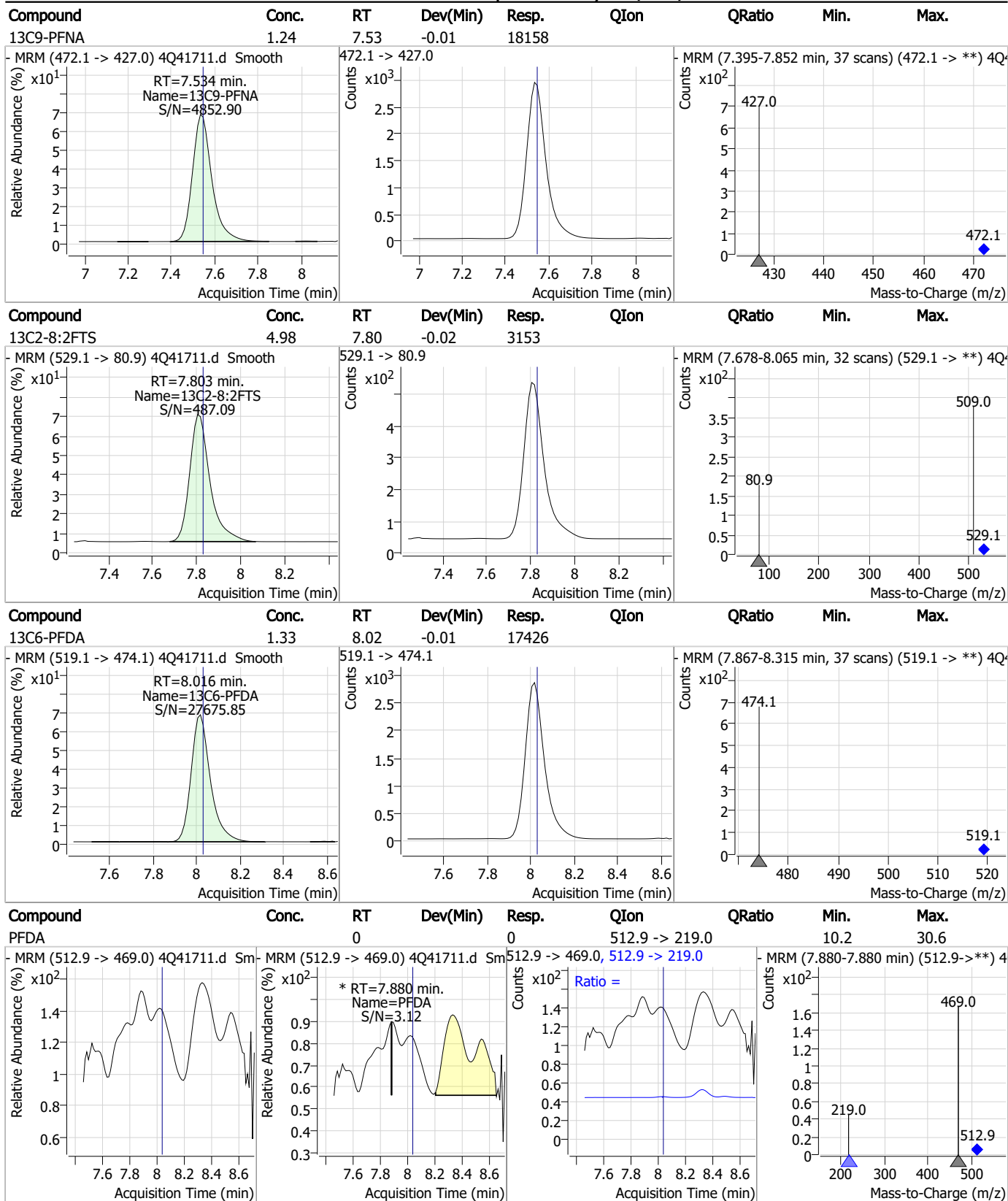
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Perfluorinated Compounds by LC/MS/MS

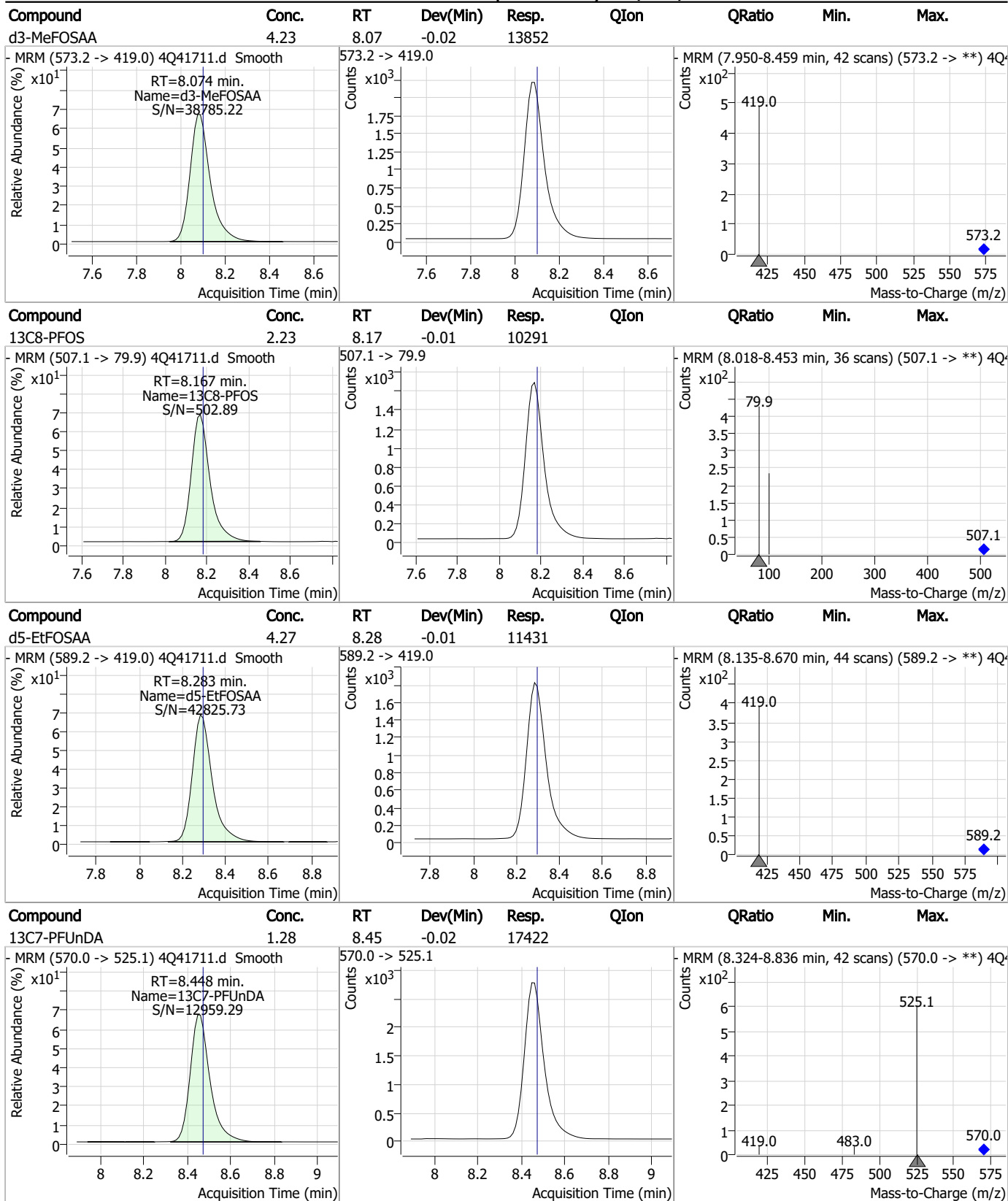


Perfluorinated Compounds by LC/MS/MS



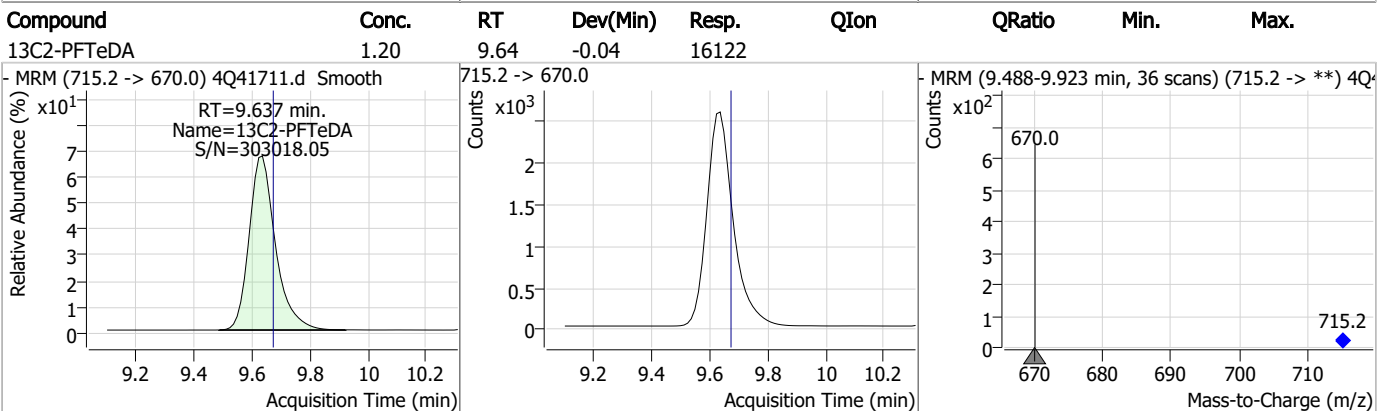
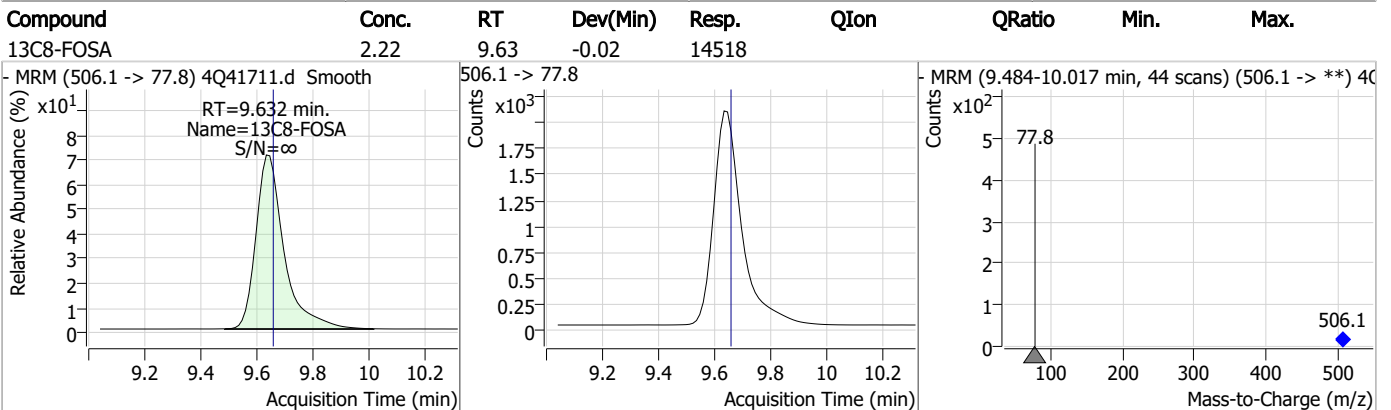
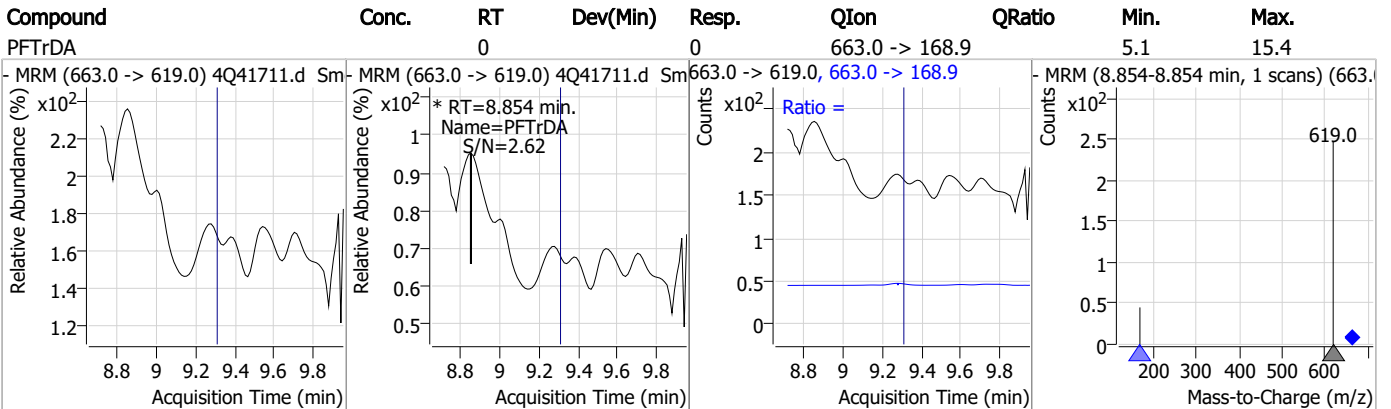
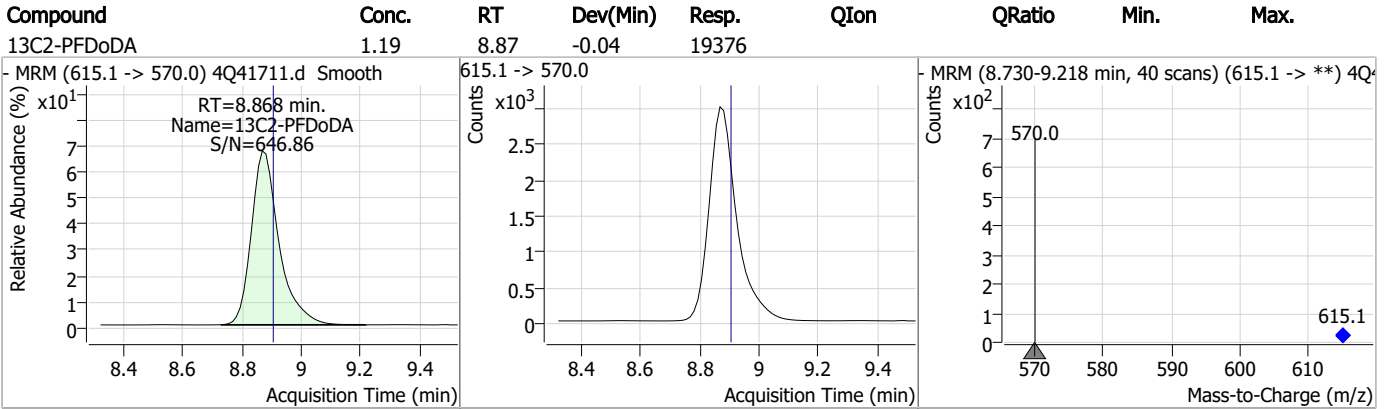
7.2.1
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Perfluorinated Compounds by LC/MS/MS



7.2.1
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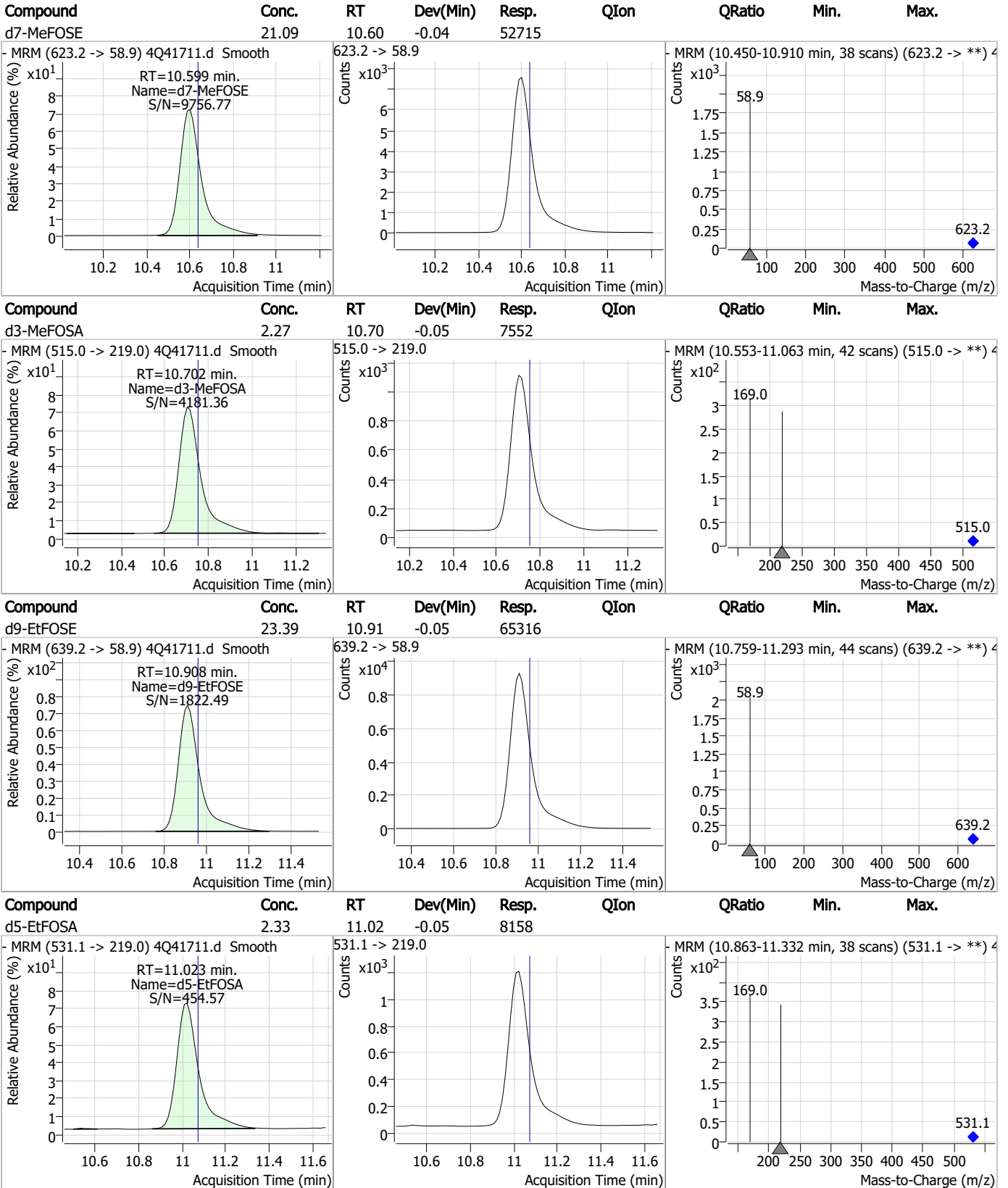
Perfluorinated Compounds by LC/MS/MS



7.2.1

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Perfluorinated Compounds by LC/MS/MS



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7

Perfluorinated Compounds by LC/MS/MS

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 Operator : marthav
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 Acq. Date-Time : 3/6/2023 5:31:19 PM
 Sample Name : iblk
 Vial : P1-A1
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	127060	10.00 µg/L	0.041
M5-PFPeA	4.475	268.3 -> 223.0	68427	5.00 µg/L	0.012
M5-PFHxA	5.497	318.0 -> 273.0	58054	2.50 µg/L	-0.012
M4-PFHpA	6.355	367.1 -> 322.0	30074	2.50 µg/L	-0.012
M8-PFOA	7.012	421.1 -> 376.0	34271	2.50 µg/L	-0.012
M9-PFNA	7.534	472.1 -> 427.0	18330	1.25 µg/L	-0.012
M6-PFDA	8.004	519.1 -> 474.1	17331	1.25 µg/L	-0.025
M7-PFUnDA	8.448	570.0 -> 525.1	17288	1.25 µg/L	-0.025
M2-PFDoDA	8.856	615.1 -> 570.0	19990	1.25 µg/L	-0.050
M2-PFTeDA	9.599	715.2 -> 670.0	17052	1.25 µg/L	-0.075
M8-FOSA	9.620	506.1 -> 77.8	15572	2.50 µg/L	-0.037
M3-PFBS	5.439	302.1 -> 79.9	12034	2.50 µg/L	-0.012
M3-PFHxS	7.117	402.1 -> 79.9	7843	2.50 µg/L	-0.013
M8-PFOS	8.154	507.1 -> 79.9	10572	2.50 µg/L	-0.026
M2-4:2FTS	5.210	329.1 -> 80.9	1319	5.00 µg/L	-0.012
M2-6:2FTS	6.774	429.1 -> 80.9	1823	5.00 µg/L	-0.012
M2-8:2FTS	7.803	529.1 -> 80.9	3068	5.00 µg/L	-0.025
M3-MeFOSAA	8.074	573.2 -> 419.0	13658	5.00 µg/L	-0.025
M3-HFPO-DA	5.827	286.9 -> 168.9	31748	10.00 µg/L	-0.012
M5-EtFOSAA	8.271	589.2 -> 419.0	10953	5.00 µg/L	-0.025
M7-MeFOSE	10.561	623.2 -> 58.9	54402	25.00 µg/L	-0.075
M9-EtFOSE	10.871	639.2 -> 58.9	68781	25.00 µg/L	-0.087
M5-EtFOSA	10.973	531.1 -> 219.0	9421	2.50 µg/L	-0.100
M3-MeFOSA	10.678	515.0 -> 219.0	8634	2.50 µg/L	-0.075
13C4-PFOS	8.155	502.8 -> 79.9	10893	2.50 µg/L	-0.026
13C3-PFBA	3.155	216.0 -> 172.0	71229	5.00 µg/L	0.040
18O2-PFHxS	7.116	403.0 -> 83.9	5661	2.50 µg/L	-0.013
13C4-PFOA	7.013	417.1 -> 372.0	41350	2.50 µg/L	-0.012
13C2-PFDA	8.004	515.1 -> 470.1	15657	1.25 µg/L	-0.025
13C5-PFNA	7.534	468.0 -> 423.0	20539	1.25 µg/L	-0.012
13C2-PFHxA	5.498	315.1 -> 270.0	50671	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1319	4.30 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 85.9%		
13C2-6:2FTS	6.774	429.1 -> 80.9	1823	4.19 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 83.8%		
13C2-8:2FTS	7.803	529.1 -> 80.9	3068	4.53 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 90.6%		
13C2-PFDoDA	8.856	615.1 -> 570.0	19990	1.21 µg/L	-0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.6%		
13C2-PFTeDA	9.599	715.2 -> 670.0	17052	1.25 µg/L	-0.075
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.8%		
13C3-PFBS	5.439	302.1 -> 79.9	12034	2.28 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 91.4%		
13C3-PFHxS	7.117	402.1 -> 79.9	7843	2.55 µg/L	-0.013

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.9%	
13C4-PFBA	3.152	216.8 -> 171.9	127060	10.38 µg/L	0.041
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 103.8%	
13C4-PFHpA	6.355	367.1 -> 322.0	30074	2.50 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.1%	
13C5-PFHxA	5.497	318.0 -> 273.0	58054	2.64 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 105.6%	
13C5-PFPeA	4.475	268.3 -> 223.0	68427	4.95 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 98.9%	
13C6-PFDA	8.004	519.1 -> 474.1	17331	1.29 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 103.4%	
13C7-PFUnDA	8.448	570.0 -> 525.1	17288	1.24 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.6%	
13C8-FOSA	9.620	506.1 -> 77.8	15572	2.57 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.8%	
13C8-PFOA	7.012	421.1 -> 376.0	34271	2.51 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.2%	
13C8-PFOS	8.154	507.1 -> 79.9	10572	2.46 µg/L	-0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.5%	
13C9-PFNA	7.534	472.1 -> 427.0	18330	1.28 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.1%	
d3-MeFOSAA	8.074	573.2 -> 419.0	13658	4.49 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 89.8%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	31748	12.38 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 123.8%	
d3-MeFOSA	10.678	515.0 -> 219.0	8634	2.80 µg/L	-0.075
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 112.0%	
d5-EtFOSAA	8.271	589.2 -> 419.0	10953	4.41 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 88.2%	
d7-MeFOSE	10.561	623.2 -> 58.9	54402	23.45 µg/L	-0.075
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 93.8%	
d9-EtFOSE	10.871	639.2 -> 58.9	68781	26.53 µg/L	-0.087
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 106.1%	
d5-EtFOSA	10.973	531.1 -> 219.0	9421	2.89 µg/L	-0.100
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 115.7%	

Target Compounds

Compound	RT	Transition	Response	Conc. Units	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.	
		327.1 -> 80.9			
6:2FTS	-	427.1 -> 407.0	-	N.D.	
		427.1 -> 80.9			
8:2FTS	-	527.1 -> 507.0	-	N.D.	
		527.1 -> 80.8			
EtFOSAA	-	584.2 -> 419.1	-	N.D.	
		584.2 -> 526.0			
FOSA	-	498.1 -> 77.9	-	N.D.	
		498.1 -> 478.0			
MeFOSAA	-	570.1 -> 419.0	-	N.D.	
		570.1 -> 483.0			
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	-	298.7 -> 79.9	-	N.D.	
		298.7 -> 98.8			
PFDA	8.005	512.9 -> 469.0	0	µg/L m	1
		512.9 -> 219.0	0		
PFDODA	-	613.1 -> 569.0	-	N.D.	
		613.1 -> 319.0			
PFDS	-	599.0 -> 79.9	-	N.D.	

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	-	449.0 -> 98.9	-	N.D.		
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	-	N.D.		
		398.7 -> 79.9				
PFNA	7.860	398.7 -> 98.9	0	µg/L	m	1
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	-	548.8 -> 98.9	-	N.D.		
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	-	N.D.		
		498.9 -> 79.9				
PFPeA	-	498.9 -> 98.8	-	N.D.		
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	8.878	663.0 -> 619.0	0	µg/L	m	1
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

7.2.2
7

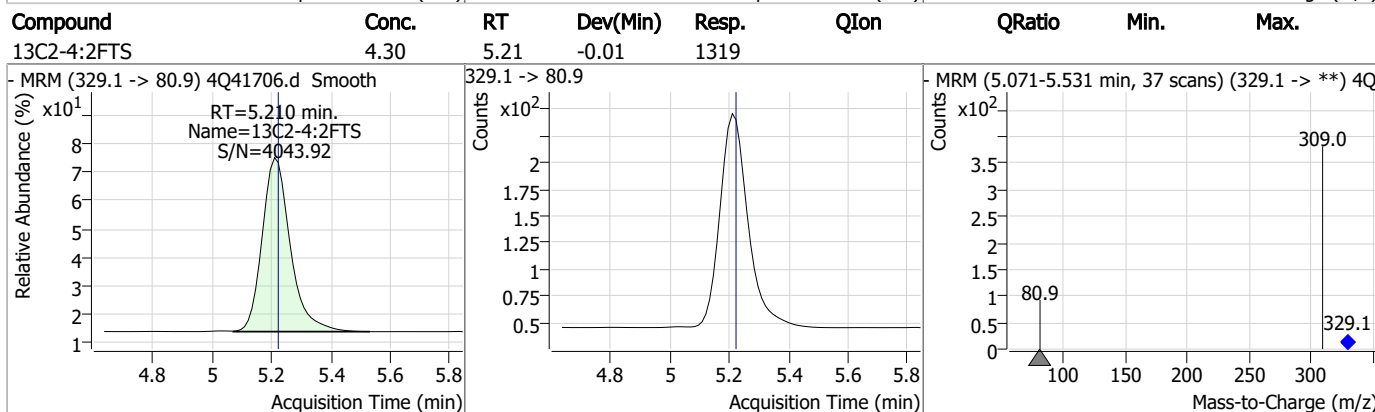
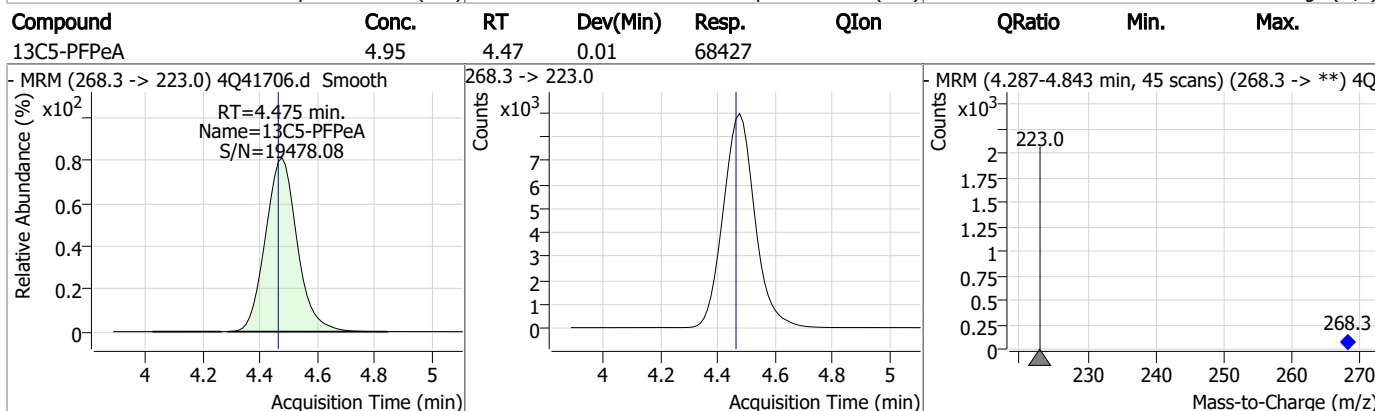
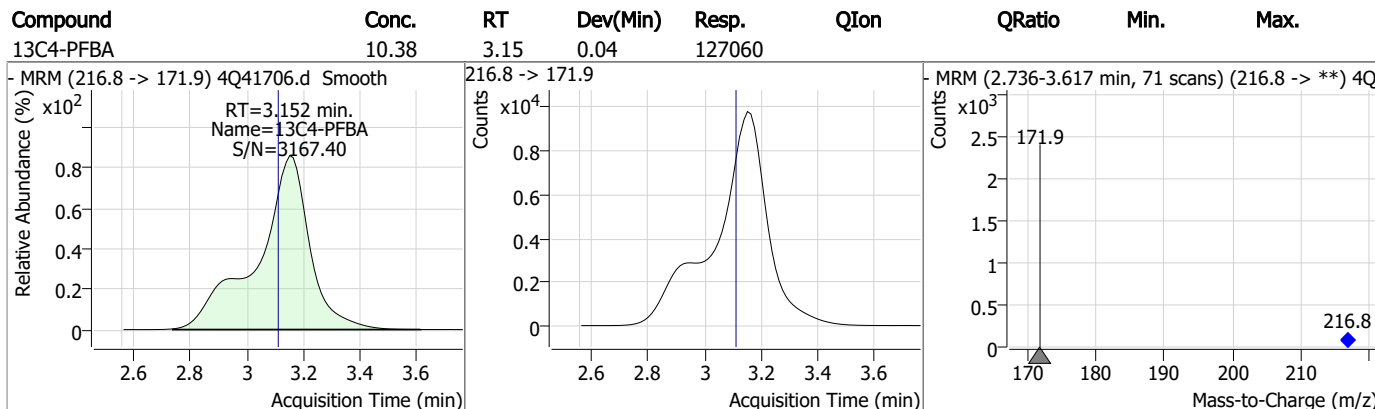
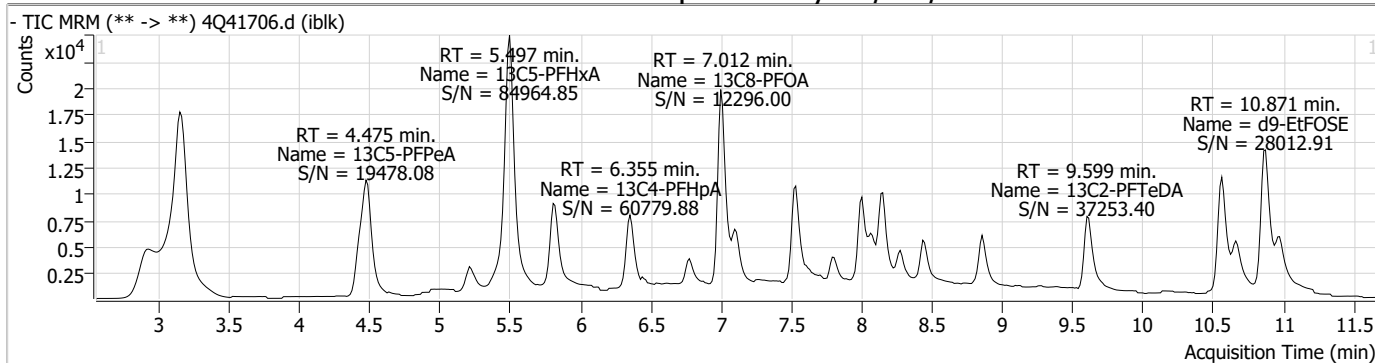
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.2.2

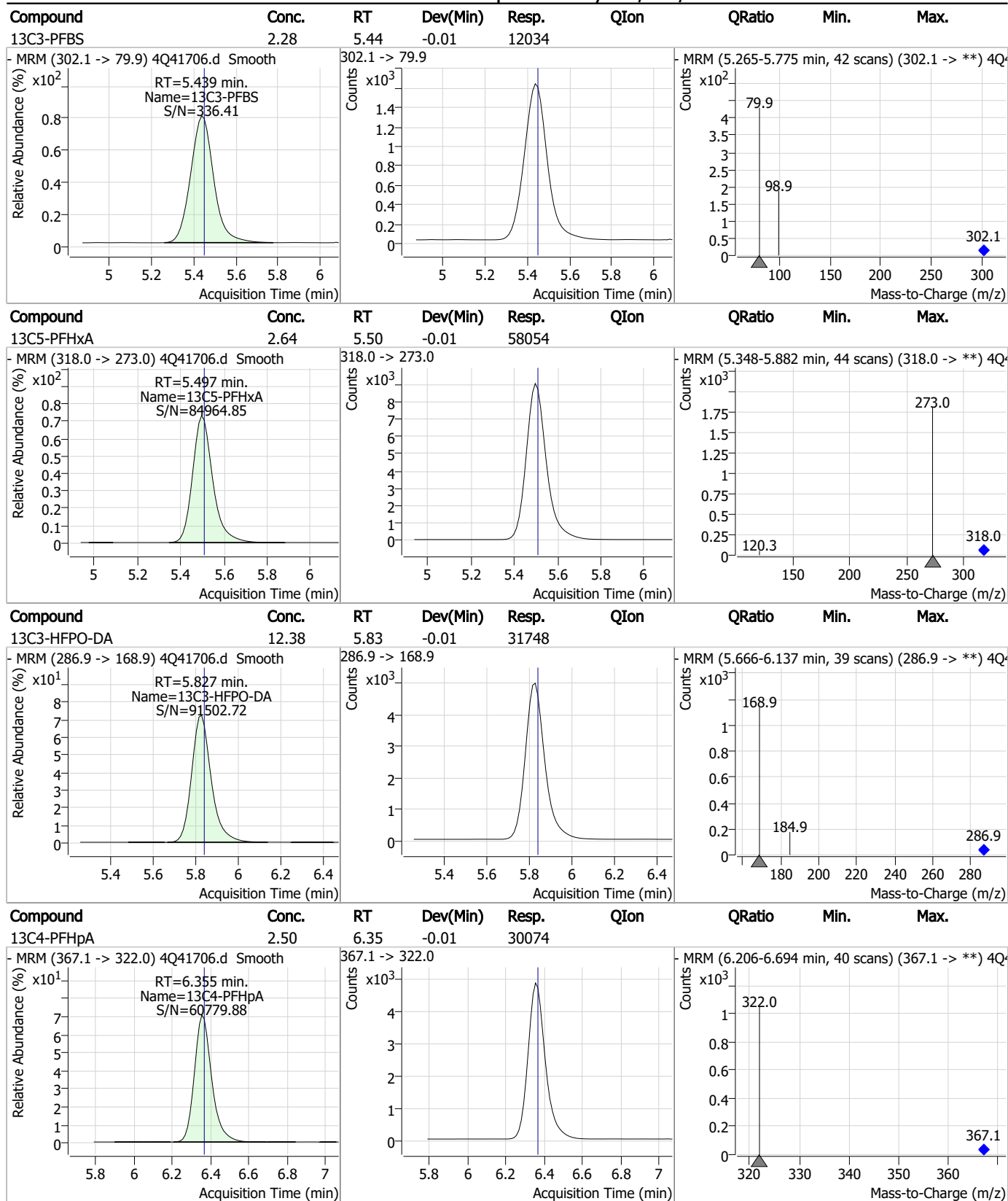
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Perfluorinated Compounds by LC/MS/MS



7.2.2
7

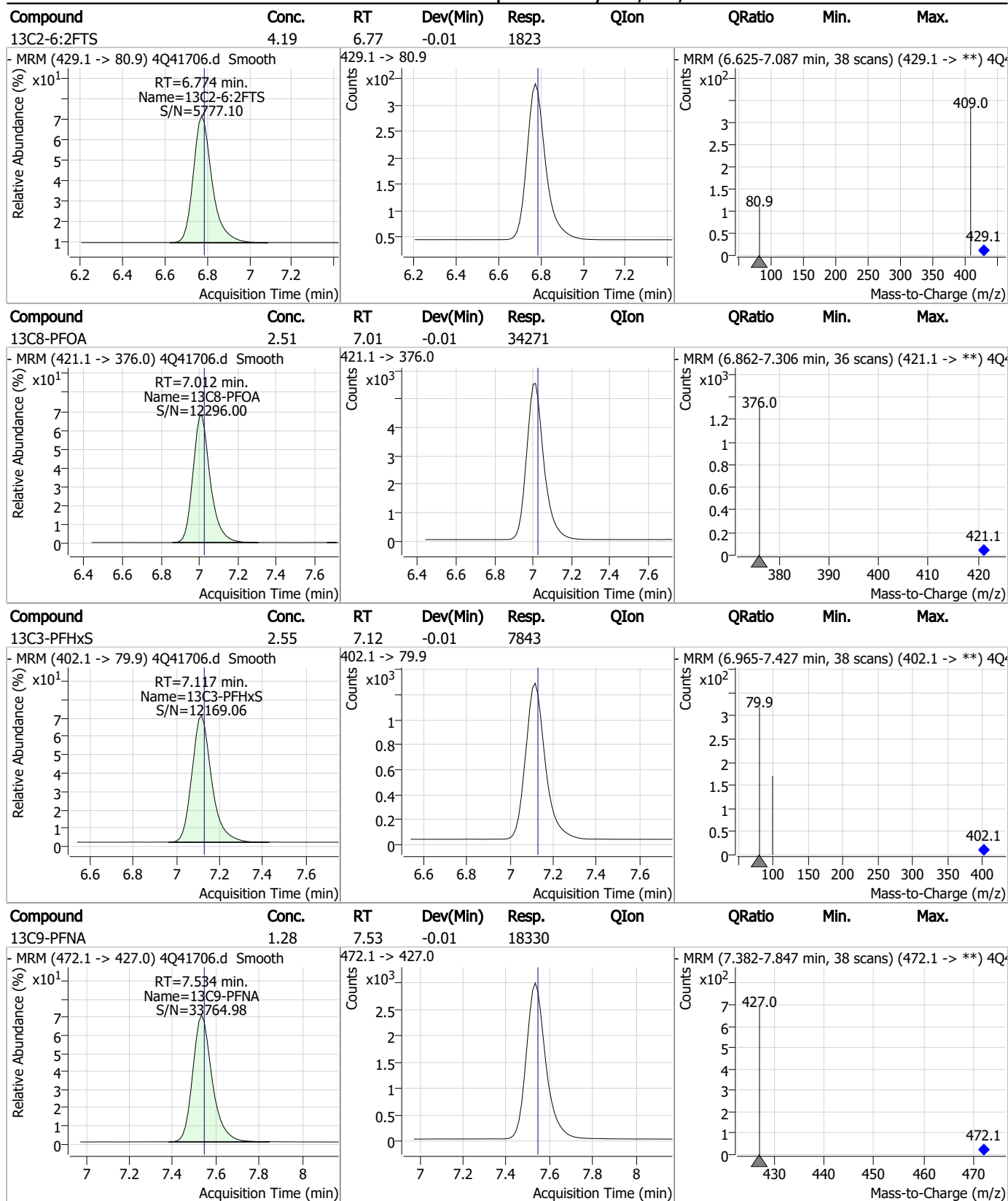
Perfluorinated Compounds by LC/MS/MS



7.2.2
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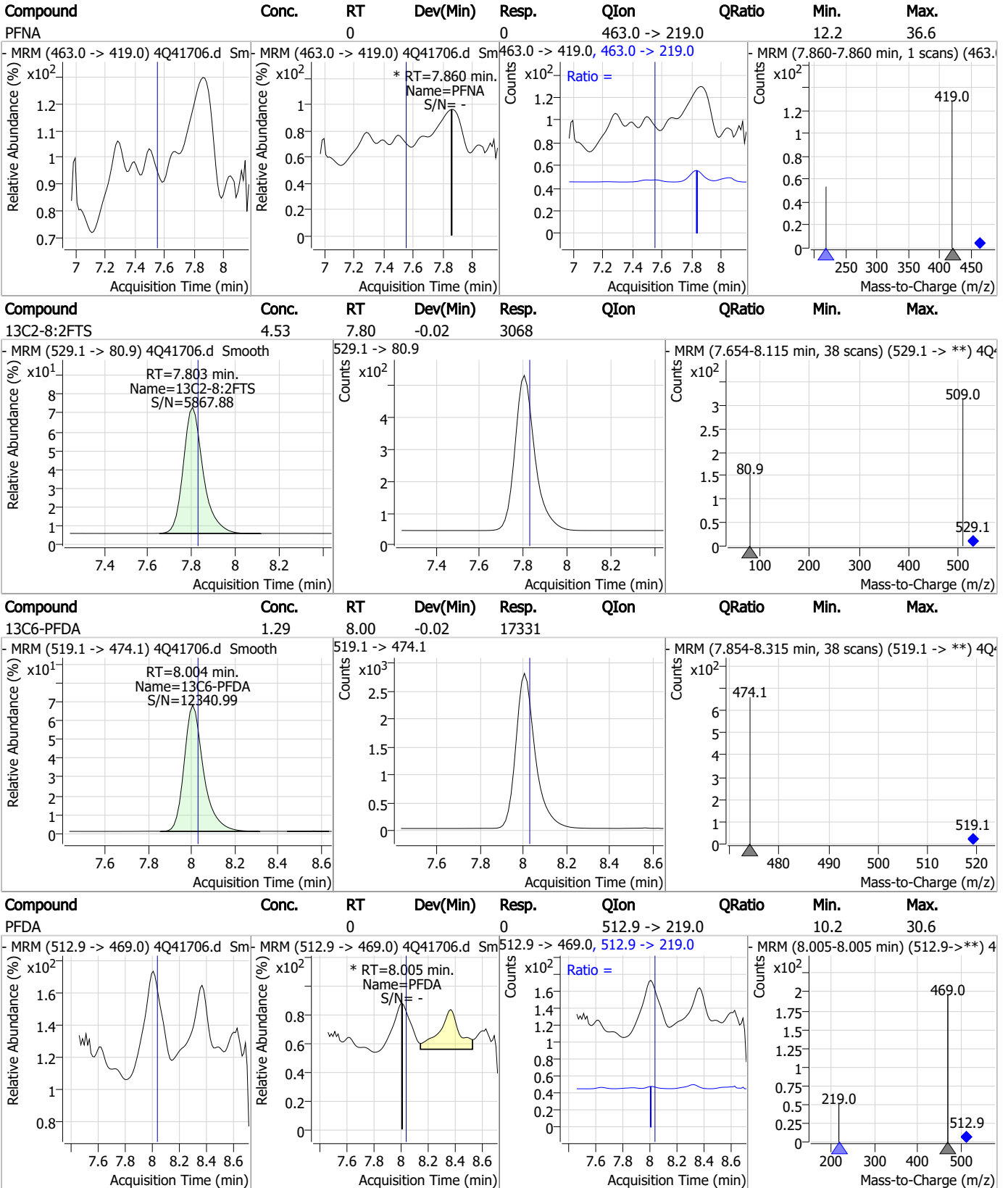


Perfluorinated Compounds by LC/MS/MS



7.2.2
7

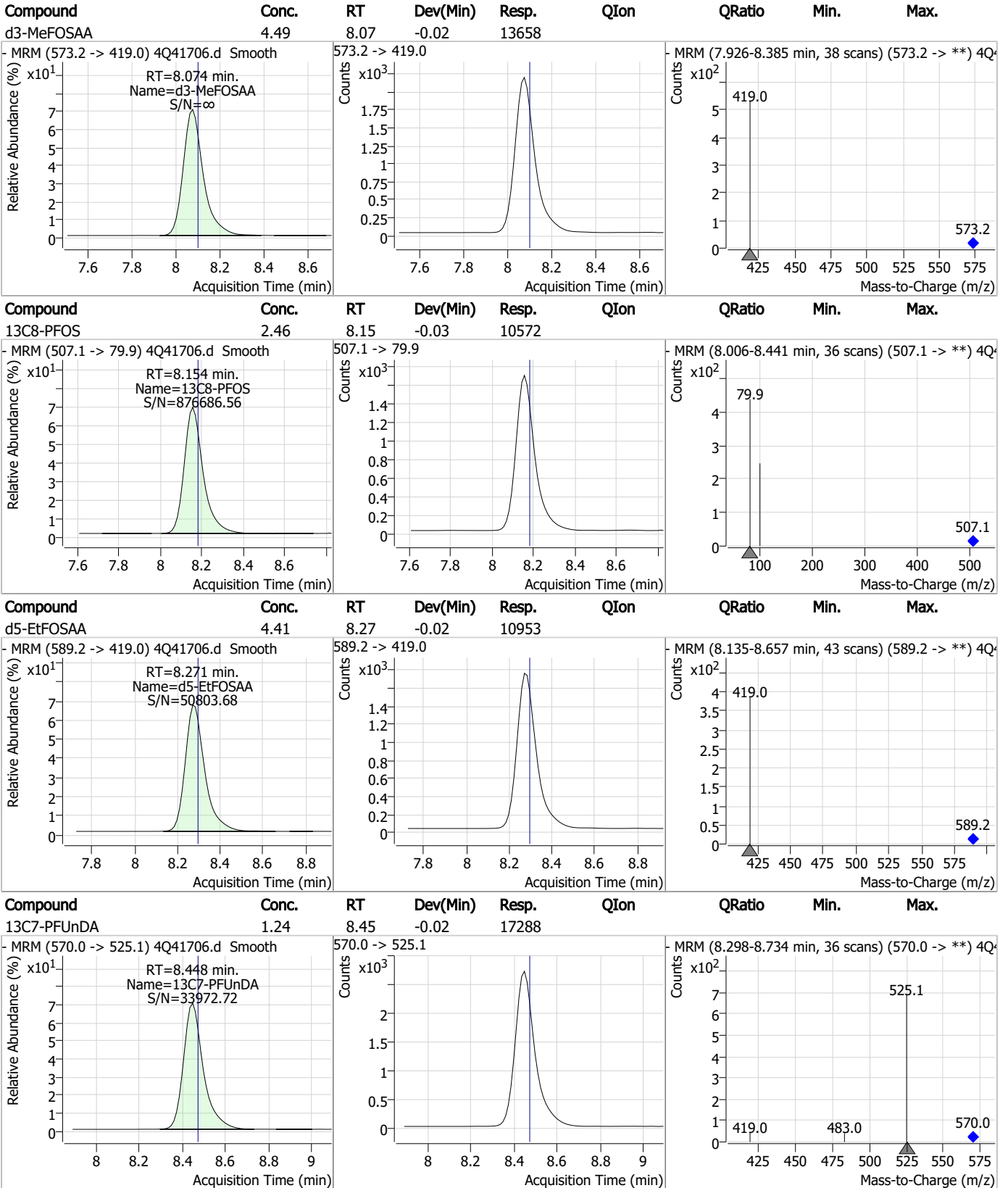
Perfluorinated Compounds by LC/MS/MS



7.2.2

7

Perfluorinated Compounds by LC/MS/MS

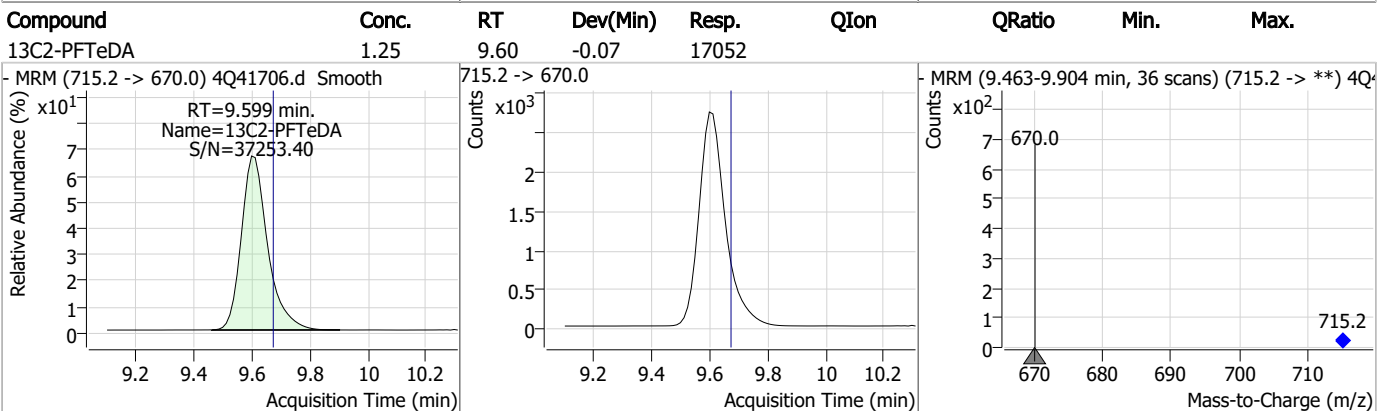
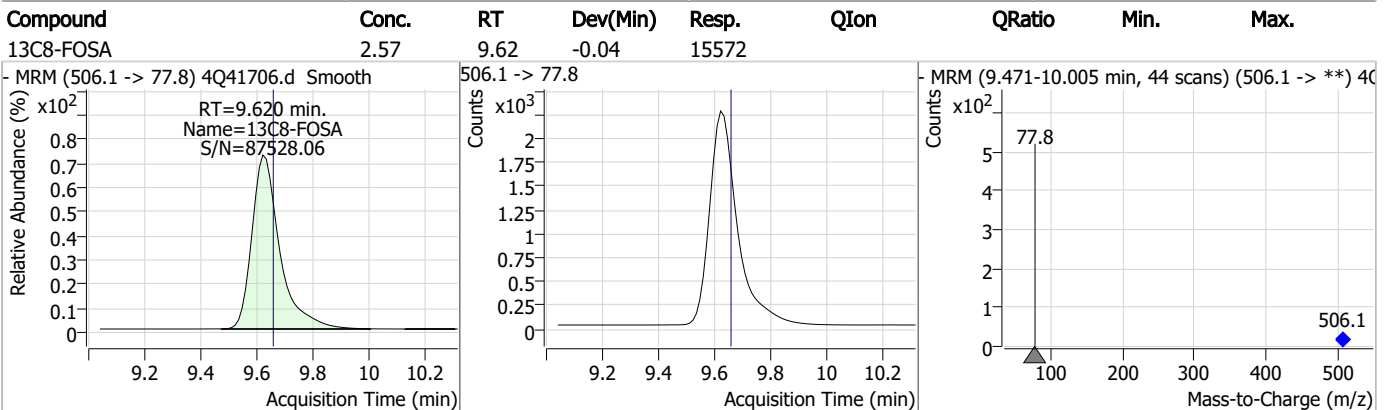
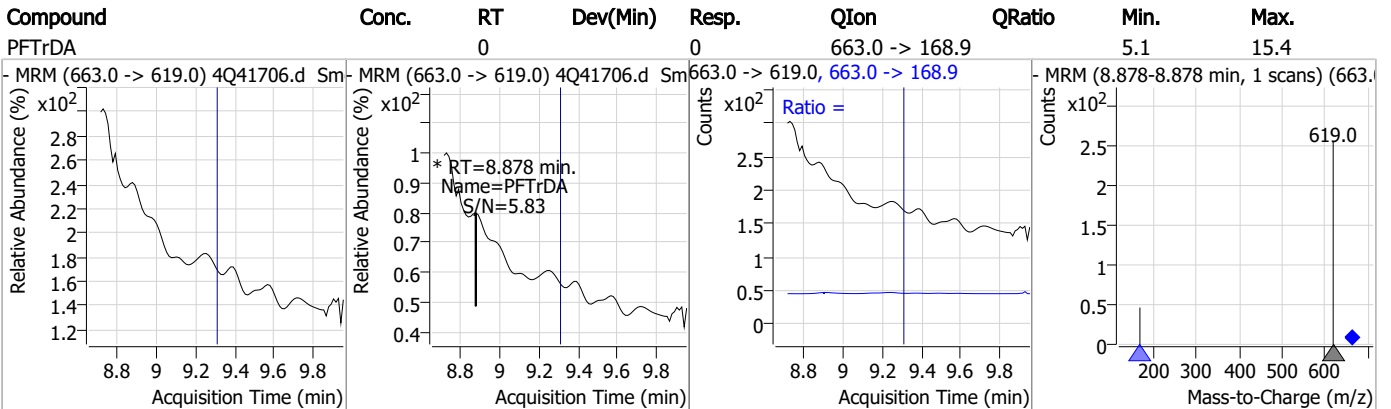
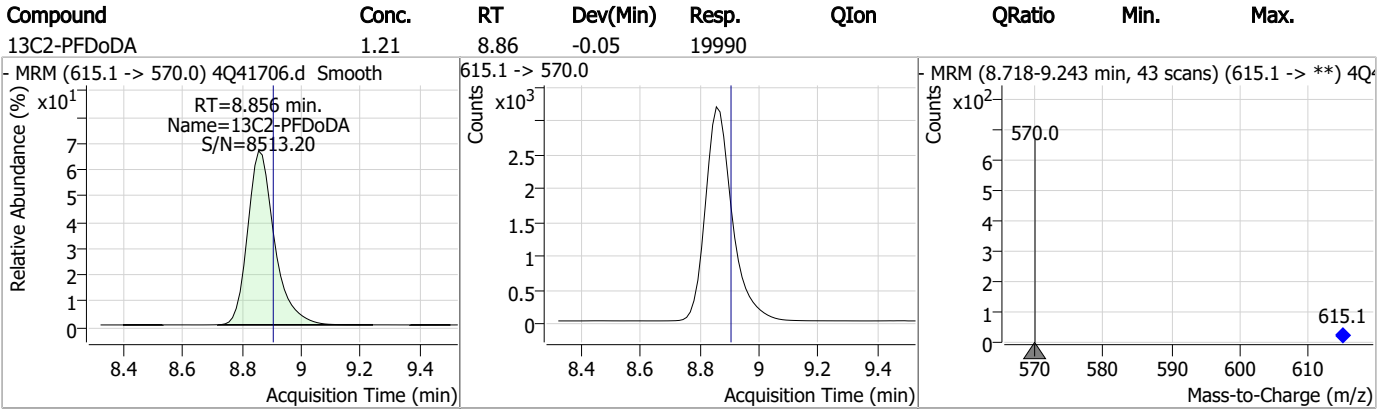


7.2.2

7



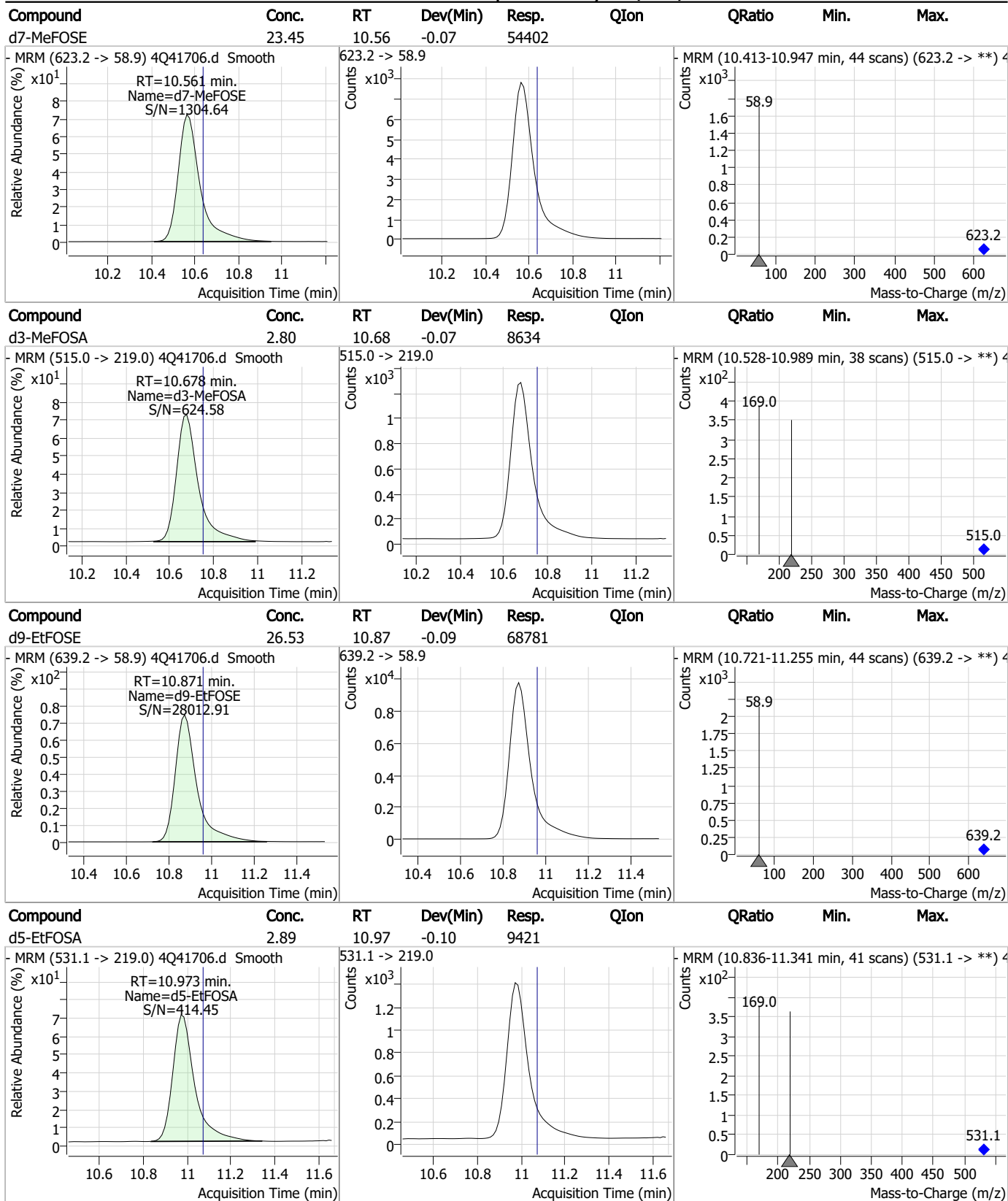
Perfluorinated Compounds by LC/MS/MS



7.2.2

7

Perfluorinated Compounds by LC/MS/MS



7.2.2
7



Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41720.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 8:48:02 PM
 Sample Name : iccb
 Vial : P1-A1
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.164	216.8 -> 171.9	134493	10.00 µg/L	0.053
M5-PFPeA	4.475	268.3 -> 223.0	69871	5.00 µg/L	0.012
M5-PFHxA	5.522	318.0 -> 273.0	59730	2.50 µg/L	0.012
M4-PFHpA	6.380	367.1 -> 322.0	31256	2.50 µg/L	0.012
M8-PFOA	7.025	421.1 -> 376.0	33476	2.50 µg/L	0.000
M9-PFNA	7.546	472.1 -> 427.0	18974	1.25 µg/L	0.000
M6-PFDA	8.016	519.1 -> 474.1	17466	1.25 µg/L	-0.012
M7-PFUnDA	8.461	570.0 -> 525.1	19019	1.25 µg/L	-0.012
M2-PFDoDA	8.881	615.1 -> 570.0	20871	1.25 µg/L	-0.025
M2-PFTeDA	9.637	715.2 -> 670.0	16472	1.25 µg/L	-0.037
M8-FOSA	9.645	506.1 -> 77.8	15606	2.50 µg/L	-0.012
M3-PFBS	5.464	302.1 -> 79.9	12459	2.50 µg/L	0.012
M3-PFHxS	7.129	402.1 -> 79.9	7537	2.50 µg/L	0.000
M8-PFOS	8.167	507.1 -> 79.9	10880	2.50 µg/L	-0.013
M2-4:2FTS	5.235	329.1 -> 80.9	1498	5.00 µg/L	0.012
M2-6:2FTS	6.798	429.1 -> 80.9	2135	5.00 µg/L	0.012
M2-8:2FTS	7.816	529.1 -> 80.9	3389	5.00 µg/L	-0.012
M3-MeFOSAA	8.086	573.2 -> 419.0	14065	5.00 µg/L	-0.012
M3-HFPO-DA	5.839	286.9 -> 168.9	32596	10.00 µg/L	0.000
M5-EtFOSAA	8.296	589.2 -> 419.0	12274	5.00 µg/L	0.000
M7-MeFOSE	10.599	623.2 -> 58.9	54770	25.00 µg/L	-0.037
M9-EtFOSE	10.921	639.2 -> 58.9	68086	25.00 µg/L	-0.037
M5-EtFOSA	11.023	531.1 -> 219.0	9045	2.50 µg/L	-0.050
M3-MeFOSA	10.715	515.0 -> 219.0	8472	2.50 µg/L	-0.037
13C4-PFOS	8.167	502.8 -> 79.9	10424	2.50 µg/L	-0.013
13C3-PFBA	3.168	216.0 -> 172.0	74805	5.00 µg/L	0.052
18O2-PFHxS	7.128	403.0 -> 83.9	5328	2.50 µg/L	0.000
13C4-PFOA	7.025	417.1 -> 372.0	42110	2.50 µg/L	0.000
13C2-PFDA	8.029	515.1 -> 470.1	16113	1.25 µg/L	0.000
13C5-PFNA	7.547	468.0 -> 423.0	21793	1.25 µg/L	0.000
13C2-PFHxA	5.523	315.1 -> 270.0	52793	2.50 µg/L	0.012
System Monitoring Compounds					
13C2-4:2FTS	5.235	329.1 -> 80.9	1498	5.18 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 103.6%		
13C2-6:2FTS	6.798	429.1 -> 80.9	2135	5.22 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 104.3%		
13C2-8:2FTS	7.816	529.1 -> 80.9	3389	5.32 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 106.4%		
13C2-PFDoDA	8.881	615.1 -> 570.0	20871	1.23 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 98.0%		
13C2-PFTeDA	9.637	715.2 -> 670.0	16472	1.17 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 93.7%		
13C3-PFBS	5.464	302.1 -> 79.9	12459	2.51 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 100.5%		
13C3-PFHxS	7.129	402.1 -> 79.9	7537	2.60 µg/L	0.000

7.2.3
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.0%	
13C4-PFBA	3.164	216.8 -> 171.9	134493	10.46 µg/L	0.053
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 104.6%	
13C4-PFHpA	6.380	367.1 -> 322.0	31256	2.50 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.8%	
13C5-PFHxA	5.522	318.0 -> 273.0	59730	2.61 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.3%	
13C5-PFPeA	4.475	268.3 -> 223.0	69871	4.85 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 97.0%	
13C6-PFDA	8.016	519.1 -> 474.1	17466	1.27 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 101.2%	
13C7-PFUnDA	8.461	570.0 -> 525.1	19019	1.33 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 106.4%	
13C8-FOSA	9.645	506.1 -> 77.8	15606	2.69 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 107.7%	
13C8-PFOA	7.025	421.1 -> 376.0	33476	2.40 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.1%	
13C8-PFOS	8.167	507.1 -> 79.9	10880	2.65 µg/L	-0.013
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 106.0%	
13C9-PFNA	7.546	472.1 -> 427.0	18974	1.24 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.6%	
d3-MeFOSAA	8.086	573.2 -> 419.0	14065	4.83 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 96.6%	
13C3-HFPO-DA	5.839	286.9 -> 168.9	32596	12.19 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 121.9%	
d3-MeFOSA	10.715	515.0 -> 219.0	8472	2.87 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 114.8%	
d5-EtFOSAA	8.296	589.2 -> 419.0	12274	5.16 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 103.3%	
d7-MeFOSE	10.599	623.2 -> 58.9	54770	24.67 µg/L	-0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 98.7%	
d9-EtFOSE	10.921	639.2 -> 58.9	68086	27.45 µg/L	-0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 109.8%	
d5-EtFOSA	11.023	531.1 -> 219.0	9045	2.90 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 116.1%	

Target Compounds

Compound	RT	Transition	Response	Conc. Units	Dev(Min)	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.		
		327.1 -> 80.9				
6:2FTS	-	427.1 -> 407.0	-	N.D.		
		427.1 -> 80.9				
8:2FTS	-	527.1 -> 507.0	-	N.D.		
		527.1 -> 80.8				
EtFOSAA	-	584.2 -> 419.1	-	N.D.		
		584.2 -> 526.0				
FOSA	-	498.1 -> 77.9	-	N.D.		
		498.1 -> 478.0				
MeFOSAA	-	570.1 -> 419.0	-	N.D.		
		570.1 -> 483.0				
PFBA	-	212.8 -> 168.9	-	N.D.		
PFBS	-	298.7 -> 79.9	-	N.D.		
		298.7 -> 98.8				
PFDA	8.329	512.9 -> 469.0	0	µg/L m	1	
		512.9 -> 219.0	0			
PFDODA	-	613.1 -> 569.0	-	N.D.		
		613.1 -> 319.0				
PFDS	-	599.0 -> 79.9	-	N.D.		



7.2.3
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	-	449.0 -> 98.9	-	N.D.		
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	-	N.D.		
		398.7 -> 79.9				
PFNA	7.885	398.7 -> 98.9	0	µg/L	m	1
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	7.401	548.8 -> 98.9	0	µg/L	m	1
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	-	N.D.		
		498.9 -> 79.9				
PFPeA	-	498.9 -> 98.8	-	N.D.		
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	8.829	663.0 -> 619.0	0	µg/L	m	1
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

7.2.3
7

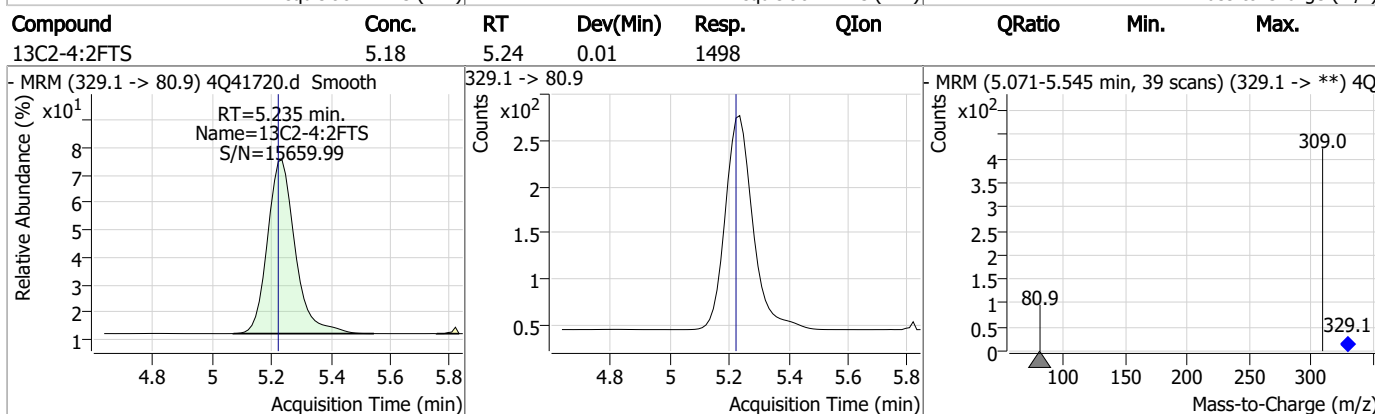
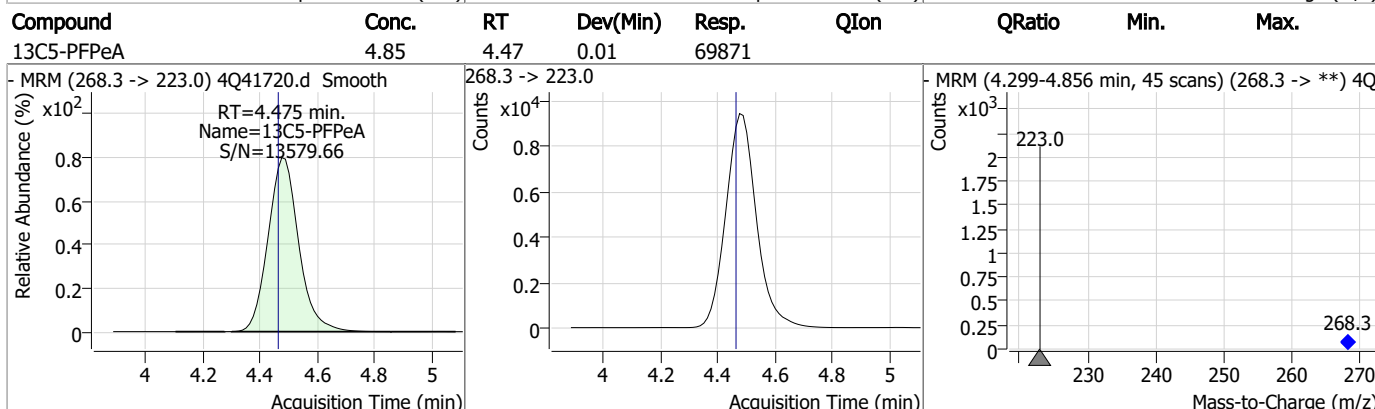
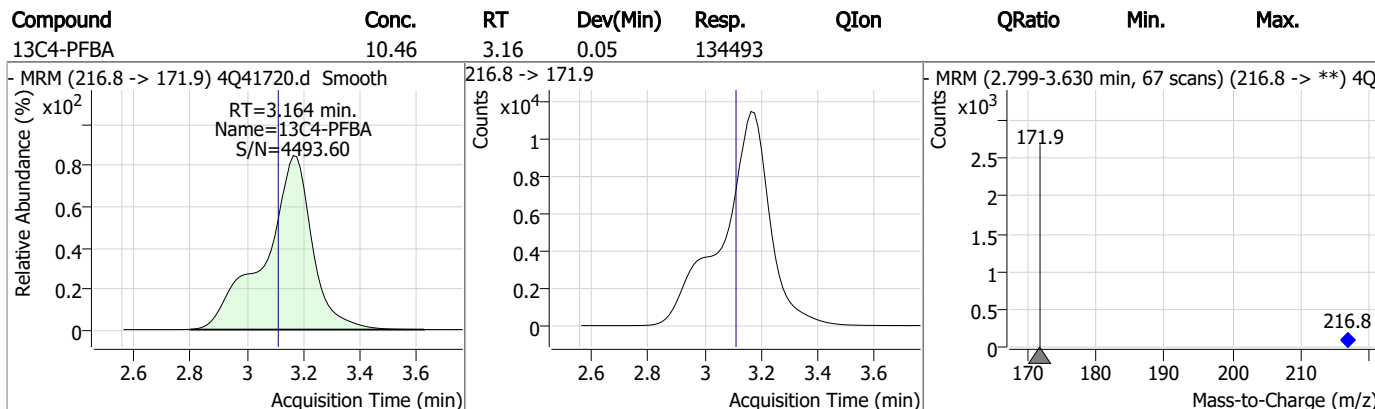
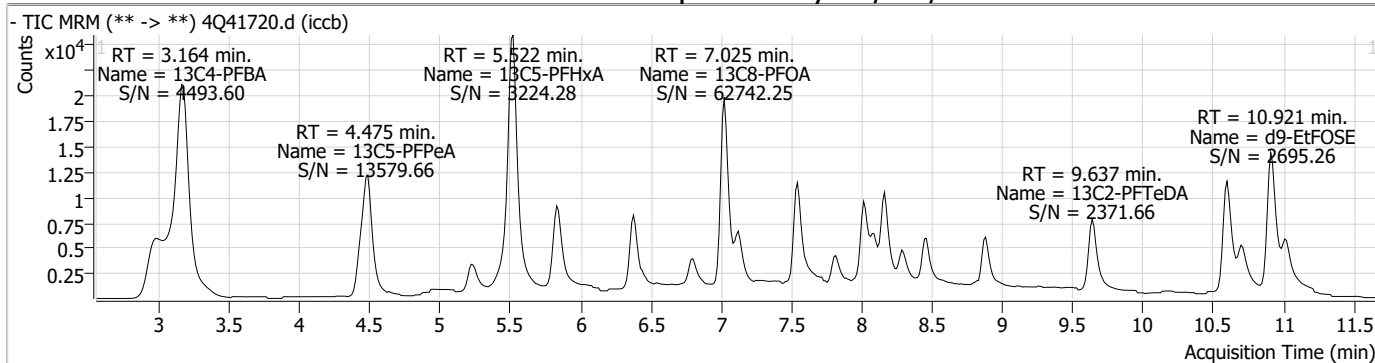
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.2.3

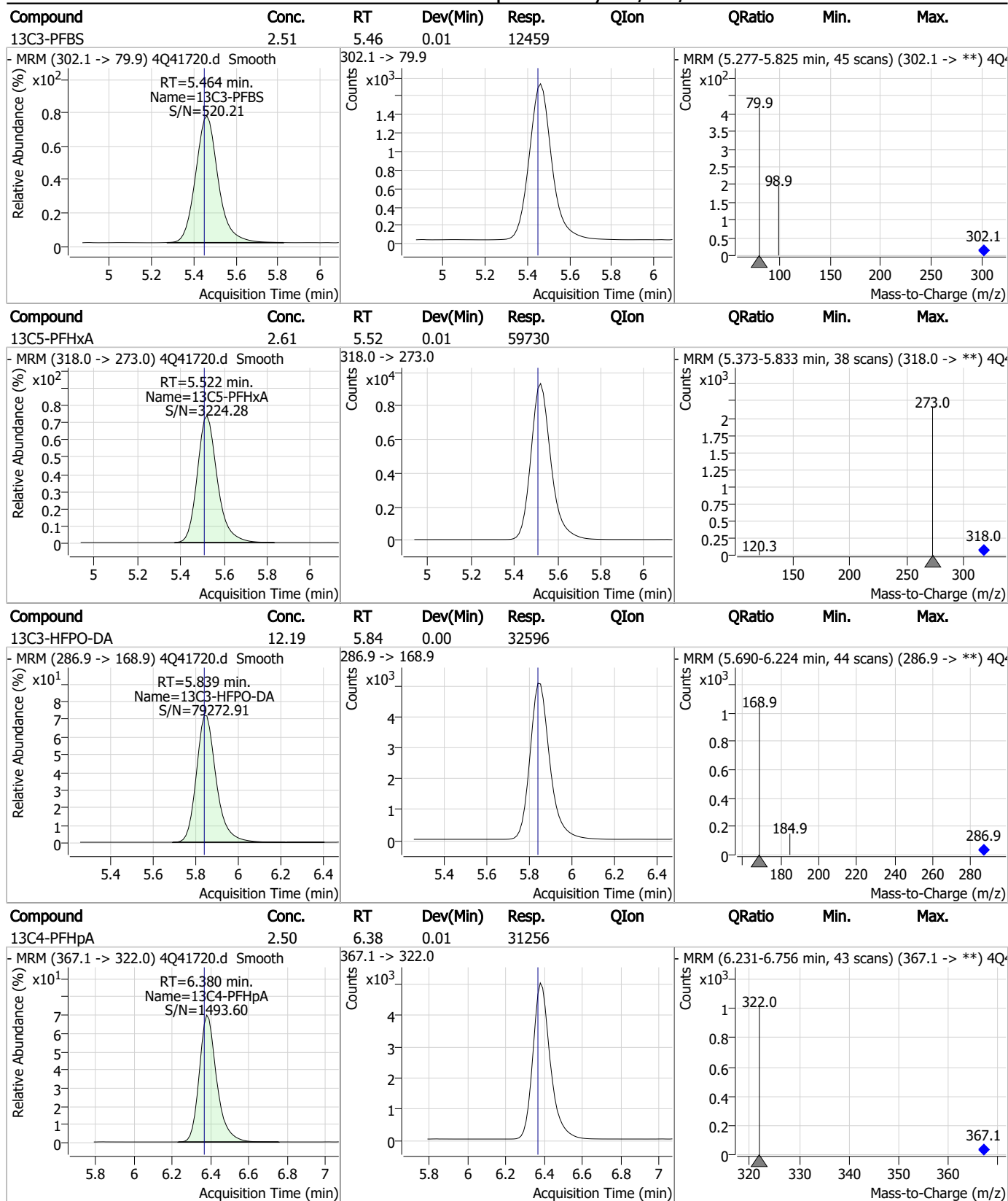
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Perfluorinated Compounds by LC/MS/MS



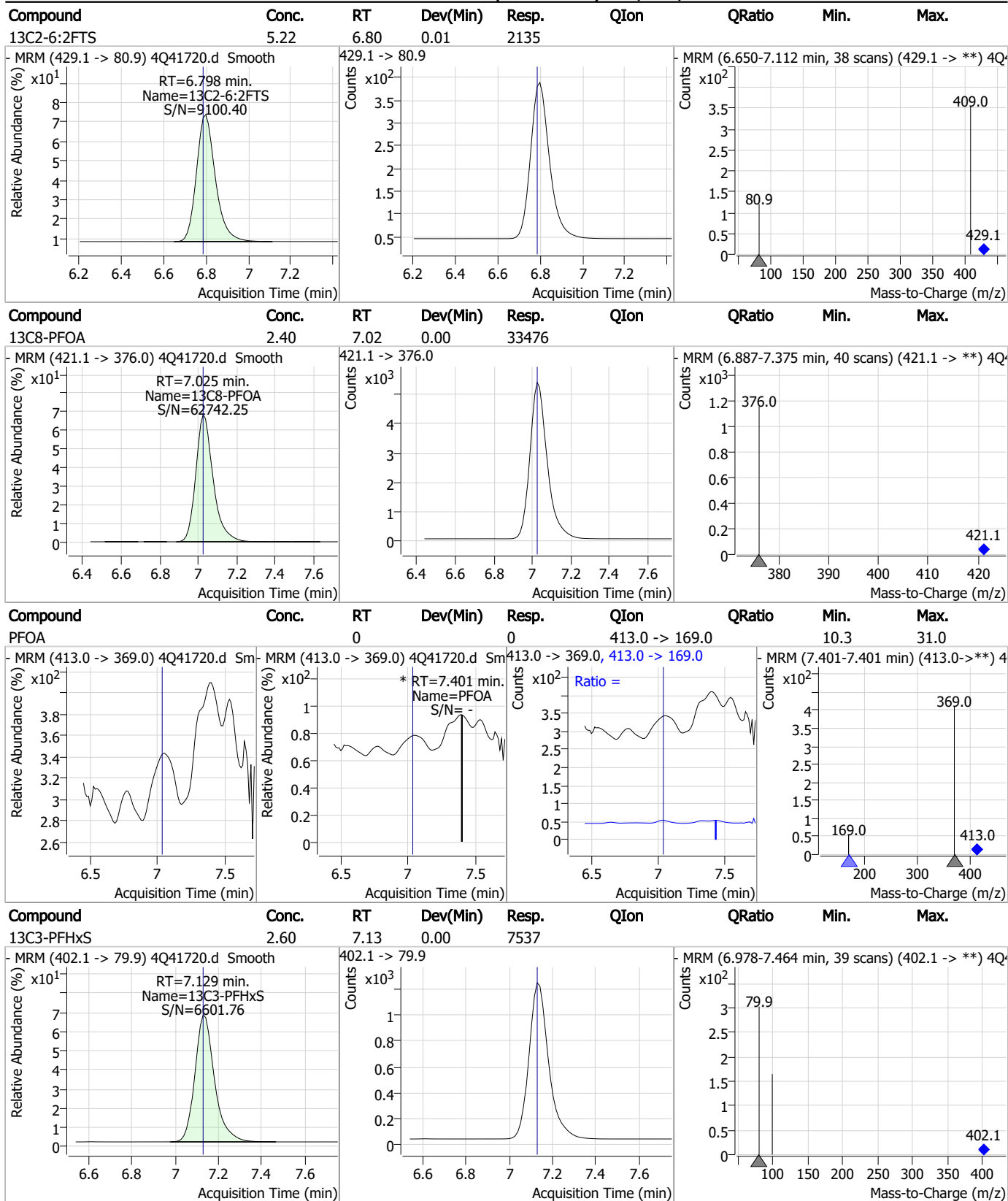
7.2.3
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Perfluorinated Compounds by LC/MS/MS



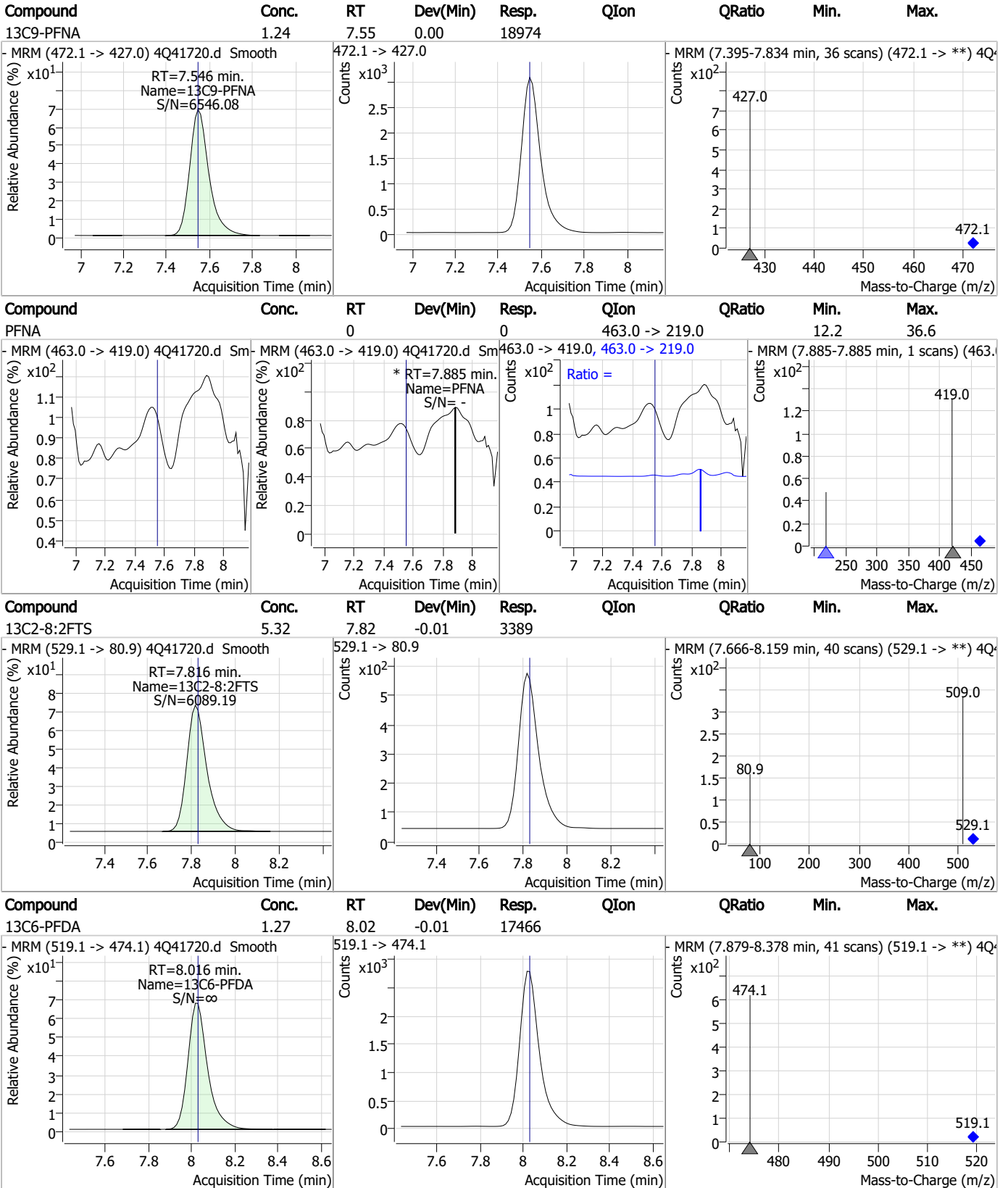
7.2.3
7

Perfluorinated Compounds by LC/MS/MS

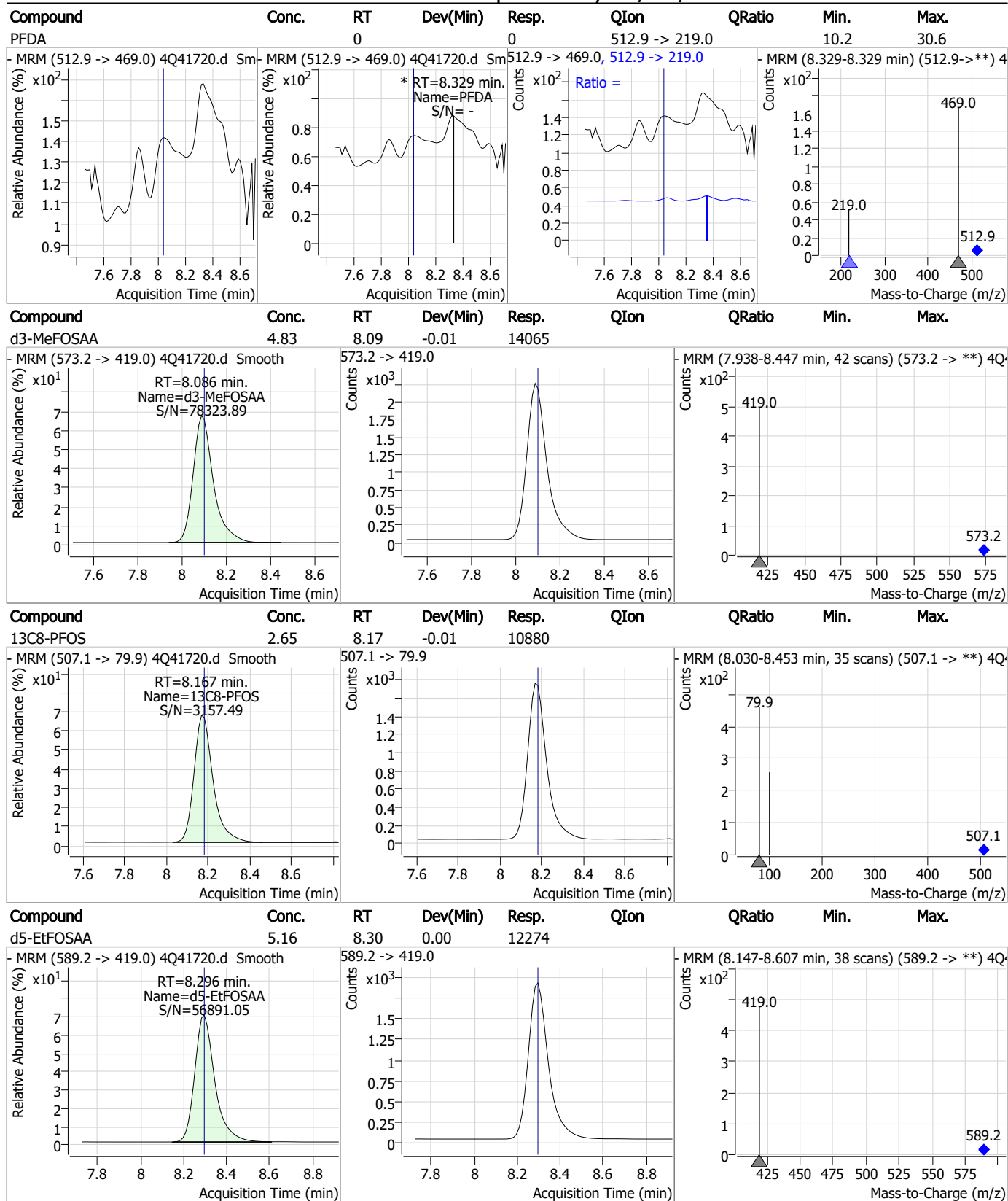


7.2.3
7

Perfluorinated Compounds by LC/MS/MS

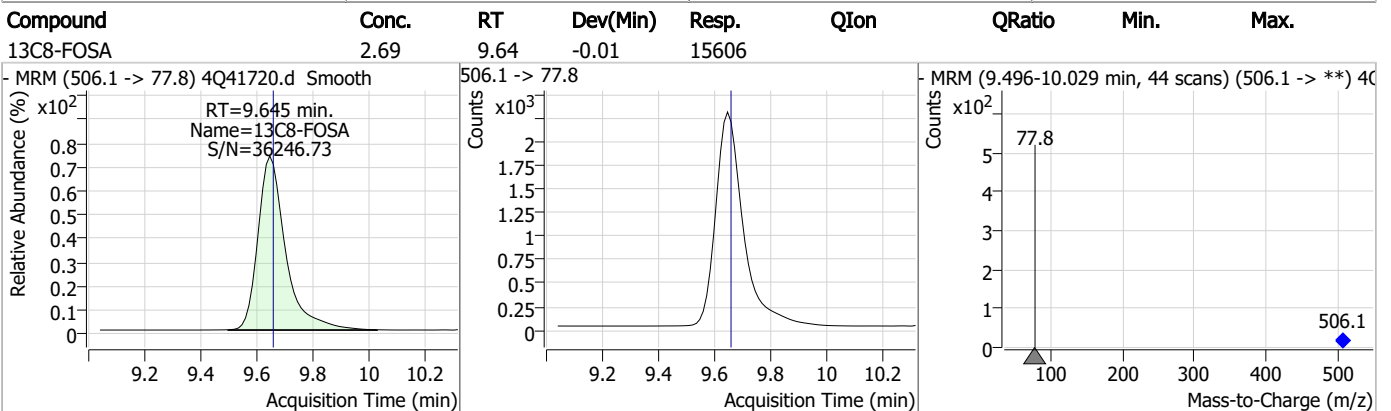
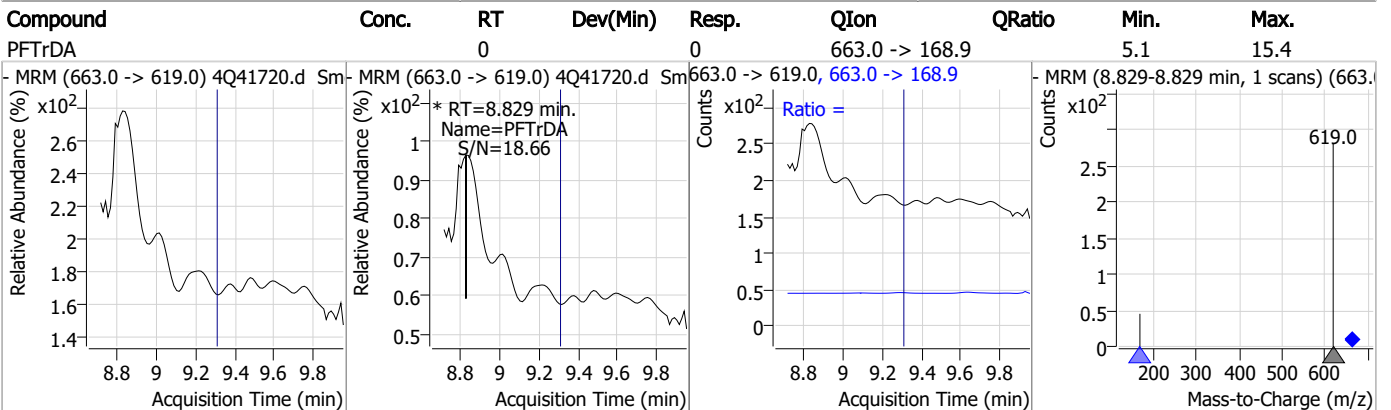
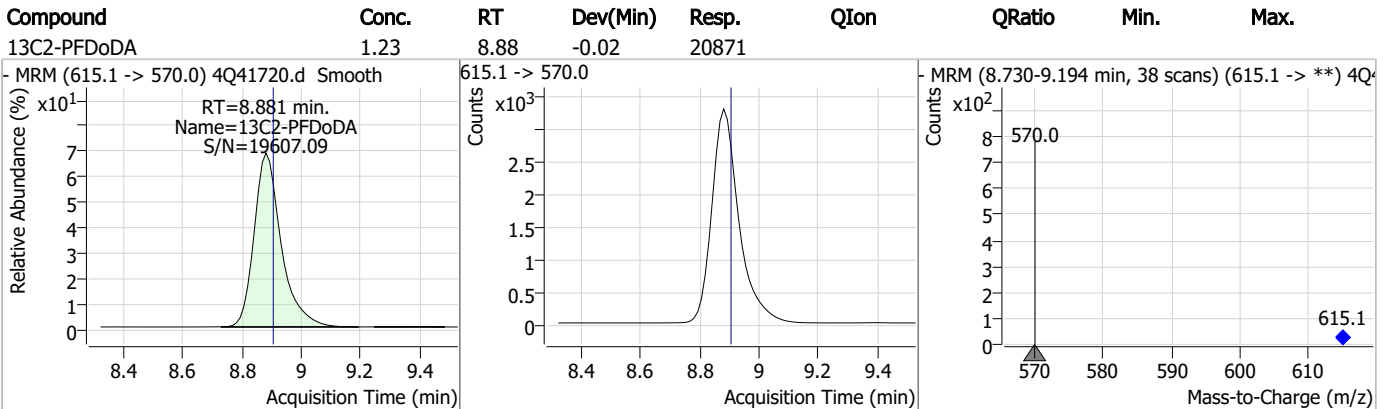
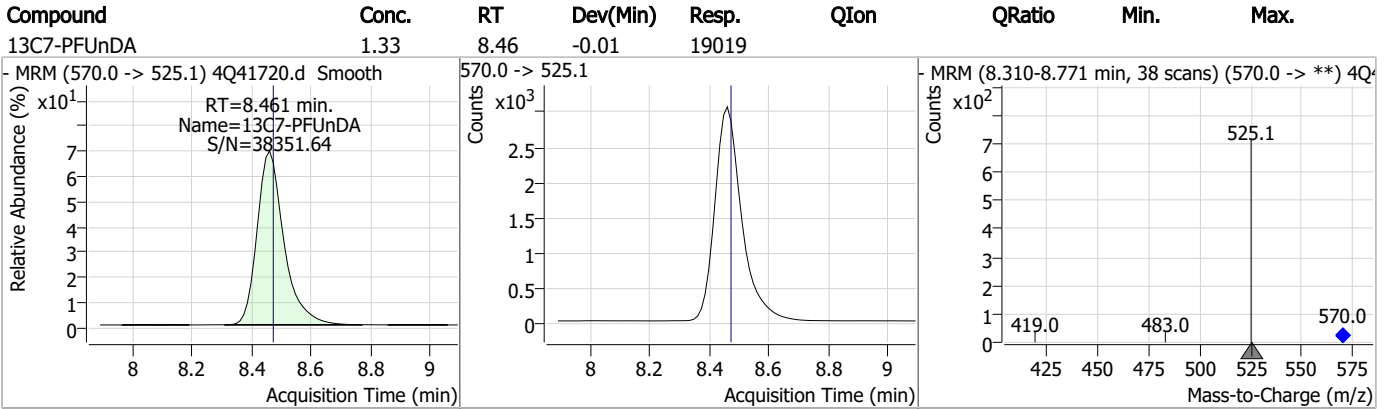


Perfluorinated Compounds by LC/MS/MS

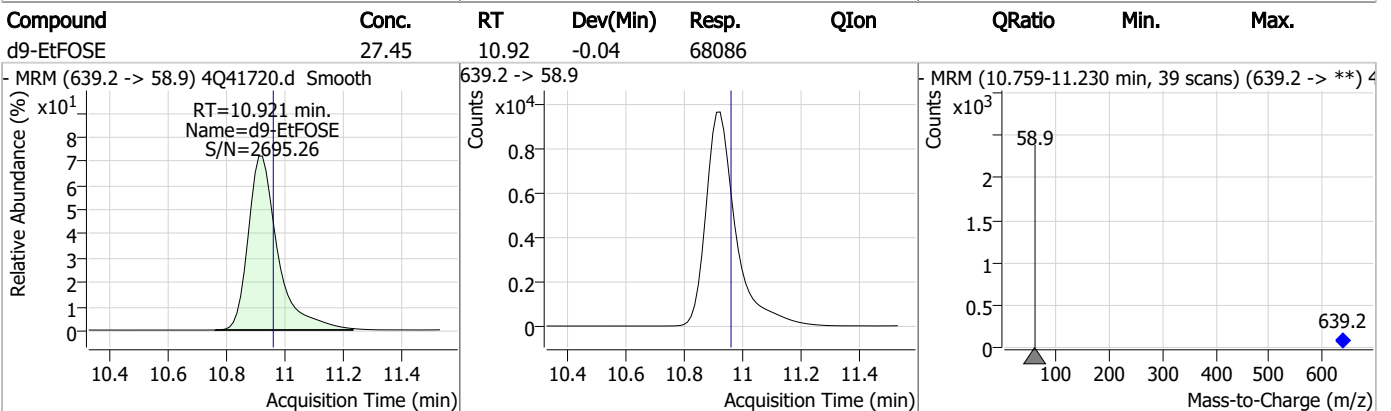
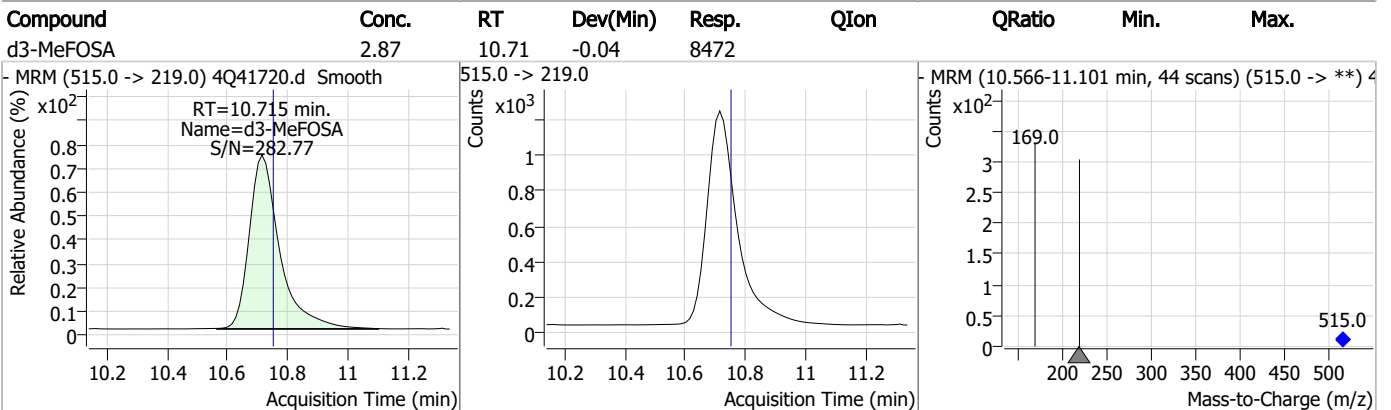
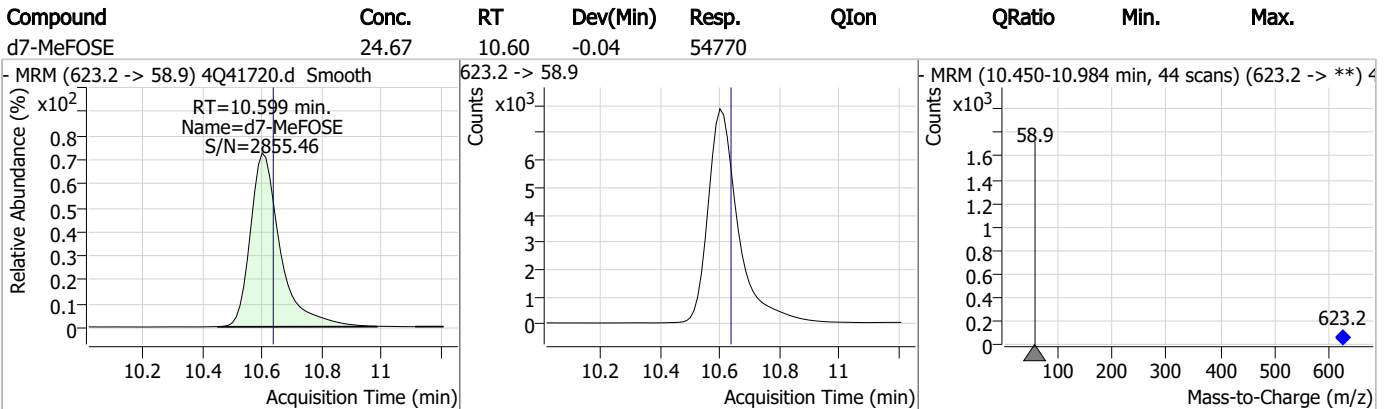
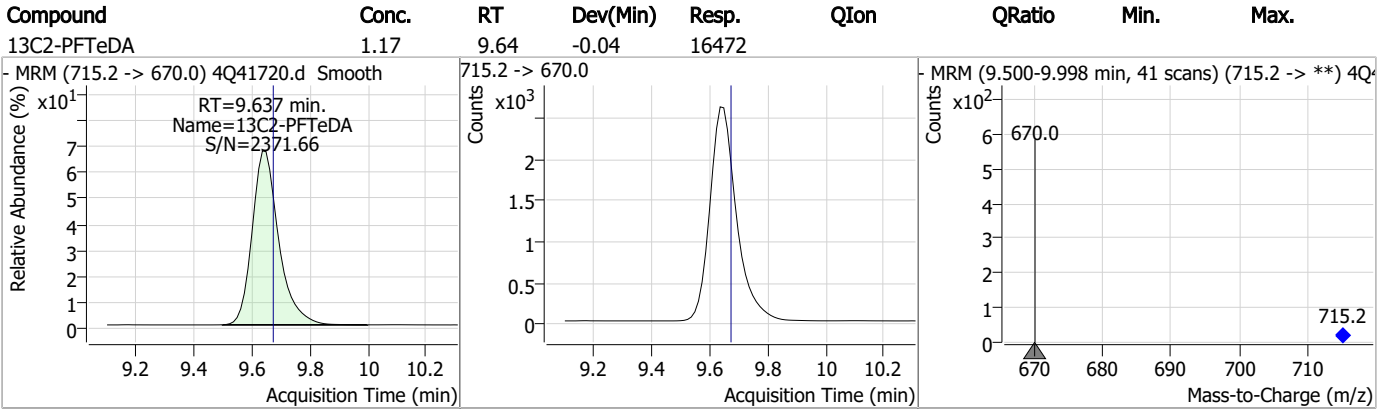


7.2.3
7

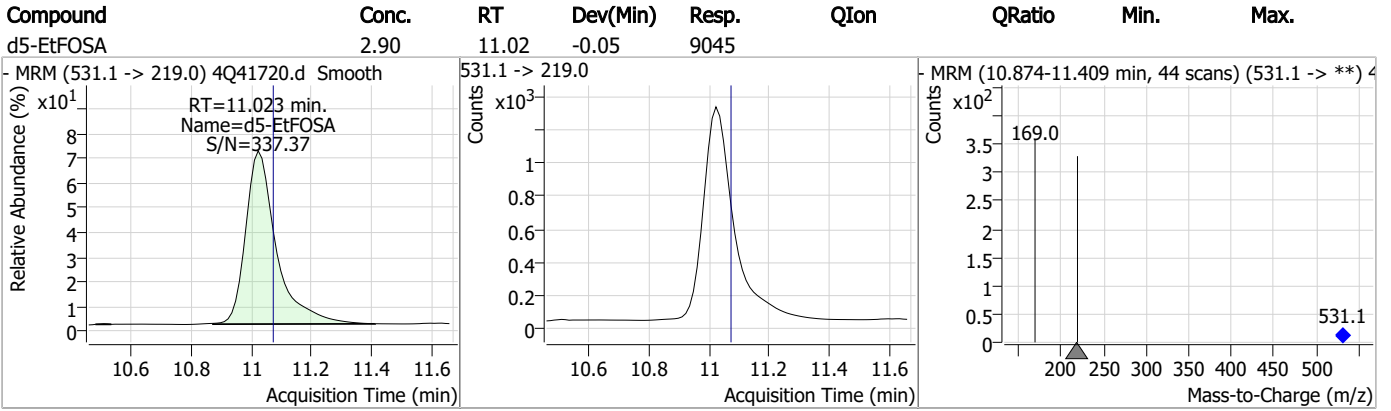
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



7.2.3

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41709.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 6:13:27 PM
 Sample Name : op95719-bs
 Vial : P6-A1
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.177	216.8 -> 171.9	49660	10.00 µg/L	0.066
M5-PFPeA	4.487	268.3 -> 223.0	67110	5.00 µg/L	0.025
M5-PFHxA	5.497	318.0 -> 273.0	56746	2.50 µg/L	-0.012
M4-PFHpA	6.355	367.1 -> 322.0	30469	2.50 µg/L	-0.012
M8-PFOA	7.012	421.1 -> 376.0	31180	2.50 µg/L	-0.012
M9-PFNA	7.534	472.1 -> 427.0	17200	1.25 µg/L	-0.012
M6-PFDA	8.004	519.1 -> 474.1	16641	1.25 µg/L	-0.025
M7-PFUnDA	8.448	570.0 -> 525.1	16755	1.25 µg/L	-0.025
M2-PFDoDA	8.868	615.1 -> 570.0	18992	1.25 µg/L	-0.037
M2-PFTeDA	9.624	715.2 -> 670.0	15459	1.25 µg/L	-0.050
M8-FOSA	9.632	506.1 -> 77.8	14231	2.50 µg/L	-0.025
M3-PFBS	5.451	302.1 -> 79.9	11730	2.50 µg/L	0.000
M3-PFHxS	7.117	402.1 -> 79.9	7251	2.50 µg/L	-0.013
M8-PFOS	8.154	507.1 -> 79.9	9844	2.50 µg/L	-0.026
M2-4:2FTS	5.223	329.1 -> 80.9	1350	5.00 µg/L	0.000
M2-6:2FTS	6.786	429.1 -> 80.9	1732	5.00 µg/L	0.000
M2-8:2FTS	7.803	529.1 -> 80.9	2935	5.00 µg/L	-0.025
M3-MeFOSAA	8.074	573.2 -> 419.0	13372	5.00 µg/L	-0.025
M3-HFPO-DA	5.827	286.9 -> 168.9	30666	10.00 µg/L	-0.012
M5-EtFOSAA	8.283	589.2 -> 419.0	10678	5.00 µg/L	-0.012
M7-MeFOSE	10.586	623.2 -> 58.9	49857	25.00 µg/L	-0.050
M9-EtFOSE	10.896	639.2 -> 58.9	61842	25.00 µg/L	-0.062
M5-EtFOSA	10.998	531.1 -> 219.0	8037	2.50 µg/L	-0.075
M3-MeFOSA	10.702	515.0 -> 219.0	7655	2.50 µg/L	-0.050
13C4-PFOS	8.155	502.8 -> 79.9	11611	2.50 µg/L	-0.026
13C3-PFBA	3.180	216.0 -> 172.0	76133	5.00 µg/L	0.065
18O2-PFHxS	7.116	403.0 -> 83.9	5411	2.50 µg/L	-0.013
13C4-PFOA	7.013	417.1 -> 372.0	41397	2.50 µg/L	-0.012
13C2-PFDA	8.004	515.1 -> 470.1	15274	1.25 µg/L	-0.025
13C5-PFNA	7.534	468.0 -> 423.0	20716	1.25 µg/L	-0.012
13C2-PFHxA	5.498	315.1 -> 270.0	51567	2.50 µg/L	-0.012

System Monitoring Compounds

13C2-4:2FTS	5.223	329.1 -> 80.9	1350	4.60 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 92.0%		
13C2-6:2FTS	6.786	429.1 -> 80.9	1732	4.16 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 83.3%		
13C2-8:2FTS	7.803	529.1 -> 80.9	2935	4.54 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 90.7%		
13C2-PFDoDA	8.868	615.1 -> 570.0	18992	1.18 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 94.1%		
13C2-PFTeDA	9.624	715.2 -> 670.0	15459	1.16 µg/L	-0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 92.8%		
13C3-PFBS	5.451	302.1 -> 79.9	11730	2.33 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 93.2%		
13C3-PFHxS	7.117	402.1 -> 79.9	7251	2.46 µg/L	-0.013

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.6%		
13C4-PFBA	3.177	216.8 -> 171.9	49660	3.79 µg/L	0.066
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 37.9%		
13C4-PFHpA	6.355	367.1 -> 322.0	30469	2.49 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 99.6%		
13C5-PFHxA	5.497	318.0 -> 273.0	56746	2.54 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 101.4%		
13C5-PFPeA	4.487	268.3 -> 223.0	67110	4.77 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 95.3%		
13C6-PFDA	8.004	519.1 -> 474.1	16641	1.27 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 101.7%		
13C7-PFUnDA	8.448	570.0 -> 525.1	16755	1.24 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 98.9%		
13C8-FOSA	9.632	506.1 -> 77.8	14231	2.90 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 88.1%		
13C8-PFOA	7.012	421.1 -> 376.0	31180	2.28 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 91.1%		
13C8-PFOS	8.154	507.1 -> 79.9	9844	2.15 µg/L	-0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 86.1%		
13C9-PFNA	7.534	472.1 -> 427.0	17200	1.19 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 95.0%		
d3-MeFOSAA	8.074	573.2 -> 419.0	13372	4.12 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 82.5%		
13C3-HFPO-DA	5.827	286.9 -> 168.9	30666	11.75 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 117.5%		
d3-MeFOSA	10.702	515.0 -> 219.0	7655	2.33 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 93.1%		
d5-EtFOSAA	8.283	589.2 -> 419.0	10678	4.03 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 80.7%		
d7-MeFOSE	10.586	623.2 -> 58.9	49857	20.16 µg/L	-0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 80.6%		
d9-EtFOSE	10.896	639.2 -> 58.9	61842	22.38 µg/L	-0.062
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 89.5%		
d5-EtFOSA	10.998	531.1 -> 219.0	8037	2.32 µg/L	-0.075
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 92.6%		
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0	20127	10.94 µg/L	97
		327.1 -> 80.9	8728		
6:2FTS	6.774	427.1 -> 407.0	15741	12.56 µg/L	97
		427.1 -> 80.9	6602		
8:2FTS	7.804	527.1 -> 507.0	15237	11.53 µg/L	97
		527.1 -> 80.8	6978		
EtFOSAA	8.284	584.2 -> 419.1	4836	2.82 µg/L	m 78
		584.2 -> 526.0	2761		
FOSA	9.636	498.1 -> 77.9	15701	3.06 µg/L	99
		498.1 -> 478.0	471		
MeFOSAA	8.075	570.1 -> 419.0	5543	3.02 µg/L	m 93
		570.1 -> 483.0	1199		
PFBA	3.183	212.8 -> 168.9	13173	12.32 µg/L	100
PFBS	5.452	298.7 -> 79.9	12670	3.02 µg/L	97
		298.7 -> 98.8	5021		
PFDA	8.005	512.9 -> 469.0	30899	3.24 µg/L	99
		512.9 -> 219.0	6217		
PFDoDA	8.869	613.1 -> 569.0	40052	3.24 µg/L	99
		613.1 -> 319.0	5596		
PFDS	9.032	599.0 -> 79.9	6122	2.95 µg/L	96

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.368	599.0 -> 98.8	2860	3.17	µg/L	100
		363.1 -> 319.0	48650			
PFHpS	7.673	363.1 -> 169.0	8638	2.96	µg/L	98
		449.0 -> 79.9	7967			
PFHxA	5.500	449.0 -> 98.9	4371	3.09	µg/L	100
		313.0 -> 269.0	53663			
PFHxS	7.118	313.0 -> 118.9	1602	2.84	µg/L	m
		398.7 -> 79.9	7502			
PFNA	7.535	398.7 -> 98.9	3682	3.23	µg/L	98
		463.0 -> 419.0	29360			
PFNS	8.611	463.0 -> 219.0	7462	3.11	µg/L	94
		548.8 -> 79.9	4860			
PFOA	7.014	548.8 -> 98.9	2650	3.29	µg/L	99
		413.0 -> 369.0	46539			
PFOS	8.156	413.0 -> 169.0	9860	2.48	µg/L	m
		498.9 -> 79.9	10331			
PFPeA	4.489	498.9 -> 98.8	5683	6.74	µg/L	100
		263.0 -> 219.0	86671			
PFPeS	6.419	349.1 -> 79.9	6628	2.72	µg/L	93
		349.1 -> 98.9	3123			
PFTeDA	9.625	713.1 -> 669.0	34092	3.18	µg/L	100
		713.1 -> 168.9	2936			
PFTrDA	9.267	663.0 -> 619.0	46674	3.16	µg/L	99
		663.0 -> 168.9	4705			
PFUnDA	8.449	563.1 -> 519.0	27119	3.15	µg/L	94
		563.1 -> 269.1	4874			
11CI-PF3OUdS	9.306	630.9 -> 450.9	92552	10.59	µg/L	98
		632.9 -> 452.9	27727			
9CI-PF3ONS	8.488	530.8 -> 351.0	114149	11.04	µg/L	100
		532.8 -> 353.0	33328			
ADONA	6.619	376.9 -> 250.9	224307	11.13	µg/L	100
		376.9 -> 84.8	59113			
HFPO-DA	5.828	284.9 -> 168.9	31021	12.85	µg/L	99
		284.9 -> 184.9	3682			
3:3FTCA	4.204	241.0 -> 177.0	12004	17.29	µg/L	99
		241.0 -> 117.0	1096			
5:3FTCA	6.333	341.0 -> 237.1	230011	80.03	µg/L	99
		341.0 -> 217.0	163231			
7:3FTCA	7.711	441.0 -> 316.9	86363	80.70	µg/L	97
		441.0 -> 336.9	195330			
EtFOSA	11.012	526.0 -> 219.0	9279	2.83	µg/L	100
		526.0 -> 169.0	10351			
EtFOSE	10.921	630.0 -> 58.9	66862	30.53	µg/L	100
		511.9 -> 219.0	7403			
MeFOSA	10.704	511.9 -> 169.0	8699	2.68	µg/L	96
		616.1 -> 58.9	58447			
MeFOSE	10.599	699.1 -> 79.9	5014	30.70	µg/L	100
		699.1 -> 98.8	2903			
PFDoDS	9.765	295.0 -> 201.0	4289	2.85	µg/L	96
		295.0 -> 84.9	1102			
NFDHA	5.403	279.0 -> 85.1	49758	7.27	µg/L	97
		229.0 -> 84.9	31824			
PFMBA	4.842	314.8 -> 134.9	73700	6.90	µg/L	100
		314.8 -> 82.9	2637			
PFMPA	3.740			5.13	µg/L	100
PFEESA	5.921			5.62	µg/L	99

= Qualifier out of range, m = manually integrated, + = Area summed

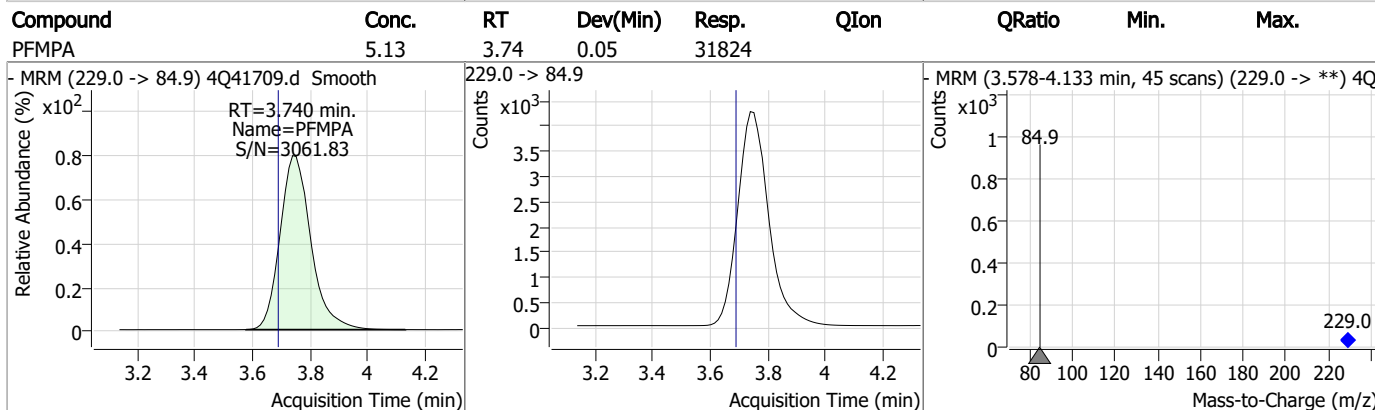
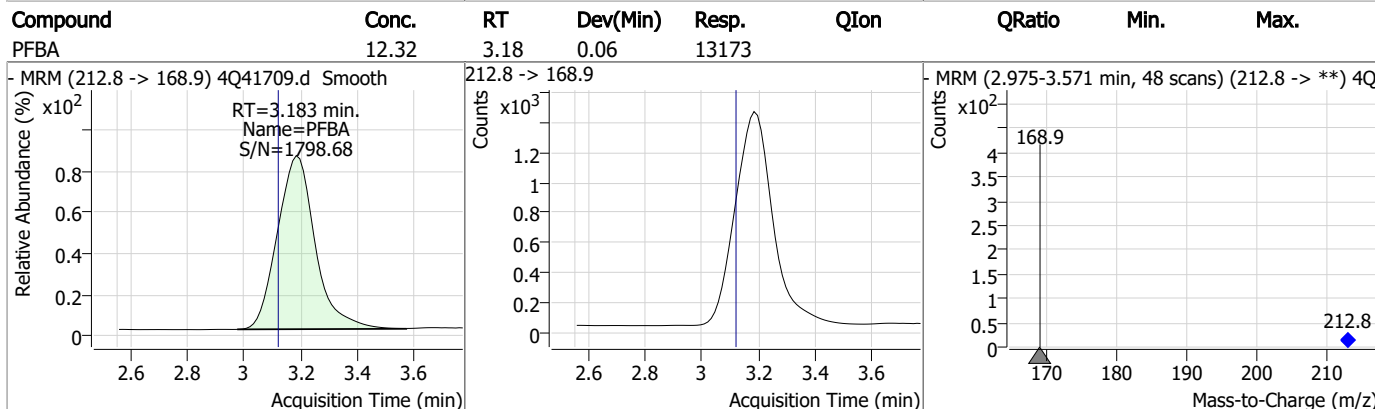
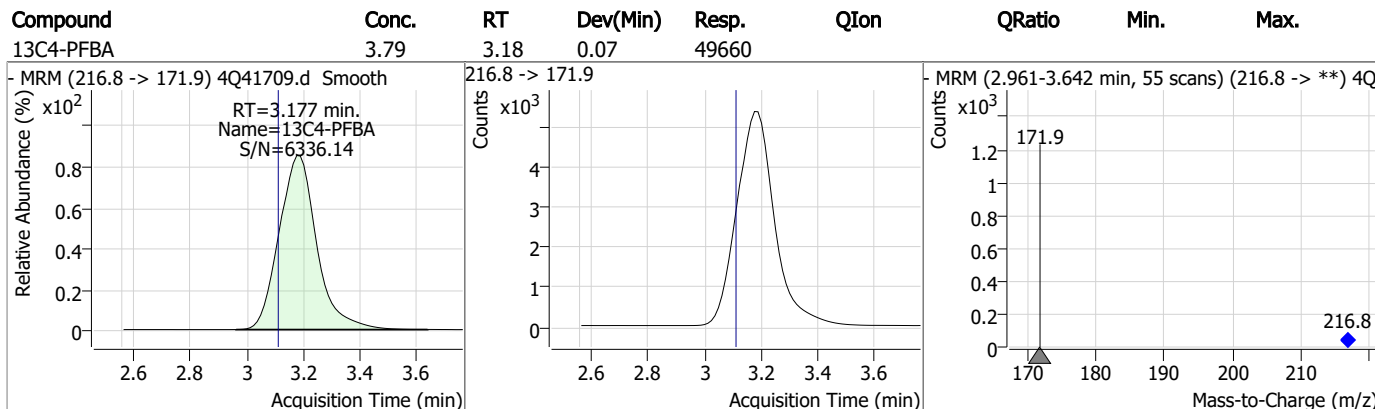
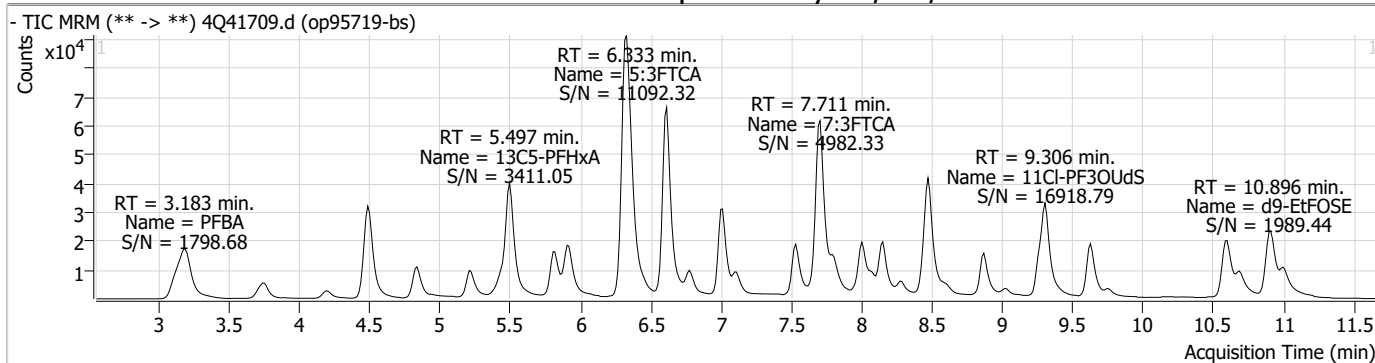
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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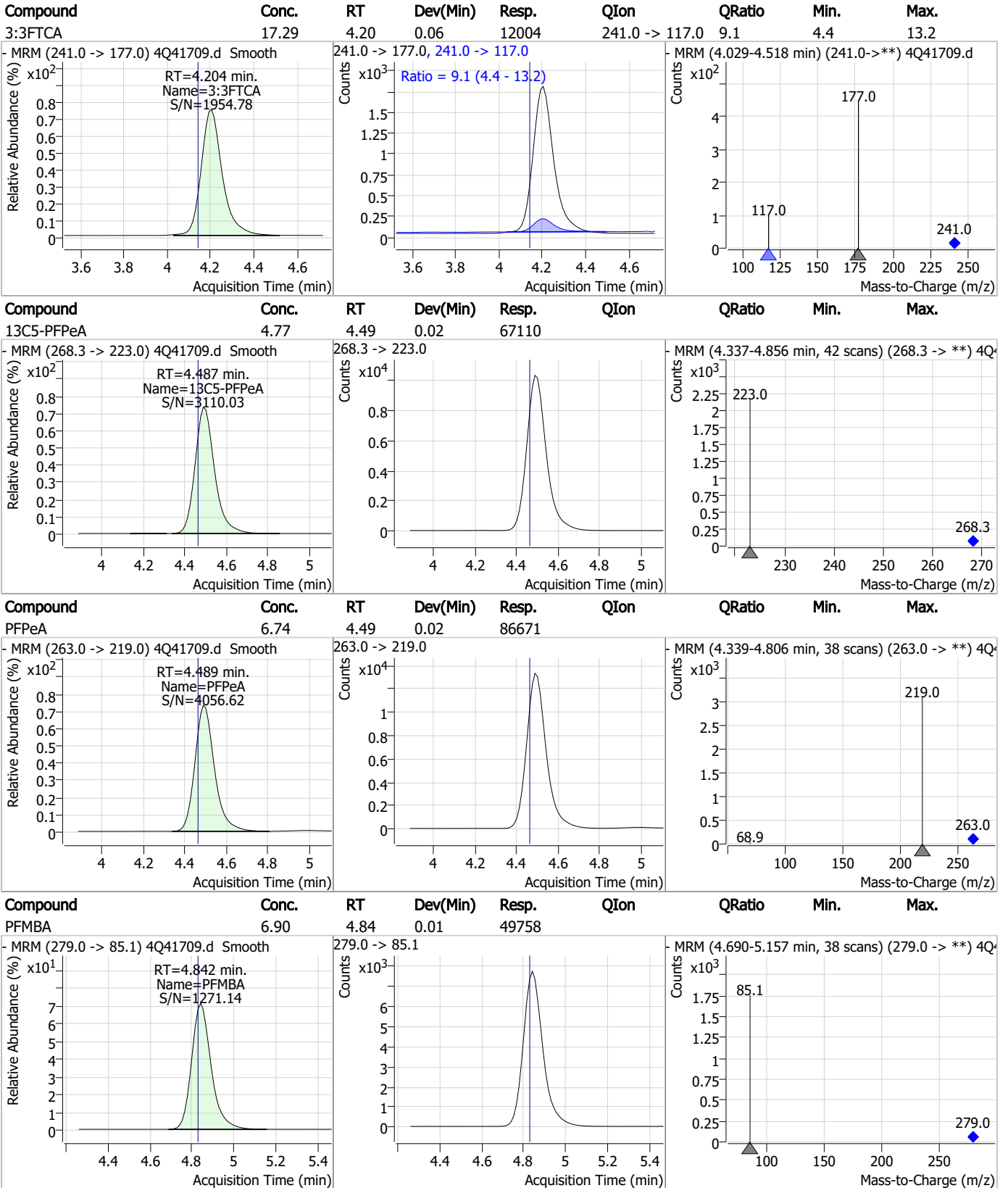
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Perfluorinated Compounds by LC/MS/MS



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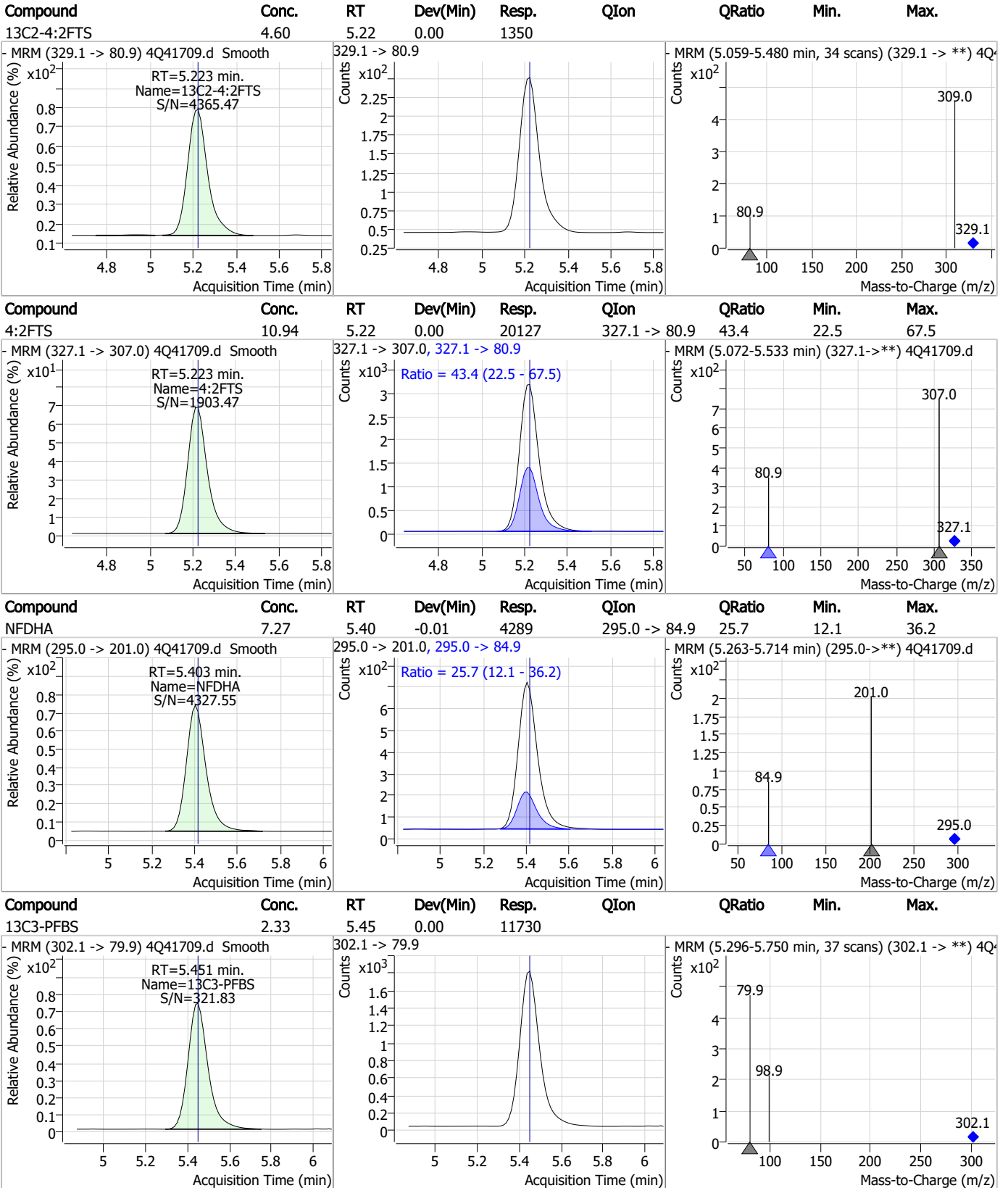
Perfluorinated Compounds by LC/MS/MS



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Perfluorinated Compounds by LC/MS/MS



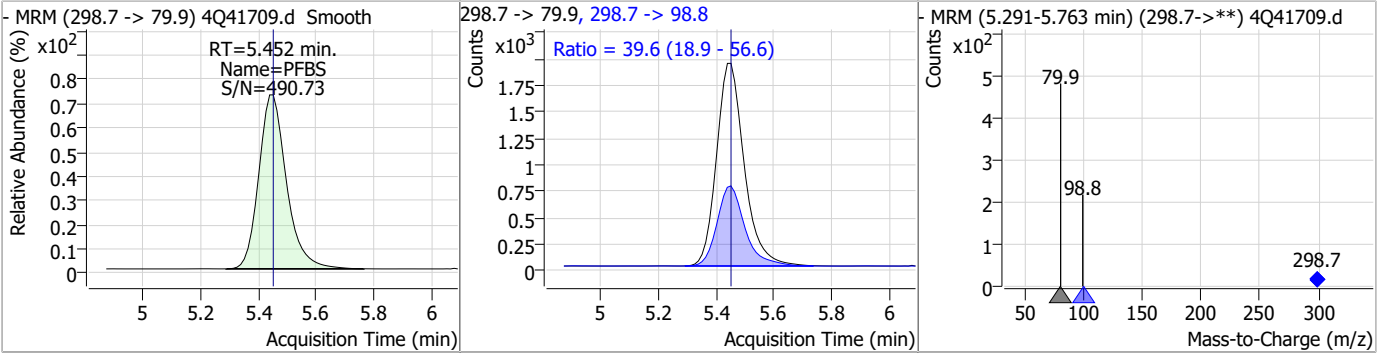
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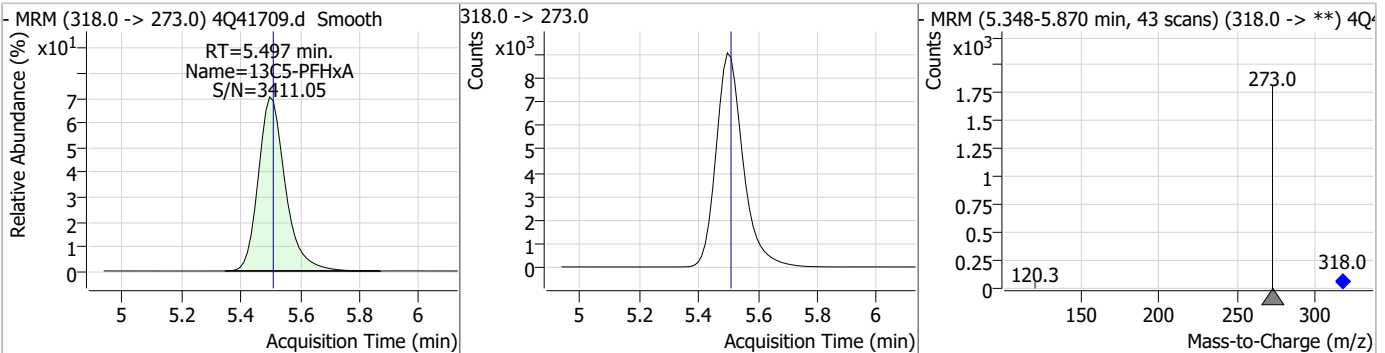


Perfluorinated Compounds by LC/MS/MS

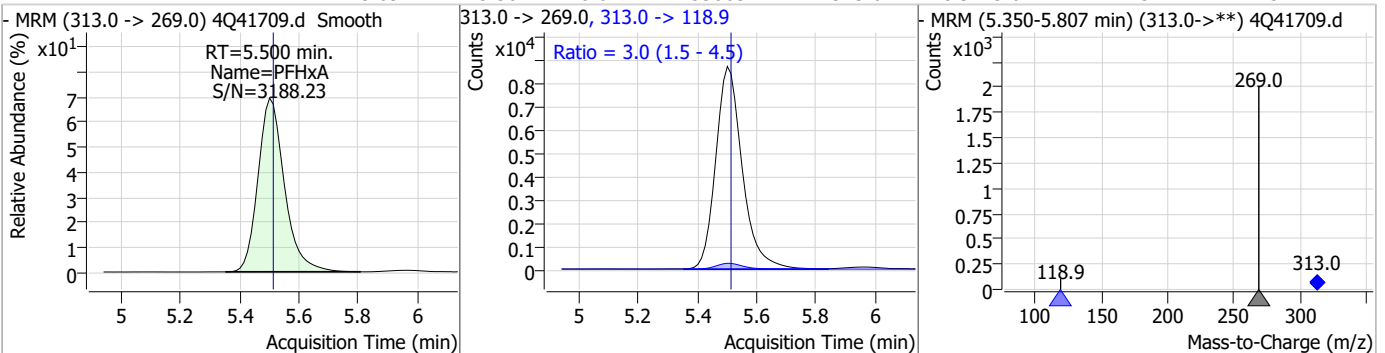
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	3.02	5.45	0.00	12670	298.7 -> 98.8	39.6	18.9	56.6



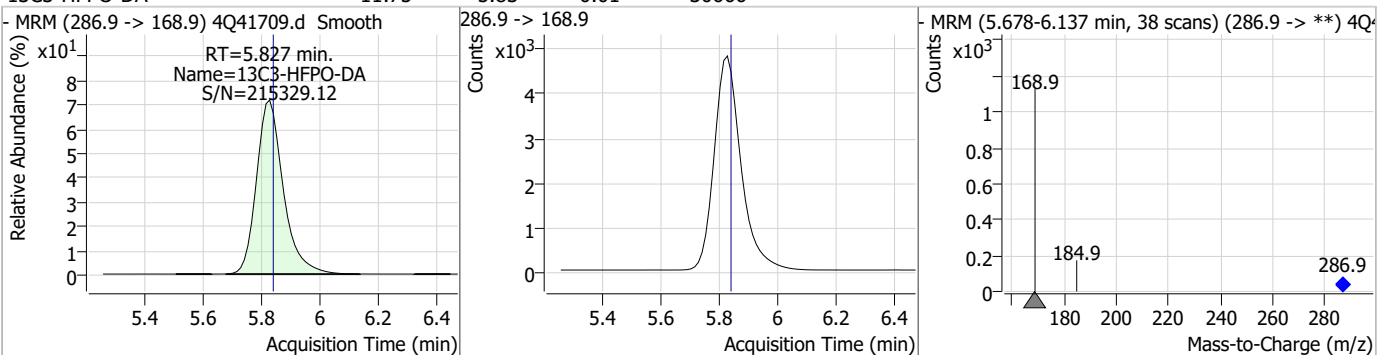
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFHxA	2.54	5.50	-0.01	56746				



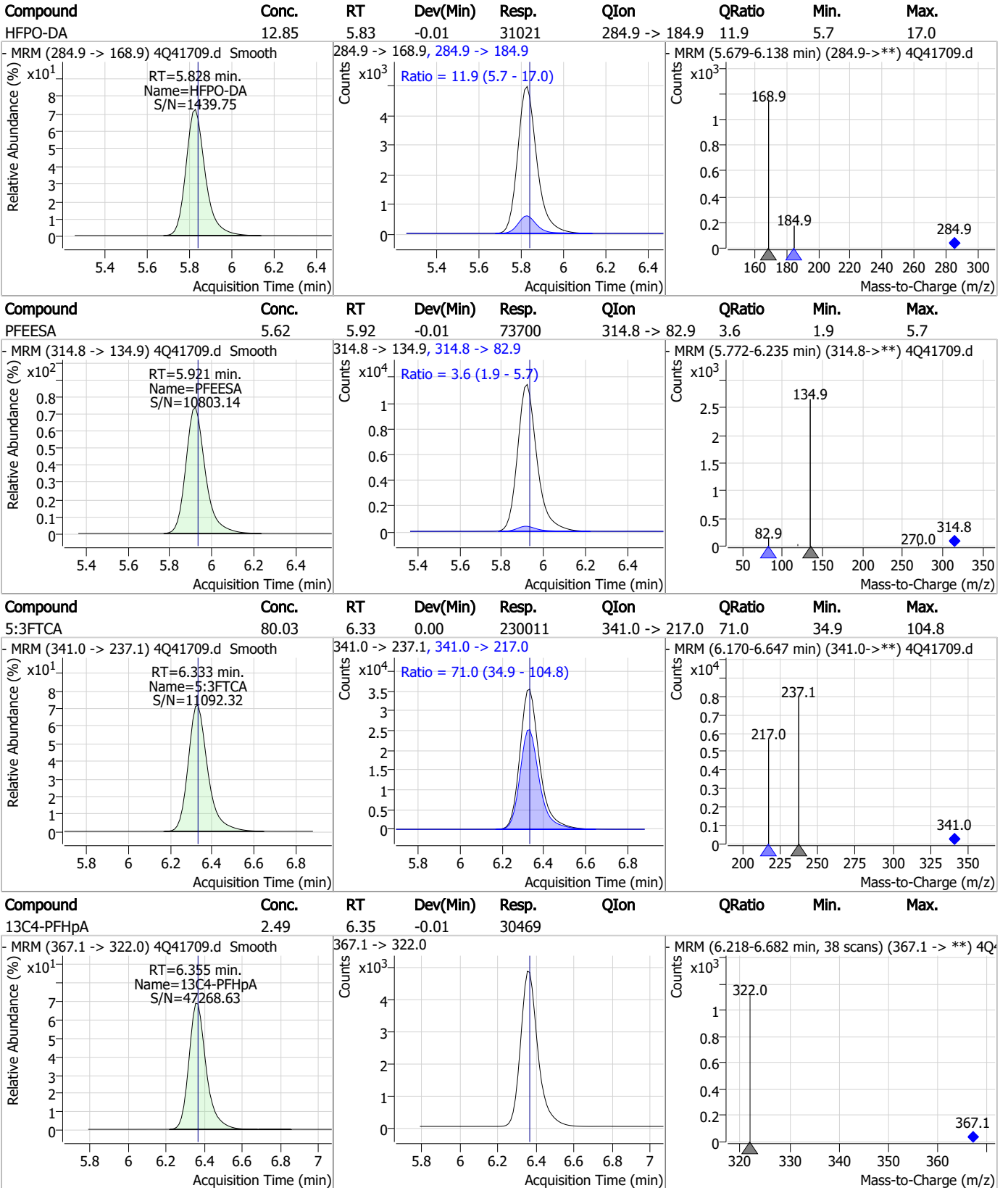
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	3.09	5.50	-0.01	53663	313.0 -> 118.9	3.0	1.5	4.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	11.75	5.83	-0.01	30666				



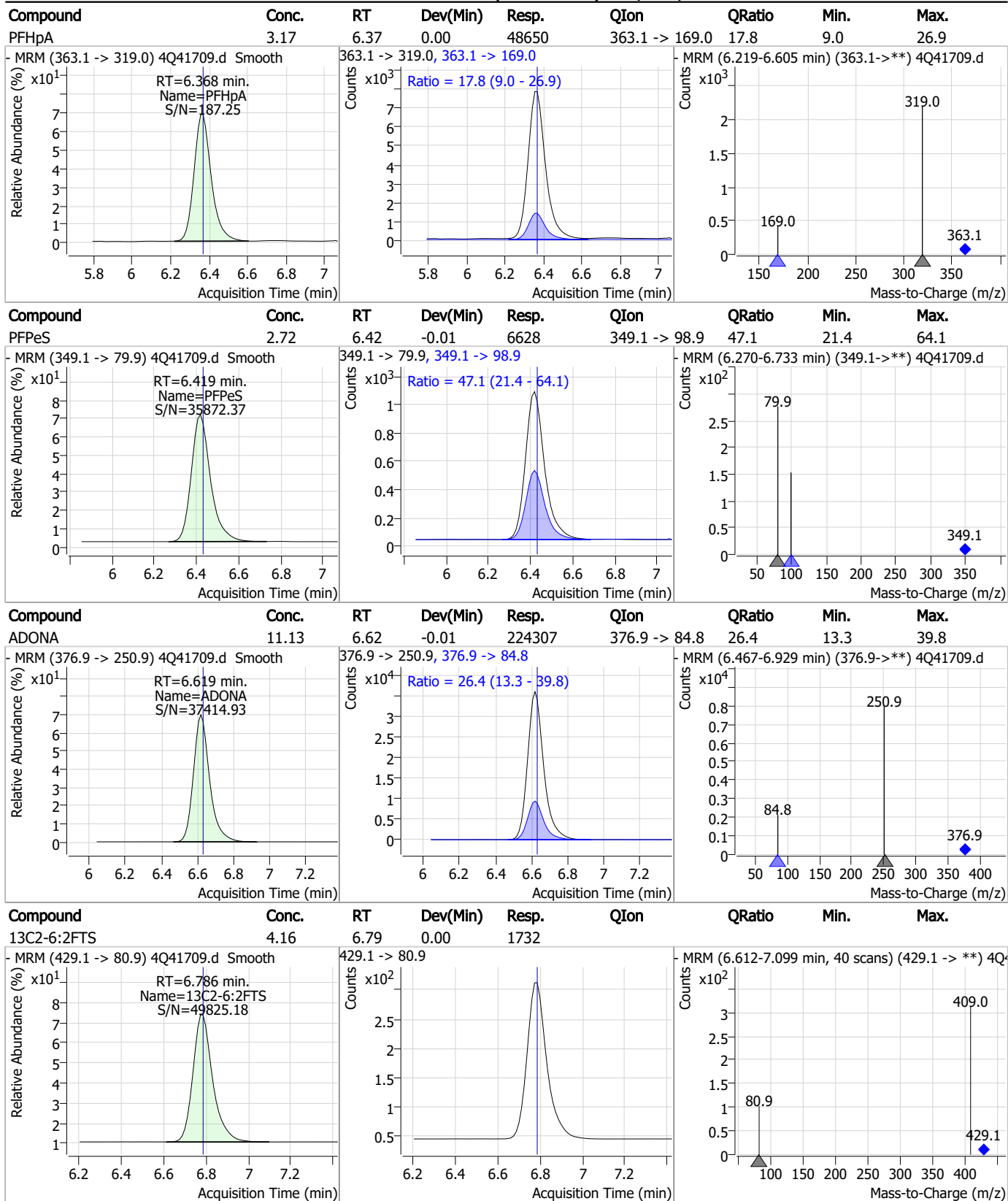
Perfluorinated Compounds by LC/MS/MS



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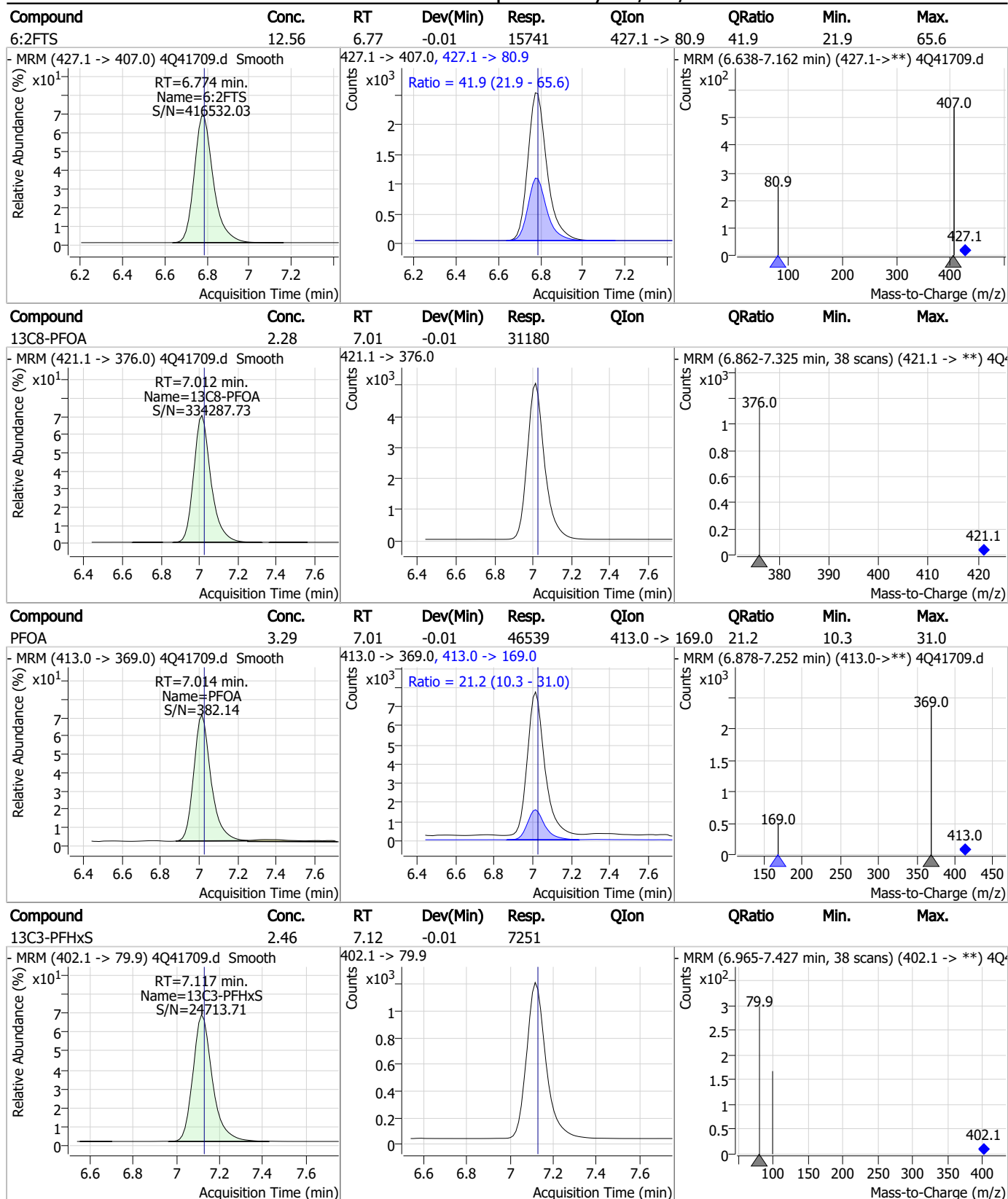
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Perfluorinated Compounds by LC/MS/MS



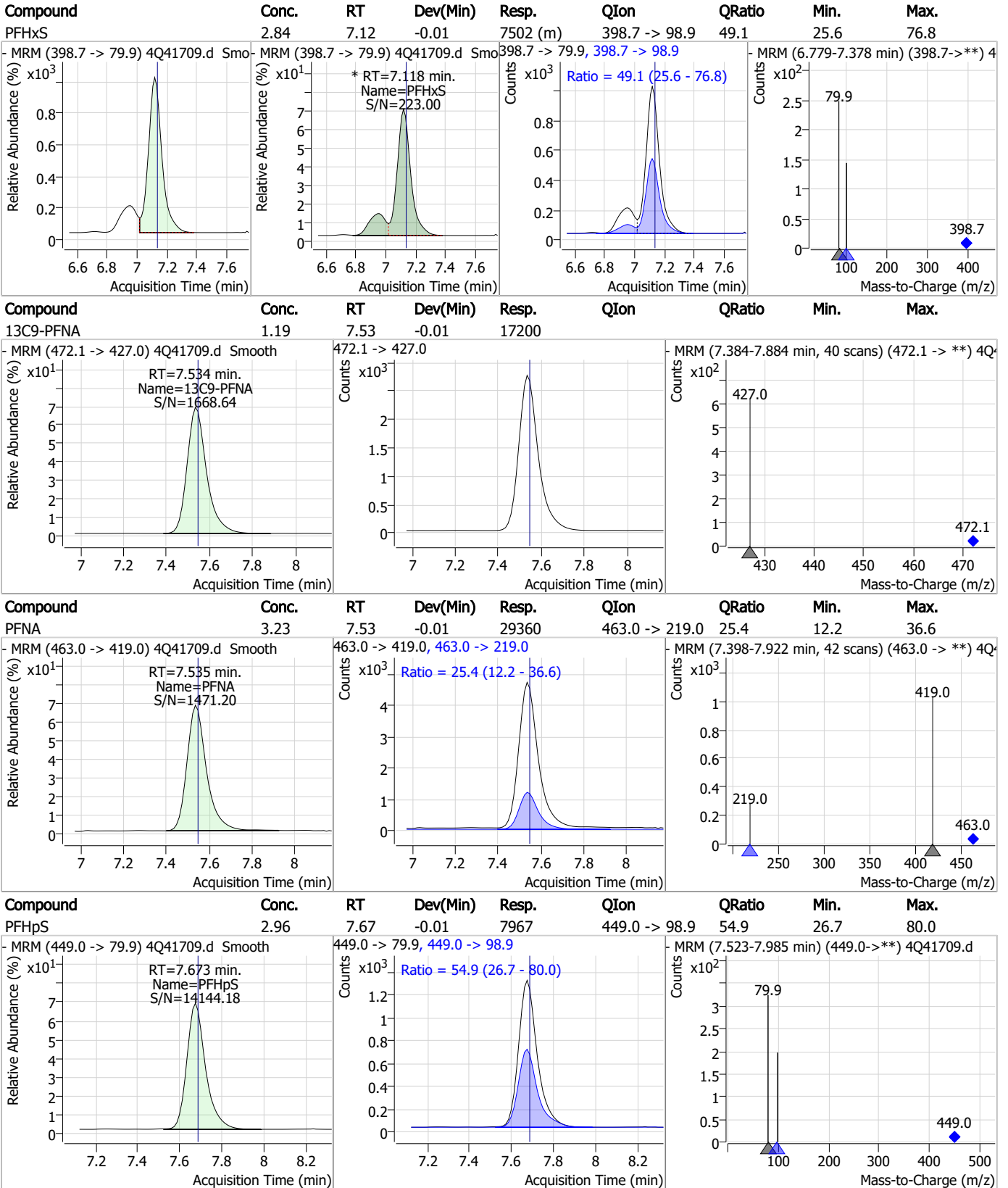
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Perfluorinated Compounds by LC/MS/MS



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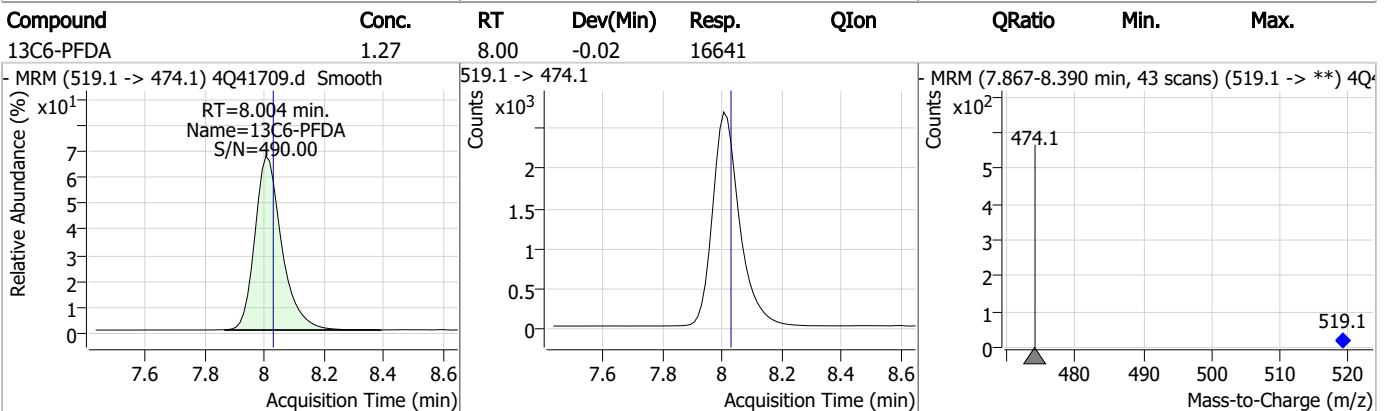
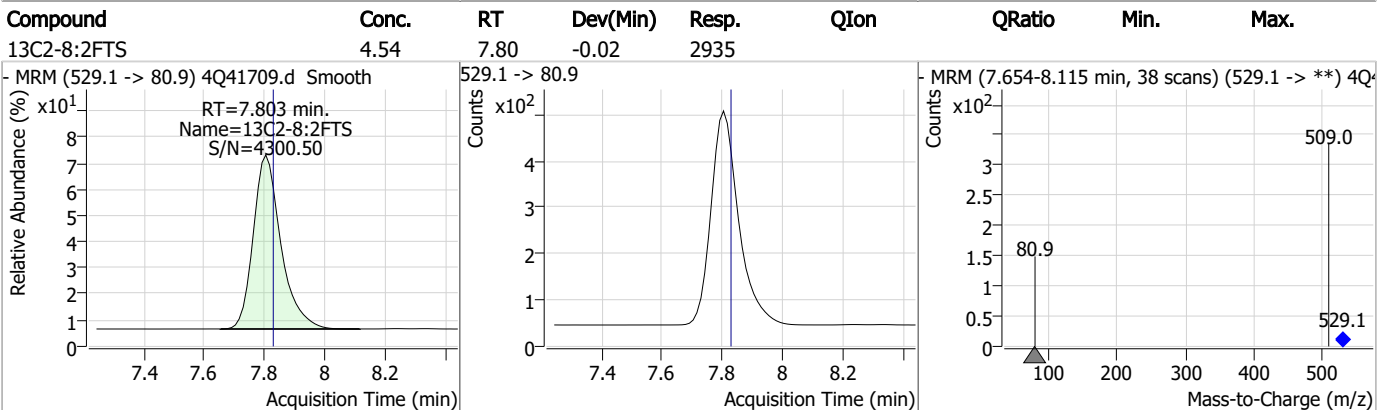
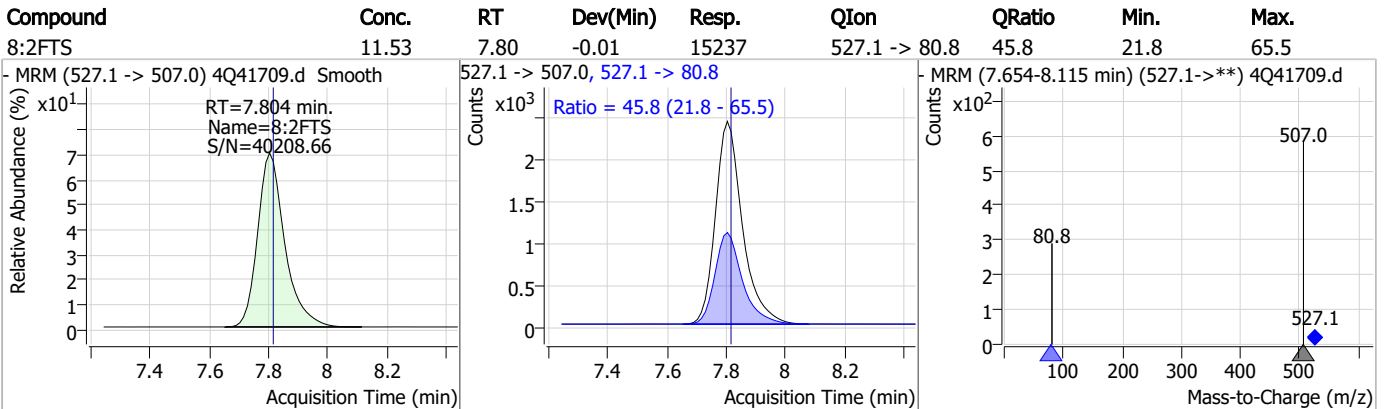
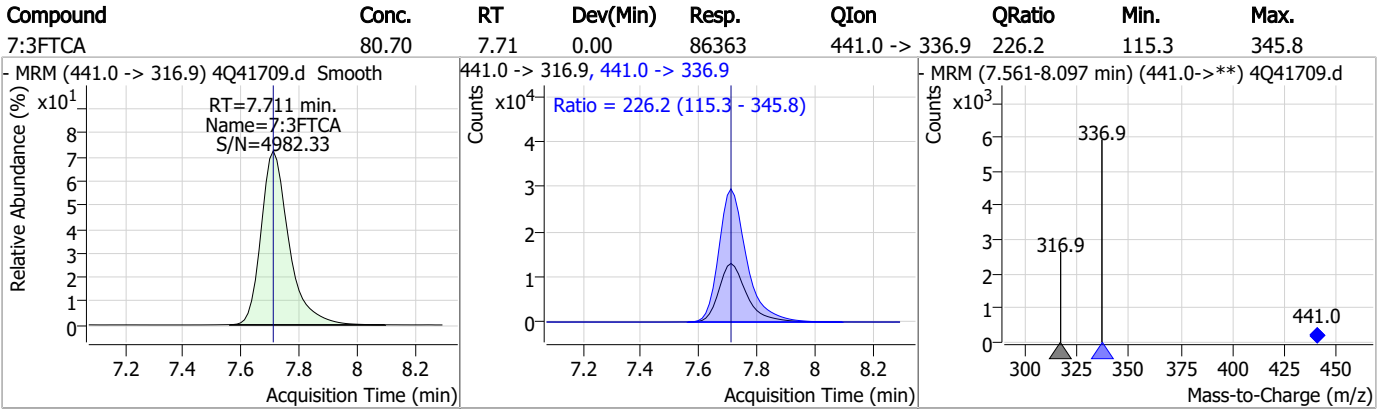
Perfluorinated Compounds by LC/MS/MS



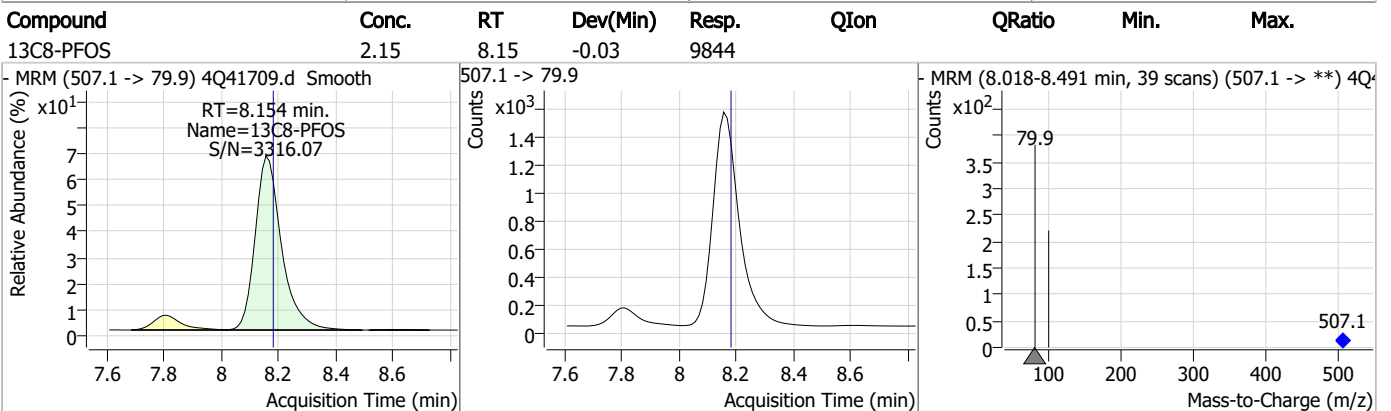
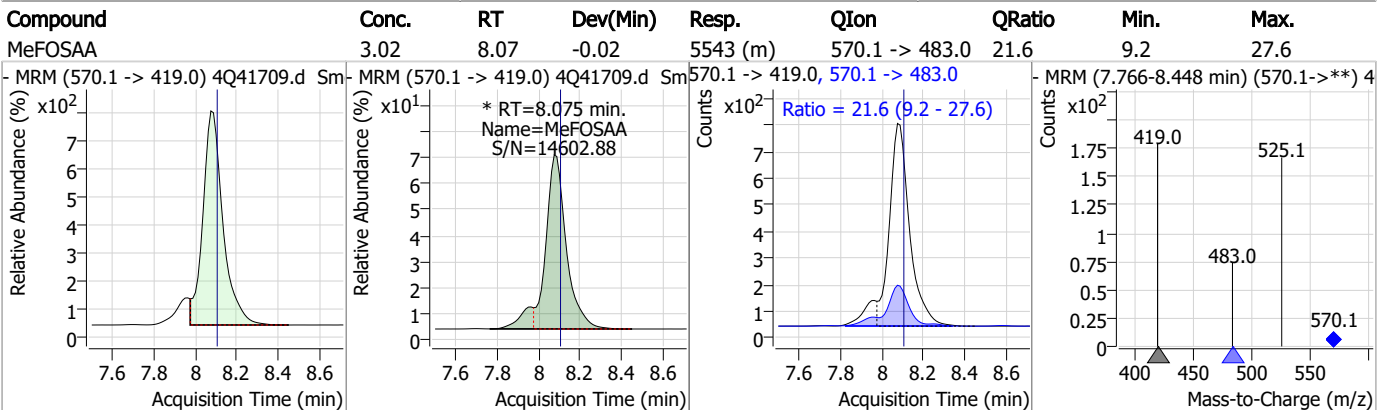
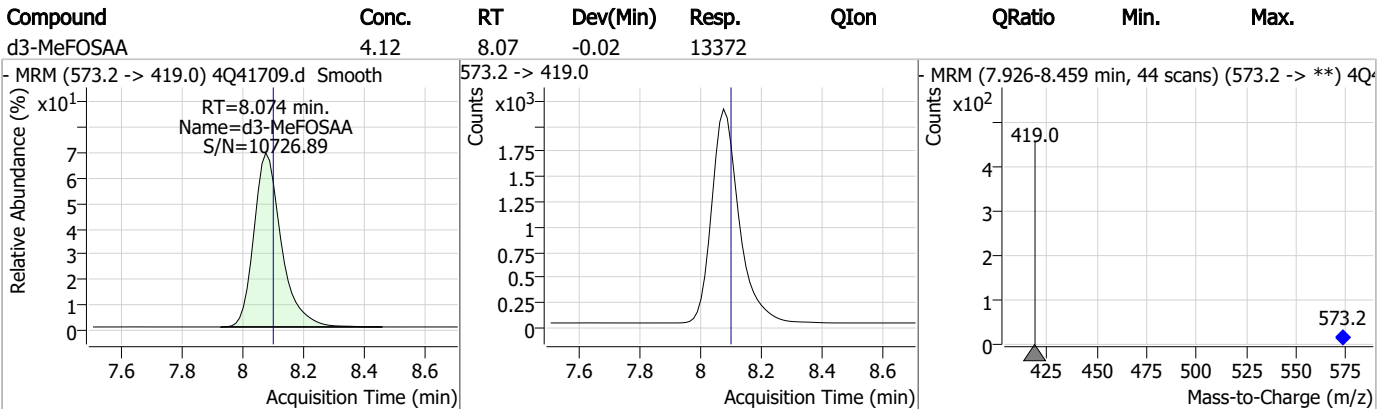
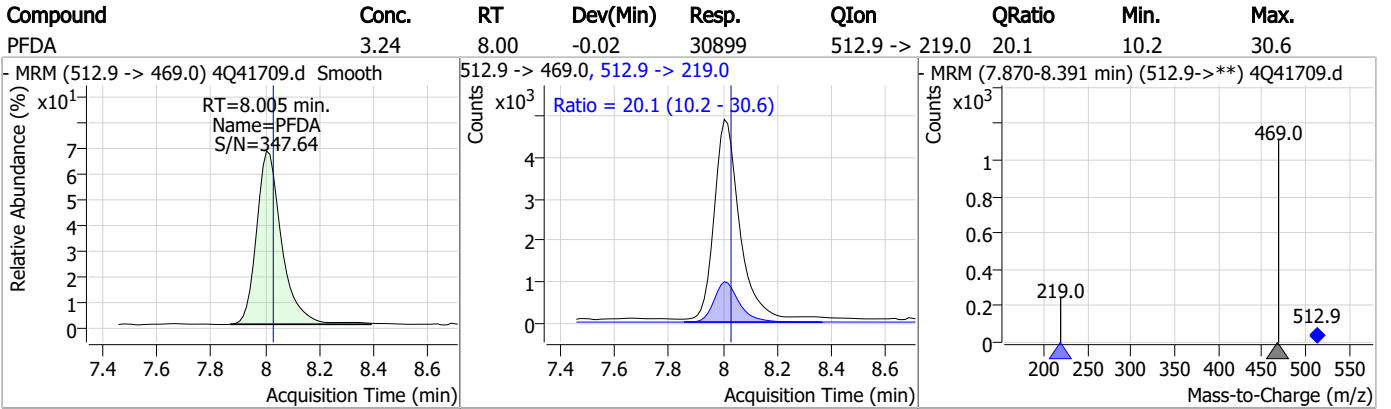
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Perfluorinated Compounds by LC/MS/MS



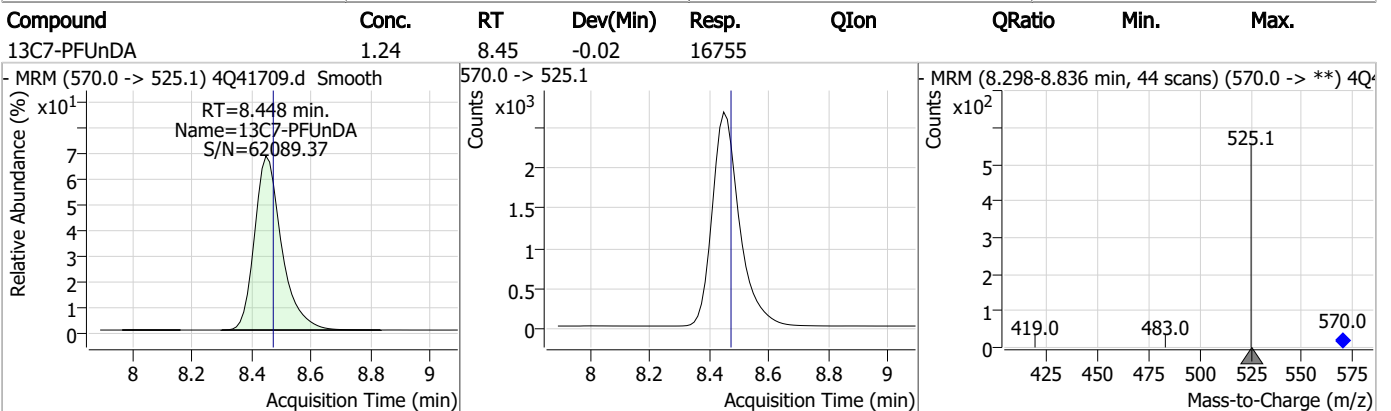
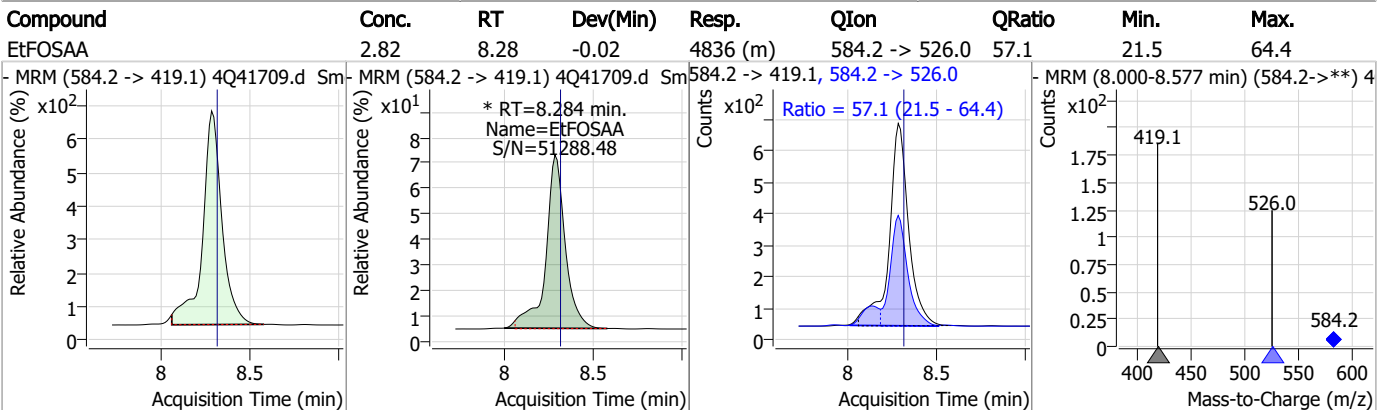
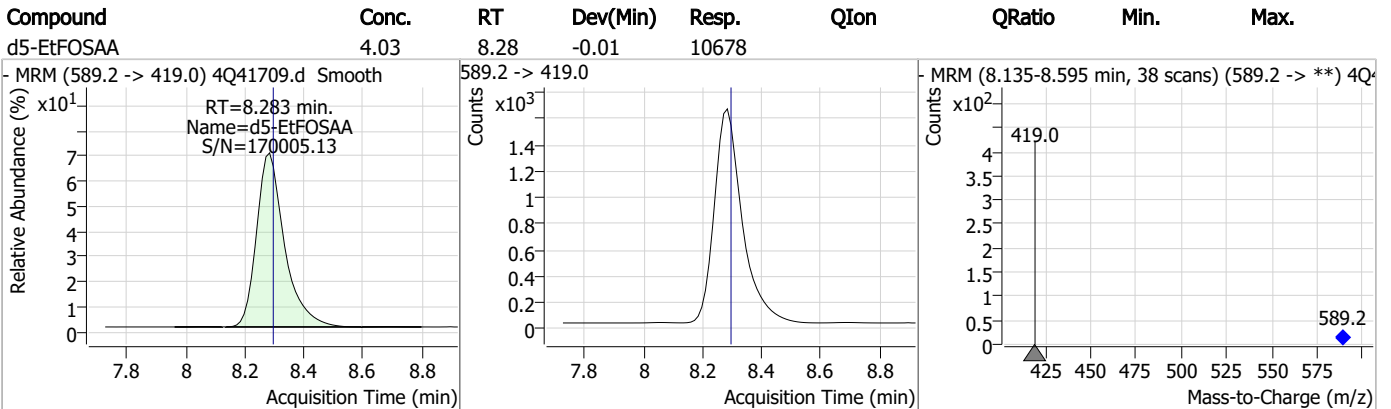
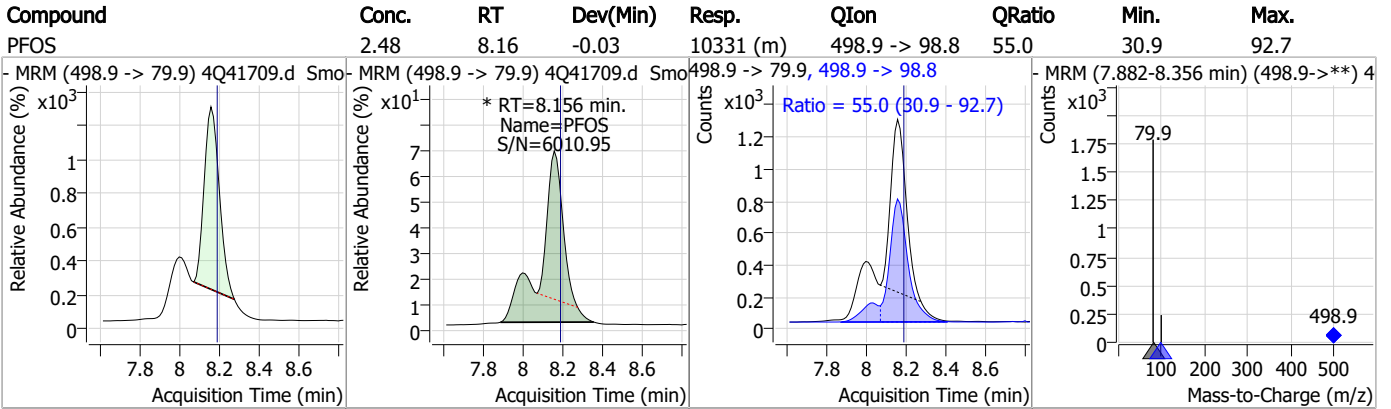
Perfluorinated Compounds by LC/MS/MS



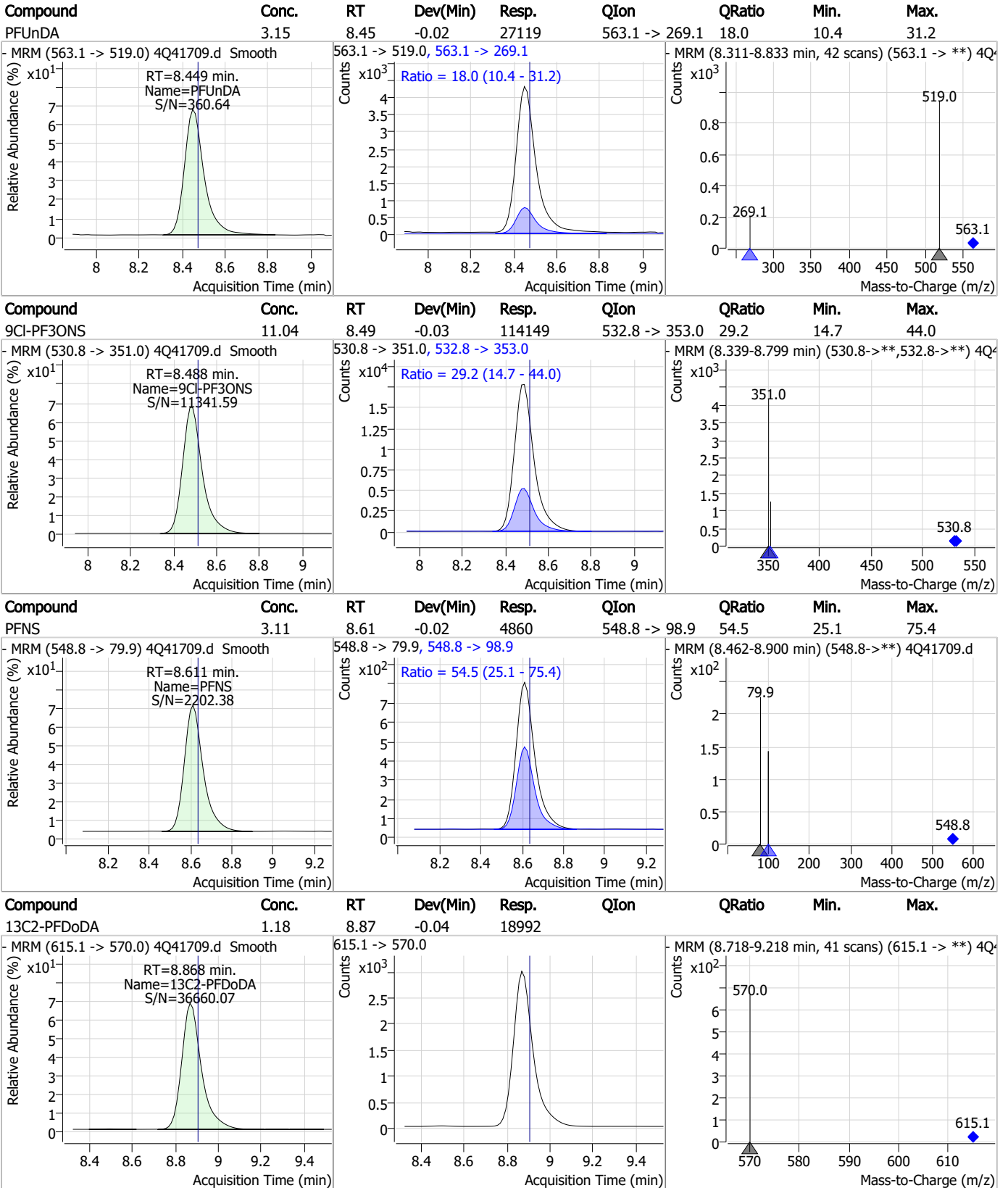
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Perfluorinated Compounds by LC/MS/MS



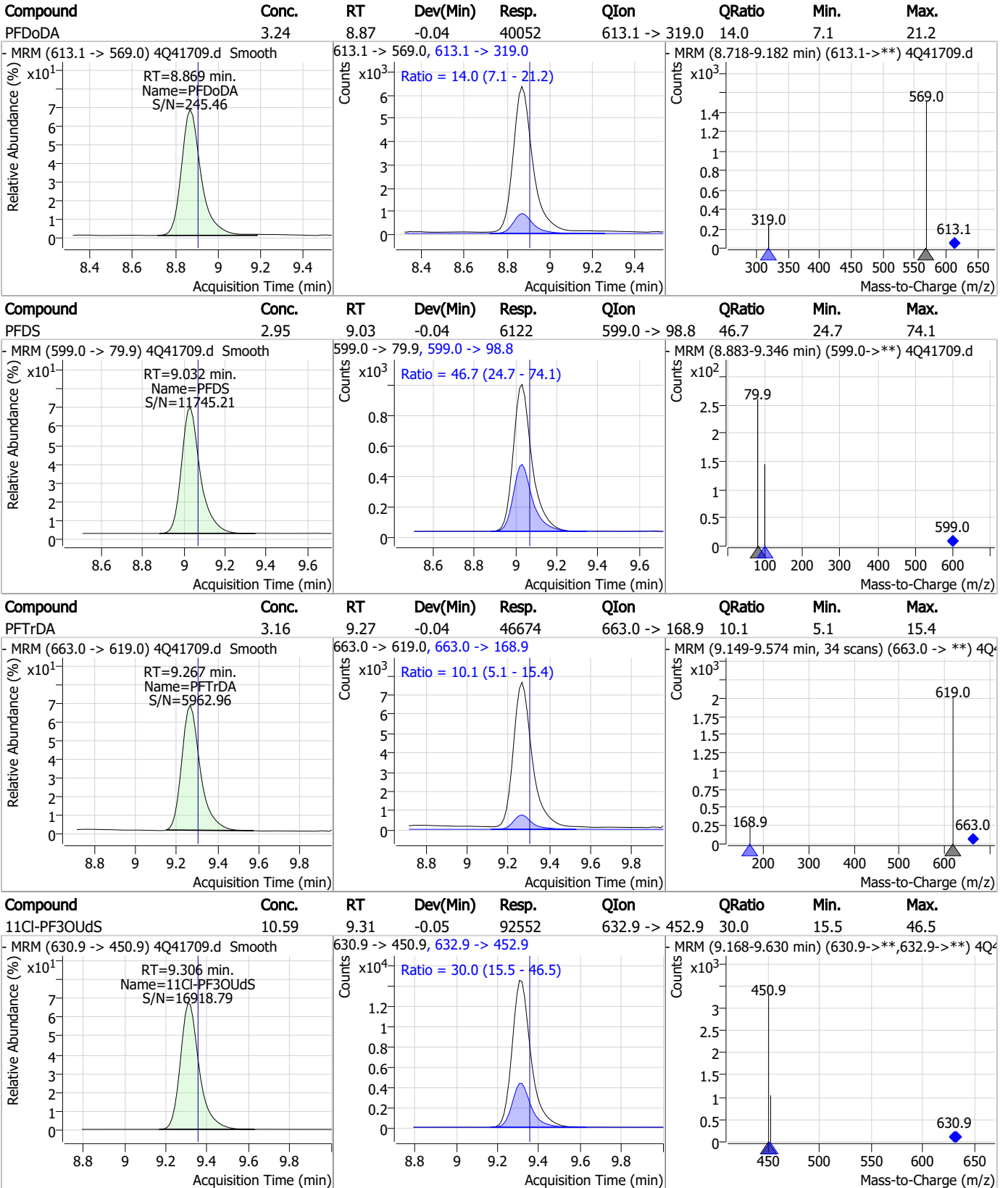
Perfluorinated Compounds by LC/MS/MS



7.3.1

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Perfluorinated Compounds by LC/MS/MS

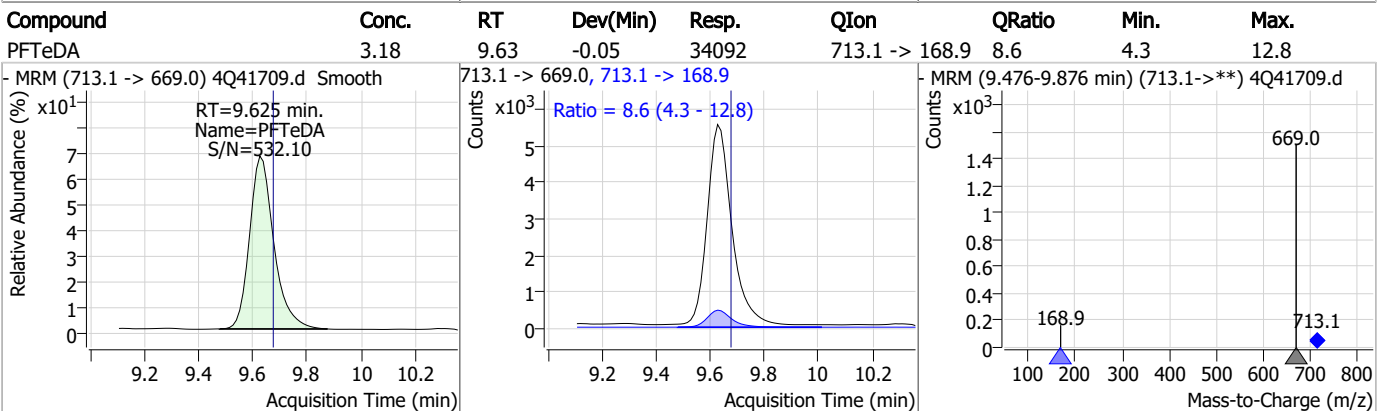
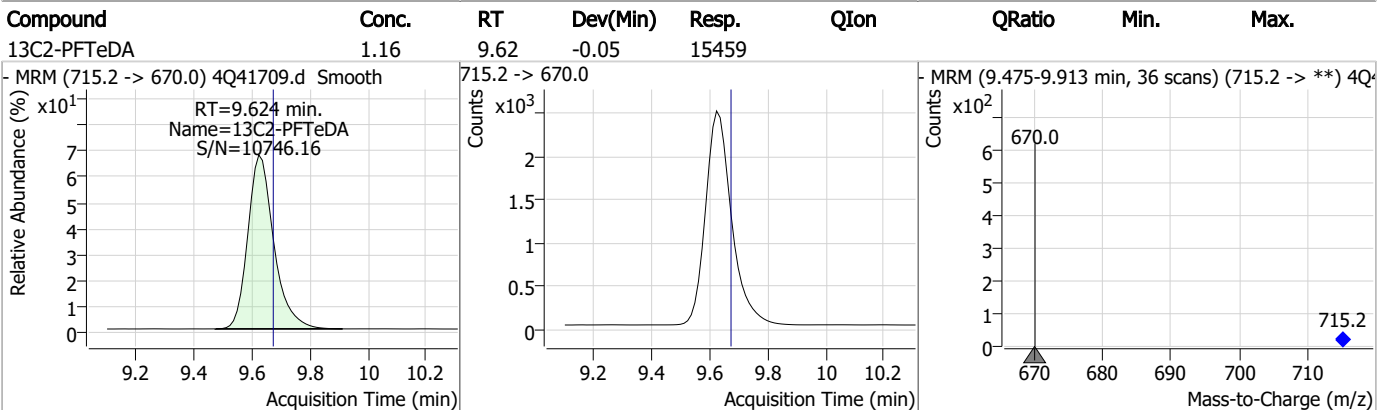
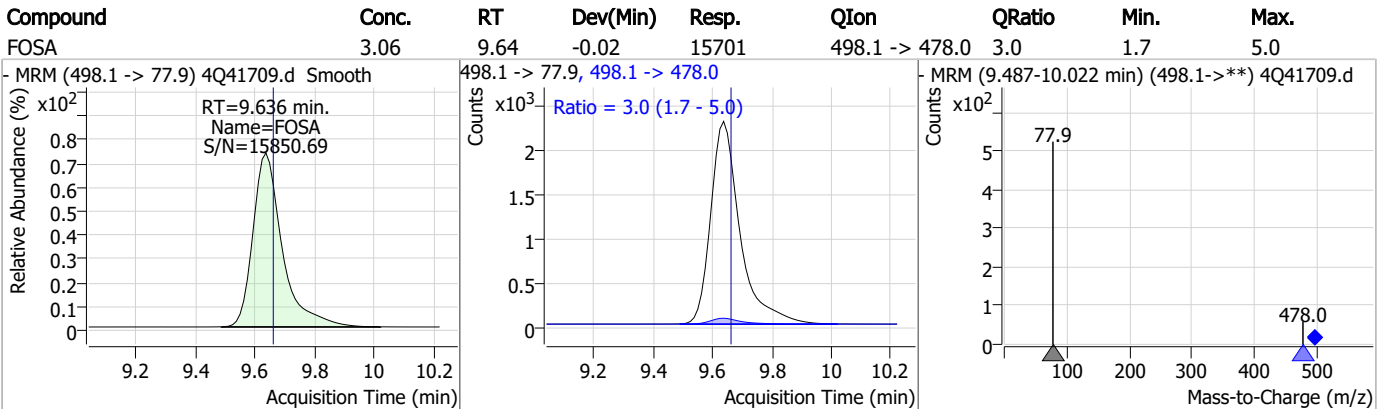
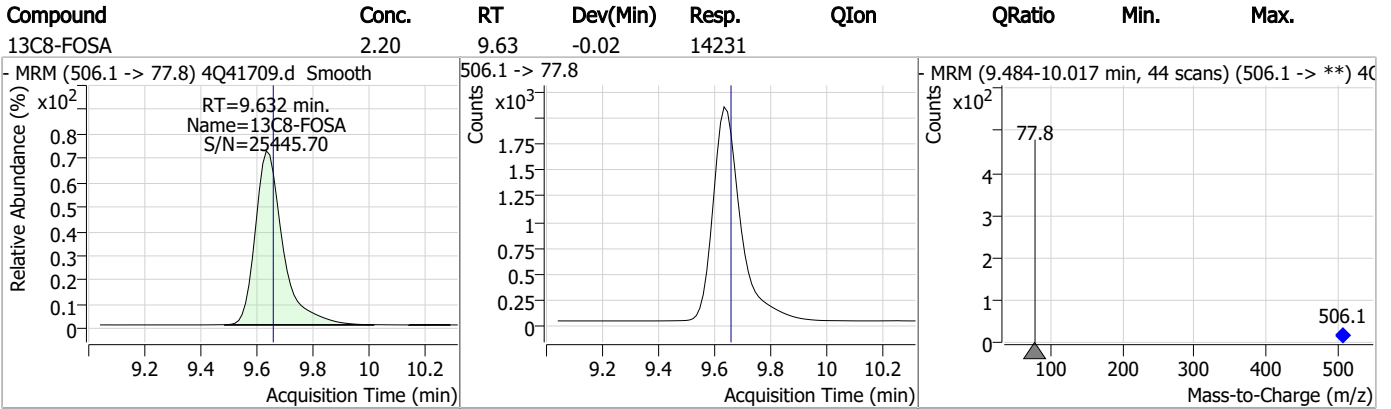


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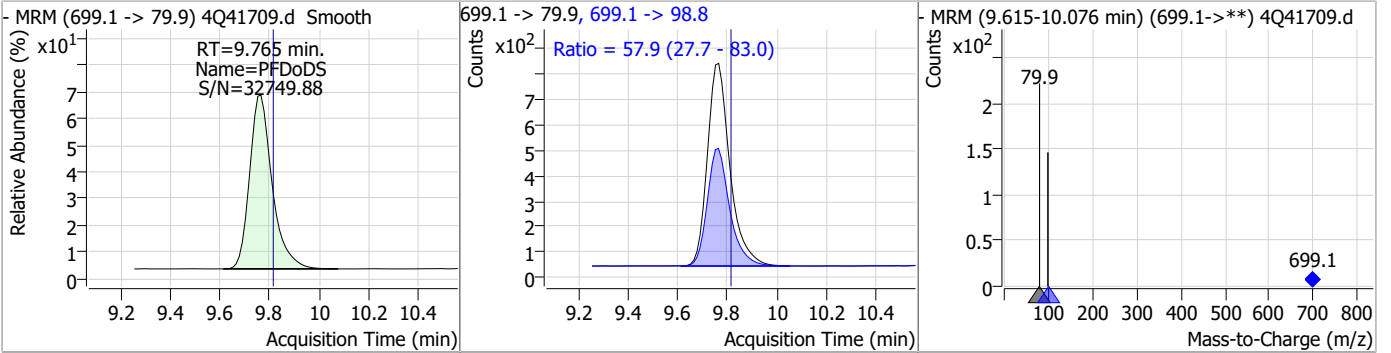


Perfluorinated Compounds by LC/MS/MS

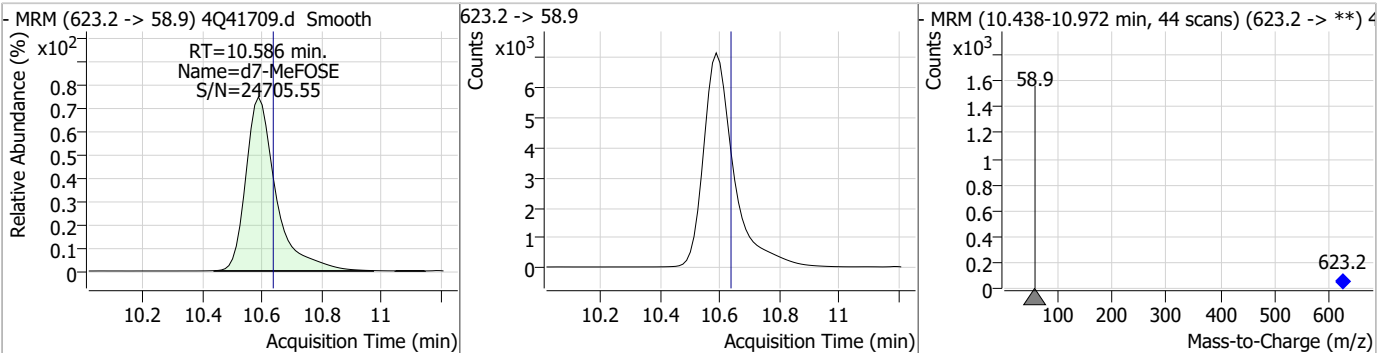


Perfluorinated Compounds by LC/MS/MS

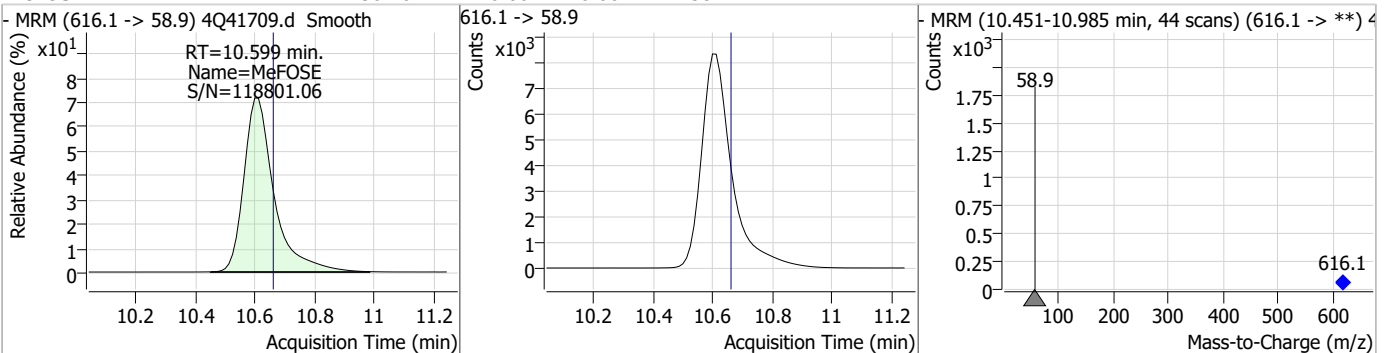
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PfDoDS	2.85	9.76	-0.05	5014	699.1 -> 98.8	57.9	27.7	83.0



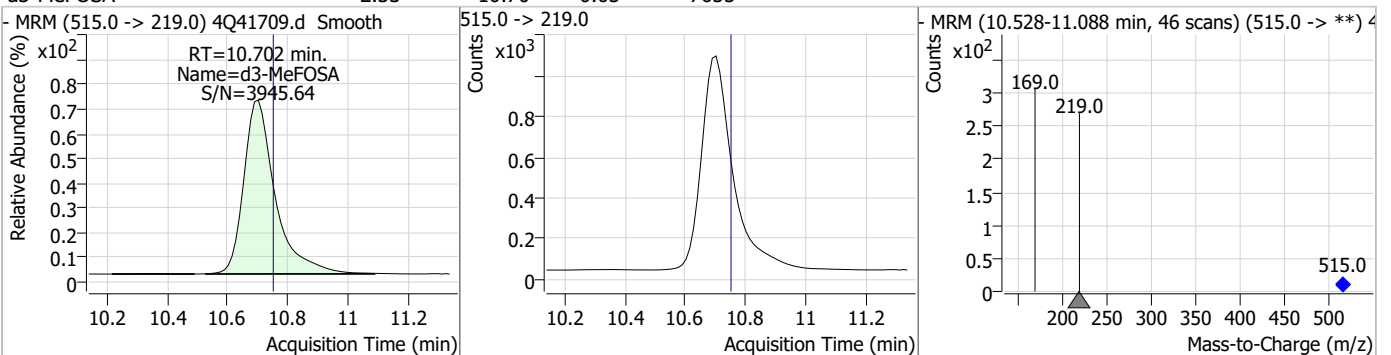
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	20.16	10.59	-0.05	49857				



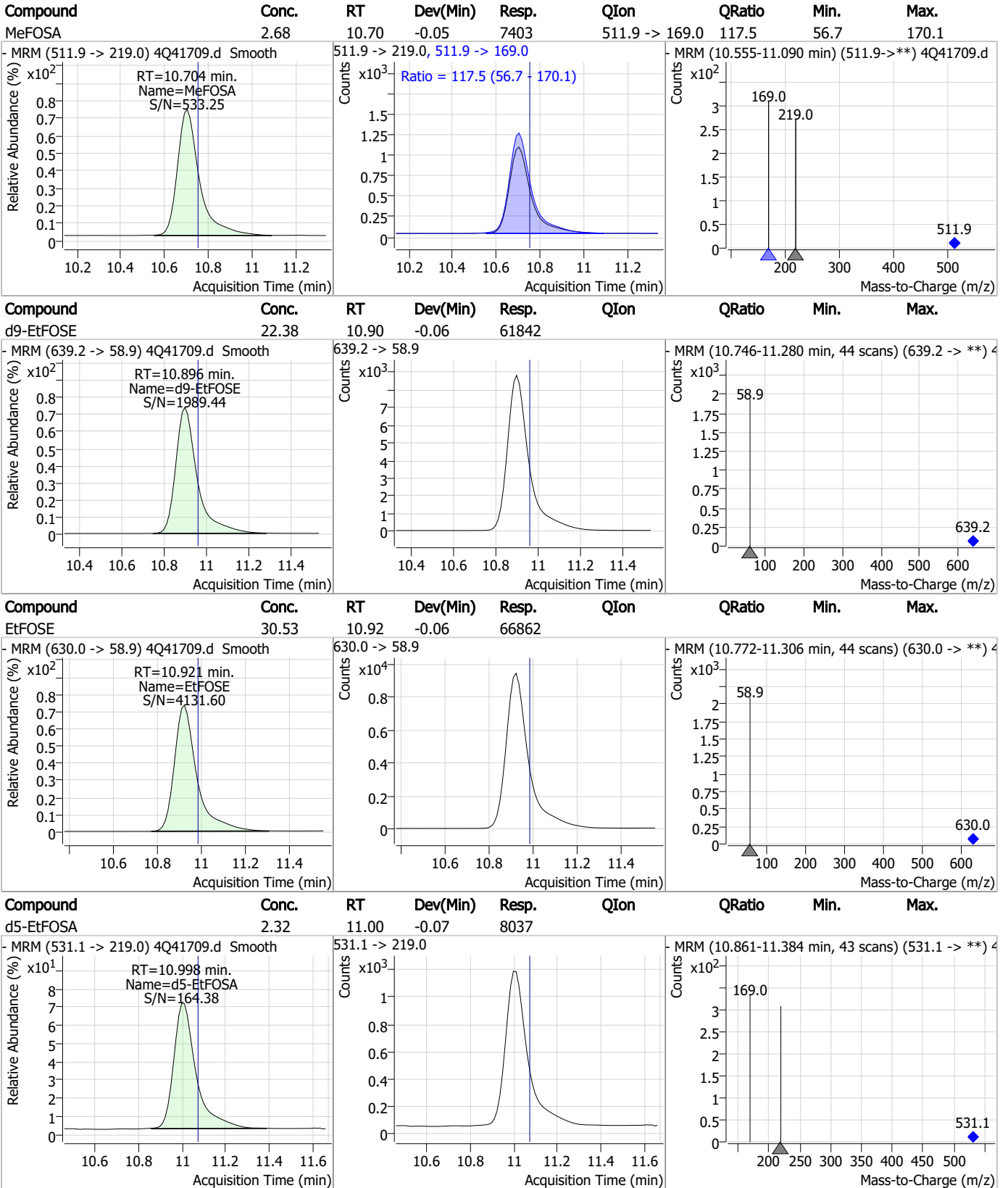
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	30.70	10.60	-0.06	58447				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.33	10.70	-0.05	7655				



Perfluorinated Compounds by LC/MS/MS

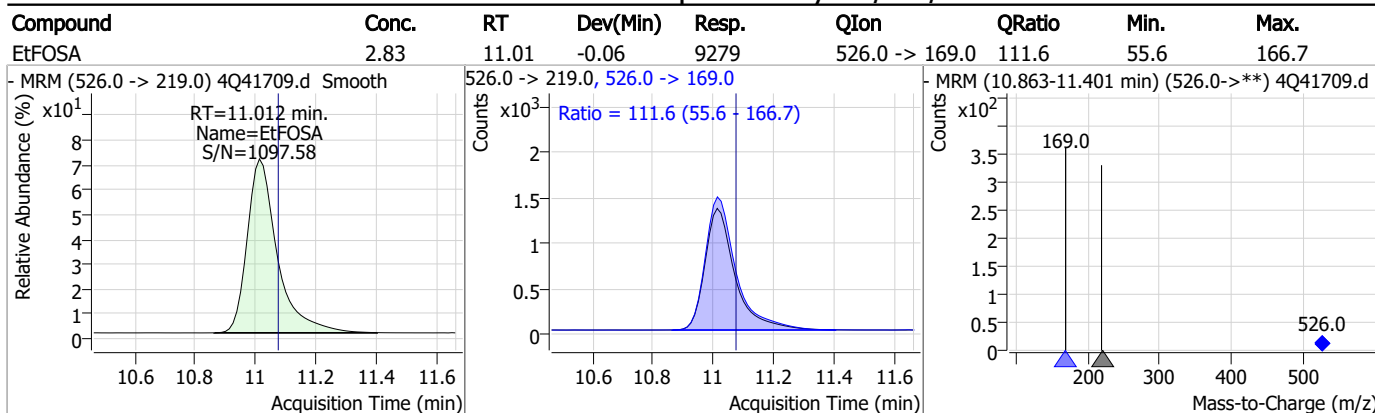


7.3.1

7



Perfluorinated Compounds by LC/MS/MS



7.3.1
7

Manual Integration Approval Summary

Sample Number: OP95719-BS Method: EPA DRAFT 1633
Lab FileID: 4Q41709.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 18:13 Supervisor approved: 03/08/23 11:03 Natasha Gumtie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.12	Split peak
MeFOSAA	2355-31-9		8.07	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.16	Split peak
EtFOSAA	2991-50-6		8.28	Split peak

7.3.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41710.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 6:27:29 PM
 Sample Name : op95719-llbs:3
 Vial : P6-A2
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.164	216.8 -> 171.9	141714	10.00 µg/L	0.053
M5-PFPeA	4.487	268.3 -> 223.0	73286	5.00 µg/L	0.025
M5-PFHxA	5.497	318.0 -> 273.0	60694	2.50 µg/L	-0.012
M4-PFHpA	6.367	367.1 -> 322.0	32212	2.50 µg/L	0.000
M8-PFOA	7.012	421.1 -> 376.0	35195	2.50 µg/L	-0.012
M9-PFNA	7.534	472.1 -> 427.0	19537	1.25 µg/L	-0.012
M6-PFDA	8.004	519.1 -> 474.1	17626	1.25 µg/L	-0.025
M7-PFUnDA	8.448	570.0 -> 525.1	17529	1.25 µg/L	-0.025
M2-PFDoDA	8.868	615.1 -> 570.0	20102	1.25 µg/L	-0.037
M2-PFTeDA	9.624	715.2 -> 670.0	16336	1.25 µg/L	-0.050
M8-FOSA	9.632	506.1 -> 77.8	14826	2.50 µg/L	-0.025
M3-PFBS	5.451	302.1 -> 79.9	12259	2.50 µg/L	0.000
M3-PFHxS	7.117	402.1 -> 79.9	7748	2.50 µg/L	-0.013
M8-PFOS	8.154	507.1 -> 79.9	10262	2.50 µg/L	-0.026
M2-4:2FTS	5.223	329.1 -> 80.9	1430	5.00 µg/L	0.000
M2-6:2FTS	6.786	429.1 -> 80.9	1908	5.00 µg/L	0.000
M2-8:2FTS	7.803	529.1 -> 80.9	2914	5.00 µg/L	-0.025
M3-MeFOSAA	8.074	573.2 -> 419.0	13753	5.00 µg/L	-0.025
M3-HFPO-DA	5.827	286.9 -> 168.9	33339	10.00 µg/L	-0.012
M5-EtFOSAA	8.283	589.2 -> 419.0	11069	5.00 µg/L	-0.012
M7-MeFOSE	10.586	623.2 -> 58.9	54657	25.00 µg/L	-0.050
M9-EtFOSE	10.896	639.2 -> 58.9	66091	25.00 µg/L	-0.062
M5-EtFOSA	11.011	531.1 -> 219.0	8311	2.50 µg/L	-0.062
M3-MeFOSA	10.702	515.0 -> 219.0	7461	2.50 µg/L	-0.050
13C4-PFOS	8.155	502.8 -> 79.9	11731	2.50 µg/L	-0.026
13C3-PFBA	3.168	216.0 -> 172.0	74767	5.00 µg/L	0.052
18O2-PFHxS	7.116	403.0 -> 83.9	5425	2.50 µg/L	-0.013
13C4-PFOA	7.013	417.1 -> 372.0	40627	2.50 µg/L	-0.012
13C2-PFDA	8.004	515.1 -> 470.1	16055	1.25 µg/L	-0.025
13C5-PFNA	7.534	468.0 -> 423.0	20722	1.25 µg/L	-0.012
13C2-PFHxA	5.498	315.1 -> 270.0	51886	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1430	4.86 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 97.2%		
13C2-6:2FTS	6.786	429.1 -> 80.9	1908	4.58 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 91.5%		
13C2-8:2FTS	7.803	529.1 -> 80.9	2914	4.49 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 89.8%		
13C2-PFDoDA	8.868	615.1 -> 570.0	20102	1.18 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 94.7%		
13C2-PFTeDA	9.624	715.2 -> 670.0	16336	1.17 µg/L	-0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 93.3%		
13C3-PFBS	5.451	302.1 -> 79.9	12259	2.43 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 97.1%		
13C3-PFHxS	7.117	402.1 -> 79.9	7748	2.63 µg/L	-0.013

7.32
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 105.0%	
13C4-PFBA	3.164	216.8 -> 171.9	141714	11.03 µg/L	0.053
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 110.3%	
13C4-PFHpA	6.367	367.1 -> 322.0	32212	2.62 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.7%	
13C5-PFHxA	5.497	318.0 -> 273.0	60694	2.70 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 107.8%	
13C5-PFPeA	4.487	268.3 -> 223.0	73286	5.17 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 103.5%	
13C6-PFDA	8.004	519.1 -> 474.1	17626	1.28 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.5%	
13C7-PFUnDA	8.448	570.0 -> 525.1	17529	1.23 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.5%	
13C8-FOSA	9.632	506.1 -> 77.8	14826	2.27 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.9%	
13C8-PFOA	7.012	421.1 -> 376.0	35195	2.62 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.8%	
13C8-PFOS	8.154	507.1 -> 79.9	10262	2.22 µg/L	-0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.8%	
13C9-PFNA	7.534	472.1 -> 427.0	19537	1.35 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 107.8%	
d3-MeFOSAA	8.074	573.2 -> 419.0	13753	4.20 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 84.0%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	33339	12.69 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 126.9%	
d3-MeFOSA	10.702	515.0 -> 219.0	7461	2.25 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.8%	
d5-EtFOSAA	8.283	589.2 -> 419.0	11069	4.14 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.8%	
d7-MeFOSE	10.586	623.2 -> 58.9	54657	21.88 µg/L	-0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 87.5%	
d9-EtFOSE	10.896	639.2 -> 58.9	66091	23.67 µg/L	-0.062
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 94.7%	
d5-EtFOSA	11.011	531.1 -> 219.0	8311	2.37 µg/L	-0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.8%	
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0 327.1 -> 80.9	7752 3289	3.98 µg/L	96
6:2FTS	6.774	427.1 -> 407.0 427.1 -> 80.9	6191 2638	4.48 µg/L	98
8:2FTS	7.804	527.1 -> 507.0 527.1 -> 80.8	5902 2520	4.50 µg/L	98
EtFOSAA	8.284	584.2 -> 419.1 584.2 -> 526.0	1989 730	1.12 µg/L	m 90
FOSA	9.636	498.1 -> 77.9 498.1 -> 478.0	5684 224	1.06 µg/L	98
MeFOSAA	8.087	570.1 -> 419.0 570.1 -> 483.0	1981 482	1.05 µg/L	m 87
PFBA	3.158	212.8 -> 168.9	13488	4.42 µg/L	100
PFBS	5.452	298.7 -> 79.9 298.7 -> 98.8	4680 1791	1.07 µg/L	99
PFDA	8.005	512.9 -> 469.0 512.9 -> 219.0	12449 2332	1.23 µg/L	96
PFDODA	8.869	613.1 -> 569.0 613.1 -> 319.0	14962 2074	1.14 µg/L	99
PFDS	9.032	599.0 -> 79.9	2265	1.05 µg/L	99

7.3.2
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	1129			
PFHpA	6.368	363.1 -> 319.0	17903	1.10	µg/L	99
		363.1 -> 169.0	3100			
PFHpS	7.673	449.0 -> 79.9	2706	0.97	µg/L	96
		449.0 -> 98.9	1369			
PFHxA	5.500	313.0 -> 269.0	20346	1.10	µg/L	99
		313.0 -> 118.9	556			
PFHxS	7.118	398.7 -> 79.9	2753	0.97	µg/L	m 99
		398.7 -> 98.9	1389			
PFNA	7.535	463.0 -> 419.0	11133	1.08	µg/L	97
		463.0 -> 219.0	2875			
PFNS	8.611	548.8 -> 79.9	2000	1.23	µg/L	98
		548.8 -> 98.9	983			
PFOA	7.014	413.0 -> 369.0	17871	1.12	µg/L	99
		413.0 -> 169.0	3631			
PFOS	8.156	498.9 -> 79.9	4367	1.01	µg/L	m 87
		498.9 -> 98.8	2252			
PFPeA	4.489	263.0 -> 219.0	32893	2.34	µg/L	100
PFPeS	6.419	349.1 -> 79.9	2540	0.97	µg/L	99
		349.1 -> 98.9	1105			
PFTeDA	9.625	713.1 -> 669.0	12348	1.09	µg/L	98
		713.1 -> 168.9	958			
PFTrDA	9.267	663.0 -> 619.0	17490	1.12	µg/L	100
		663.0 -> 168.9	1802			
PFUnDA	8.449	563.1 -> 519.0	10252	1.14	µg/L	96
		563.1 -> 269.1	1936			
11CI-PF3OUdS	9.319	630.9 -> 450.9	34882	3.67	µg/L	100
		632.9 -> 452.9	10794			
9CI-PF3ONS	8.476	530.8 -> 351.0	41255	3.67	µg/L	99
		532.8 -> 353.0	12333			
ADONA	6.619	376.9 -> 250.9	83473	3.81	µg/L	99
		376.9 -> 84.8	22407			
HFPO-DA	5.828	284.9 -> 168.9	10802	4.12	µg/L	99
		284.9 -> 184.9	1261			
3:3FTCA	4.179	241.0 -> 177.0	4365	5.76	µg/L	94
		241.0 -> 117.0	477			
5:3FTCA	6.333	341.0 -> 237.1	87010	28.30	µg/L	100
		341.0 -> 217.0	60536			
7:3FTCA	7.711	441.0 -> 316.9	31849	27.82	µg/L	98
		441.0 -> 336.9	74252			
EtFOSA	11.024	526.0 -> 219.0	3487	1.03	µg/L	100
		526.0 -> 169.0	3876			
EtFOSE	10.921	630.0 -> 58.9	25946	11.08	µg/L	100
MeFOSA	10.704	511.9 -> 219.0	2718	1.01	µg/L	97
		511.9 -> 169.0	3180			
MeFOSE	10.612	616.1 -> 58.9	22865	10.96	µg/L	100
PFDoDS	9.765	699.1 -> 79.9	2054	1.12	µg/L	93
		699.1 -> 98.8	1240			
NFDHA	5.403	295.0 -> 201.0	1728	2.74	µg/L	98
		295.0 -> 84.9	430			
PFMBA	4.842	279.0 -> 85.1	18545	2.35	µg/L	100
PFMPA	3.727	229.0 -> 84.9	16418	2.42	µg/L	100
PFEESA	5.921	314.8 -> 134.9	27241	1.94	µg/L	100
		314.8 -> 82.9	1000			

= Qualifier out of range, m = manually integrated, + = Area summed

7.3.2
7

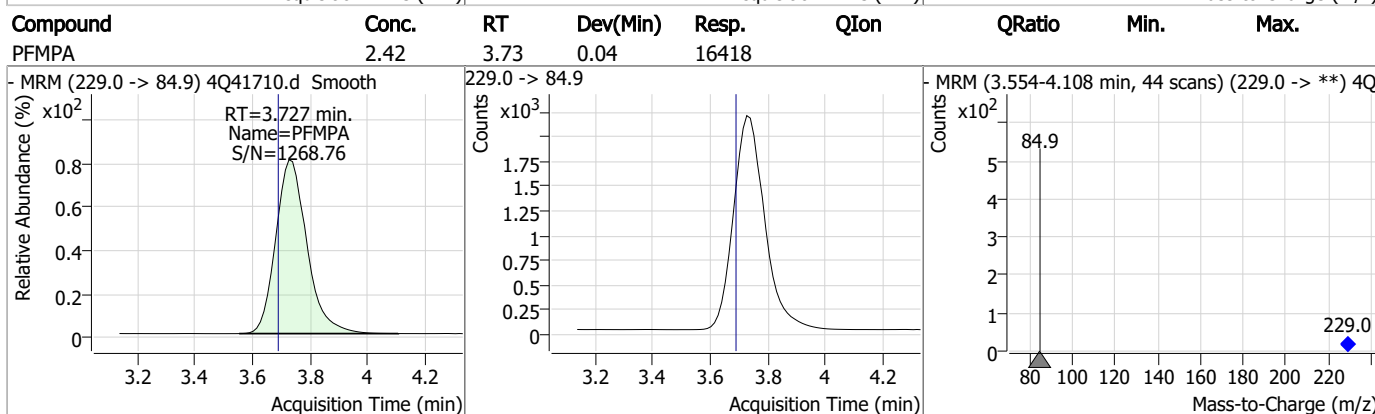
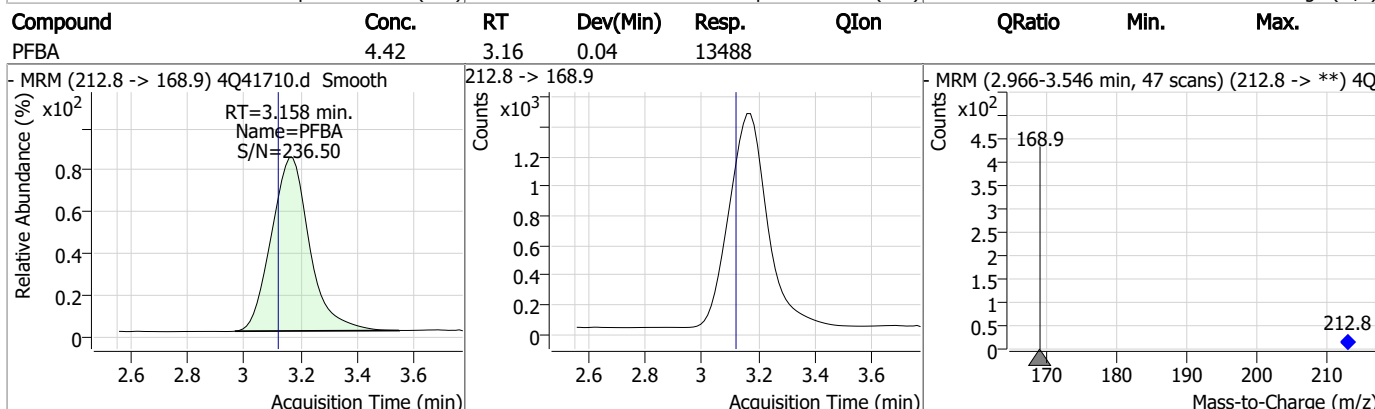
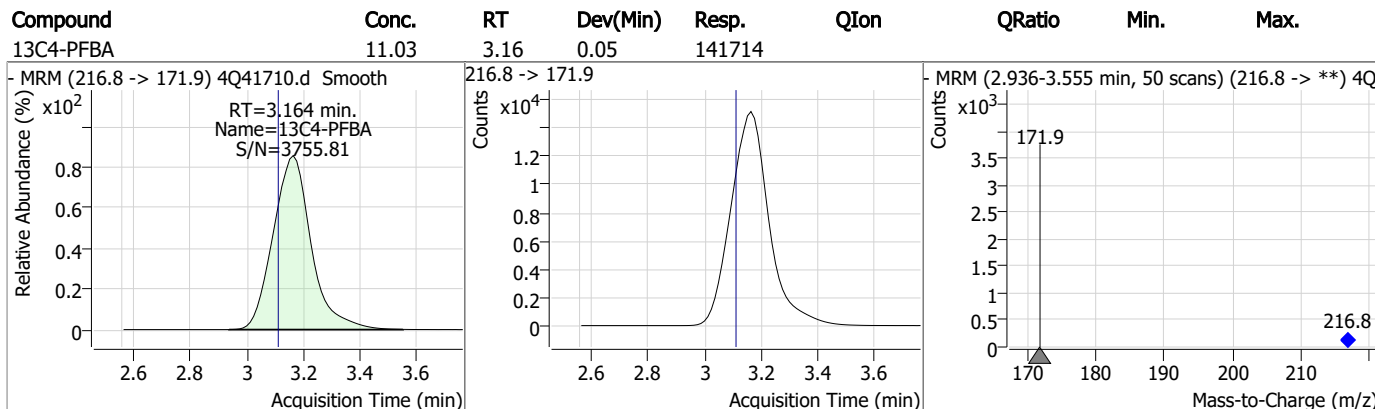
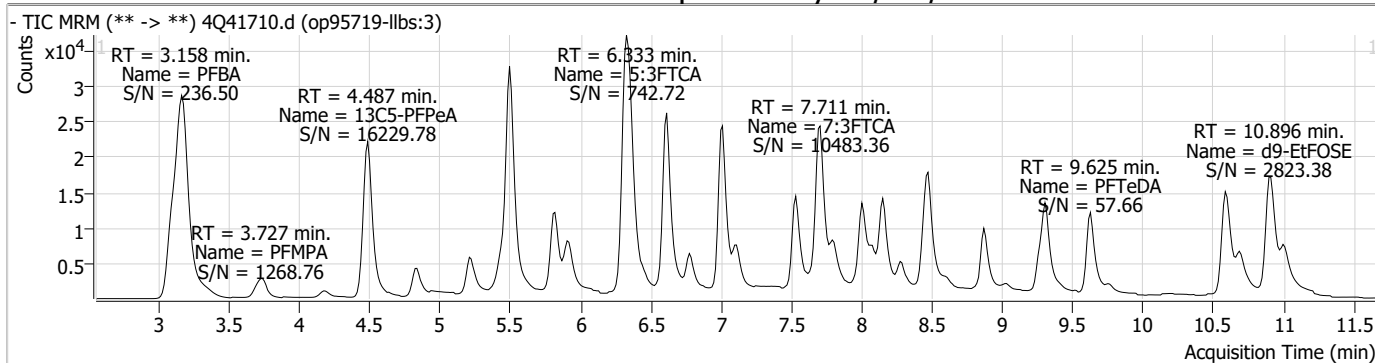
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.3.2

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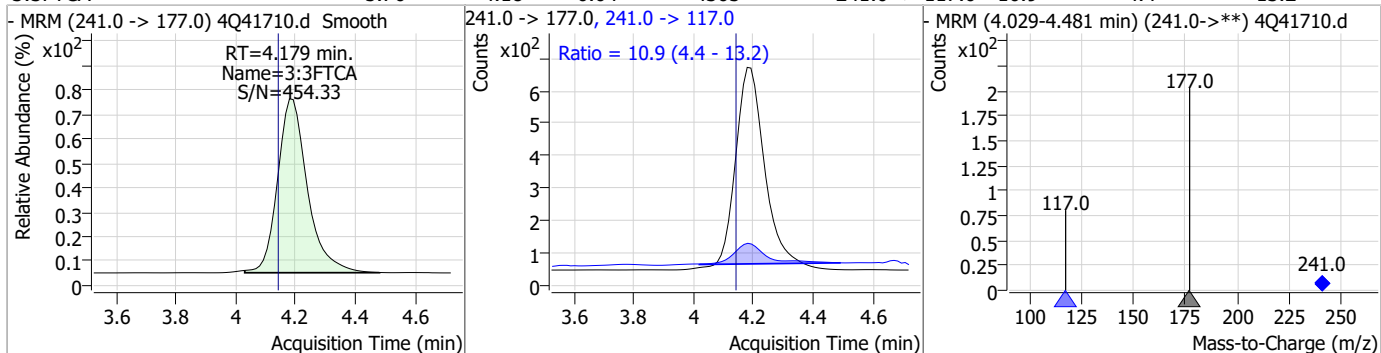
Perfluorinated Compounds by LC/MS/MS



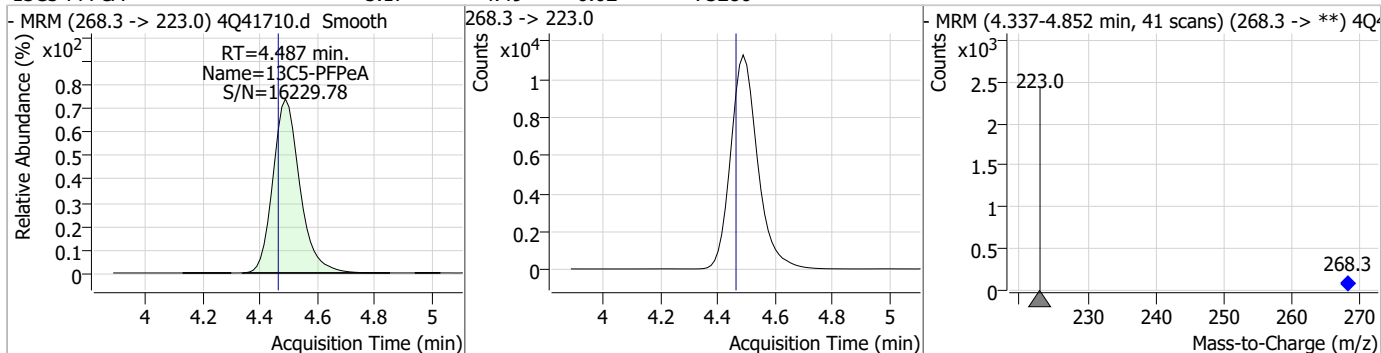
7.3.2
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Perfluorinated Compounds by LC/MS/MS

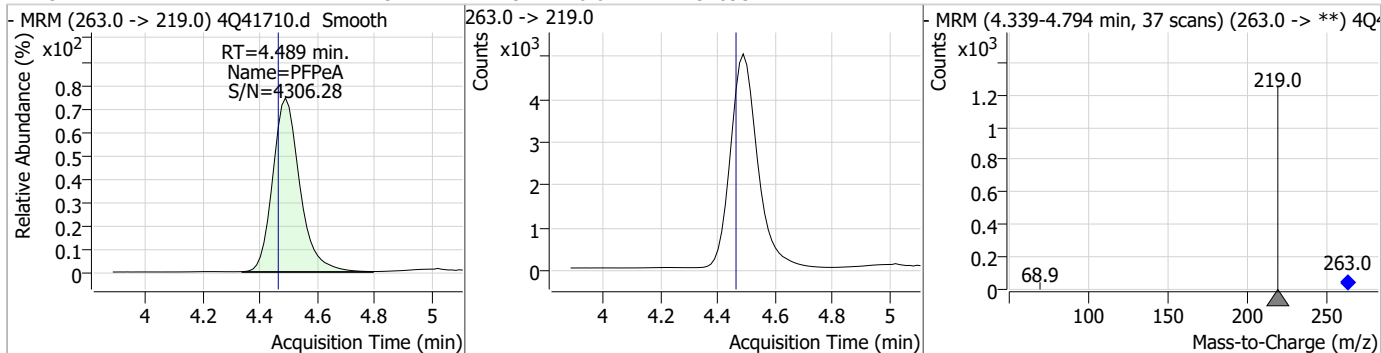
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
3:3FTCA	5.76	4.18	0.04	4365	241.0 -> 117.0	10.9	4.4	13.2



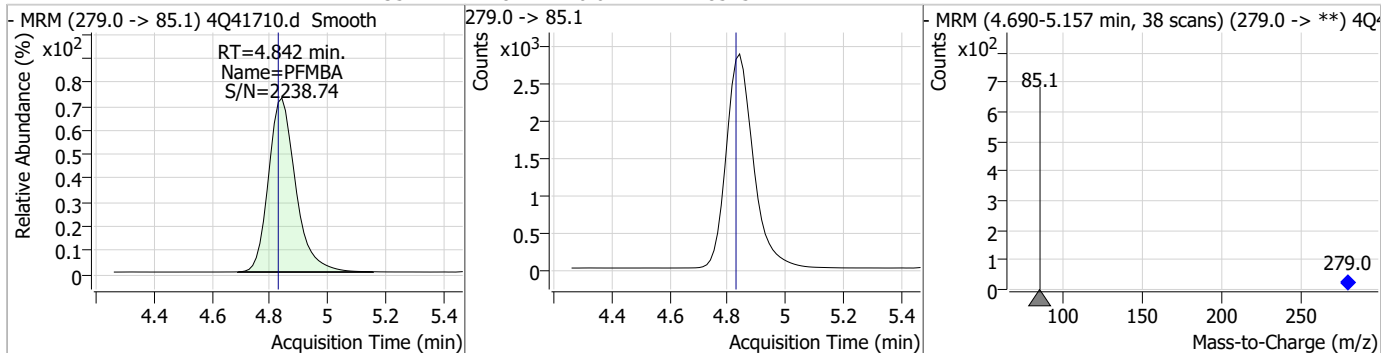
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFPeA	5.17	4.49	0.02	73286				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	2.34	4.49	0.02	32893				

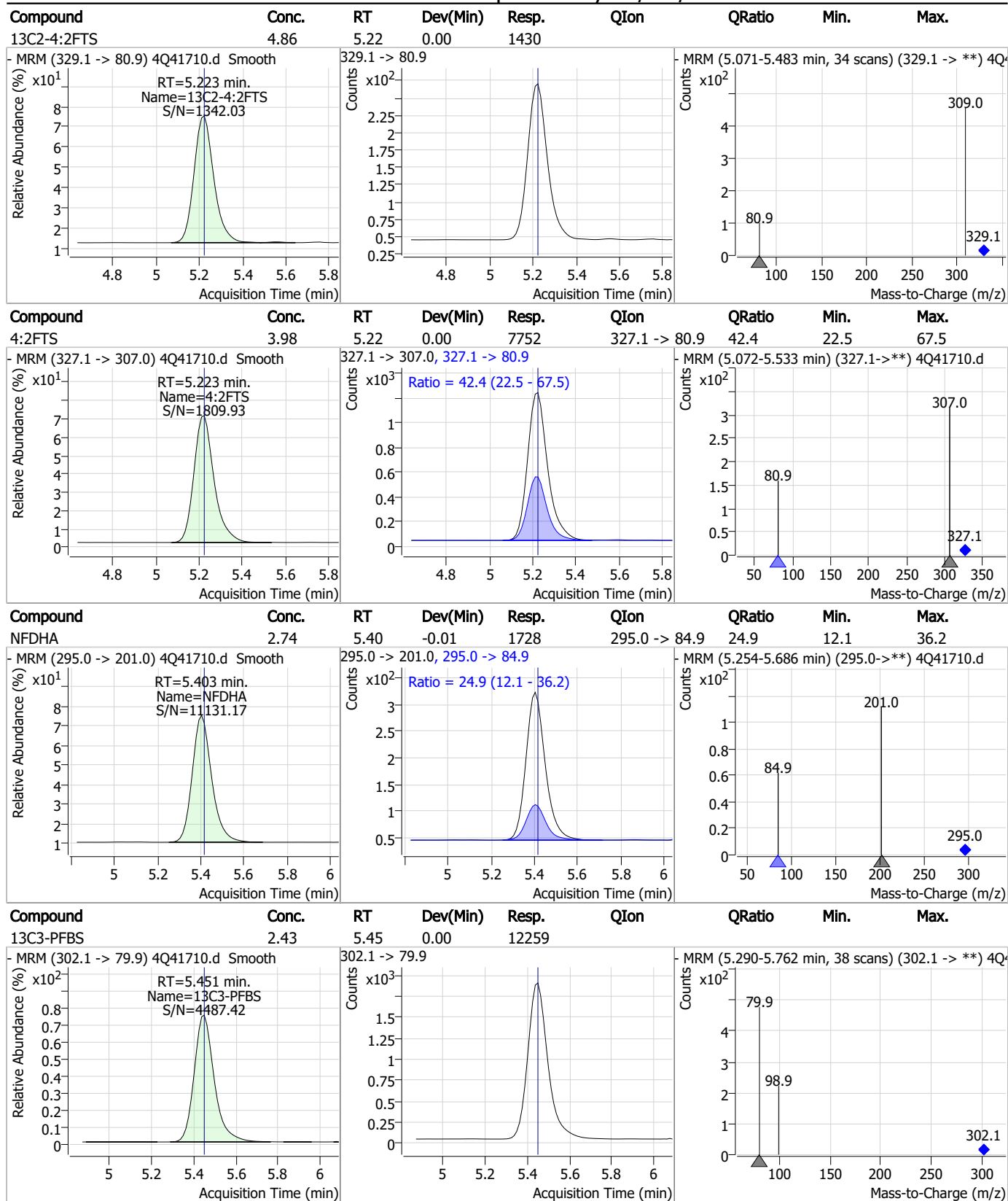


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFMBA	2.35	4.84	0.01	18545				



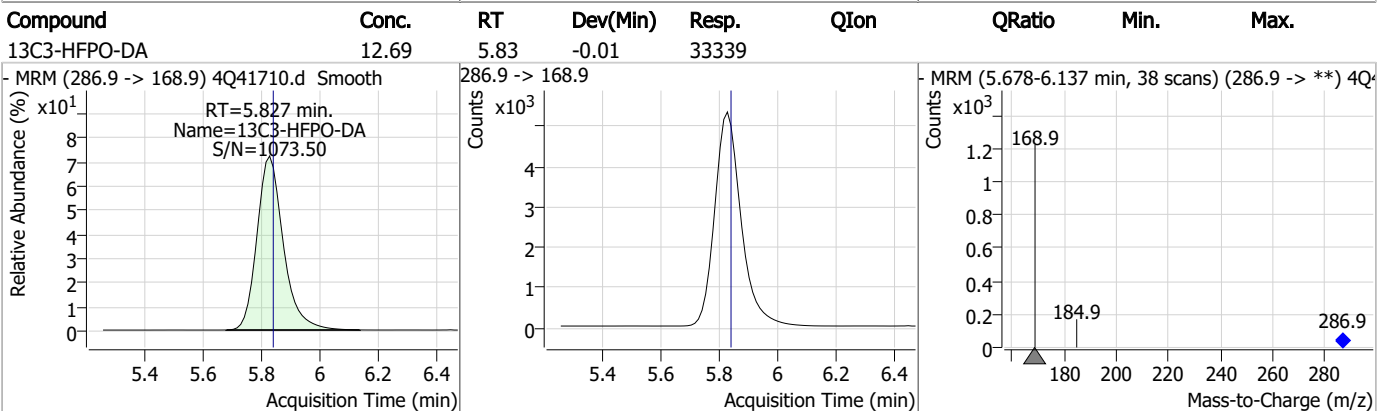
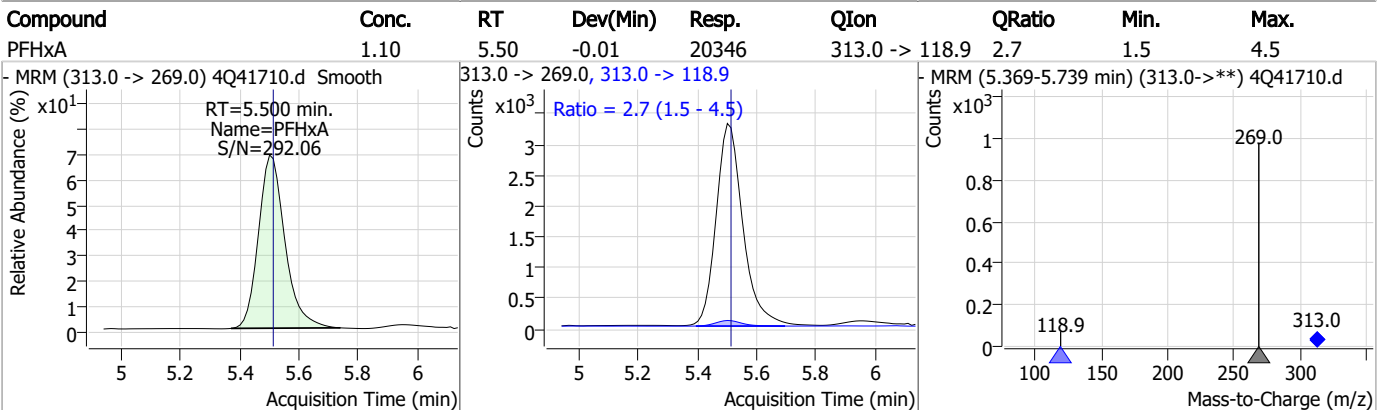
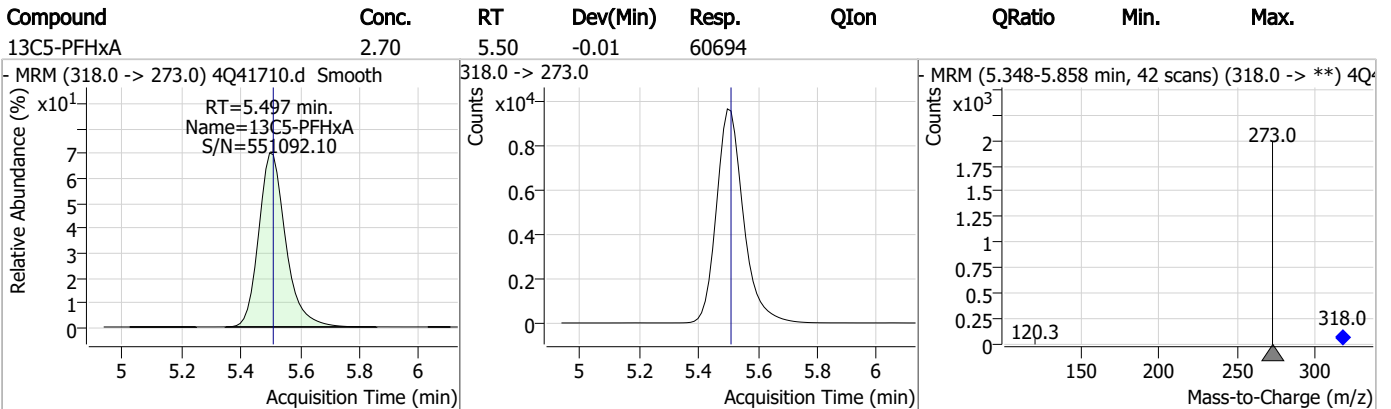
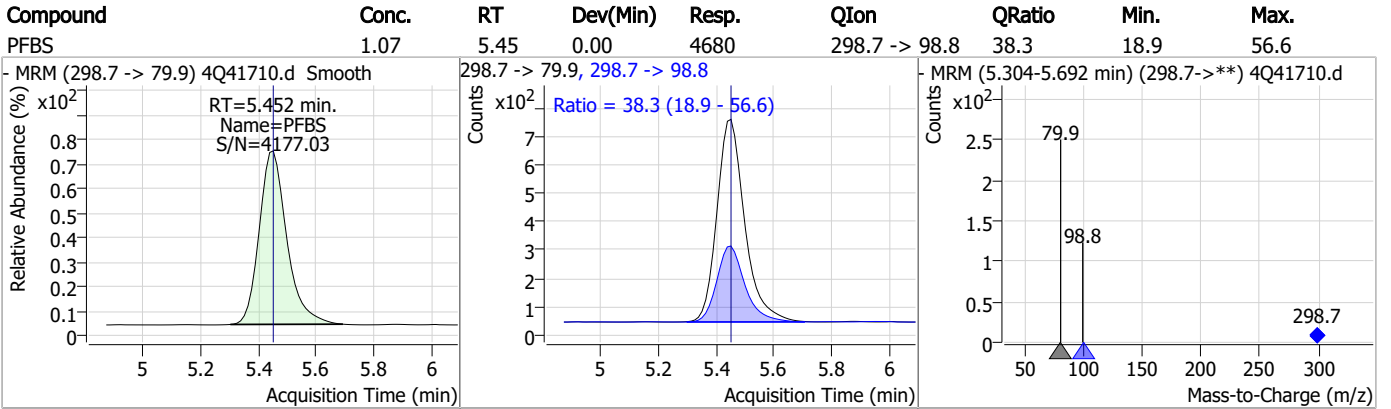
7.3.2
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Perfluorinated Compounds by LC/MS/MS



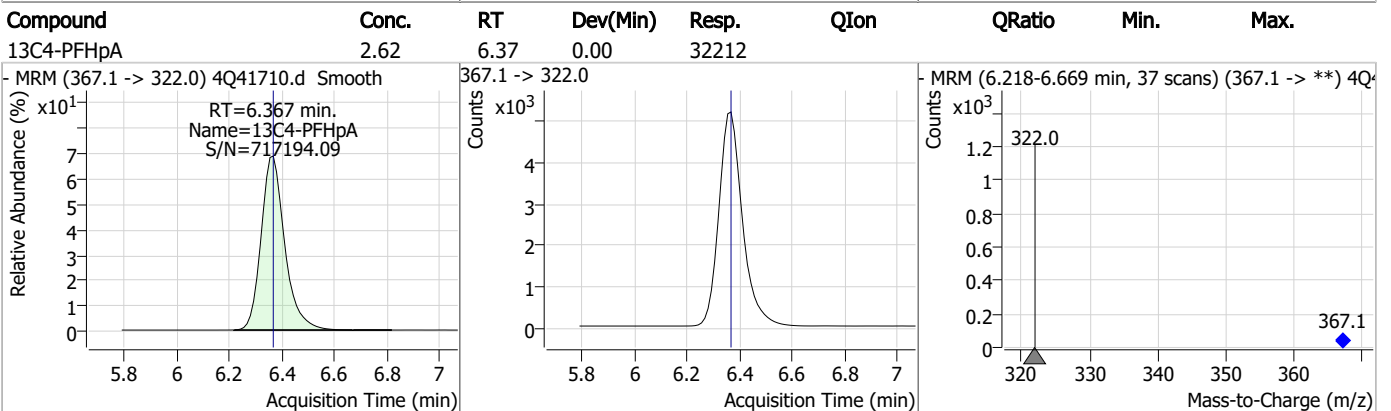
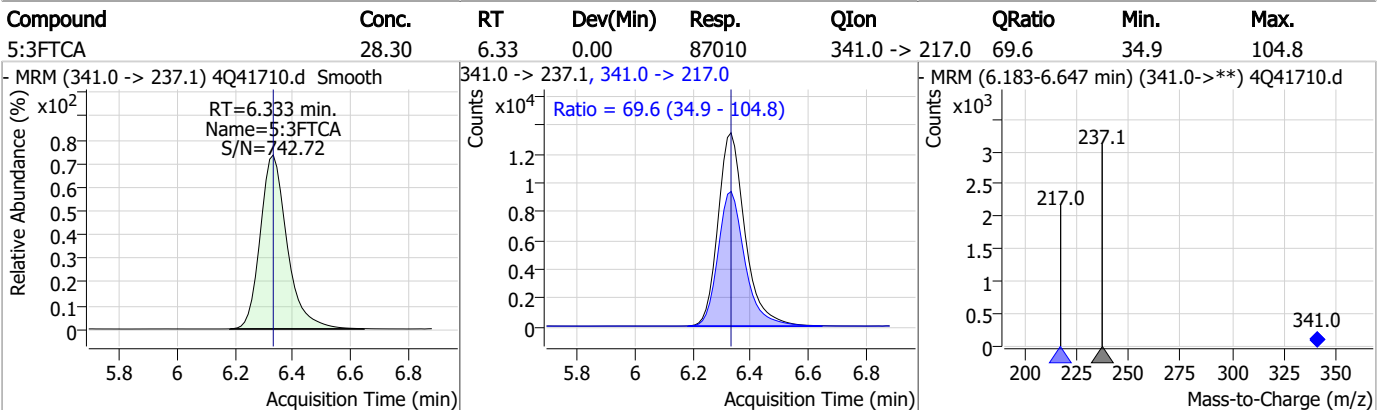
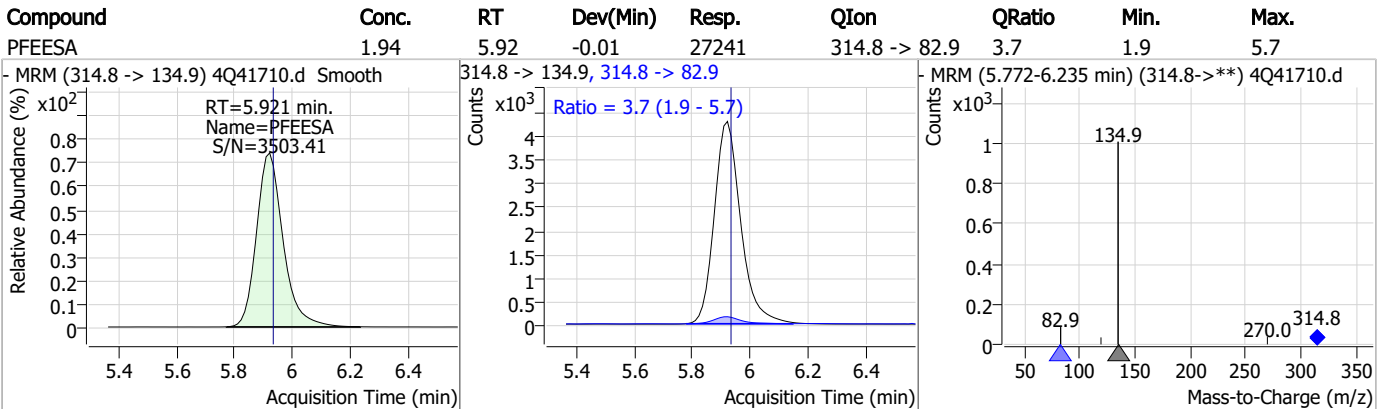
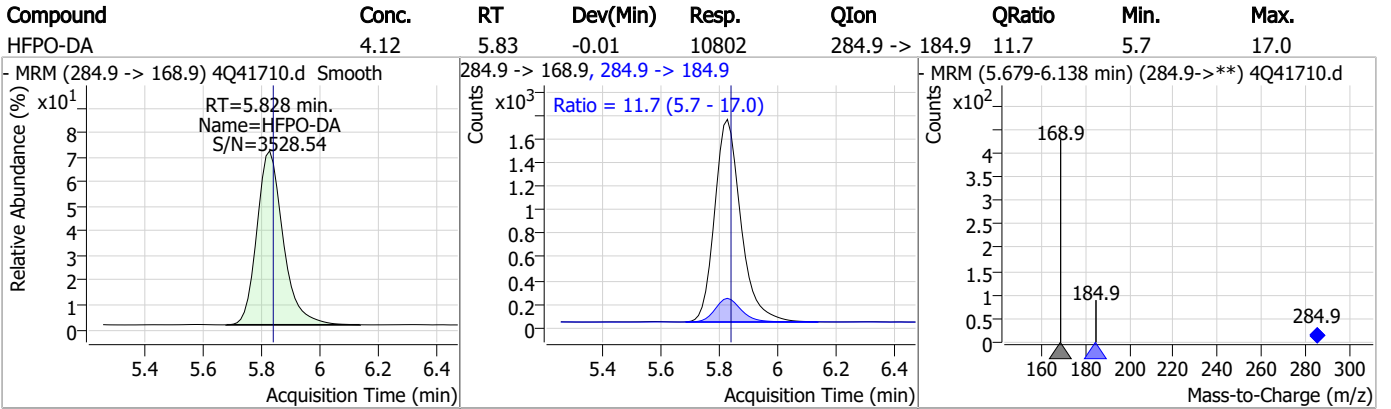
7.3.2
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Perfluorinated Compounds by LC/MS/MS



7.3.2
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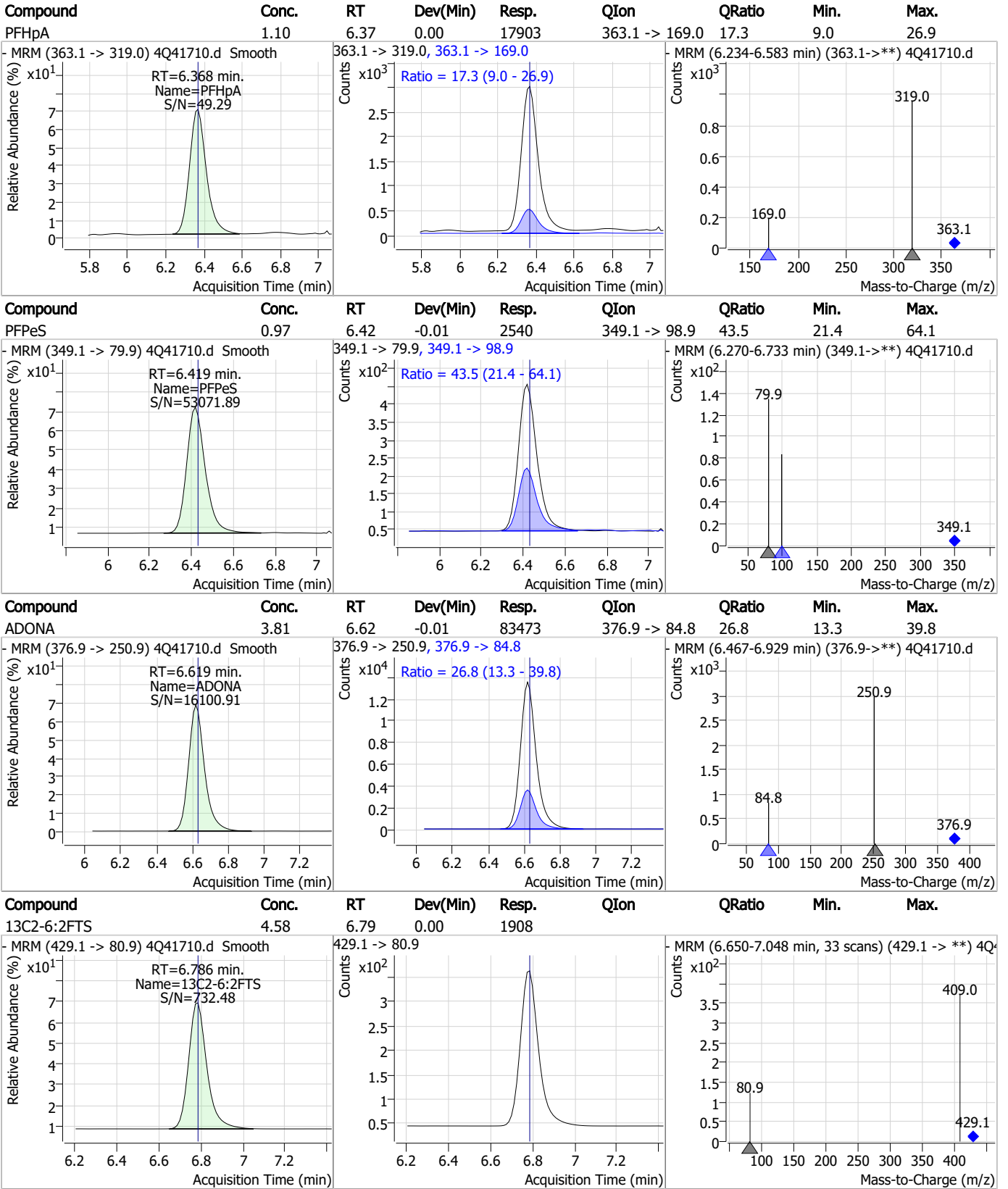
Perfluorinated Compounds by LC/MS/MS



7.3.2

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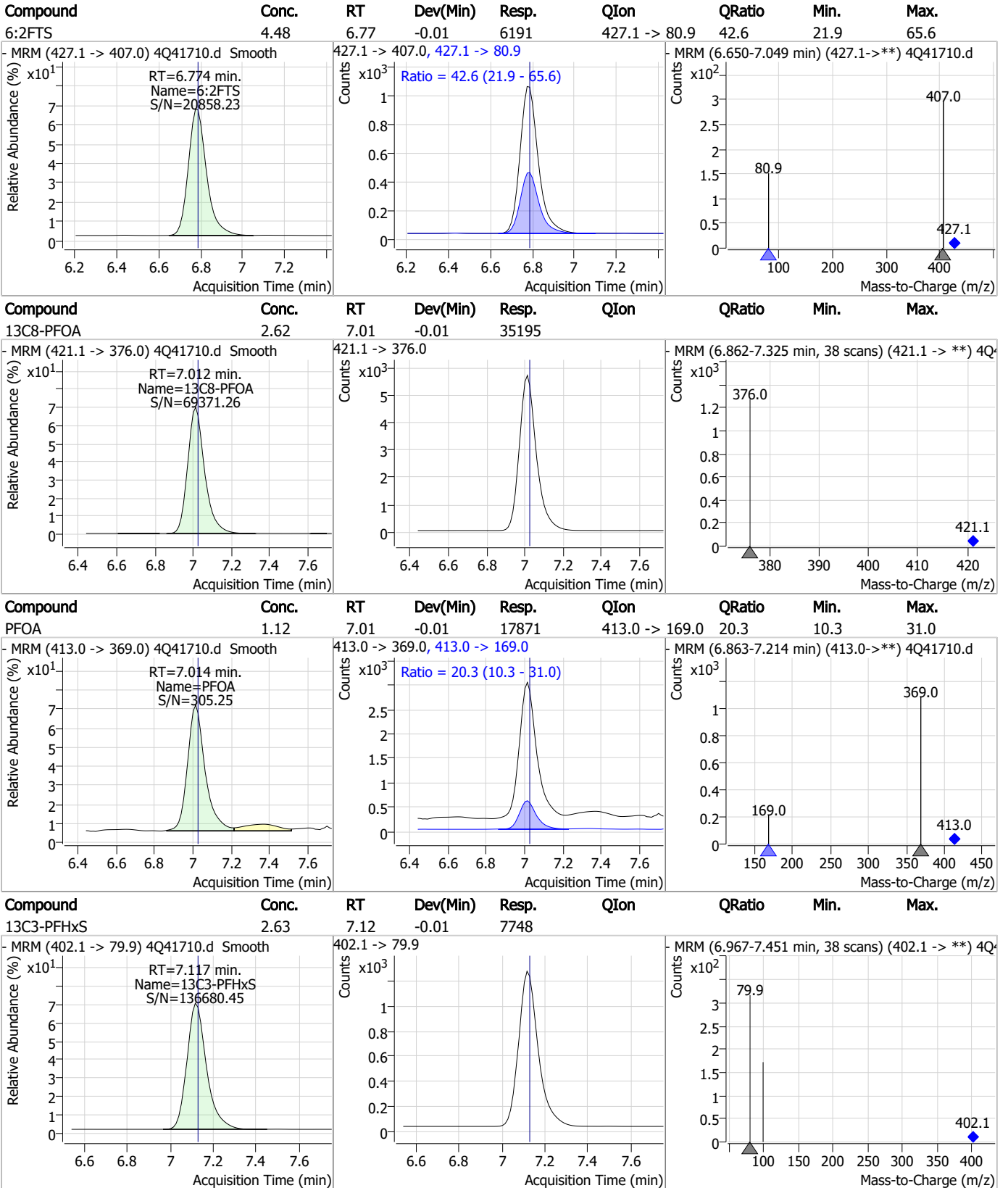
Perfluorinated Compounds by LC/MS/MS



7.3.2

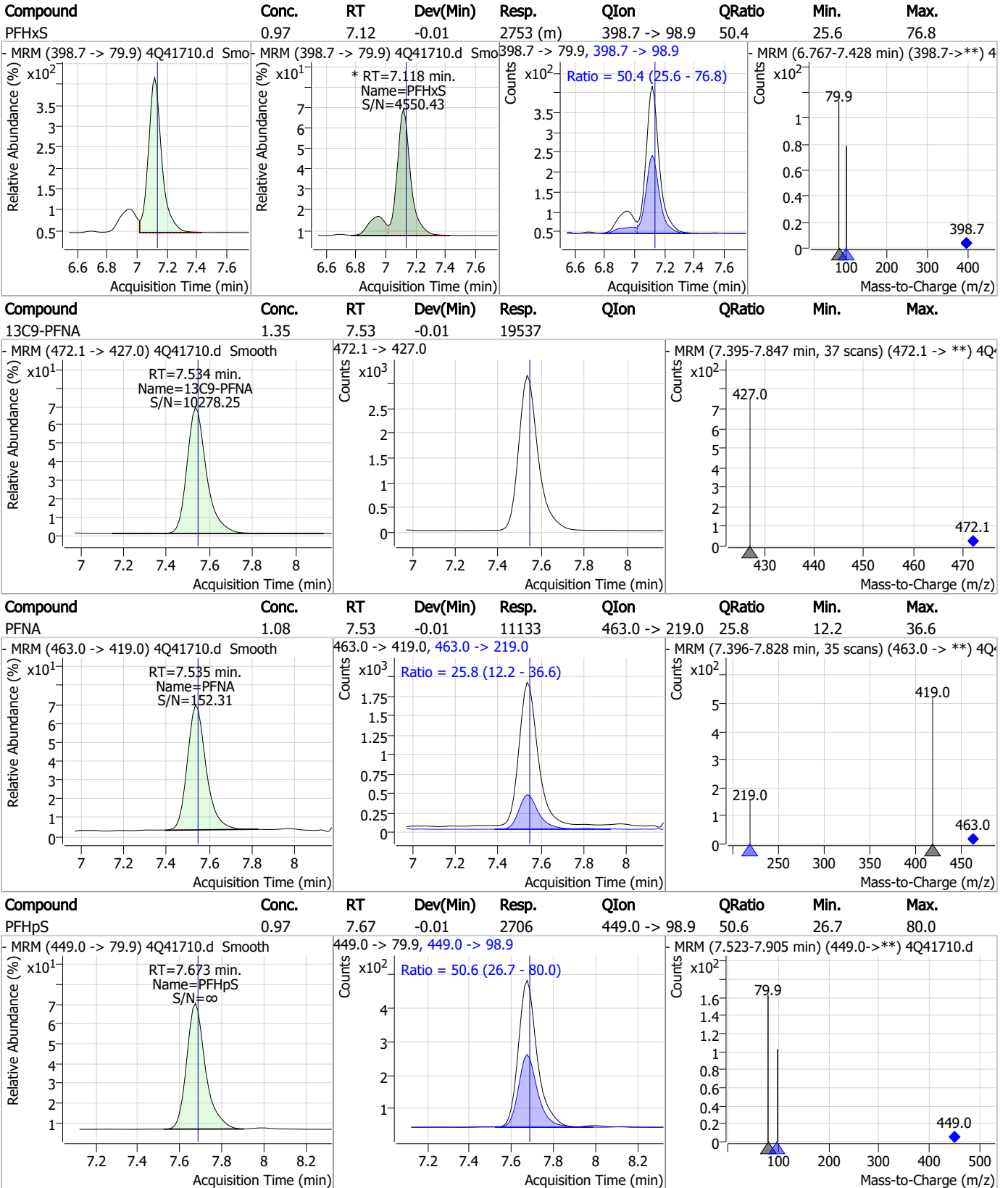
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Perfluorinated Compounds by LC/MS/MS



7.3.2

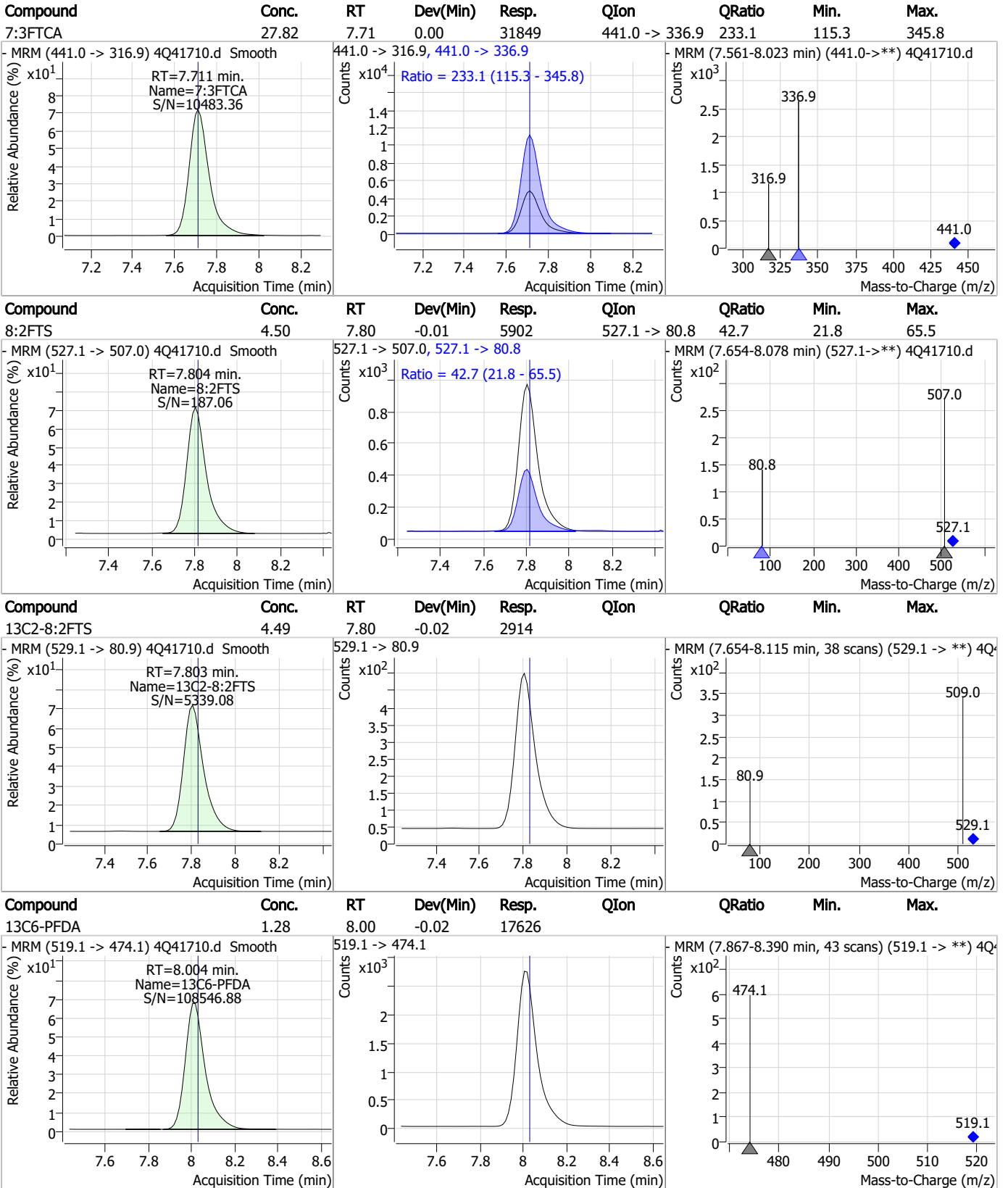
Perfluorinated Compounds by LC/MS/MS



7.3.2

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Perfluorinated Compounds by LC/MS/MS

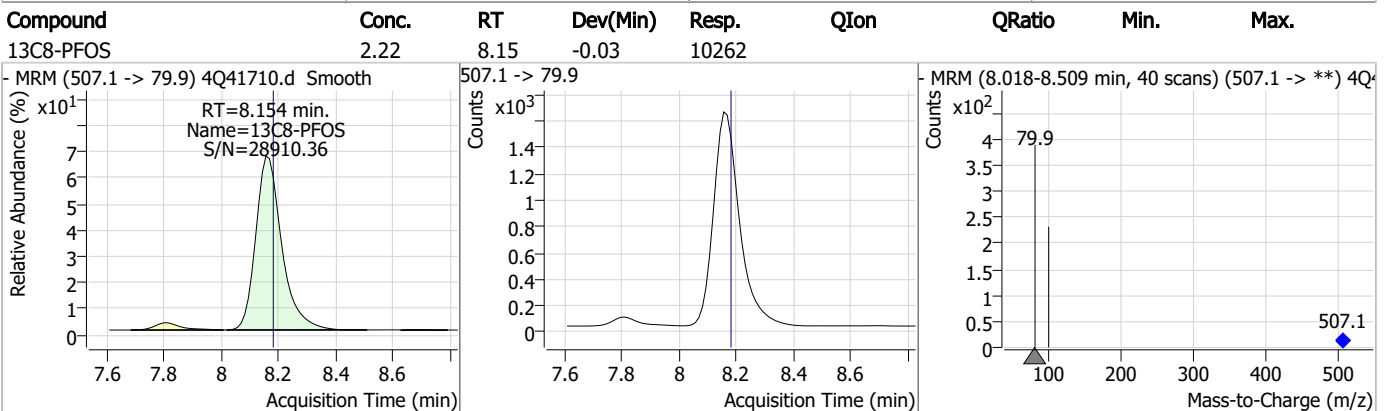
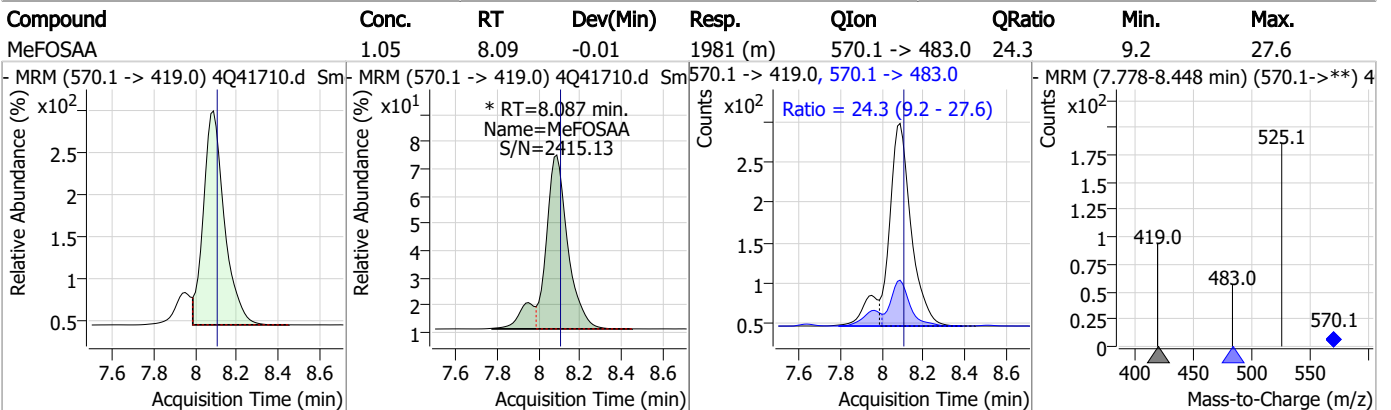
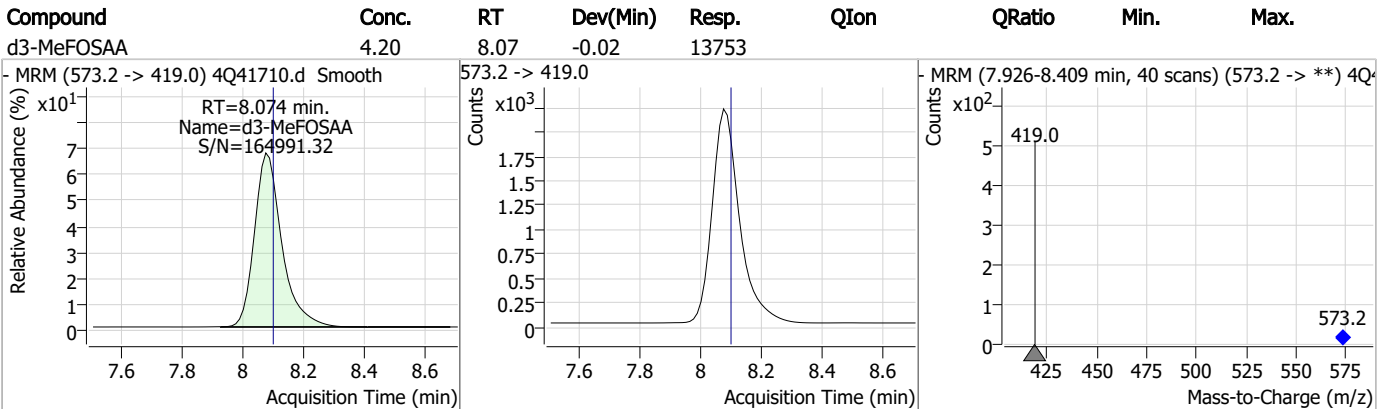
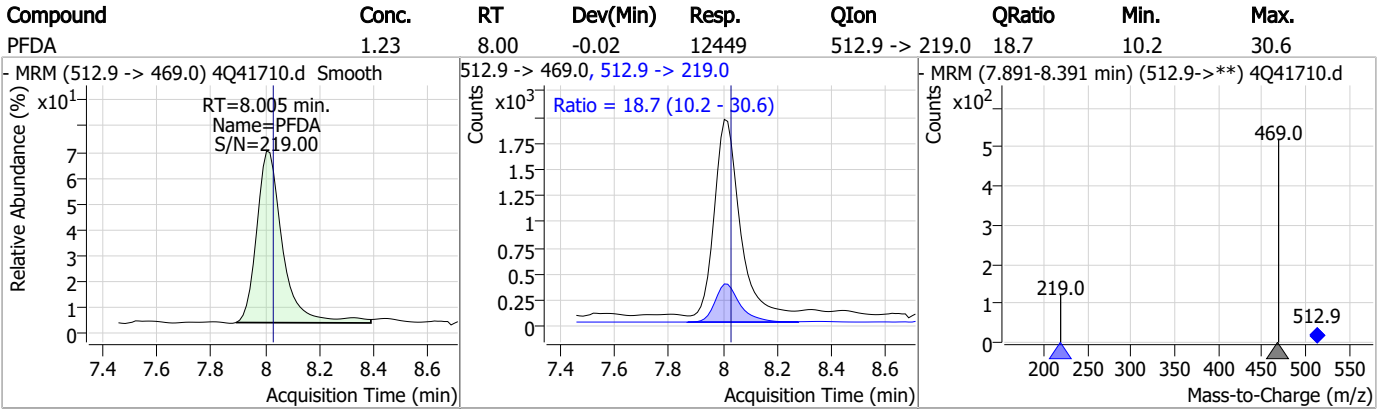


7.3.2

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Perfluorinated Compounds by LC/MS/MS

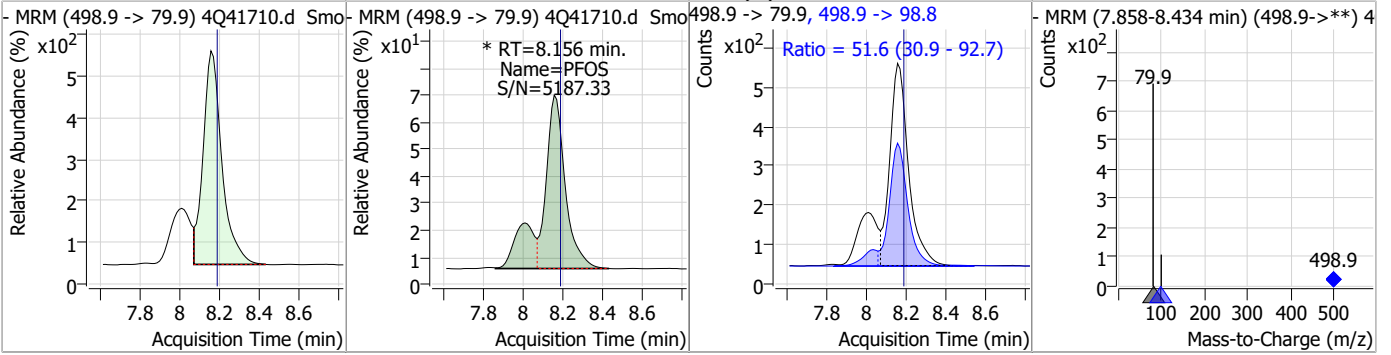


7.3.2

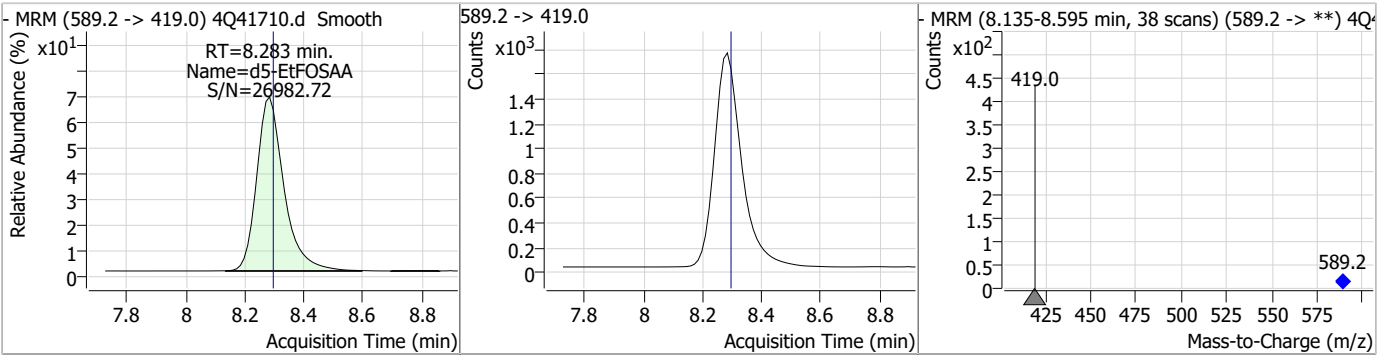
7

Perfluorinated Compounds by LC/MS/MS

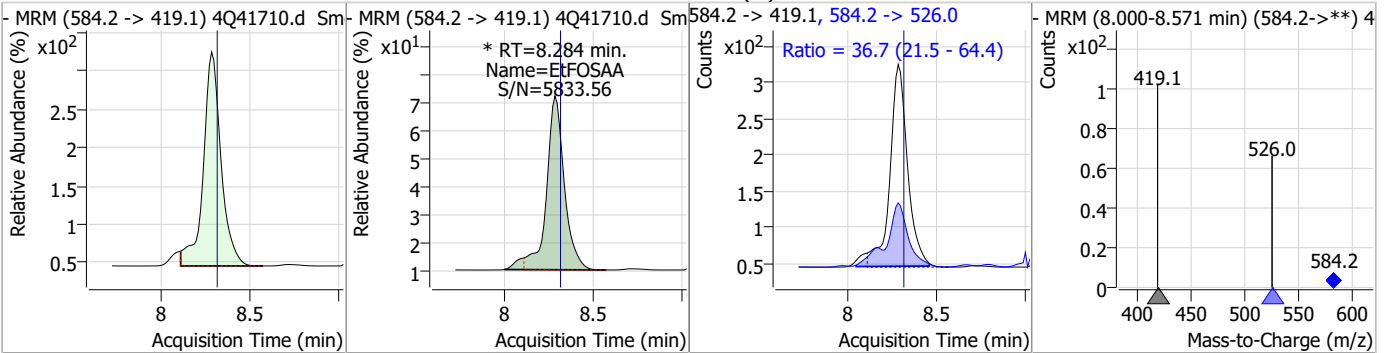
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	1.01	8.16	-0.03	4367 (m)	498.9 -> 98.8	51.6	30.9	92.7



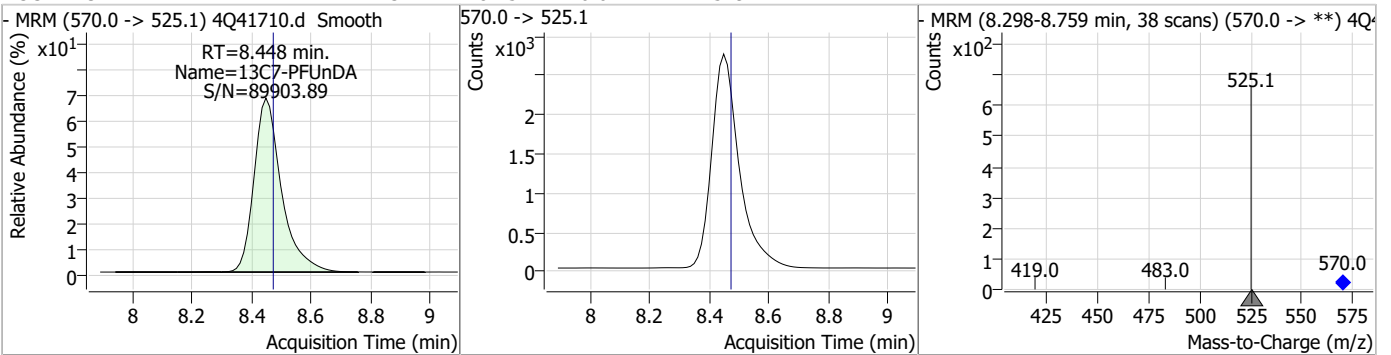
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	4.14	8.28	-0.01	11069				



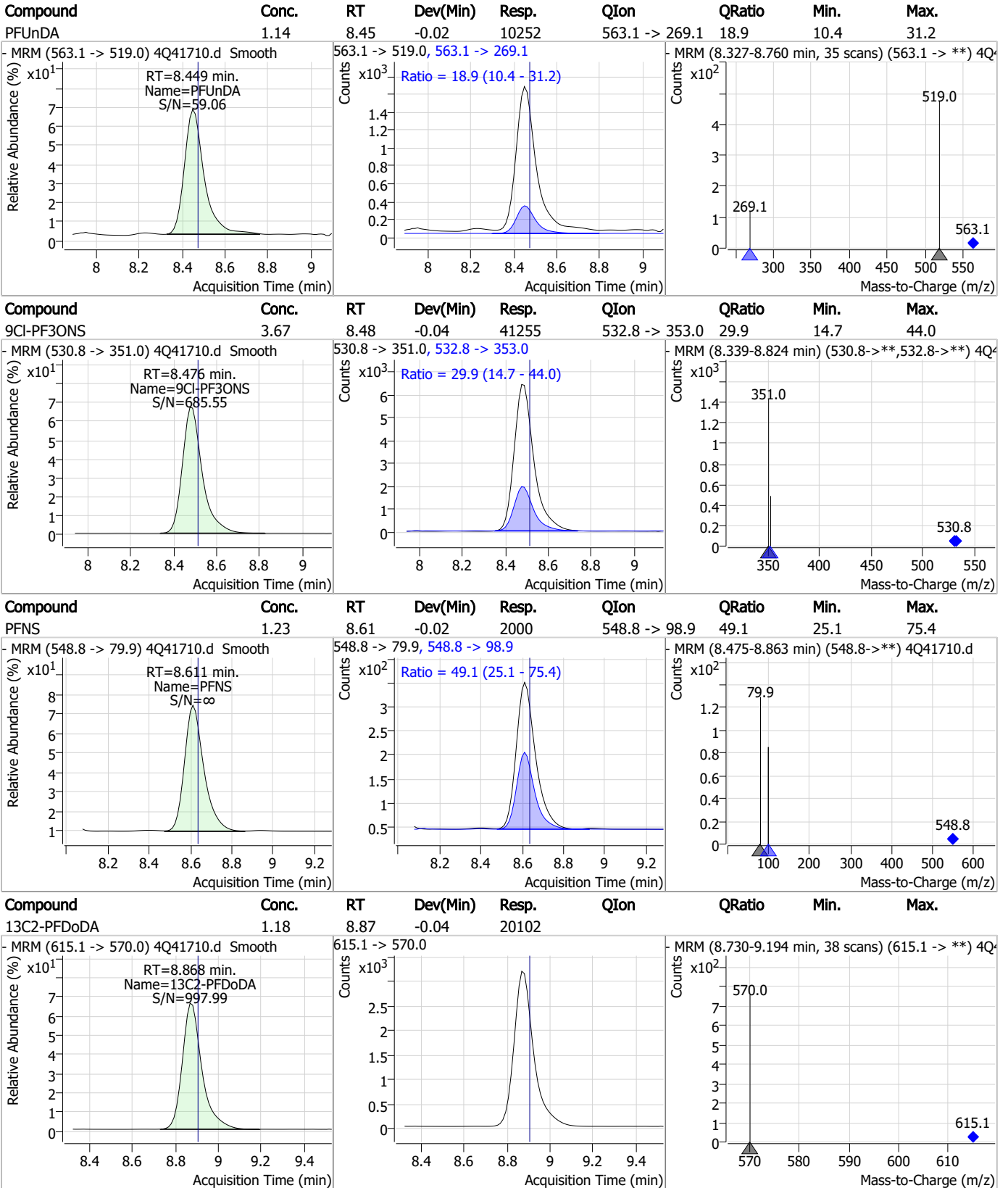
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	1.12	8.28	-0.02	1989 (m)	584.2 -> 526.0	36.7	21.5	64.4



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C7-PFUnDA	1.23	8.45	-0.02	17529				



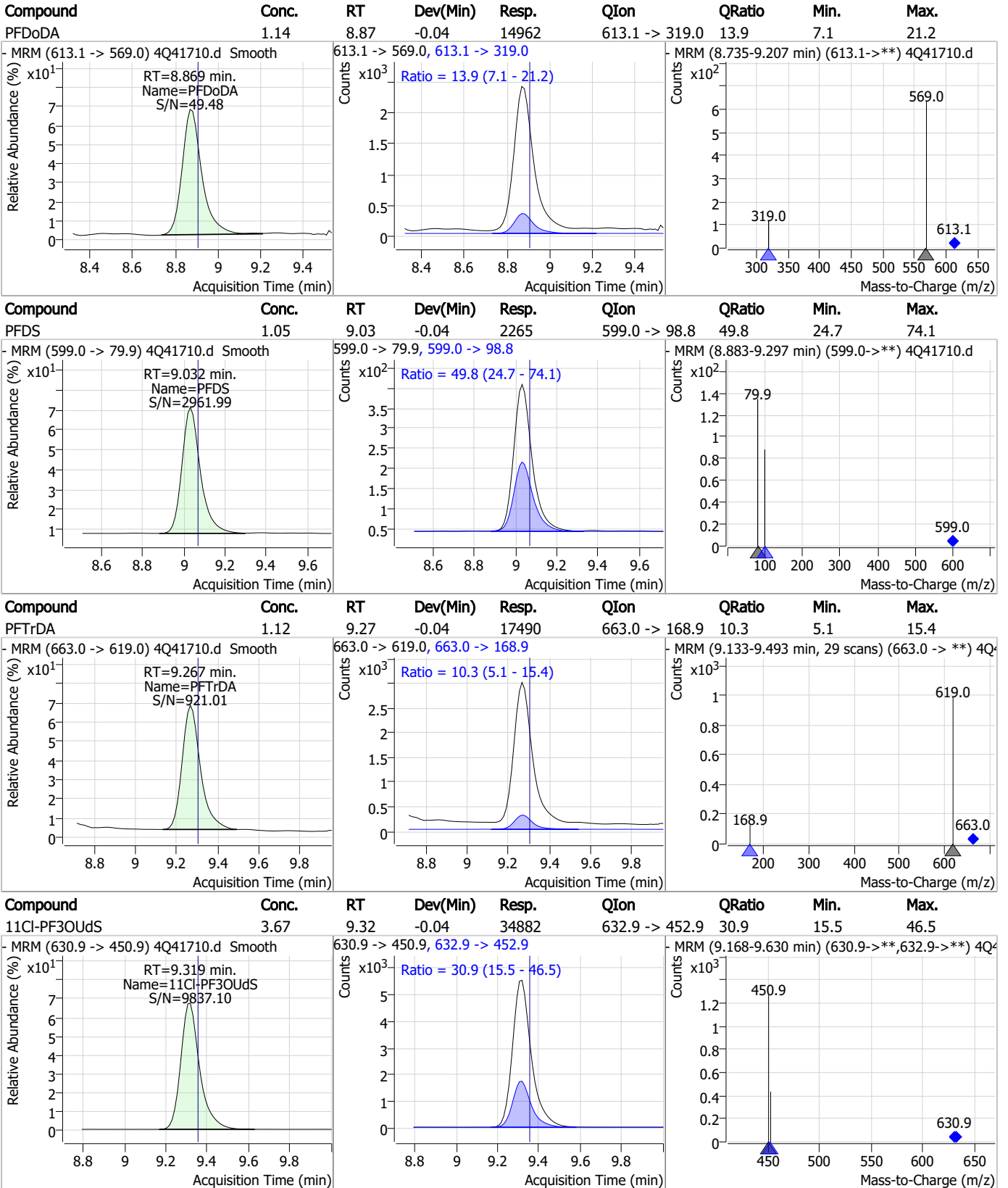
Perfluorinated Compounds by LC/MS/MS



7.3.2

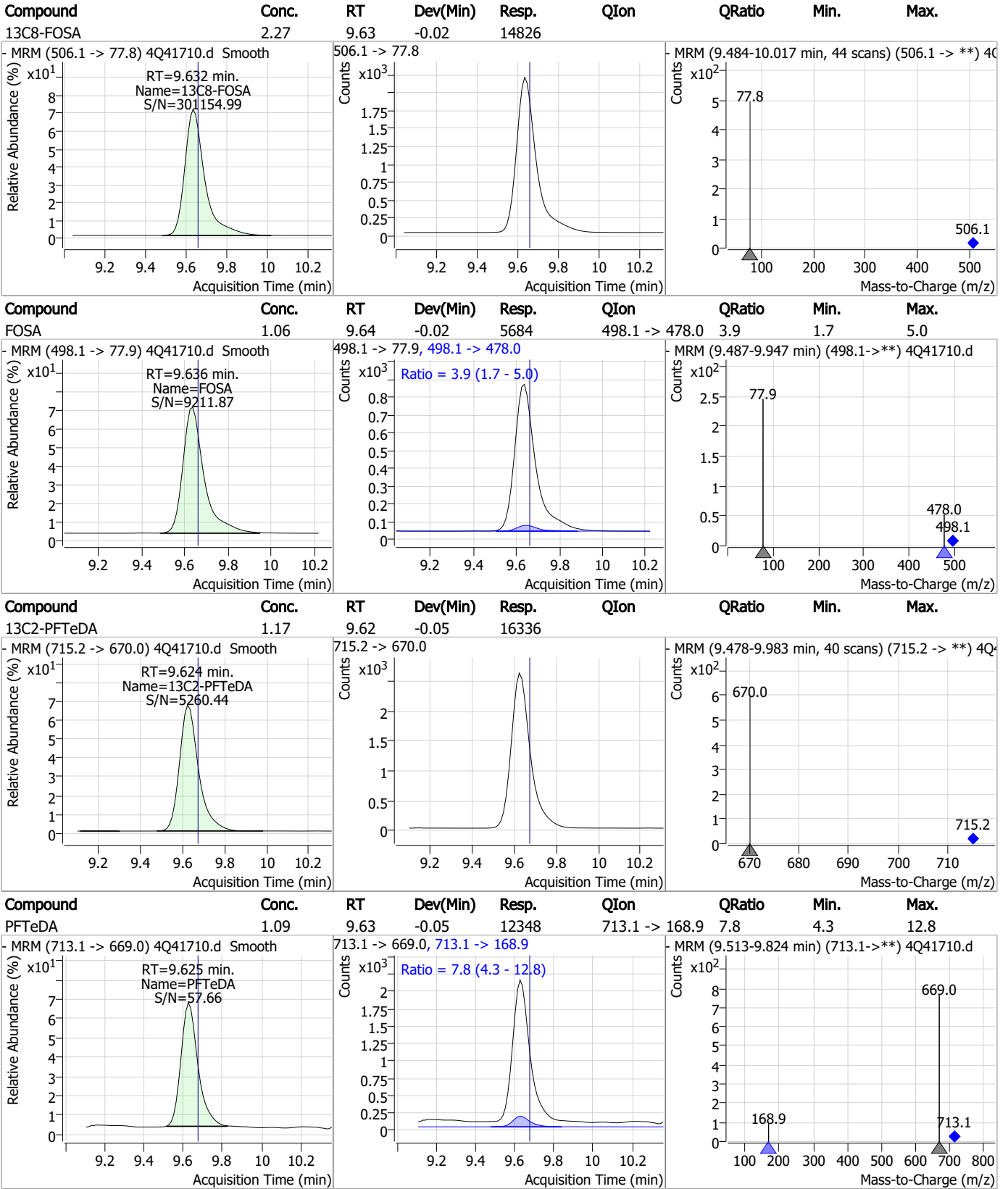
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Perfluorinated Compounds by LC/MS/MS



7.3.2
7

Perfluorinated Compounds by LC/MS/MS

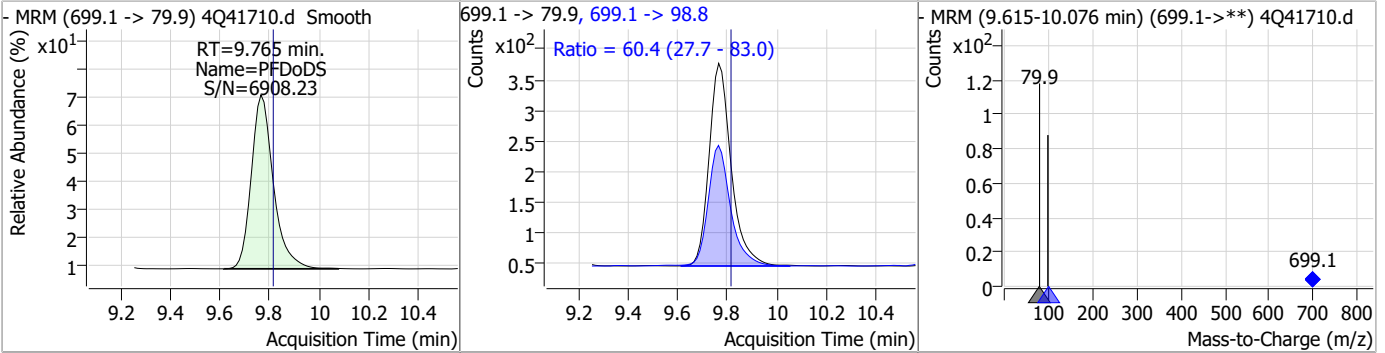


7.3.2

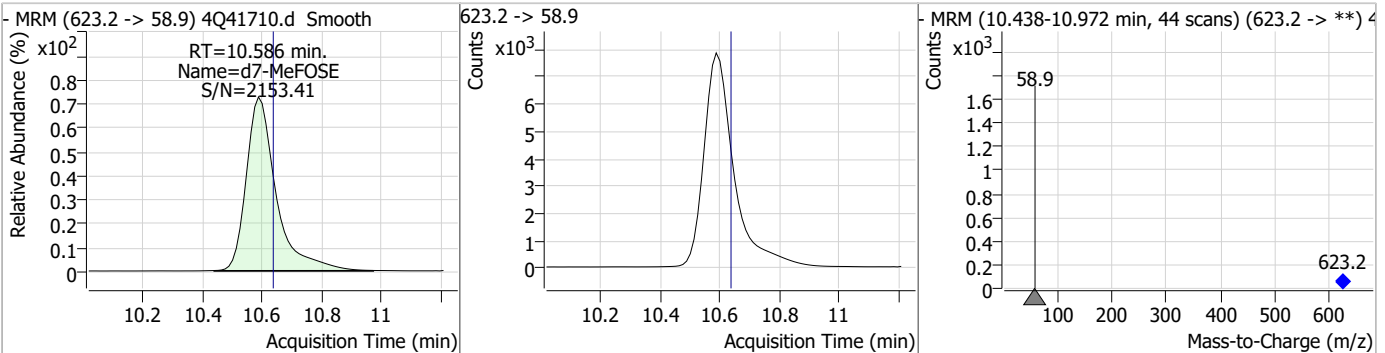
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Perfluorinated Compounds by LC/MS/MS

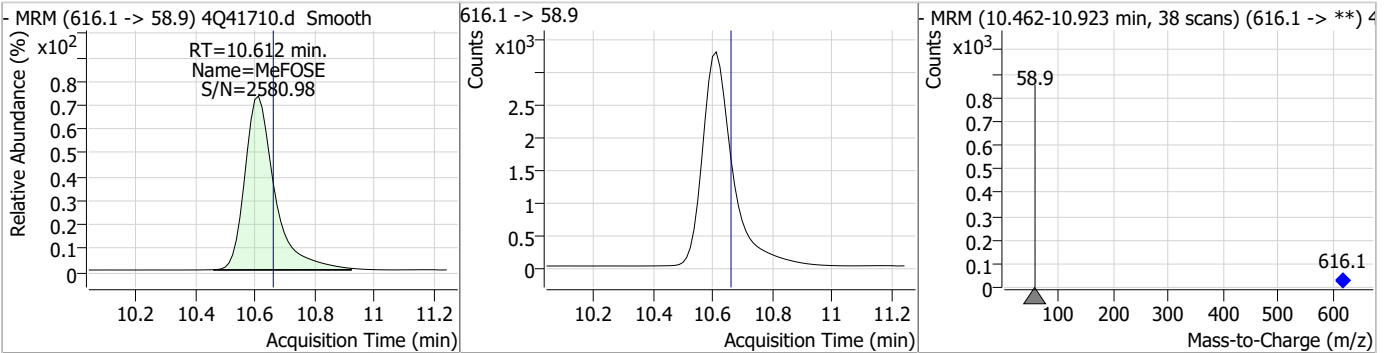
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoS	1.12	9.76	-0.05	2054	699.1 -> 98.8	60.4	27.7	83.0



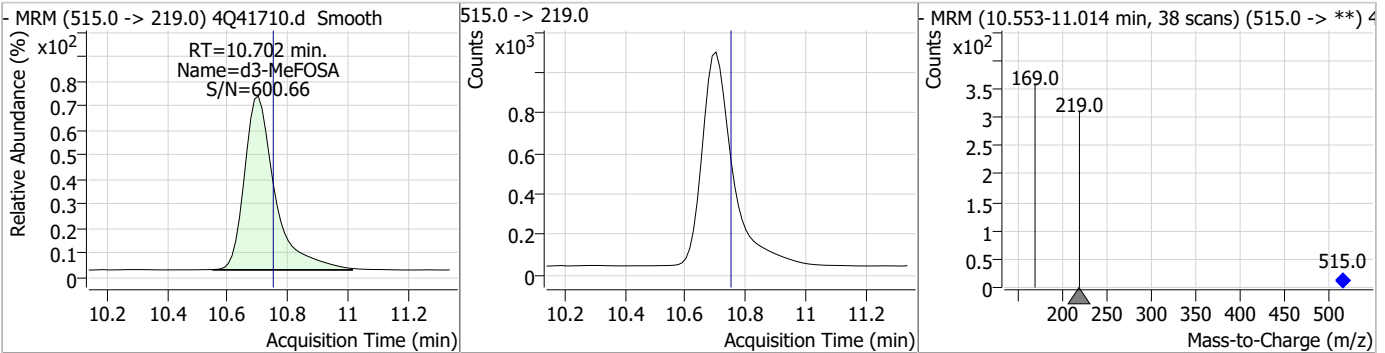
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	21.88	10.59	-0.05	54657				



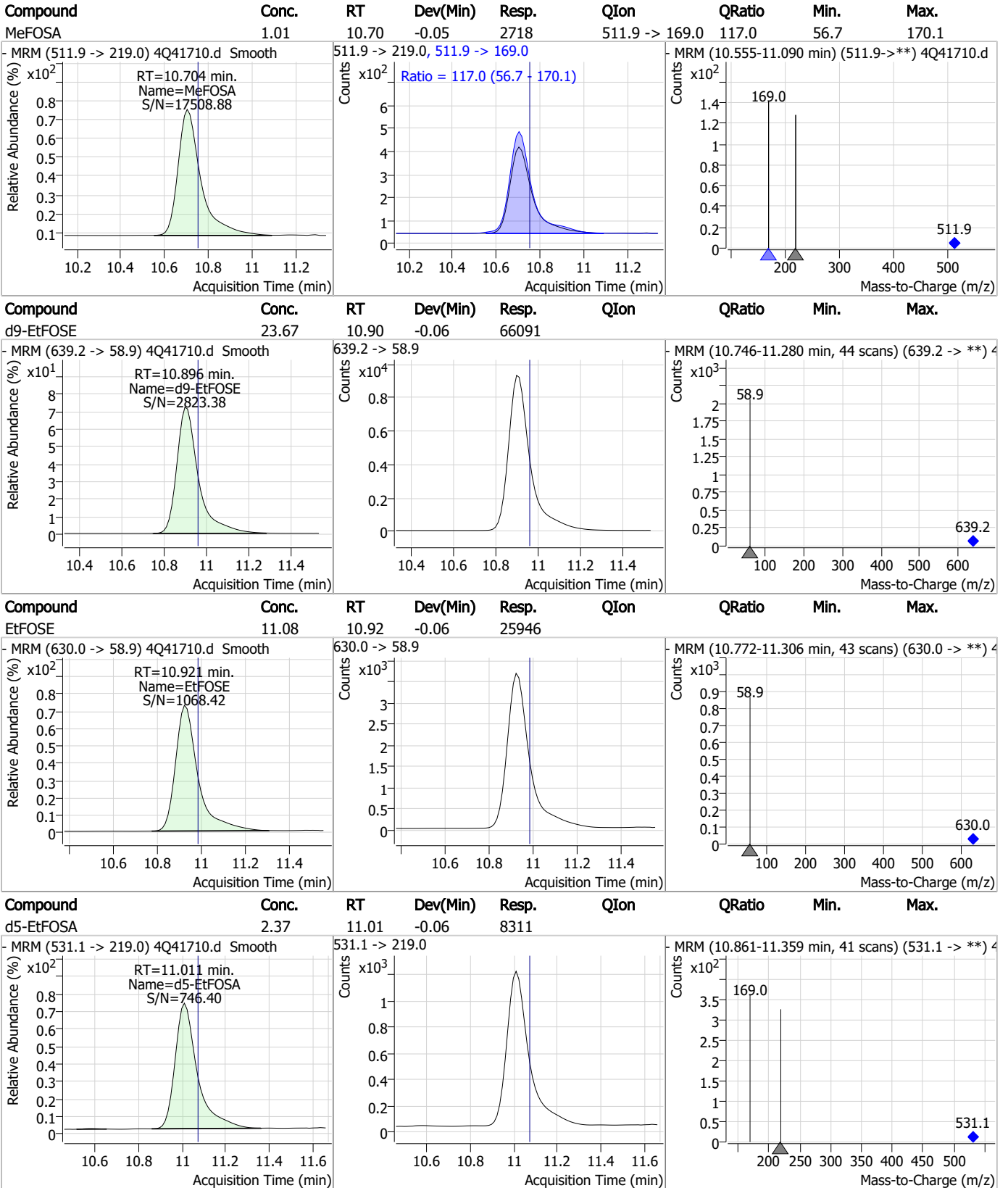
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	10.96	10.61	-0.05	22865				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.25	10.70	-0.05	7461				

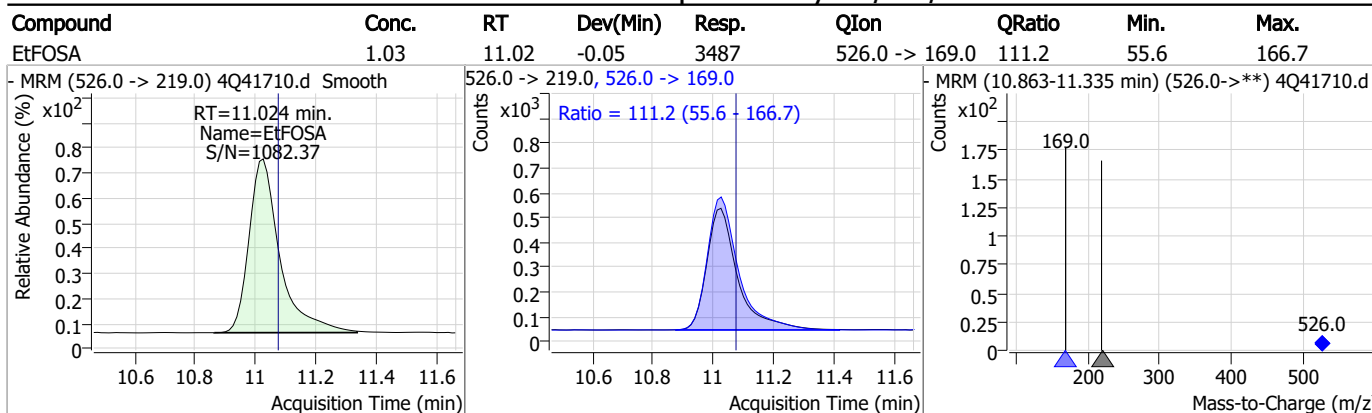


Perfluorinated Compounds by LC/MS/MS



7.3.2
7

Perfluorinated Compounds by LC/MS/MS



7.3.2
7

Manual Integration Approval Summary

Sample Number: OP95719-LLBS Method: EPA DRAFT 1633
Lab FileID: 4Q41710.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 18:27 Supervisor approved: 03/08/23 11:03 Natasha Guntie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.12	Split peak
MeFOSAA	2355-31-9		8.09	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.16	Split peak
EtFOSAA	2991-50-6		8.28	Split peak

7.3.2.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41713.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 7:09:41 PM
 Sample Name : op95719-ms
 Vial : P6-A5
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,560,,,5.0,1,water

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
Internal Standards						
M4-PFBA	3.177	216.8 -> 171.9	35568	10.00	µg/L	-0.062
M5-PFPeA	4.487	268.3 -> 223.0	67164	5.00	µg/L	-0.087
M5-PFHxA	5.509	318.0 -> 273.0	55473	2.50	µg/L	-0.012
M4-PFHpA	6.367	367.1 -> 322.0	30033	2.50	µg/L	0.025
M8-PFOA	7.012	421.1 -> 376.0	33760	2.50	µg/L	0.063
M9-PFNA	7.546	472.1 -> 427.0	17469	1.25	µg/L	0.050
M6-PFDA	8.016	519.1 -> 474.1	16046	1.25	µg/L	0.049
M7-PFUnDA	8.461	570.0 -> 525.1	15774	1.25	µg/L	0.075
M2-PFDoDA	8.881	615.1 -> 570.0	18038	1.25	µg/L	0.113
M2-PFTeDA	9.637	715.2 -> 670.0	14152	1.25	µg/L	0.149
M8-FOSA	9.645	506.1 -> 77.8	13704	2.50	µg/L	0.136
M3-PFBS	5.451	302.1 -> 79.9	11845	2.50	µg/L	-0.038
M3-PFHxS	7.129	402.1 -> 79.9	7228	2.50	µg/L	0.064
M8-PFOS	8.167	507.1 -> 79.9	9346	2.50	µg/L	0.049
M2-4:2FTS	5.223	329.1 -> 80.9	1242	5.00	µg/L	-0.037
M2-6:2FTS	6.786	429.1 -> 80.9	1778	5.00	µg/L	0.062
M2-8:2FTS	7.803	529.1 -> 80.9	2892	5.00	µg/L	0.037
M3-MeFOSAA	8.086	573.2 -> 419.0	11564	5.00	µg/L	0.049
M3-HFPO-DA	5.839	286.9 -> 168.9	30799	10.00	µg/L	0.012
M5-EtFOSAA	8.296	589.2 -> 419.0	9663	5.00	µg/L	0.062
M7-MeFOSE	10.599	623.2 -> 58.9	45492	25.00	µg/L	0.186
M9-EtFOSE	10.908	639.2 -> 58.9	56198	25.00	µg/L	0.199
M5-EtFOSA	11.023	531.1 -> 219.0	7601	2.50	µg/L m	0.211
M3-MeFOSA	10.702	515.0 -> 219.0	7246	2.50	µg/L m	0.187
13C4-PFOS	8.167	502.8 -> 79.9	11325	2.50	µg/L	0.049
13C3-PFBA	3.180	216.0 -> 172.0	77594	5.00	µg/L	-0.062
18O2-PFHxS	7.128	403.0 -> 83.9	5196	2.50	µg/L	0.064
13C4-PFOA	7.013	417.1 -> 372.0	43499	2.50	µg/L	0.063
13C2-PFDA	8.017	515.1 -> 470.1	16139	1.25	µg/L	0.049
13C5-PFNA	7.547	468.0 -> 423.0	21553	1.25	µg/L	0.050
13C2-PFHxA	5.510	315.1 -> 270.0	52363	2.50	µg/L	-0.012

System Monitoring Compounds

13C2-4:2FTS	5.223	329.1 -> 80.9	1242	4.40	µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 88.1%			
13C2-6:2FTS	6.786	429.1 -> 80.9	1778	4.45	µg/L	0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 89.1%			
13C2-8:2FTS	7.803	529.1 -> 80.9	2892	4.65	µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 93.1%			
13C2-PFDoDA	8.881	615.1 -> 570.0	18038	1.06	µg/L	0.113
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 84.6%			
13C2-PFTeDA	9.637	715.2 -> 670.0	14152	1.00	µg/L	0.149
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 80.4%			
13C3-PFBS	5.451	302.1 -> 79.9	11845	2.45	µg/L	-0.038
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.0%			
13C3-PFHxS	7.129	402.1 -> 79.9	7228	2.56	µg/L	0.064

7.4.1
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 102.3%		
13C4-PFBA	3.177	216.8 -> 171.9	35568	2.67 µg/L	-0.062
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 26.7%		
13C4-PFHpA	6.367	367.1 -> 322.0	30033	2.42 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 96.7%		
13C5-PFHxA	5.509	318.0 -> 273.0	55473	2.44 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 97.6%		
13C5-PFPeA	4.487	268.3 -> 223.0	67164	4.70 µg/L	-0.087
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 94.0%		
13C6-PFDA	8.016	519.1 -> 474.1	16046	1.16 µg/L	0.049
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 92.8%		
13C7-PFUnDA	8.461	570.0 -> 525.1	15774	1.10 µg/L	0.075
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 88.1%		
13C8-FOSA	9.645	506.1 -> 77.8	13704	2.18 µg/L	0.136
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 87.0%		
13C8-PFOA	7.012	421.1 -> 376.0	33760	2.35 µg/L	0.063
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 93.9%		
13C8-PFOS	8.167	507.1 -> 79.9	9346	2.09 µg/L	0.049
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 83.8%		
13C9-PFNA	7.546	472.1 -> 427.0	17469	1.16 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 92.7%		
d3-MeFOSAA	8.086	573.2 -> 419.0	11564	3.66 µg/L	0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 73.1%		
13C3-HFPO-DA	5.839	286.9 -> 168.9	30799	11.62 µg/L	0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 116.2%		
d3-MeFOSA	10.702	515.0 -> 219.0	7246	2.26 µg/L	m 0.187
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 90.4%		
d5-EtFOSAA	8.296	589.2 -> 419.0	9663	3.74 µg/L	0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 74.9%		
d7-MeFOSE	10.599	623.2 -> 58.9	45492	18.86 µg/L	0.186
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 75.4%		
d9-EtFOSE	10.908	639.2 -> 58.9	56198	20.85 µg/L	0.199
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 83.4%		
d5-EtFOSA	11.023	531.1 -> 219.0	7601	2.25 µg/L	m 0.211
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 89.8%		
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0	19832	11.73 µg/L	97
		327.1 -> 80.9	8565		
6:2FTS	6.787	427.1 -> 407.0	14835	11.52 µg/L	99
		427.1 -> 80.9	6346		
8:2FTS	7.816	527.1 -> 507.0	14695	11.29 µg/L	100
		527.1 -> 80.8	6436		
EtFOSAA	8.297	584.2 -> 419.1	4440	2.86 µg/L	m 88
		584.2 -> 526.0	2234		
FOSA	9.636	498.1 -> 77.9	14984	3.04 µg/L	98
		498.1 -> 478.0	408		
MeFOSAA	8.087	570.1 -> 419.0	5376	3.38 µg/L	96
		570.1 -> 483.0	1085		
PFBA	3.183	212.8 -> 168.9	9538	12.45 µg/L	100
PFBS	5.452	298.7 -> 79.9	12235	2.89 µg/L	97
		298.7 -> 98.8	4861		
PFDA	8.017	512.9 -> 469.0	29450	3.20 µg/L	97
		512.9 -> 219.0	5597		
PFDoDA	8.881	613.1 -> 569.0	35147	3.00 µg/L	100
		613.1 -> 319.0	5051		
PFDS	9.045	599.0 -> 79.9	5701	2.89 µg/L	99

7.4.1
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	2775			
PFHpA	6.368	363.1 -> 319.0	48862	3.23	µg/L	100
		363.1 -> 169.0	8675			
PFHpS	7.673	449.0 -> 79.9	7782	3.05	µg/L	96
		449.0 -> 98.9	3899			
PFHxA	5.512	313.0 -> 269.0	54917	3.24	µg/L	100
		313.0 -> 118.9	1713			
PFHxS	7.130	398.7 -> 79.9	7522	2.85	µg/L	m 95
		398.7 -> 98.9	3600			
PFNA	7.547	463.0 -> 419.0	28602	3.10	µg/L	96
		463.0 -> 219.0	7510			
PFNS	8.624	548.8 -> 79.9	4619	3.12	µg/L	96
		548.8 -> 98.9	2450			
PFOA	7.014	413.0 -> 369.0	47010	3.07	µg/L	98
		413.0 -> 169.0	9388			
PFOS	8.168	498.9 -> 79.9	10803	2.73	µg/L	m 89
		498.9 -> 98.8	5743			
PFPeA	4.489	263.0 -> 219.0	93347	7.25	µg/L	100
PFPeS	6.432	349.1 -> 79.9	6739	2.77	µg/L	95
		349.1 -> 98.9	3100			
PFTeDA	9.638	713.1 -> 669.0	31265	3.18	µg/L	99
		713.1 -> 168.9	2580			
PFTrDA	9.279	663.0 -> 619.0	43521	3.10	µg/L	98
		663.0 -> 168.9	4237			
PFUnDA	8.461	563.1 -> 519.0	24889	3.07	µg/L	100
		563.1 -> 269.1	5192			
11CI-PF3OUdS	9.319	630.9 -> 450.9	86261	9.82	µg/L	99
		632.9 -> 452.9	26250			
9CI-PF3ONS	8.488	530.8 -> 351.0	104823	10.10	µg/L	98
		532.8 -> 353.0	31813			
ADONA	6.631	376.9 -> 250.9	221285	10.94	µg/L	99
		376.9 -> 84.8	59498			
HFPO-DA	5.840	284.9 -> 168.9	29858	12.32	µg/L	100
		284.9 -> 184.9	3332			
3:3FTCA	4.192	241.0 -> 177.0	11721	16.87	µg/L	97
		241.0 -> 117.0	1156			
5:3FTCA	6.345	341.0 -> 237.1	229430	81.66	µg/L	100
		341.0 -> 217.0	161009			
7:3FTCA	7.711	441.0 -> 316.9	84420	80.69	µg/L	99
		441.0 -> 336.9	193921			
EtFOSA	11.024	526.0 -> 219.0	8401	2.71	µg/L	99
		526.0 -> 169.0	9451			
EtFOSE	10.934	630.0 -> 58.9	61039	30.67	µg/L	100
MeFOSA	10.716	511.9 -> 219.0	7050	2.70	µg/L	99
		511.9 -> 169.0	8102			
MeFOSE	10.612	616.1 -> 58.9	53827	30.99	µg/L	100
PFDoDS	9.765	699.1 -> 79.9	4798	2.87	µg/L	100
		699.1 -> 98.8	2667			
NFDHA	5.415	295.0 -> 201.0	4236	7.35	µg/L	94
		295.0 -> 84.9	1151			
PFMBA	4.842	279.0 -> 85.1	49169	6.81	µg/L	100
PFMPA	3.740	229.0 -> 84.9	31215	5.03	µg/L	100
PFEESA	5.934	314.8 -> 134.9	72477	5.65	µg/L	100
		314.8 -> 82.9	2718			

= Qualifier out of range, m = manually integrated, + = Area summed

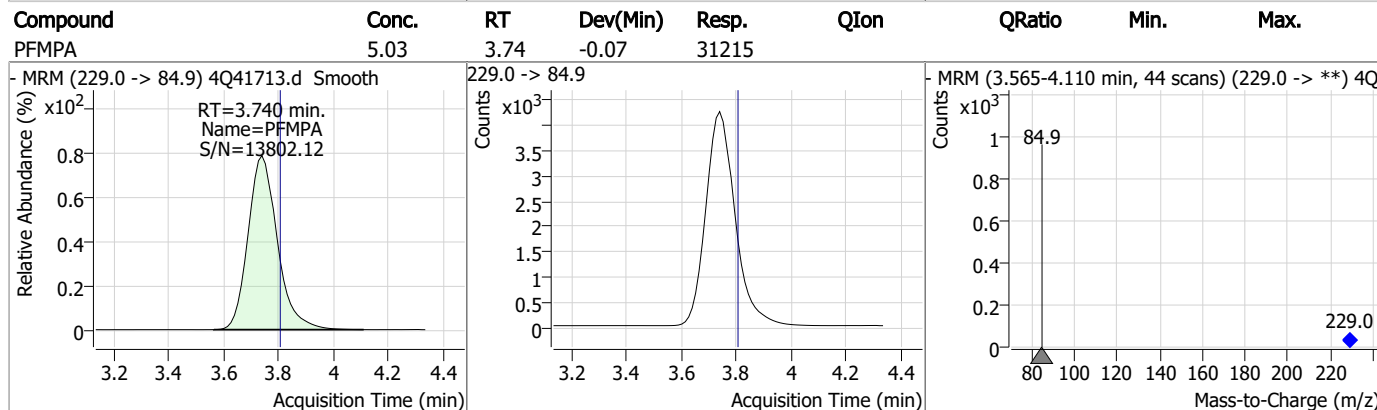
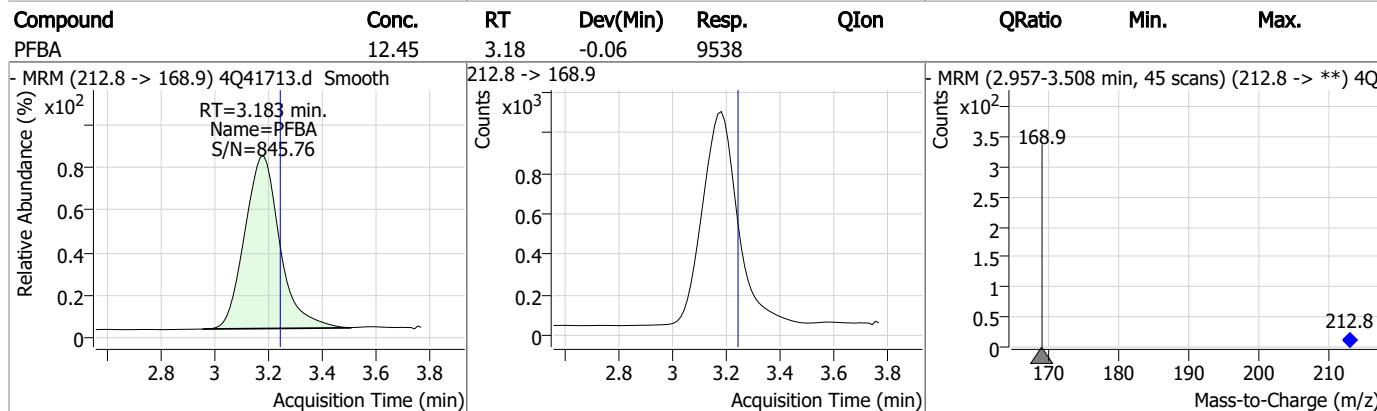
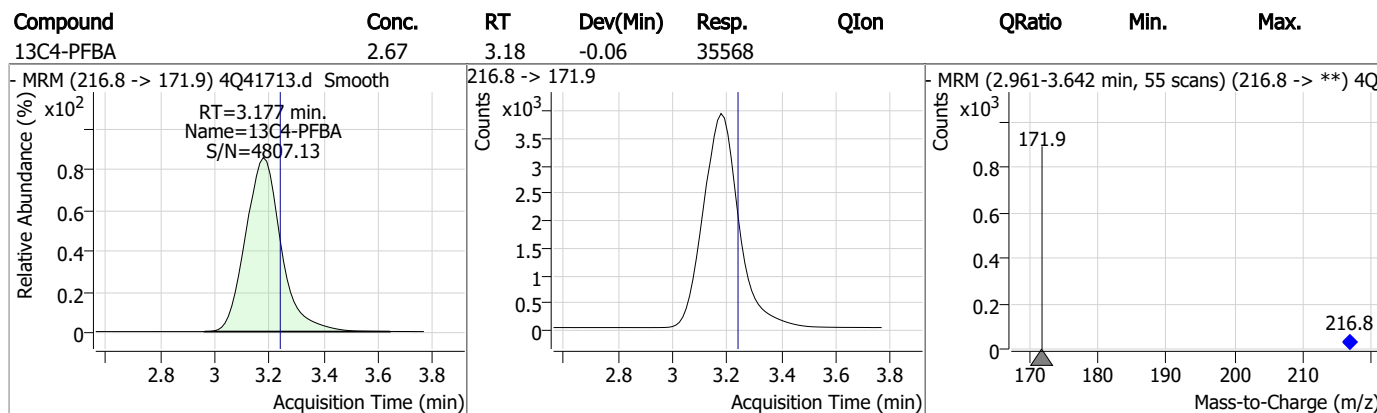
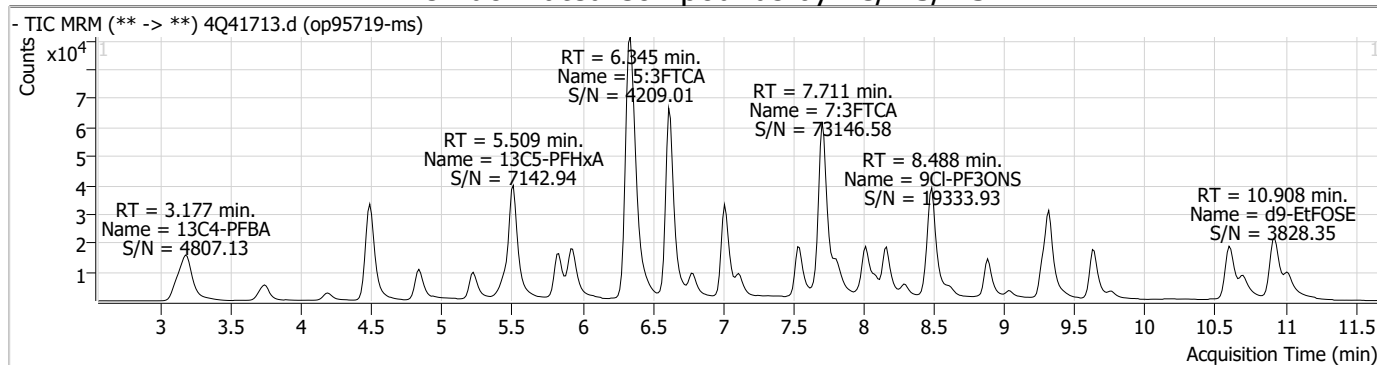
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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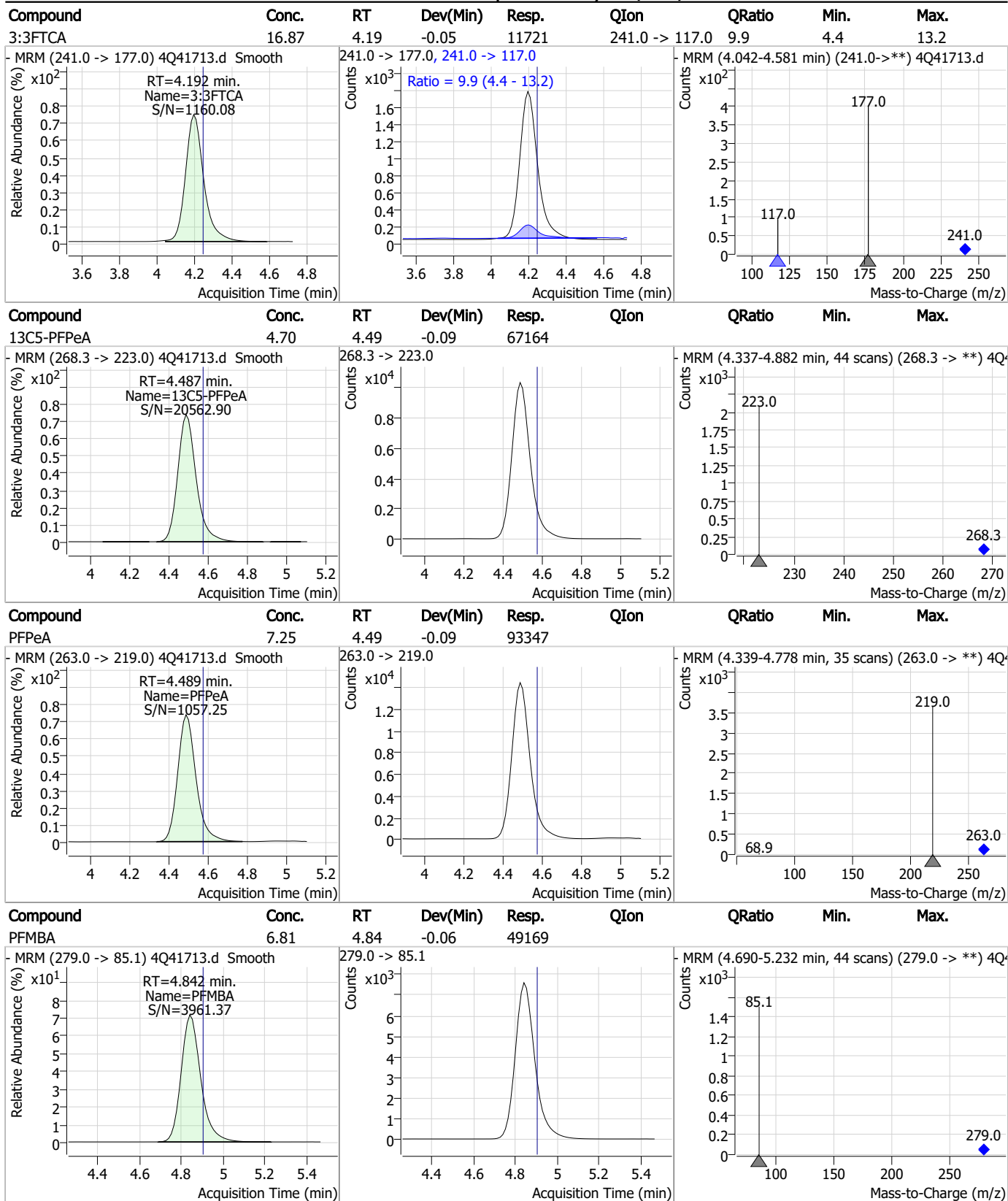
7.4.1

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Perfluorinated Compounds by LC/MS/MS

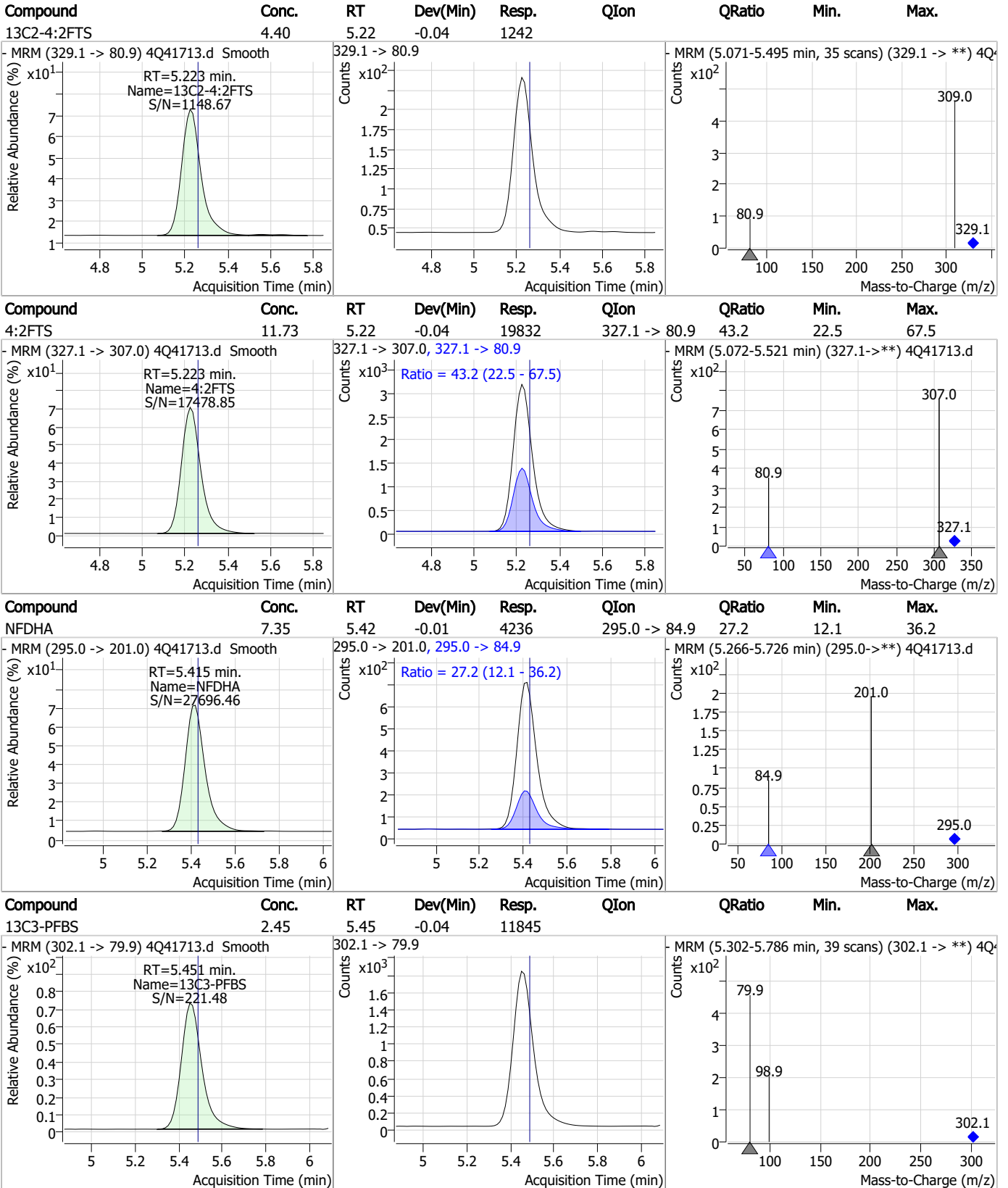


Perfluorinated Compounds by LC/MS/MS



7.4.1
7

Perfluorinated Compounds by LC/MS/MS

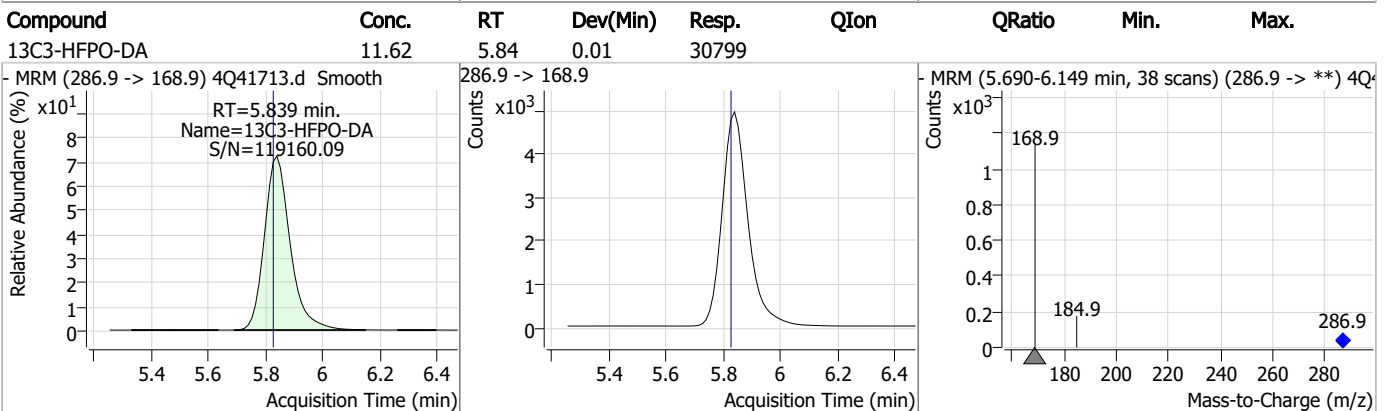
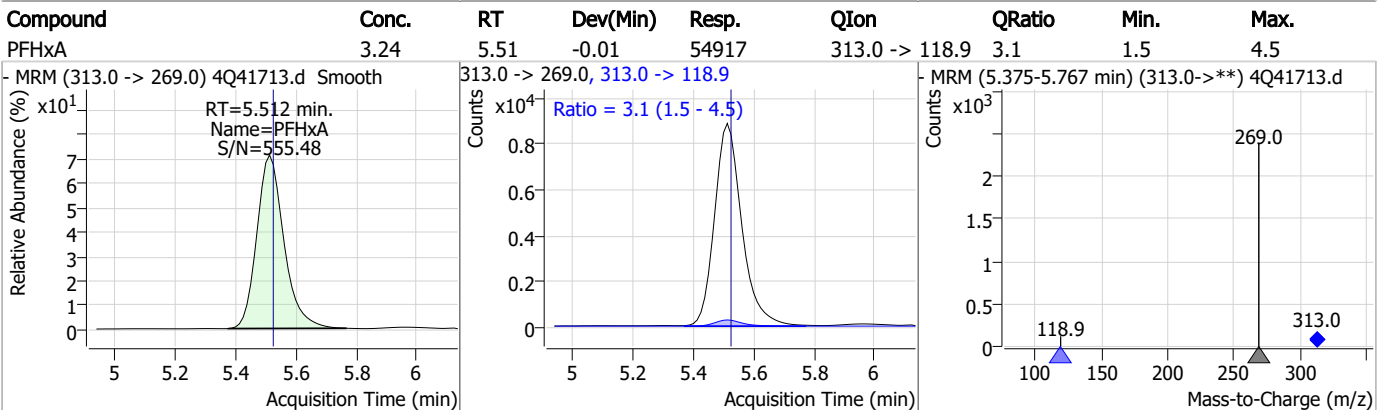
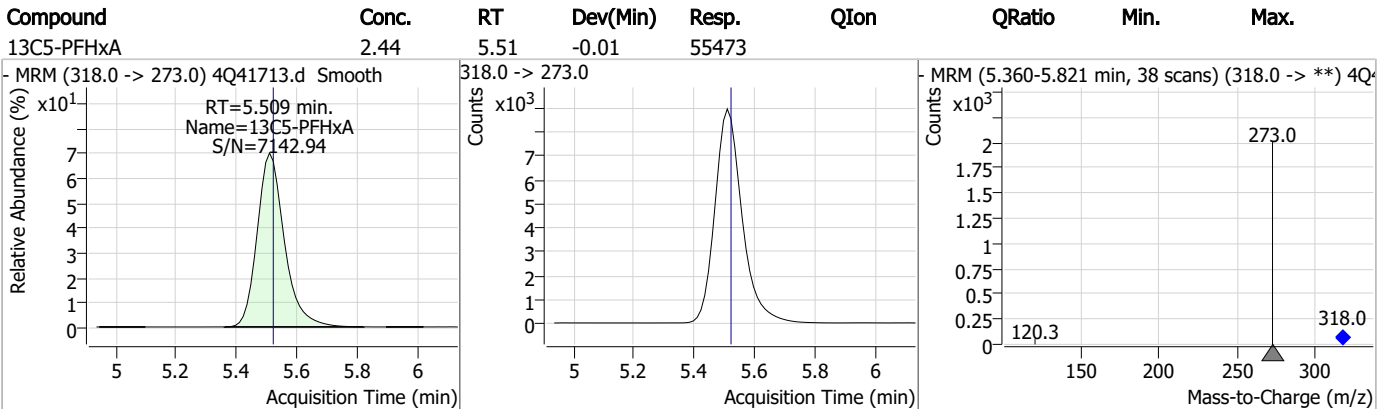
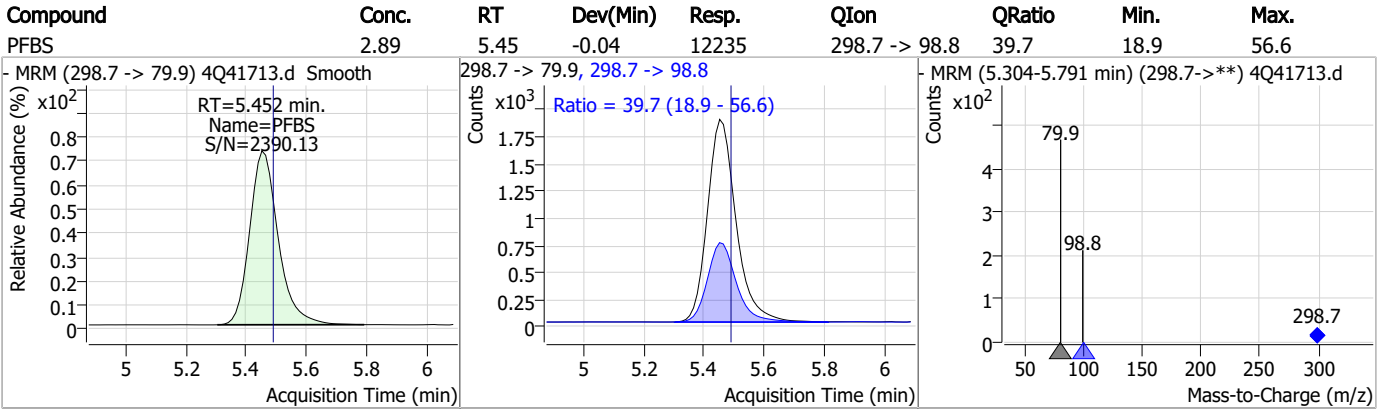


7.4.1

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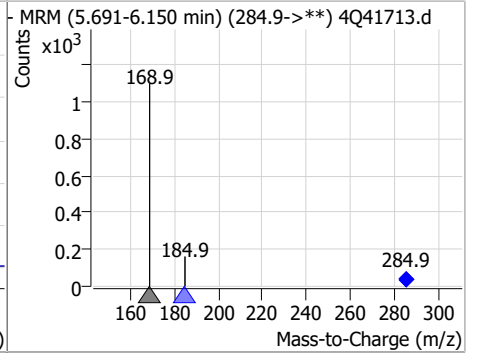
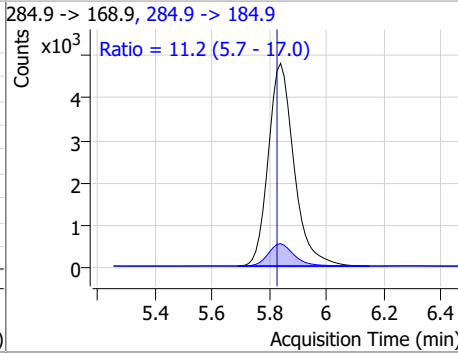
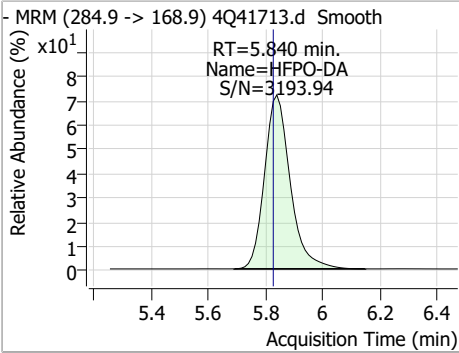


Perfluorinated Compounds by LC/MS/MS

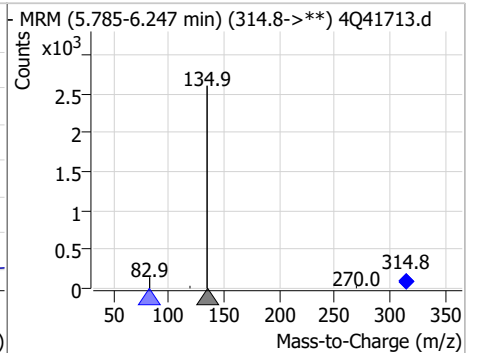
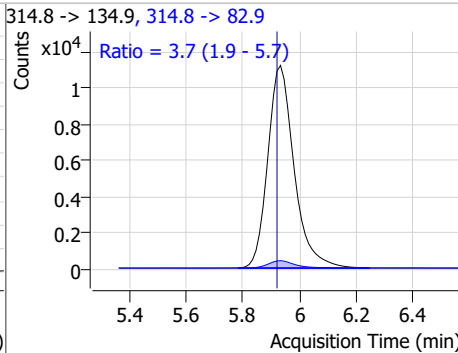
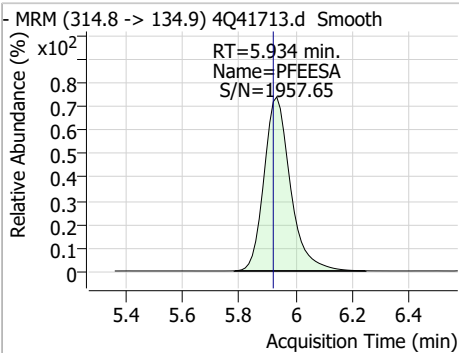


Perfluorinated Compounds by LC/MS/MS

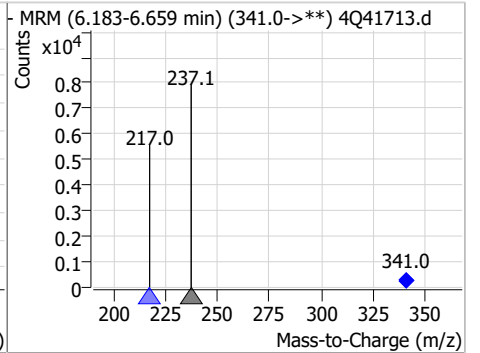
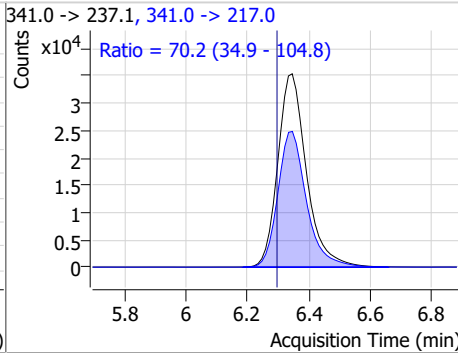
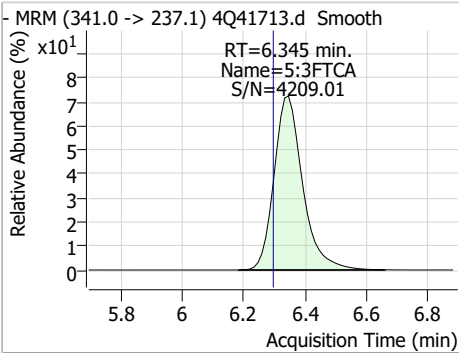
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	12.32	5.84	0.01	29858	284.9 -> 184.9	11.2	5.7	17.0



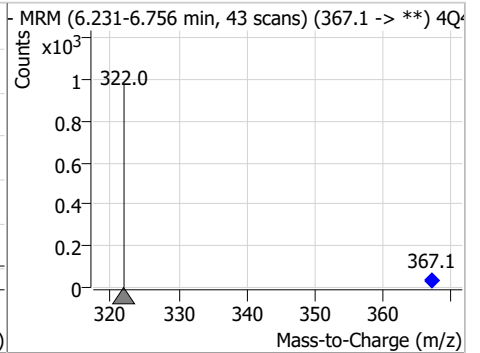
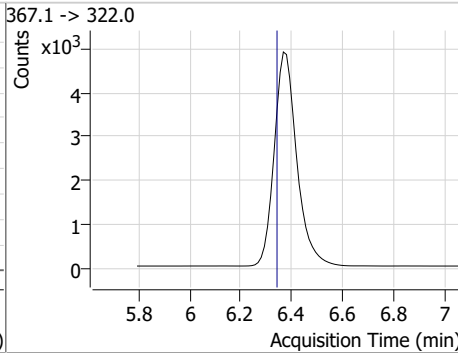
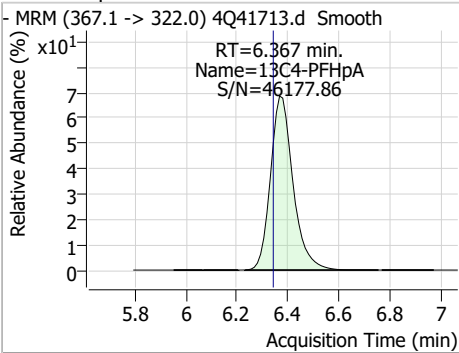
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFEESA	5.65	5.93	0.01	72477	314.8 -> 82.9	3.7	1.9	5.7



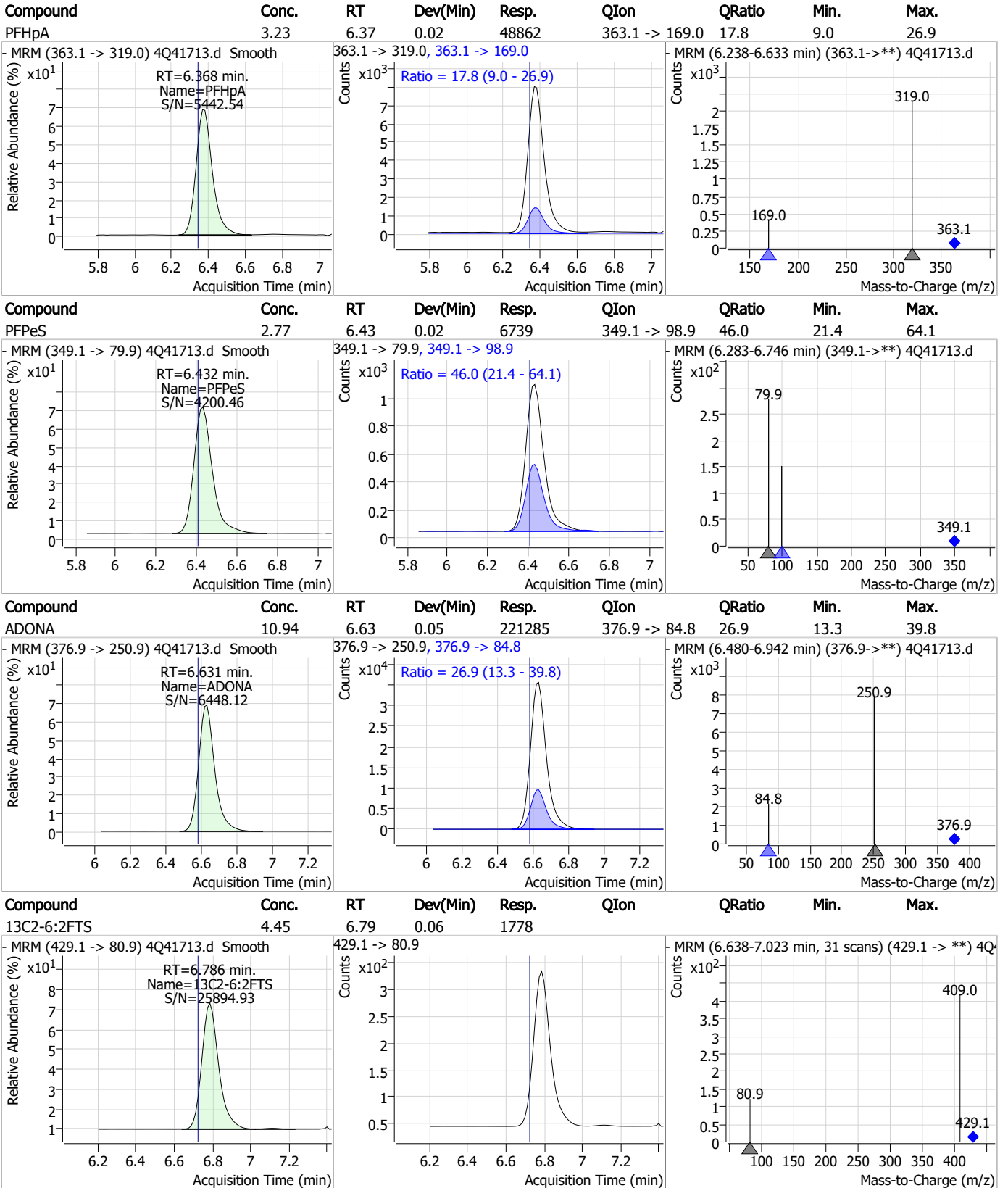
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
5:3FTCA	81.66	6.35	0.05	229430	341.0 -> 217.0	70.2	34.9	104.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C4-PFHpA	2.42	6.37	0.02	30033				



Perfluorinated Compounds by LC/MS/MS

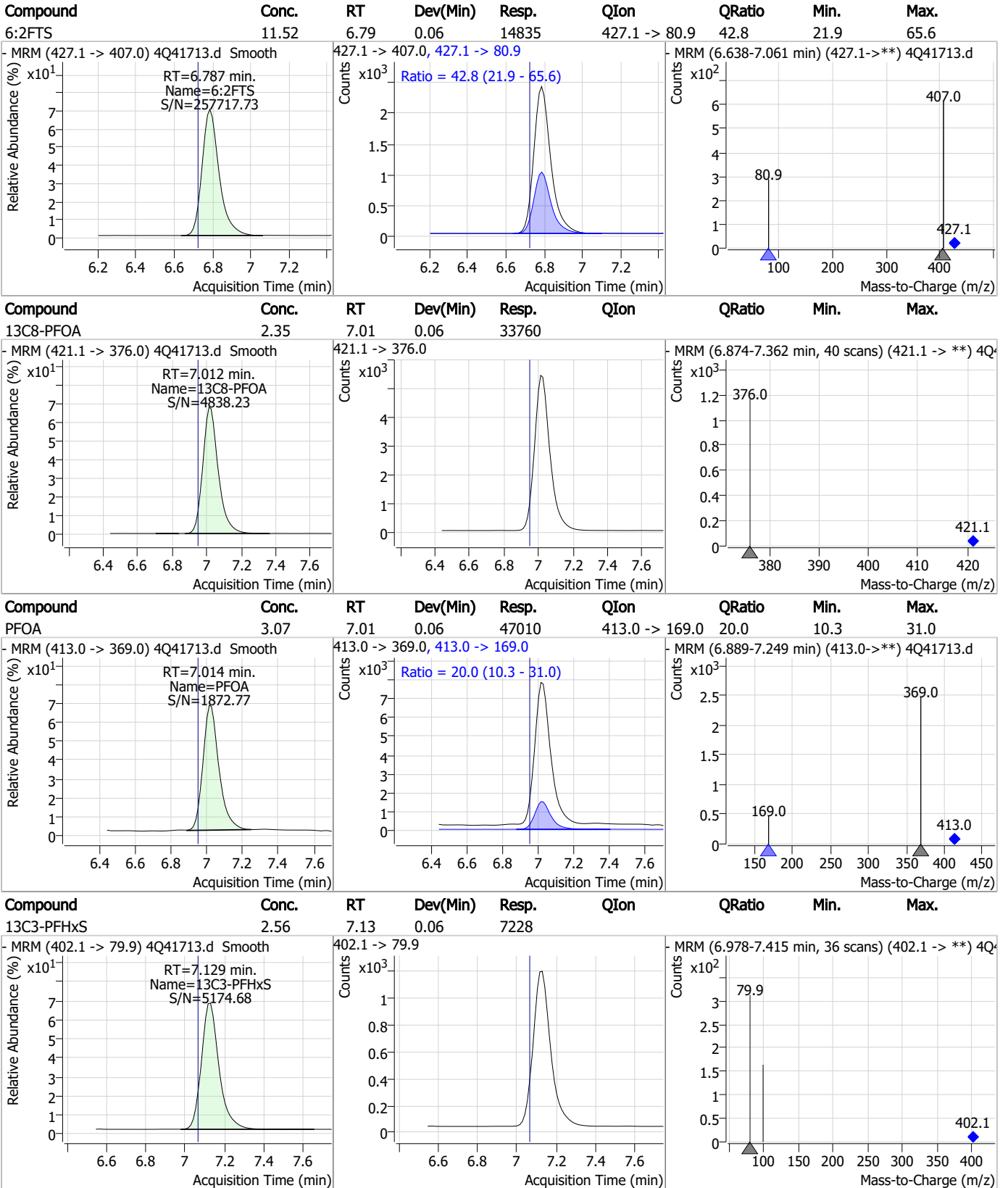


7.4.1

7



Perfluorinated Compounds by LC/MS/MS

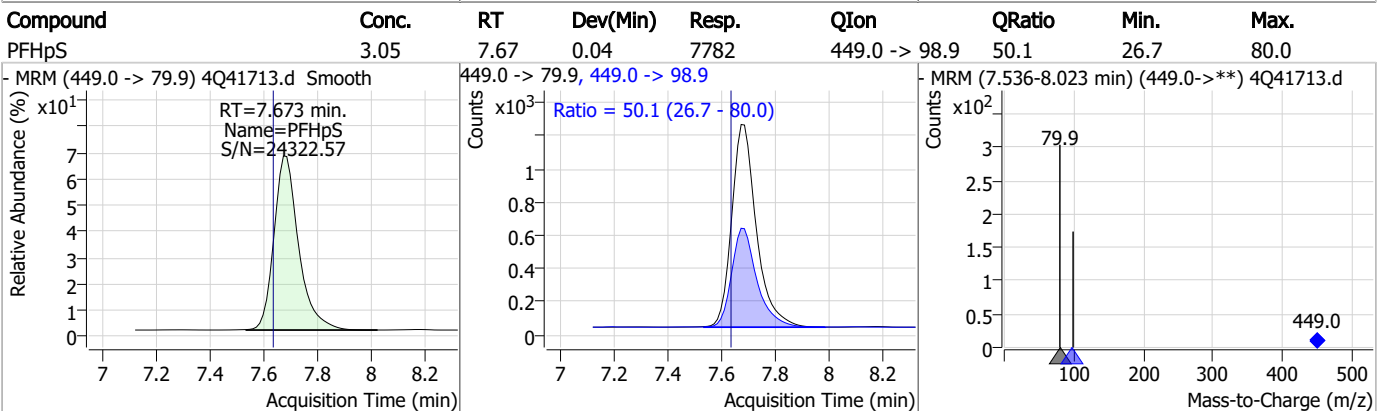
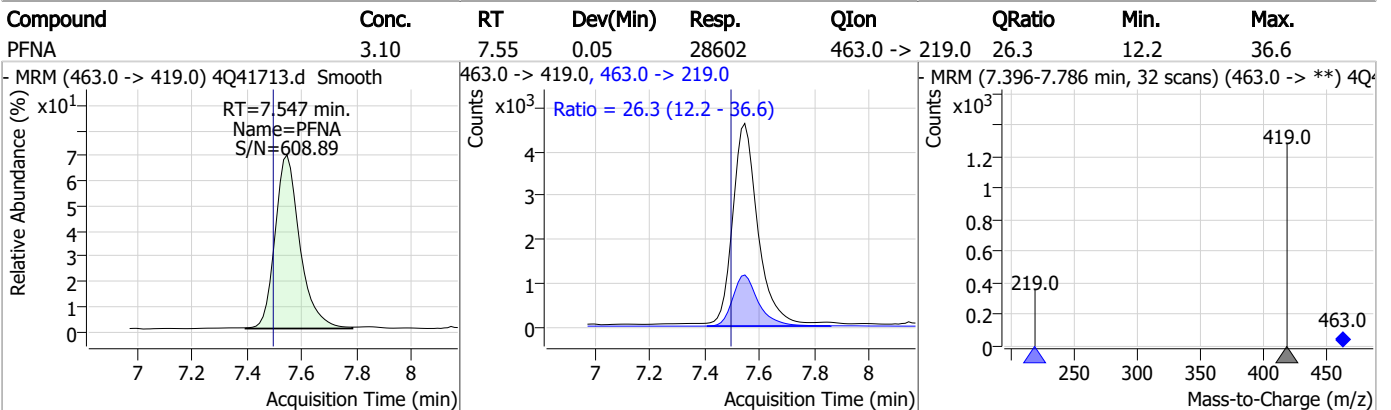
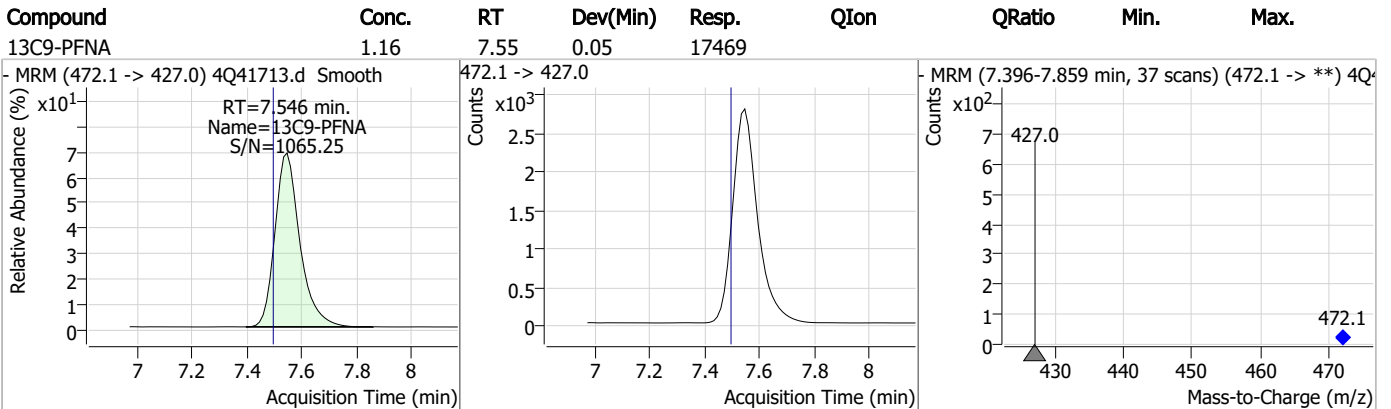
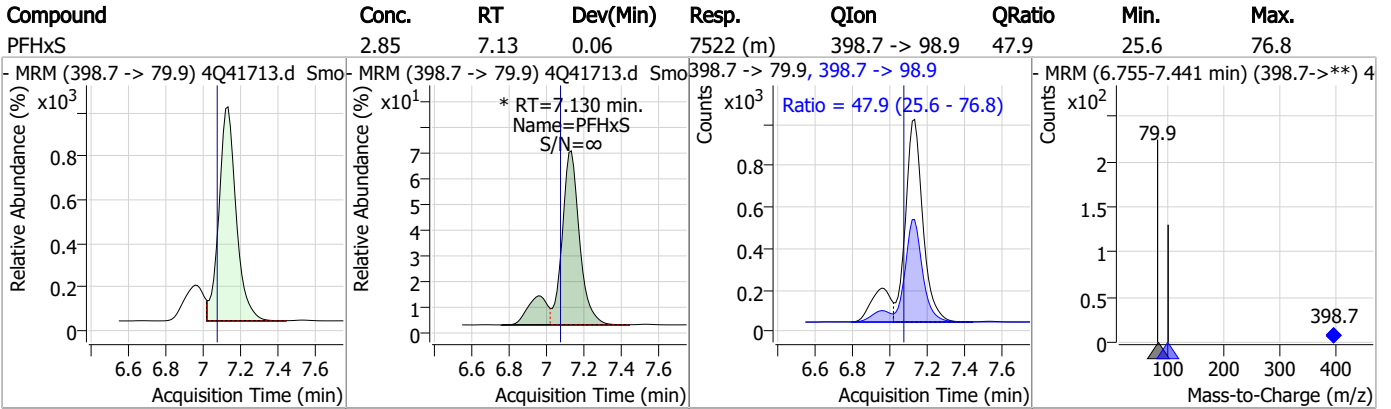


7.4.1

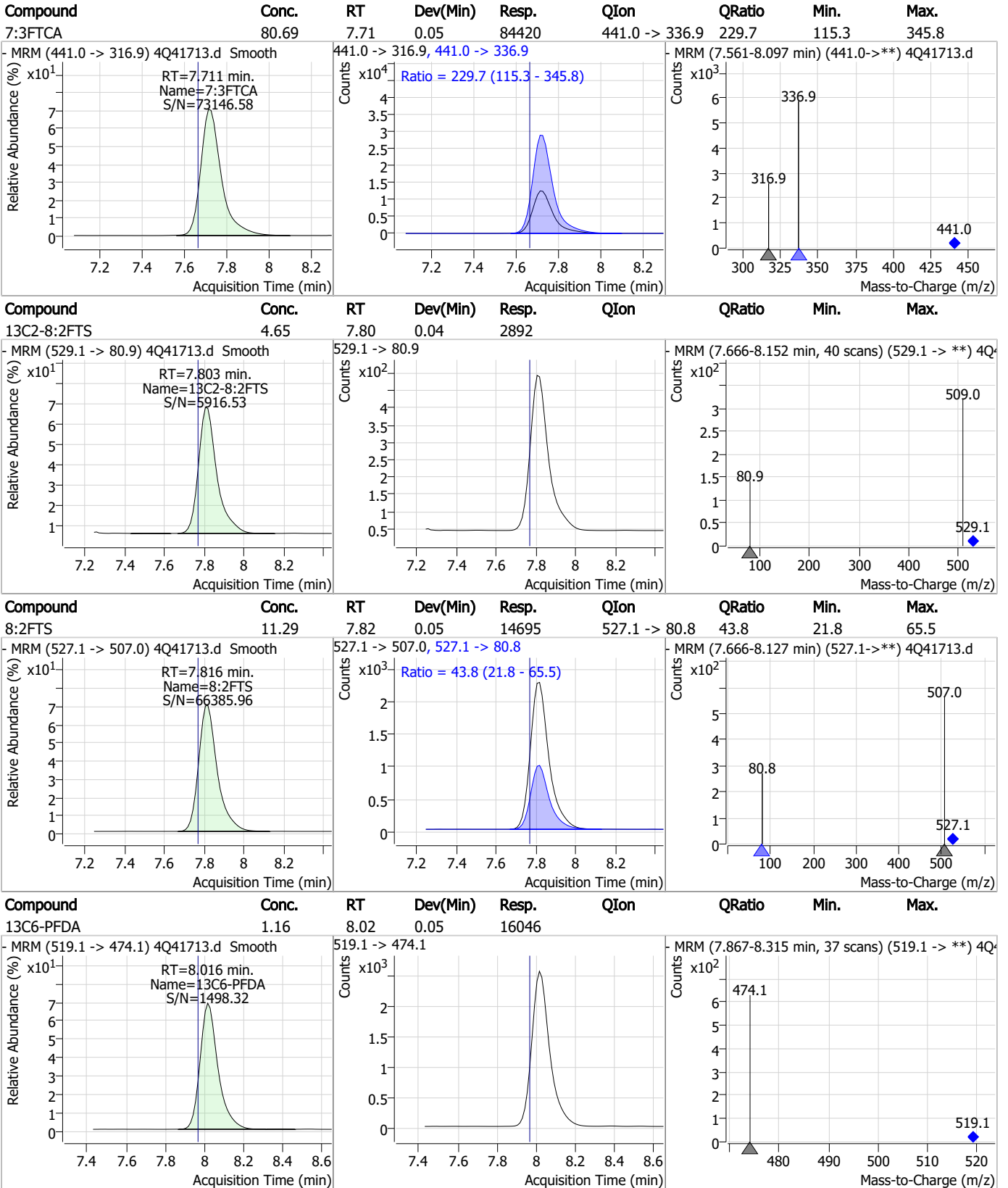
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Perfluorinated Compounds by LC/MS/MS



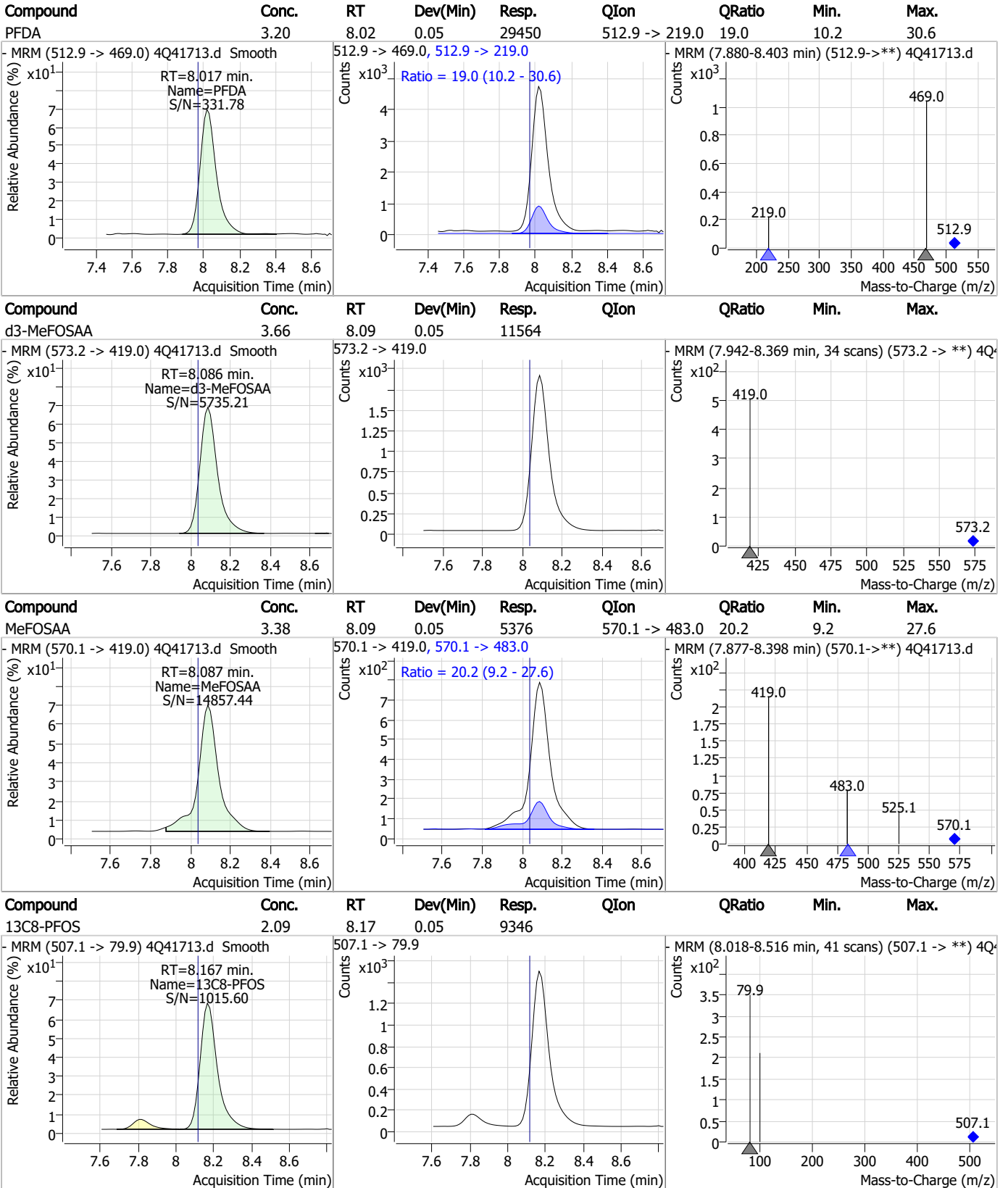
Perfluorinated Compounds by LC/MS/MS



7.4.1

7

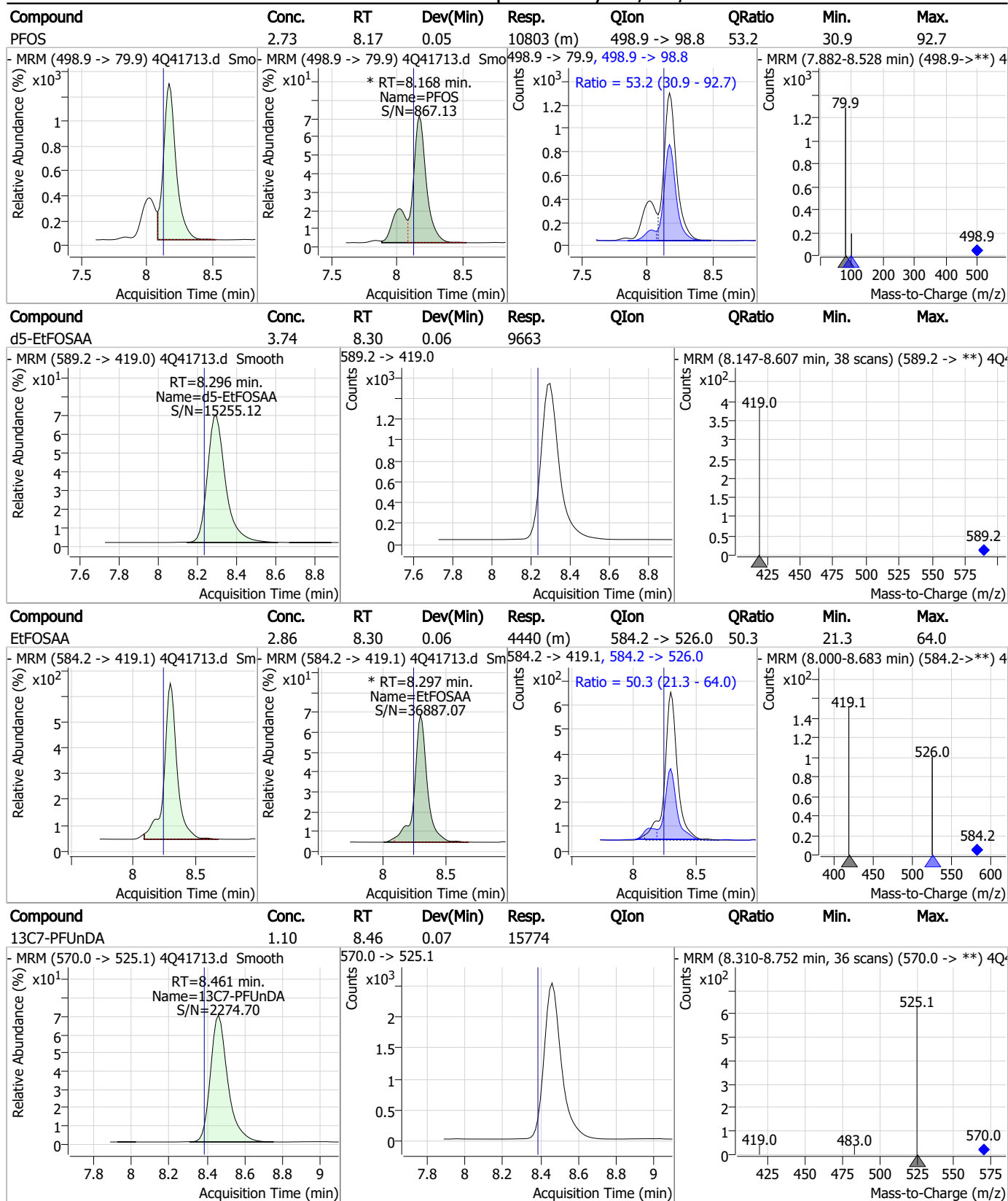
Perfluorinated Compounds by LC/MS/MS



7.4.1

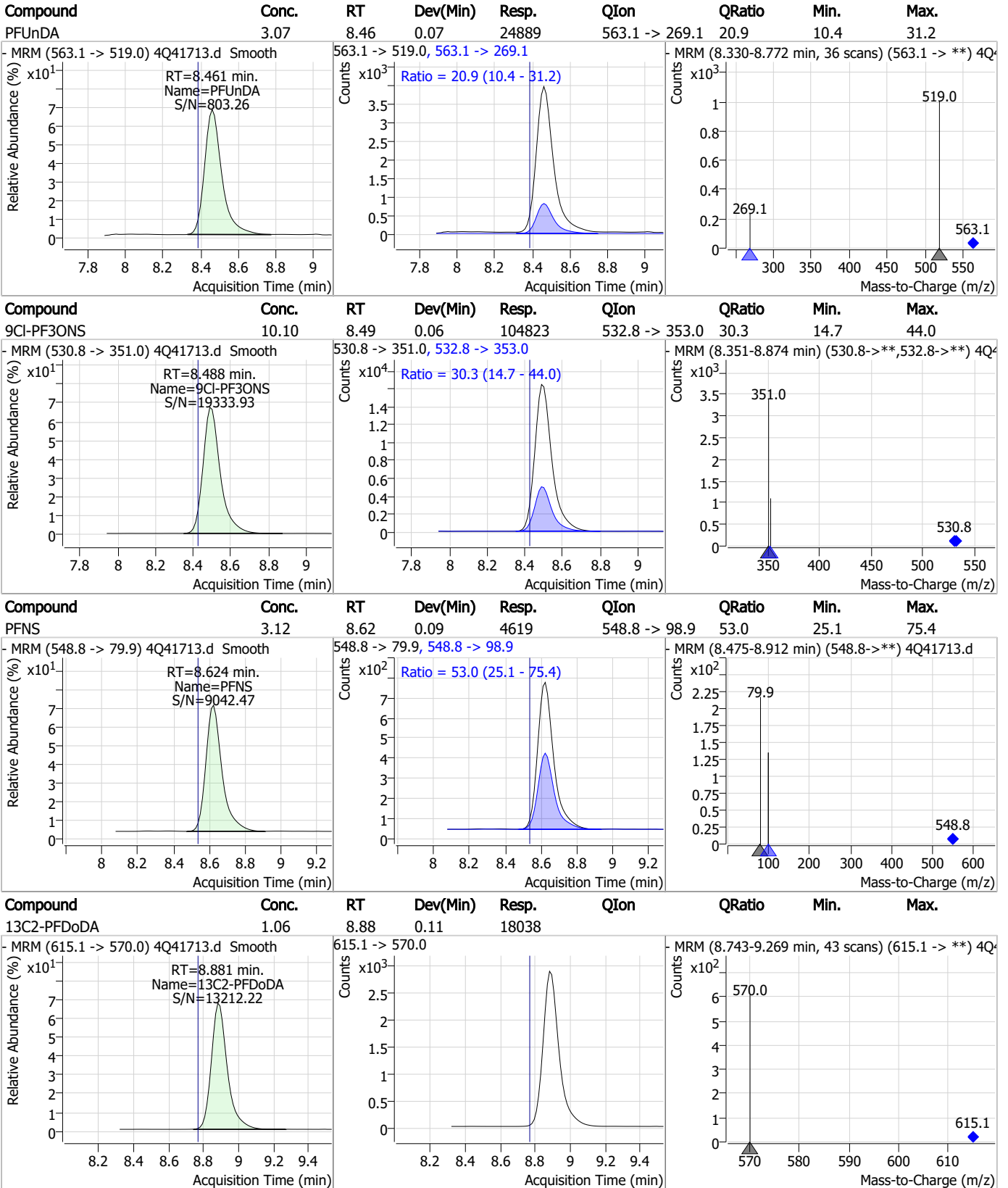
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Perfluorinated Compounds by LC/MS/MS



7.4.1
7

Perfluorinated Compounds by LC/MS/MS

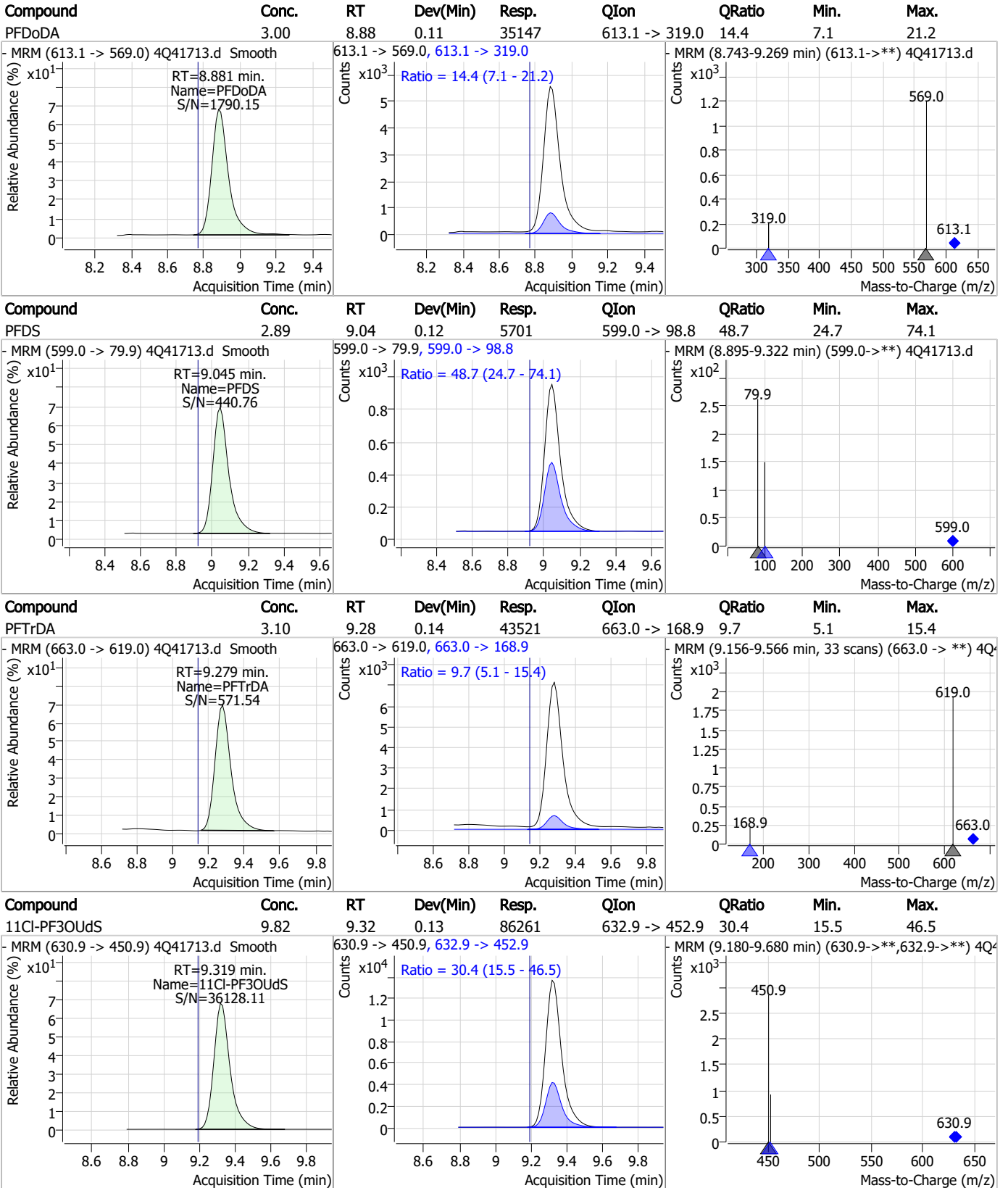


7.4.1

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Perfluorinated Compounds by LC/MS/MS

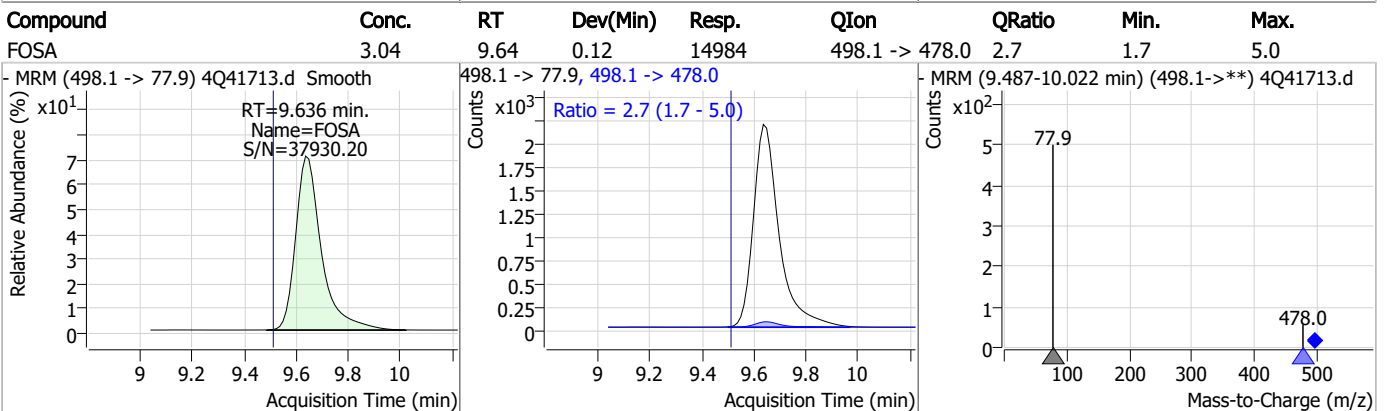
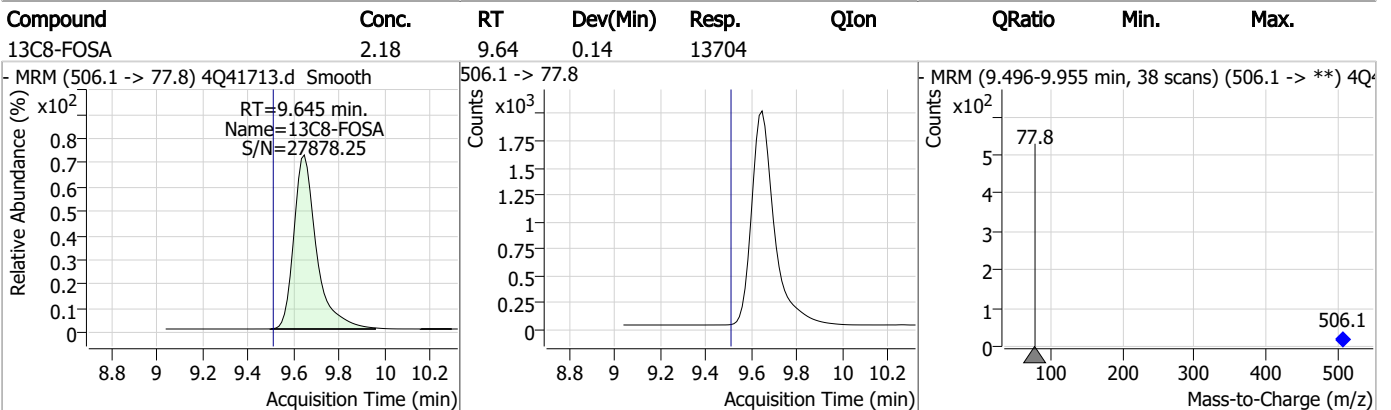
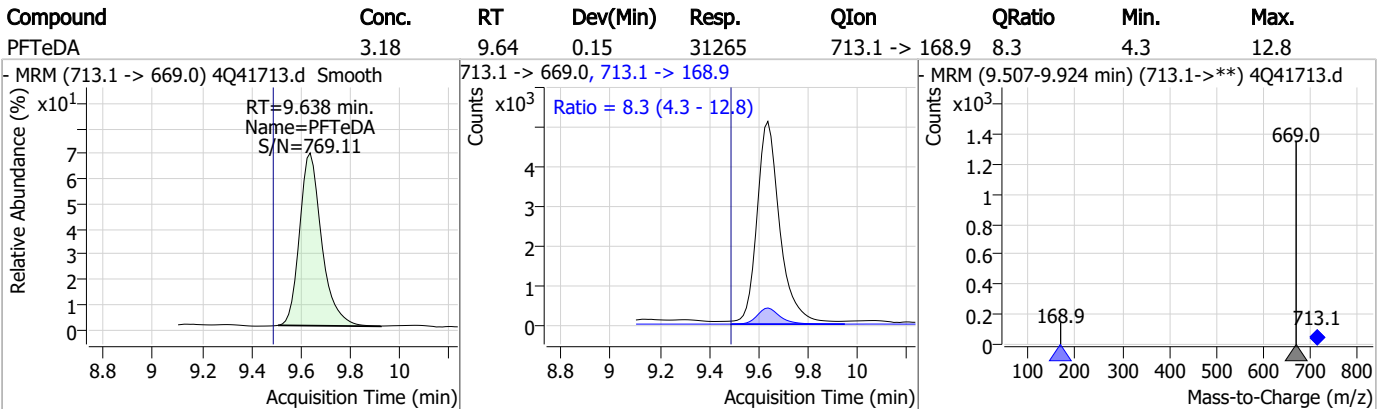
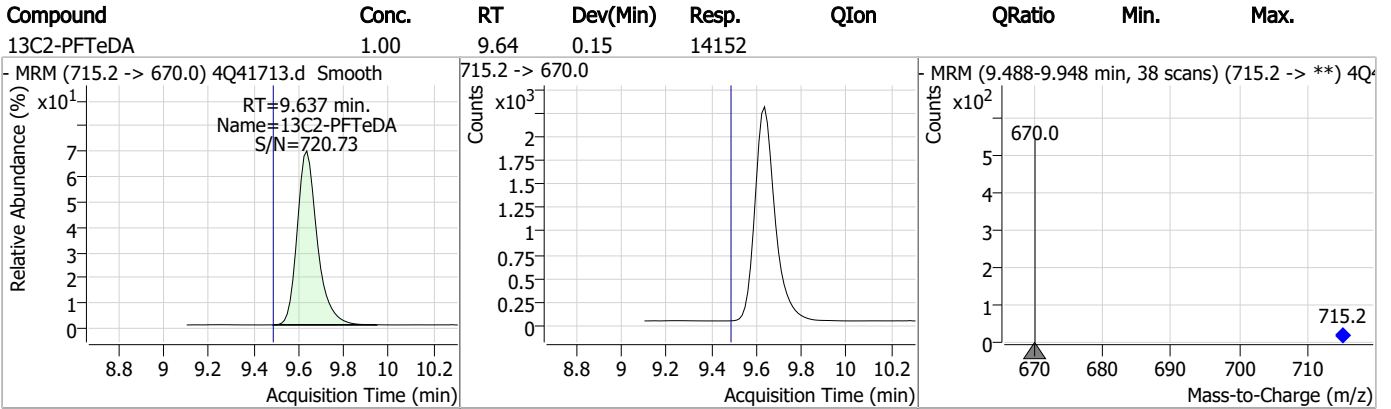


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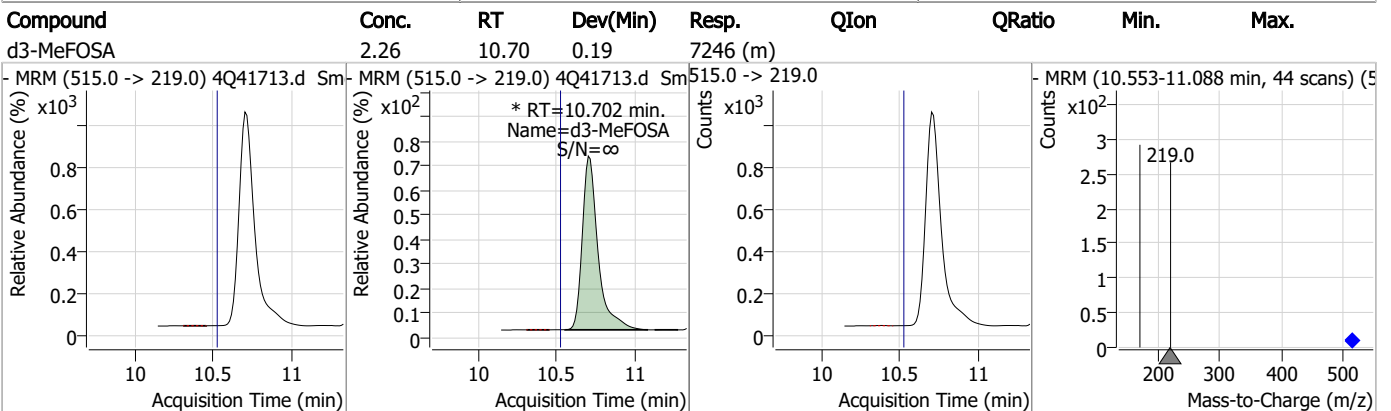
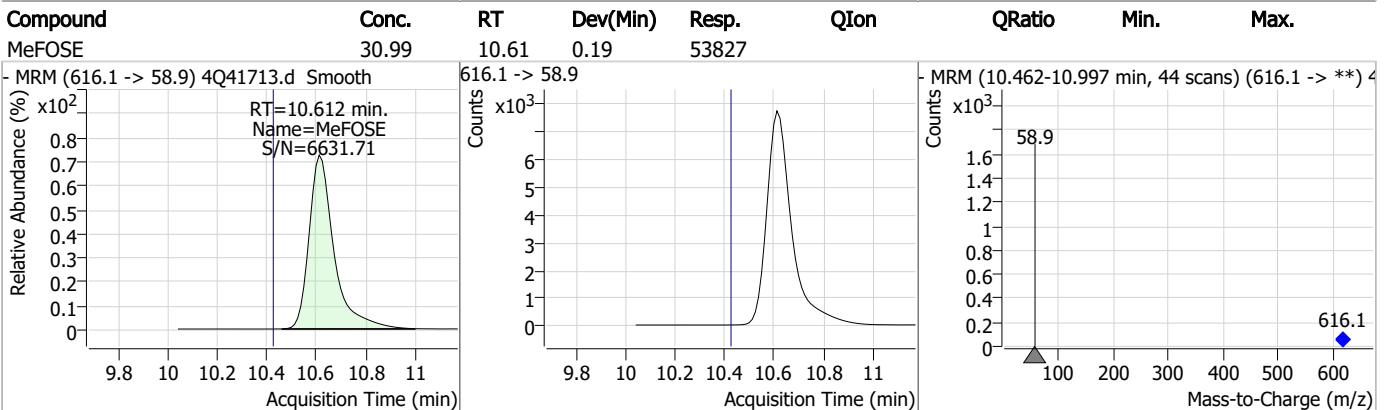
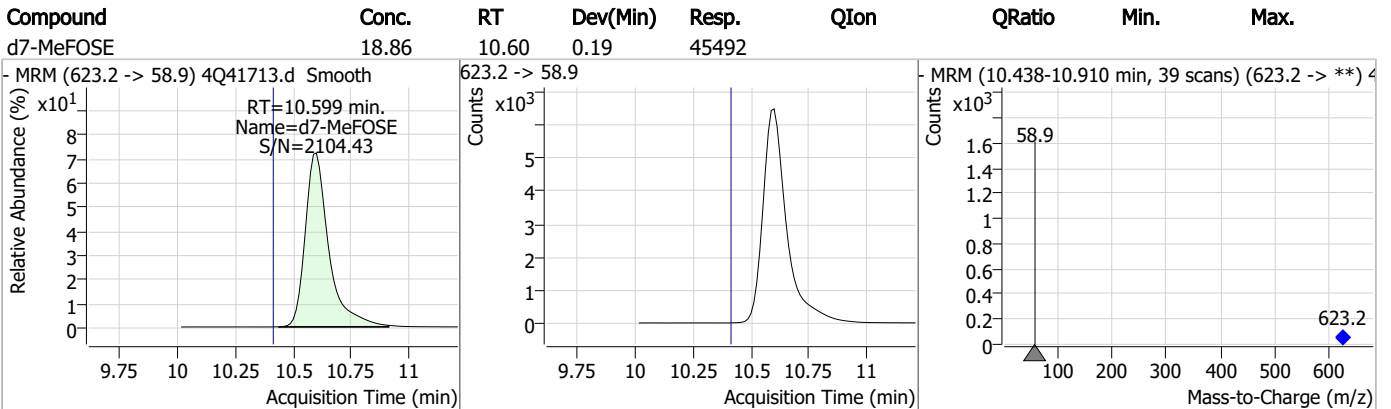
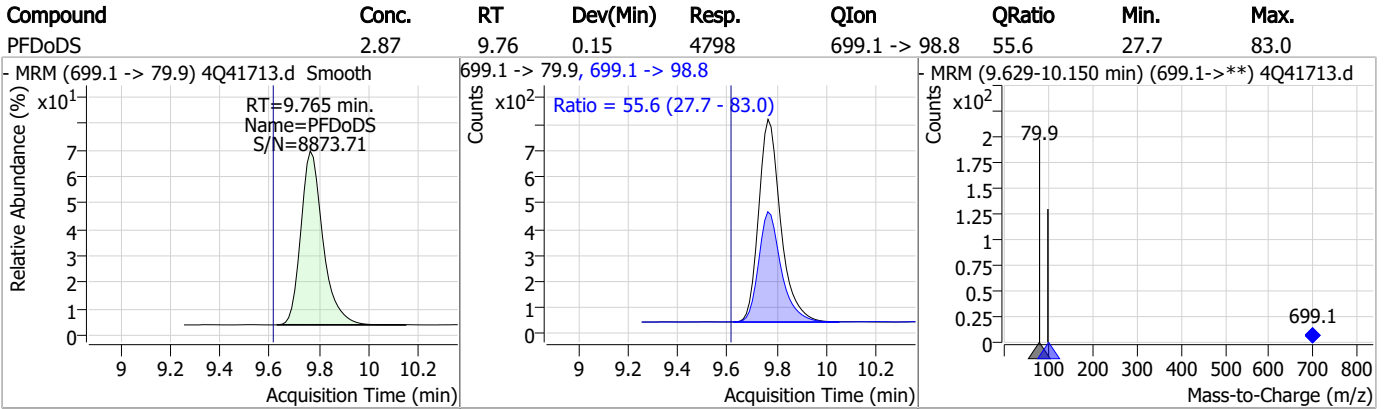
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Perfluorinated Compounds by LC/MS/MS

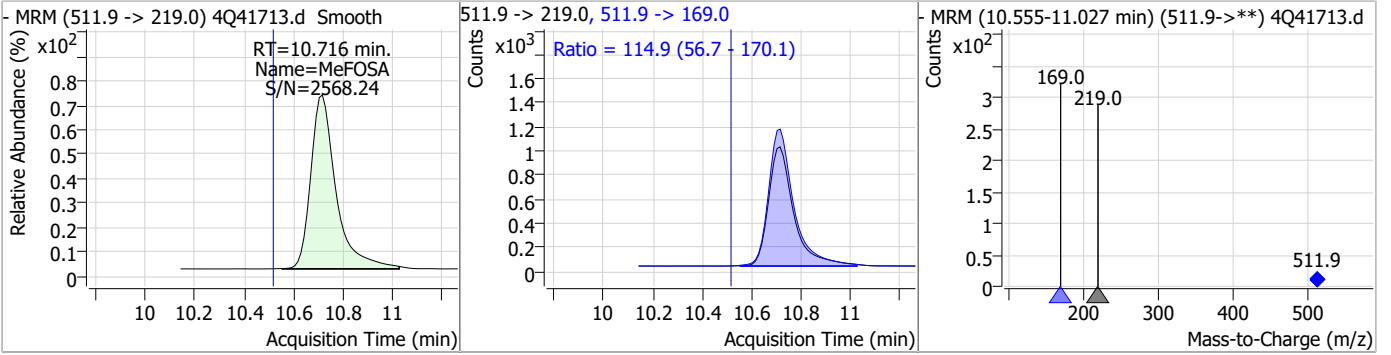


Perfluorinated Compounds by LC/MS/MS

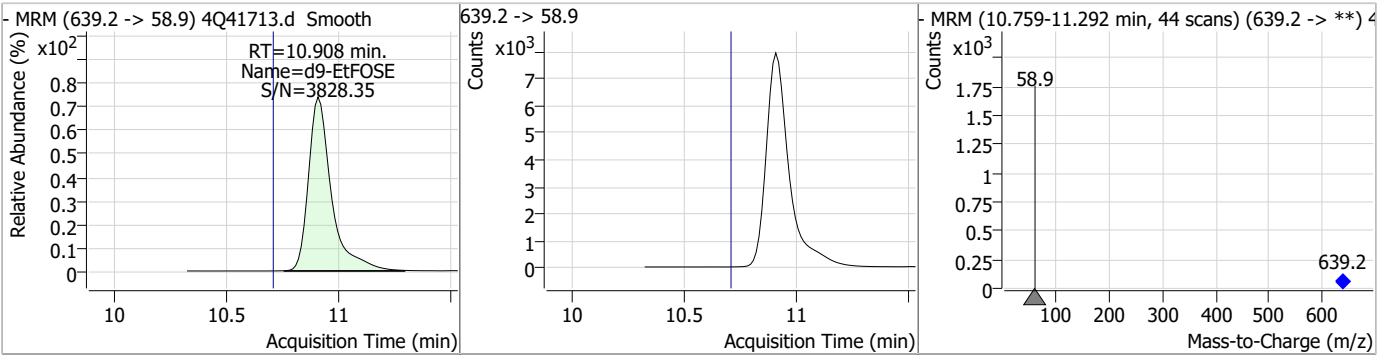


Perfluorinated Compounds by LC/MS/MS

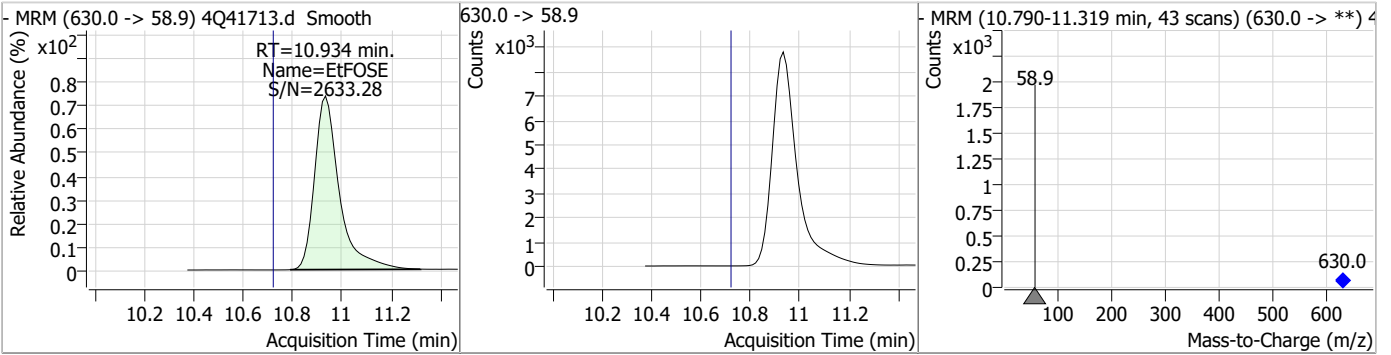
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	2.70	10.72	0.20	7050	511.9 -> 169.0	114.9	56.7	170.1



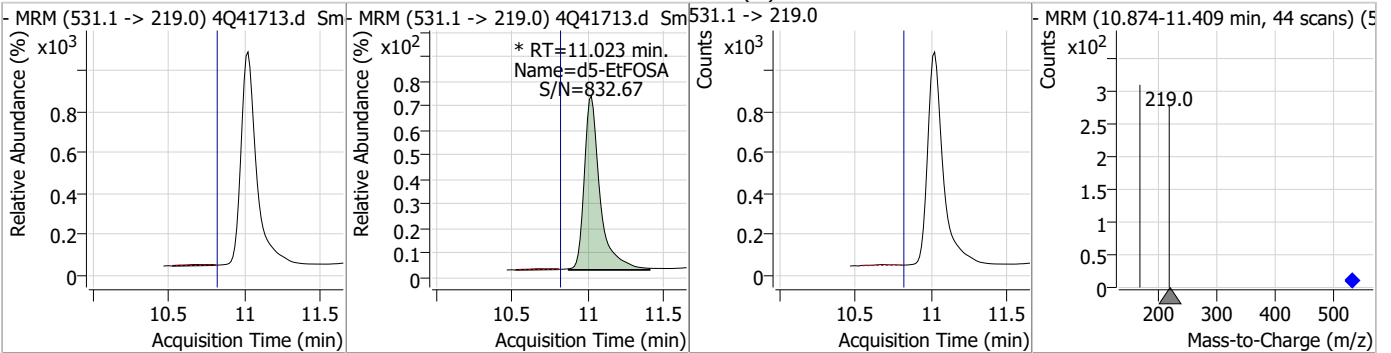
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	20.85	10.91	0.20	56198				



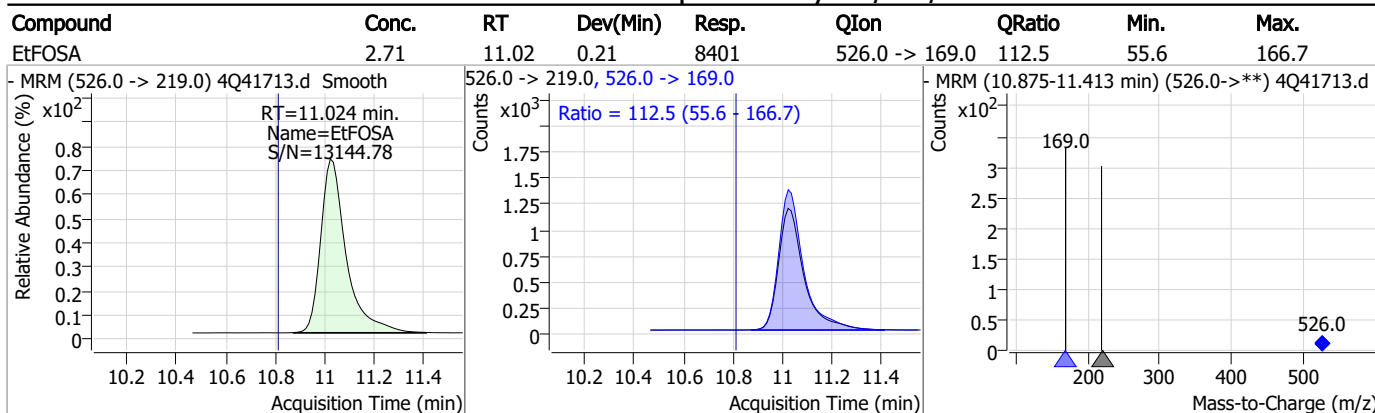
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	30.67	10.93	0.21	61039				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.25	11.02	0.21	7601 (m)				



Perfluorinated Compounds by LC/MS/MS



7.4.1

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Manual Integration Approval Summary

Sample Number: OP95719-MS Method: EPA DRAFT 1633
Lab FileID: 4Q41713.D Analyst approved: 03/09/23 09:18 Anna Ludwig
Injection Time: 03/06/23 19:09 Supervisor approved: 03/09/23 09:25 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.13	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.17	Split peak
EtFOSAA	2991-50-6		8.30	Split peak
d3-MeFOSA			10.70	Poor instrument integration
d5-EtFOSA			11.02	Poor instrument integration

7.4.1.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41715.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 7:37:51 PM
 Sample Name : op95719-dup
 Vial : P6-A7
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,560,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.164	216.8 -> 171.9	64389	10.00 µg/L	-0.075
M5-PFPeA	4.487	268.3 -> 223.0	69850	5.00 µg/L	-0.087
M5-PFHxA	5.509	318.0 -> 273.0	57901	2.50 µg/L	-0.012
M4-PFHpA	6.380	367.1 -> 322.0	30674	2.50 µg/L	0.037
M8-PFOA	7.025	421.1 -> 376.0	34447	2.50 µg/L	0.076
M9-PFNA	7.546	472.1 -> 427.0	17383	1.25 µg/L	0.050
M6-PFDA	8.016	519.1 -> 474.1	17261	1.25 µg/L	0.049
M7-PFUnDA	8.461	570.0 -> 525.1	17210	1.25 µg/L	0.075
M2-PFDoDA	8.881	615.1 -> 570.0	17449	1.25 µg/L	0.113
M2-PFTeDA	9.649	715.2 -> 670.0	14578	1.25 µg/L	0.162
M8-FOSA	9.645	506.1 -> 77.8	14459	2.50 µg/L	0.136
M3-PFBS	5.451	302.1 -> 79.9	12354	2.50 µg/L	-0.038
M3-PFHxS	7.129	402.1 -> 79.9	7280	2.50 µg/L	0.064
M8-PFOS	8.167	507.1 -> 79.9	10051	2.50 µg/L	0.049
M2-4:2FTS	5.223	329.1 -> 80.9	1339	5.00 µg/L	-0.037
M2-6:2FTS	6.798	429.1 -> 80.9	1773	5.00 µg/L	0.074
M2-8:2FTS	7.816	529.1 -> 80.9	3095	5.00 µg/L	0.050
M3-MeFOSAA	8.086	573.2 -> 419.0	12460	5.00 µg/L	0.049
M3-HFPO-DA	5.839	286.9 -> 168.9	31641	10.00 µg/L	0.012
M5-EtFOSAA	8.296	589.2 -> 419.0	10333	5.00 µg/L	0.062
M7-MeFOSE	10.599	623.2 -> 58.9	47943	25.00 µg/L	0.186
M9-EtFOSE	10.908	639.2 -> 58.9	59144	25.00 µg/L	0.199
M5-EtFOSA	11.011	531.1 -> 219.0	7965	2.50 µg/L	0.199
M3-MeFOSA	10.715	515.0 -> 219.0	7194	2.50 µg/L	0.199
13C4-PFOS	8.167	502.8 -> 79.9	11581	2.50 µg/L	0.049
13C3-PFBA	3.168	216.0 -> 172.0	78522	5.00 µg/L	-0.075
18O2-PFHxS	7.128	403.0 -> 83.9	5716	2.50 µg/L	0.064
13C4-PFOA	7.025	417.1 -> 372.0	43550	2.50 µg/L	0.076
13C2-PFDA	8.017	515.1 -> 470.1	15697	1.25 µg/L	0.049
13C5-PFNA	7.547	468.0 -> 423.0	22050	1.25 µg/L	0.050
13C2-PFHxA	5.510	315.1 -> 270.0	54271	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1339	4.32 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 86.4%		
13C2-6:2FTS	6.798	429.1 -> 80.9	1773	4.04 µg/L	0.074
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 80.7%		
13C2-8:2FTS	7.816	529.1 -> 80.9	3095	4.53 µg/L	0.050
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 90.6%		
13C2-PFDoDA	8.881	615.1 -> 570.0	17449	1.05 µg/L	0.113
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 84.1%		
13C2-PFTeDA	9.649	715.2 -> 670.0	14578	1.06 µg/L	0.162
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 85.1%		
13C3-PFBS	5.451	302.1 -> 79.9	12354	2.32 µg/L	-0.038
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 92.9%		
13C3-PFHxS	7.129	402.1 -> 79.9	7280	2.34 µg/L	0.064

7.5.1
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 93.7%	
13C4-PFBA	3.164	216.8 -> 171.9	64389	4.77 µg/L	-0.075
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 47.7%	
13C4-PFHpA	6.380	367.1 -> 322.0	30674	2.38 µg/L	0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 95.3%	
13C5-PFHxA	5.509	318.0 -> 273.0	57901	2.46 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.3%	
13C5-PFPeA	4.487	268.3 -> 223.0	69850	4.71 µg/L	-0.087
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 94.3%	
13C6-PFDA	8.016	519.1 -> 474.1	17261	1.28 µg/L	0.049
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.7%	
13C7-PFUnDA	8.461	570.0 -> 525.1	17210	1.24 µg/L	0.075
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.9%	
13C8-FOSA	9.645	506.1 -> 77.8	14459	2.94 µg/L	0.136
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.8%	
13C8-PFOA	7.025	421.1 -> 376.0	34447	2.39 µg/L	0.076
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 95.7%	
13C8-PFOS	8.167	507.1 -> 79.9	10051	2.20 µg/L	0.049
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.1%	
13C9-PFNA	7.546	472.1 -> 427.0	17383	1.13 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 90.2%	
d3-MeFOSAA	8.086	573.2 -> 419.0	12460	3.85 µg/L	0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 77.1%	
13C3-HFPO-DA	5.839	286.9 -> 168.9	31641	11.52 µg/L	0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 115.2%	
d3-MeFOSA	10.715	515.0 -> 219.0	7194	2.19 µg/L	0.199
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 87.8%	
d5-EtFOSAA	8.296	589.2 -> 419.0	10333	3.91 µg/L	0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 78.3%	
d7-MeFOSE	10.599	623.2 -> 58.9	47943	19.44 µg/L	0.186
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 77.8%	
d9-EtFOSE	10.908	639.2 -> 58.9	59144	21.46 µg/L	0.199
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 85.8%	
d5-EtFOSA	11.011	531.1 -> 219.0	7965	2.30 µg/L	0.199
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.1%	

Target Compounds

Compound	RT	Transition	Response	Conc. Units	QValue
4:2FTS	-	327.1 -> 307.0	-	N.D.	
		327.1 -> 80.9			
6:2FTS	-	427.1 -> 407.0	-	N.D.	
		427.1 -> 80.9			
8:2FTS	-	527.1 -> 507.0	-	N.D.	
		527.1 -> 80.8			
EtFOSAA	-	584.2 -> 419.1	-	N.D.	
		584.2 -> 526.0			
FOSA	-	498.1 -> 77.9	-	N.D.	
		498.1 -> 478.0			
MeFOSAA	-	570.1 -> 419.0	-	N.D.	
		570.1 -> 483.0			
PFBA	-	212.8 -> 168.9	-	N.D.	
PFBS	-	298.7 -> 79.9	-	N.D.	
		298.7 -> 98.8			
PFDA	-	512.9 -> 469.0	-	N.D.	
		512.9 -> 219.0			
PFDODA	-	613.1 -> 569.0	-	N.D.	
		613.1 -> 319.0			
PFDS	-	599.0 -> 79.9	-	N.D.	

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	-	599.0 -> 98.8	-	N.D.		
		363.1 -> 319.0				
PFHpS	-	363.1 -> 169.0	-	N.D.		
		449.0 -> 79.9				
PFHxA	5.512	449.0 -> 98.9	3116	0.18	µg/L	99
		313.0 -> 269.0				
PFHxS	-	313.0 -> 118.9	102	N.D.		
		398.7 -> 79.9				
PFNA	-	398.7 -> 98.9	-	N.D.		
		463.0 -> 419.0				
PFNS	-	463.0 -> 219.0	-	N.D.		
		548.8 -> 79.9				
PFOA	7.351	548.8 -> 98.9	0		µg/L	1
		413.0 -> 369.0				
PFOS	-	413.0 -> 169.0	0	N.D.		
		498.9 -> 79.9				
PFPeA	4.489	498.9 -> 98.8	7854	0.59	µg/L	100
		263.0 -> 219.0				
PFPeS	-	349.1 -> 79.9	-	N.D.		
		349.1 -> 98.9				
PFTeDA	-	713.1 -> 669.0	-	N.D.		
		713.1 -> 168.9				
PFTrDA	-	663.0 -> 619.0	-	N.D.		
		663.0 -> 168.9				
PFUnDA	-	563.1 -> 519.0	-	N.D.		
		563.1 -> 269.1				
11Cl-PF3OUdS	-	630.9 -> 450.9	-	N.D.		
		632.9 -> 452.9				
9Cl-PF3ONS	-	530.8 -> 351.0	-	N.D.		
		532.8 -> 353.0				
ADONA	-	376.9 -> 250.9	-	N.D.		
		376.9 -> 84.8				
HFPO-DA	-	284.9 -> 168.9	-	N.D.		
		284.9 -> 184.9				
3:3FTCA	-	241.0 -> 177.0	-	N.D.		
		241.0 -> 117.0				
5:3FTCA	-	341.0 -> 237.1	-	N.D.		
		341.0 -> 217.0				
7:3FTCA	-	441.0 -> 316.9	-	N.D.		
		441.0 -> 336.9				
EtFOSA	-	526.0 -> 219.0	-	N.D.		
		526.0 -> 169.0				
EtFOSE	-	630.0 -> 58.9	-	N.D.		
		511.9 -> 219.0				
MeFOSA	-	511.9 -> 169.0	-	N.D.		
		616.1 -> 58.9				
MeFOSE	-	699.1 -> 79.9	-	N.D.		
		699.1 -> 98.8				
PFDoDS	-	295.0 -> 201.0	-	N.D.		
		295.0 -> 84.9				
NFDHA	-	279.0 -> 85.1	-	N.D.		
		229.0 -> 84.9				
PFMBA	-	314.8 -> 134.9	-	N.D.		
		314.8 -> 82.9				

= Qualifier out of range, m = manually integrated, + = Area summed

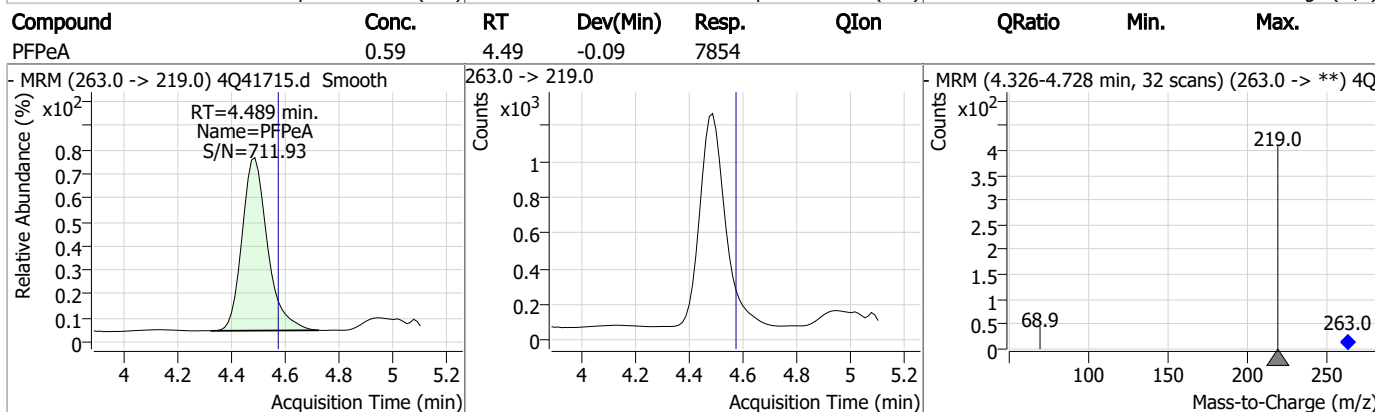
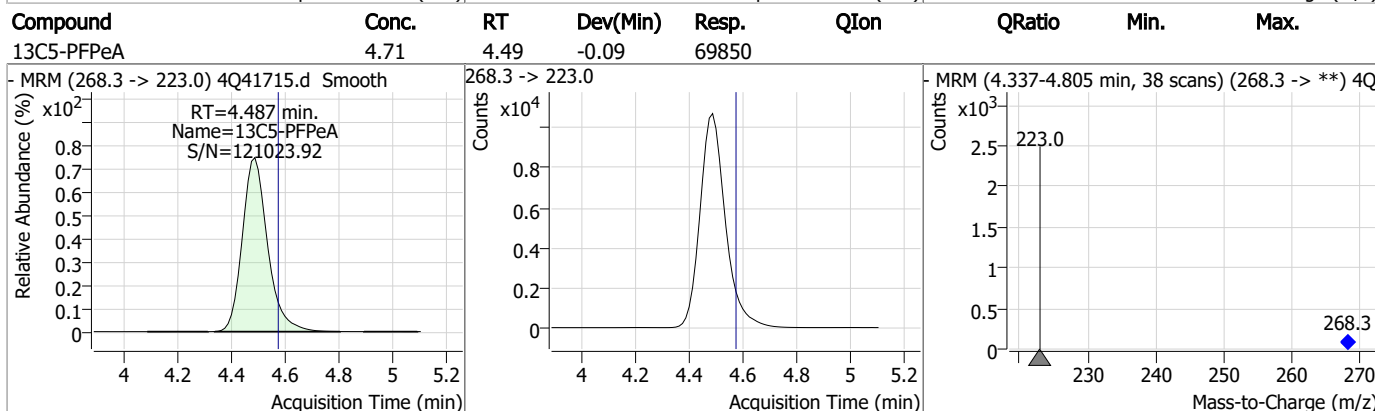
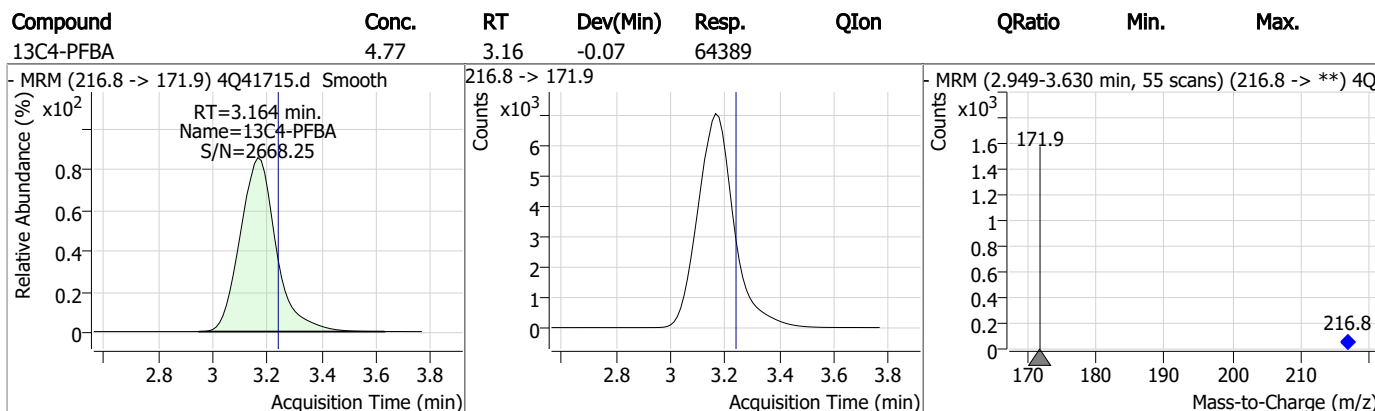
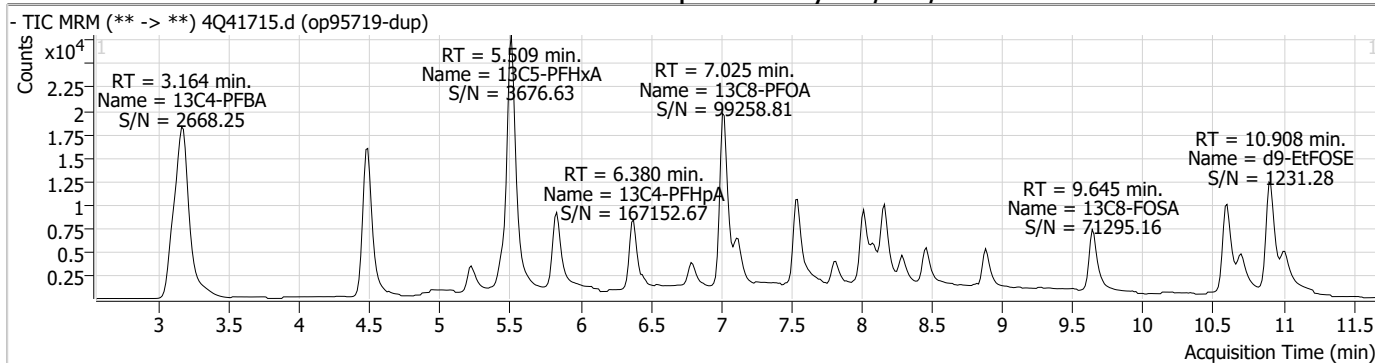
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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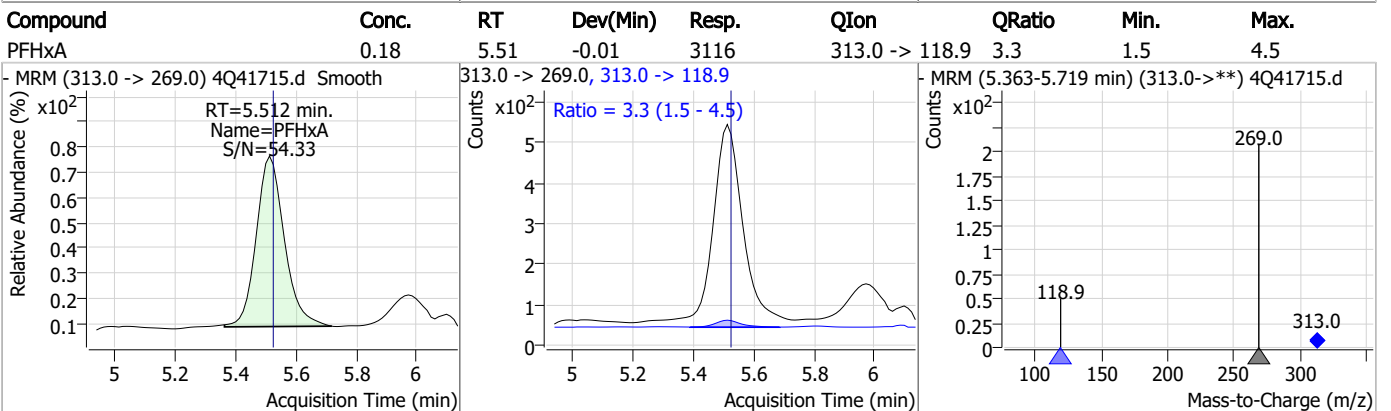
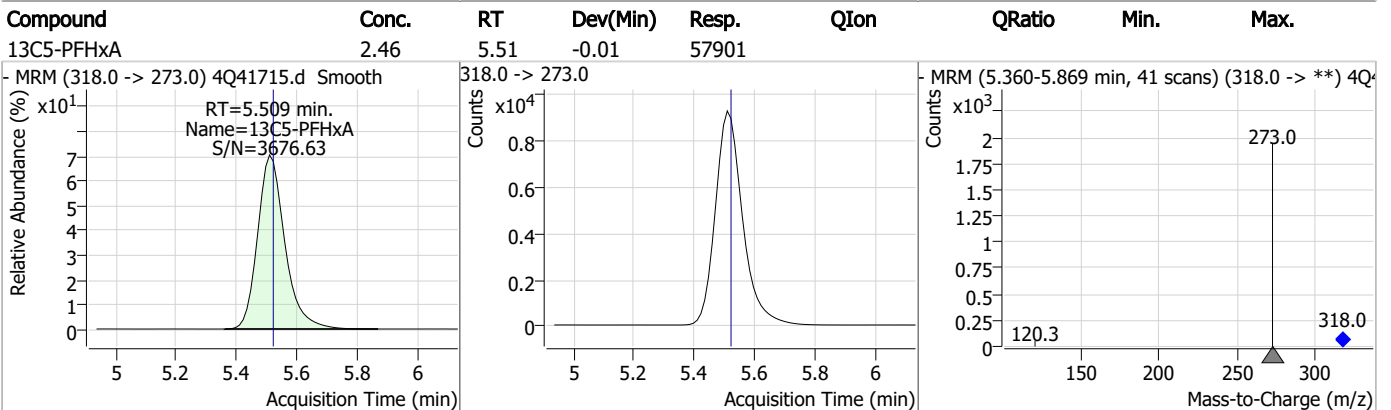
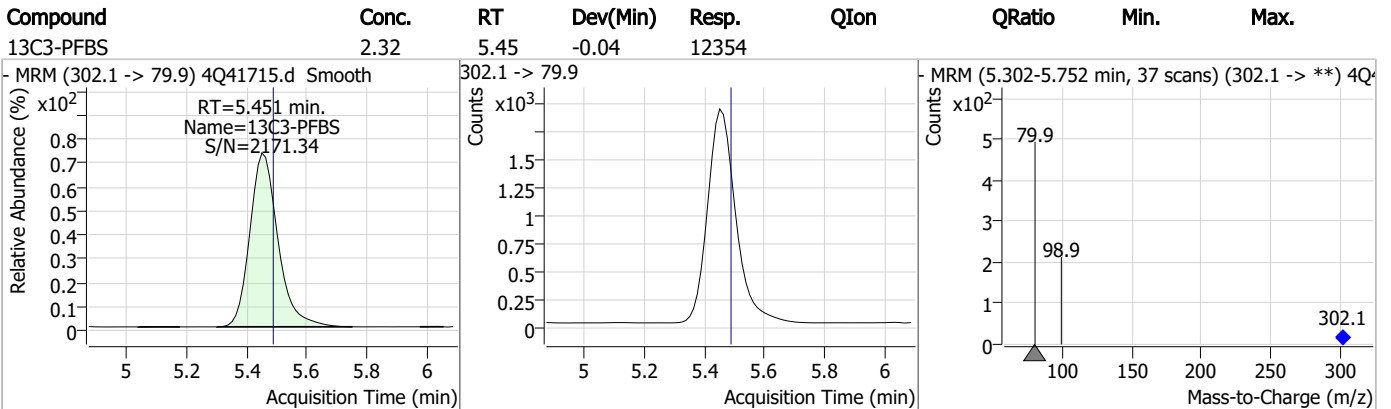
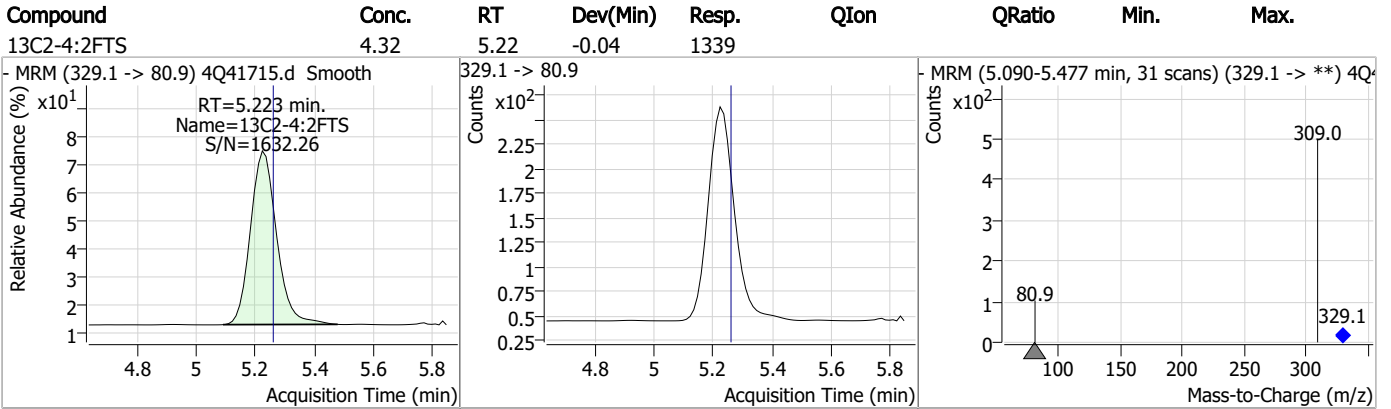
7.5.1

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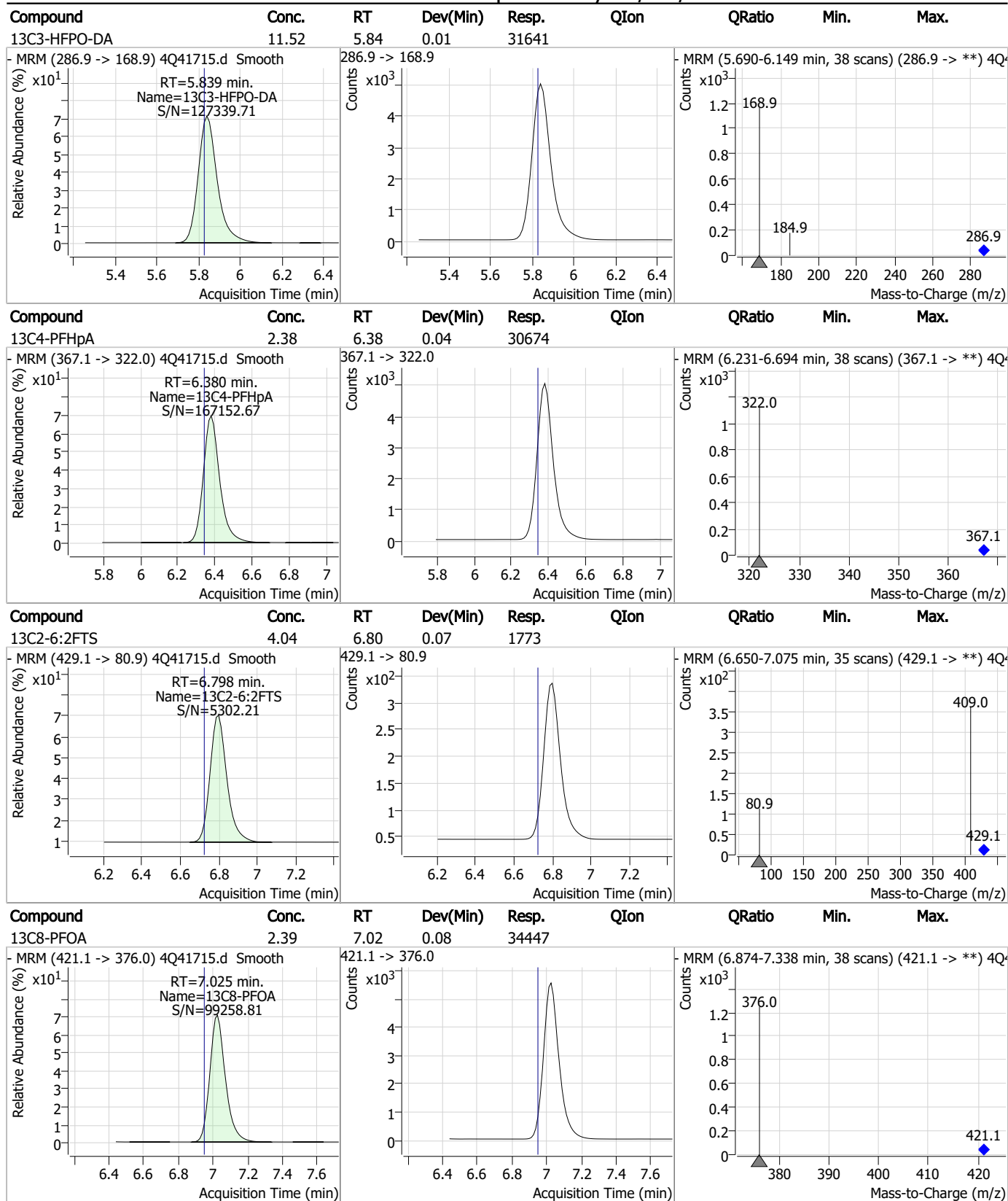
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

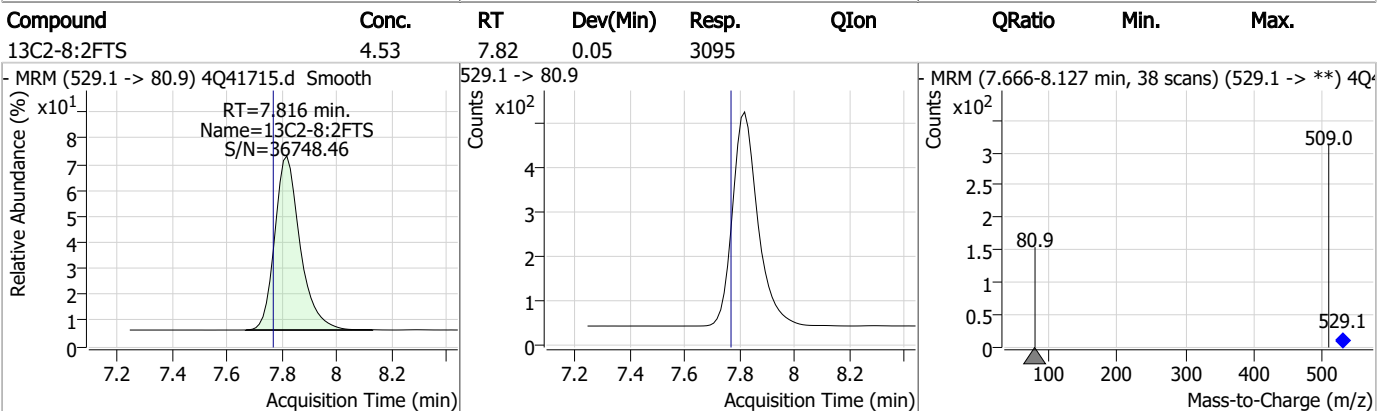
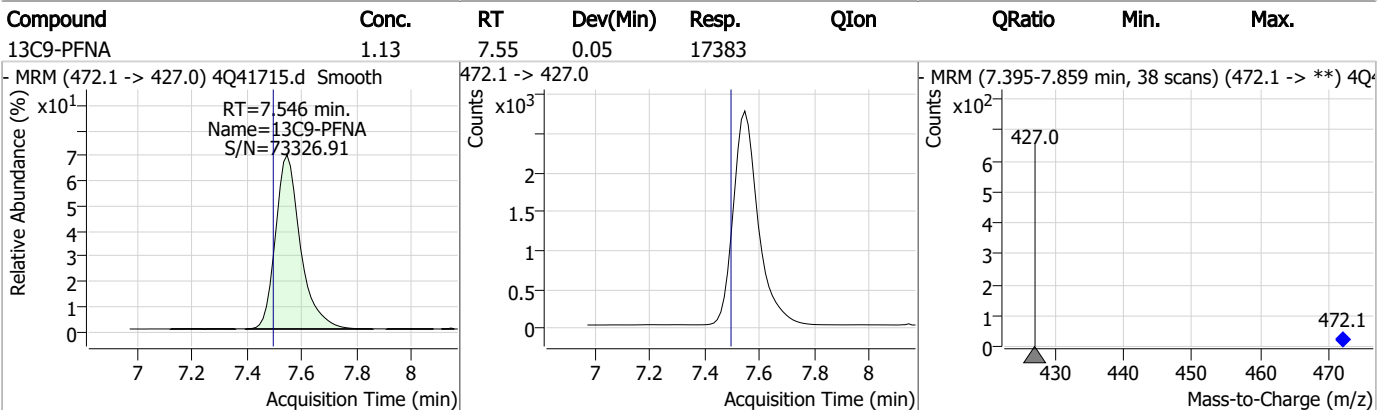
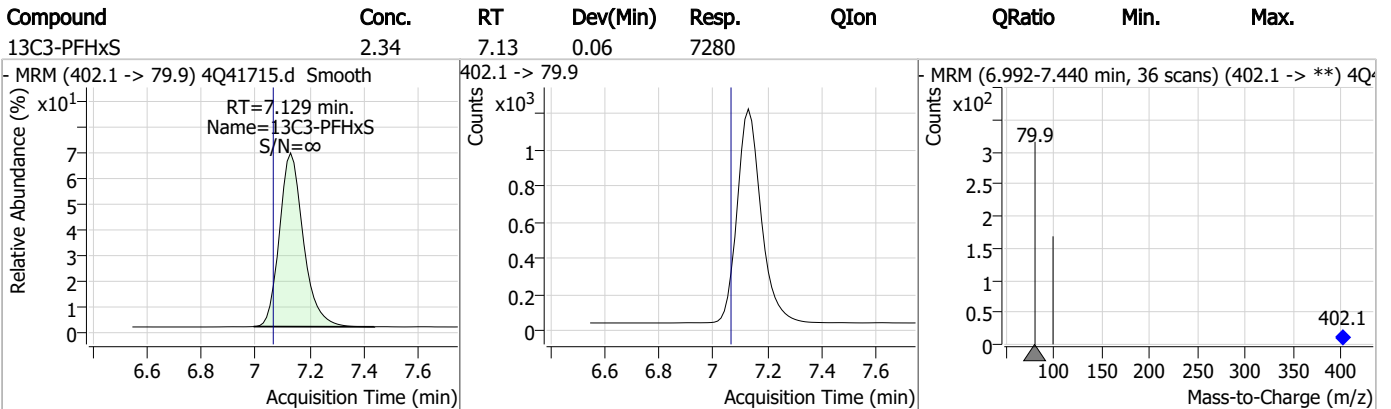
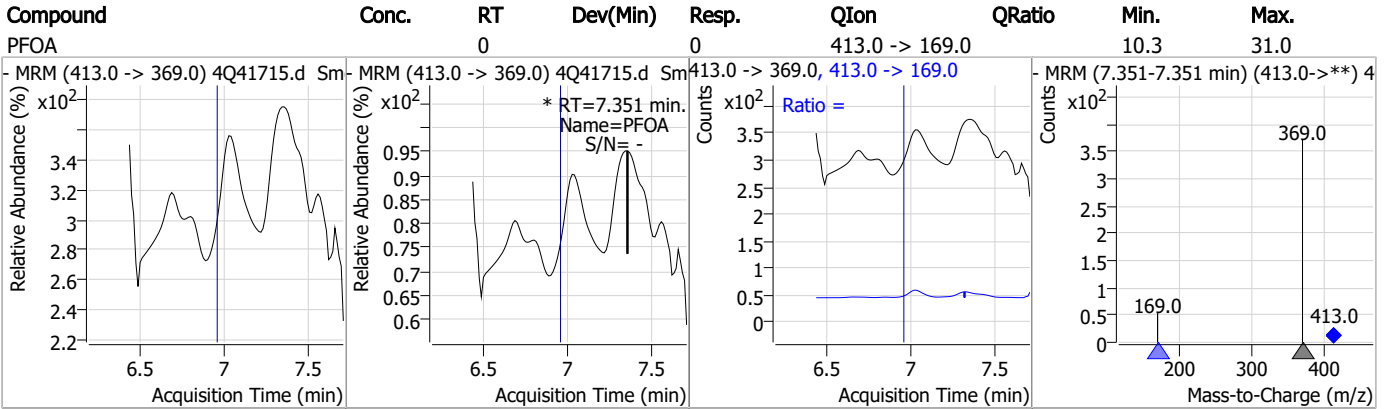


Perfluorinated Compounds by LC/MS/MS



7.5.1
7

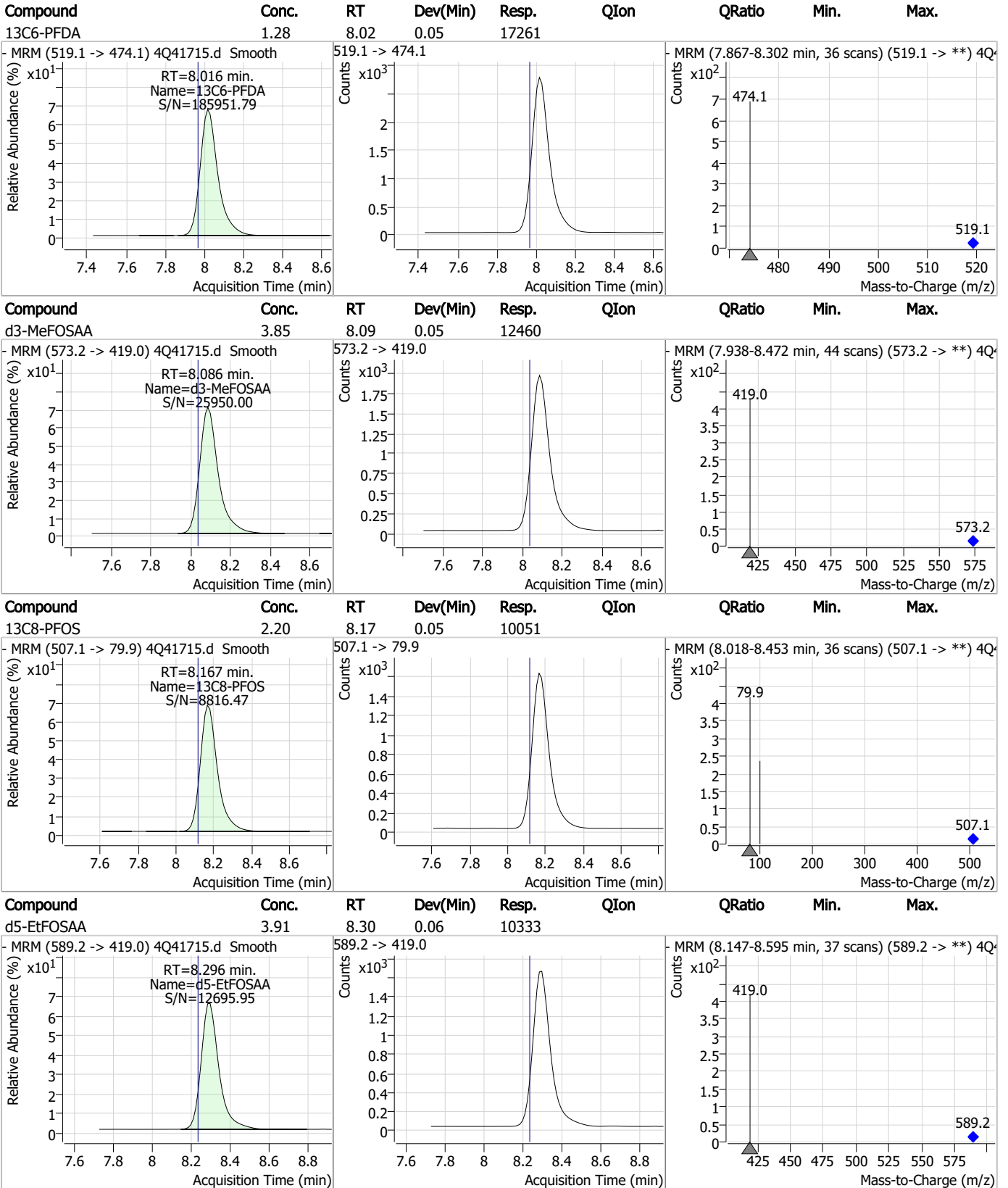
Perfluorinated Compounds by LC/MS/MS



7.5.1

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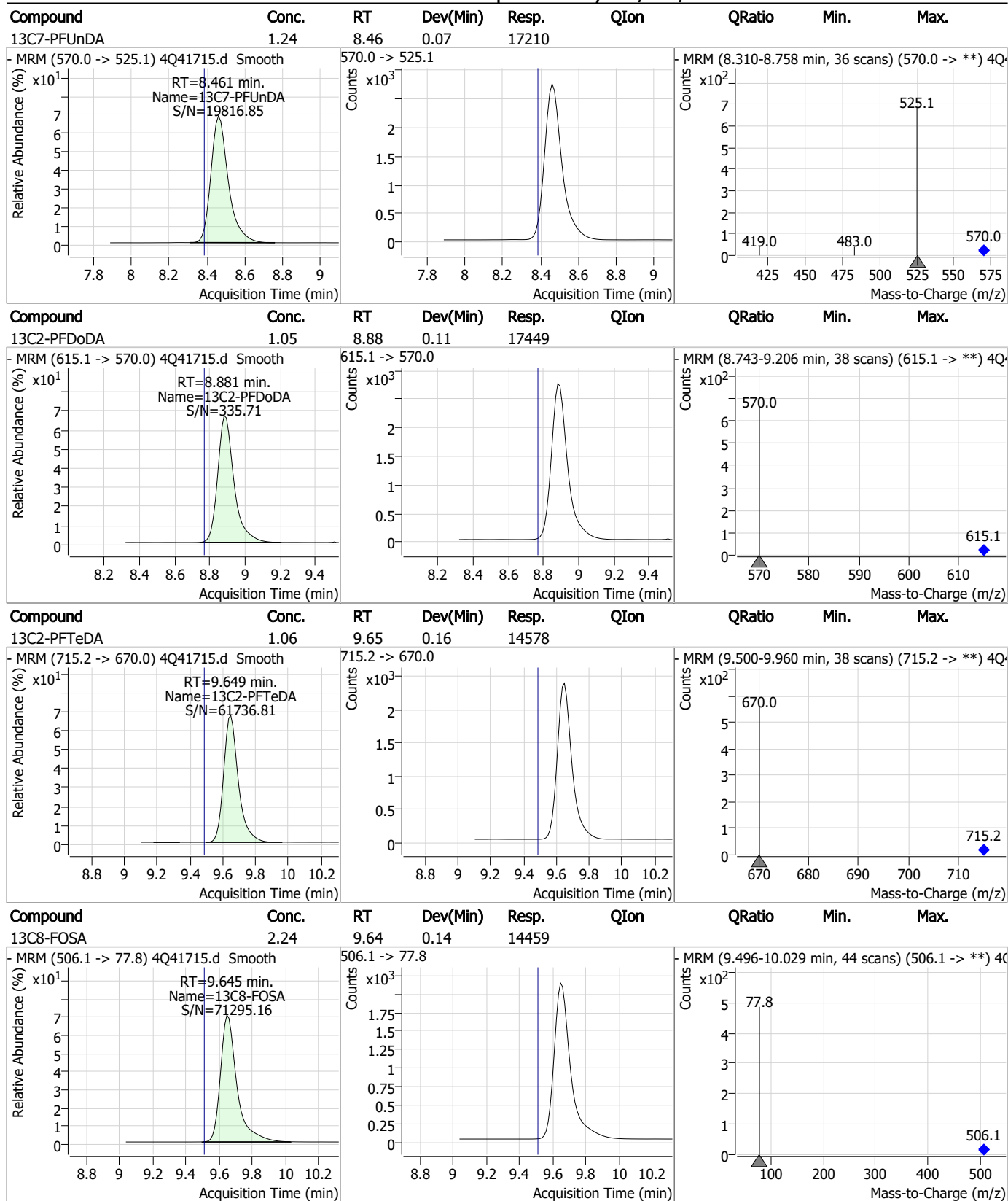
Perfluorinated Compounds by LC/MS/MS



7.5.1

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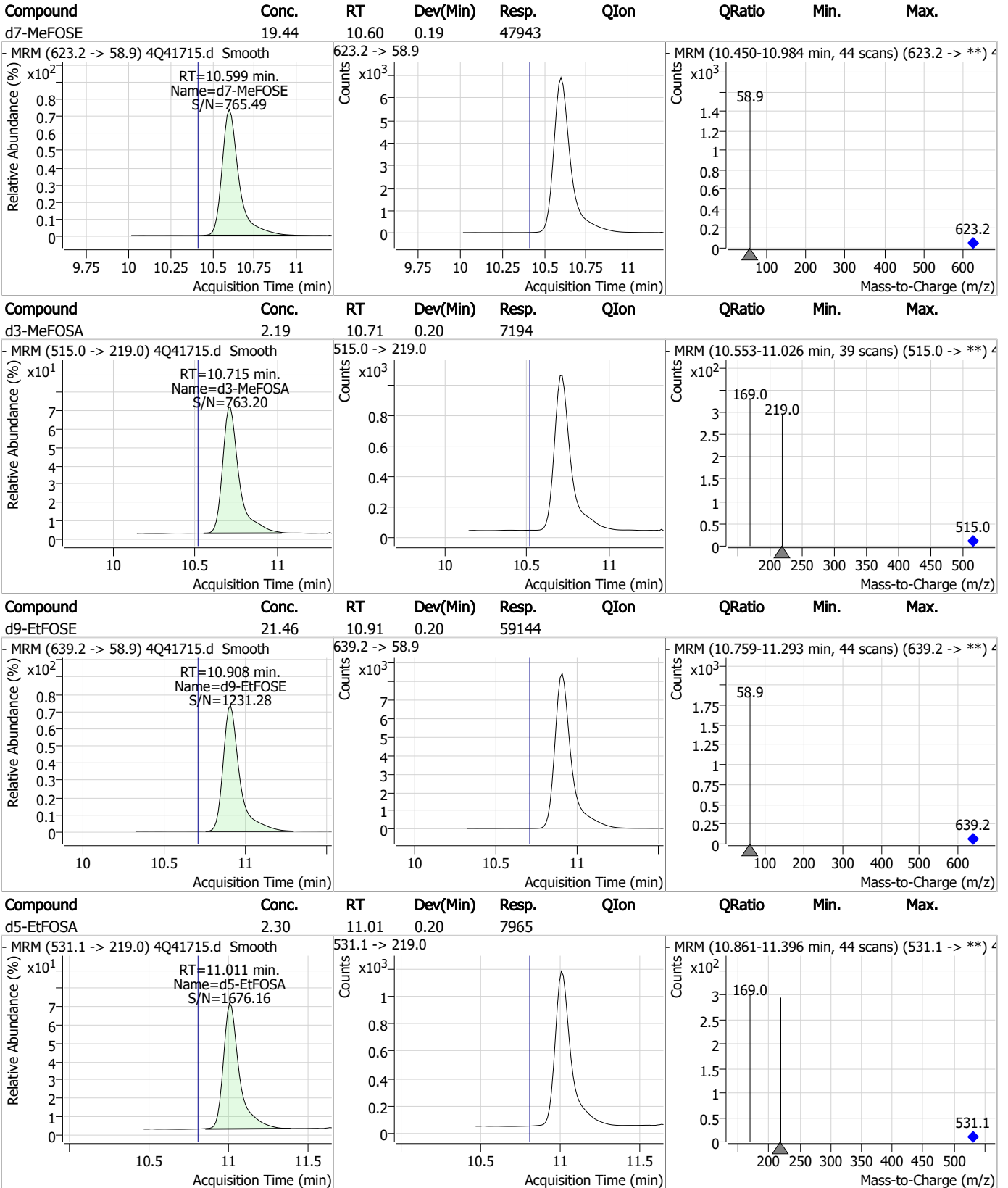
Perfluorinated Compounds by LC/MS/MS



7.5.1
7



Perfluorinated Compounds by LC/MS/MS



7.5.1

7



Manual Integrations
APPROVED
 (compounds with "m" flag)
 Norman Farmer
 03/07/23 15:28

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41645.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 5:04:20 PM
 Sample Name : RT TDCA
 Vial : P1-B3
 DA Method File : TDCA.quantmethod.xml
 Batch Name : s4q596_TDCA.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

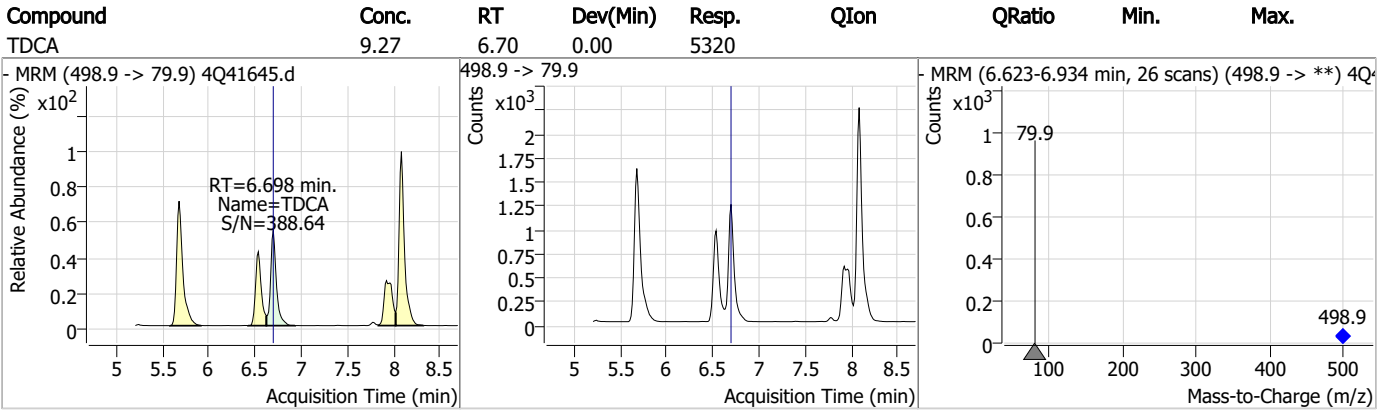
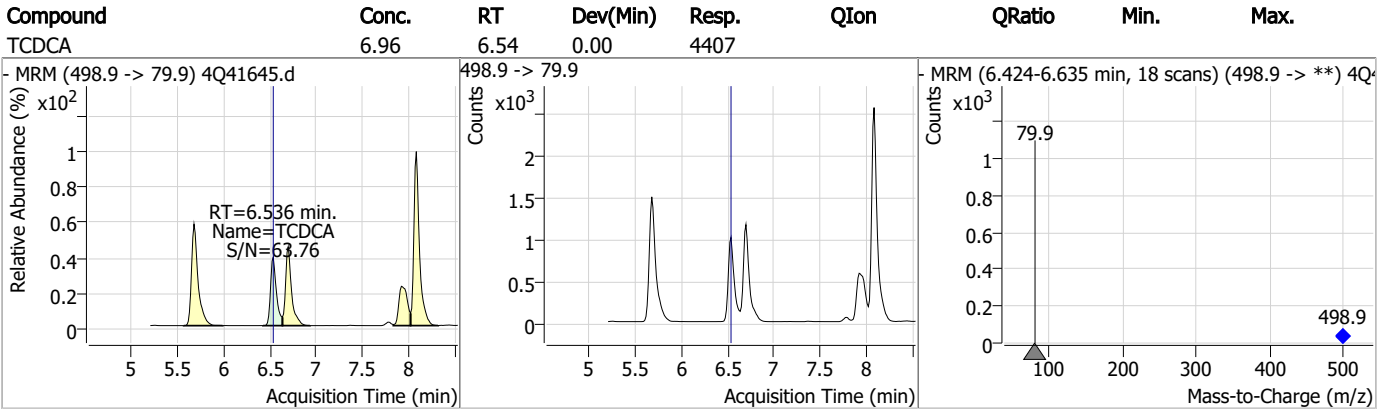
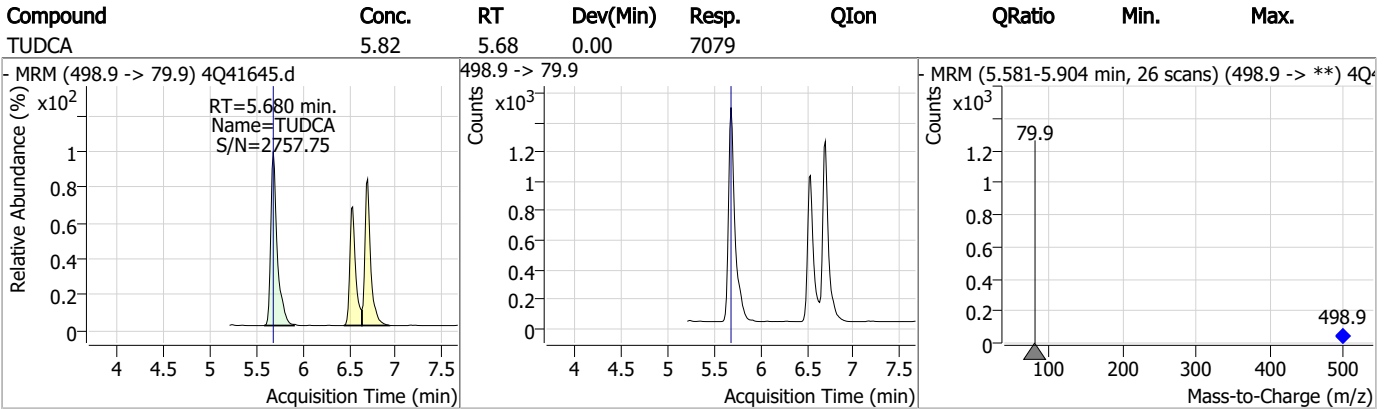
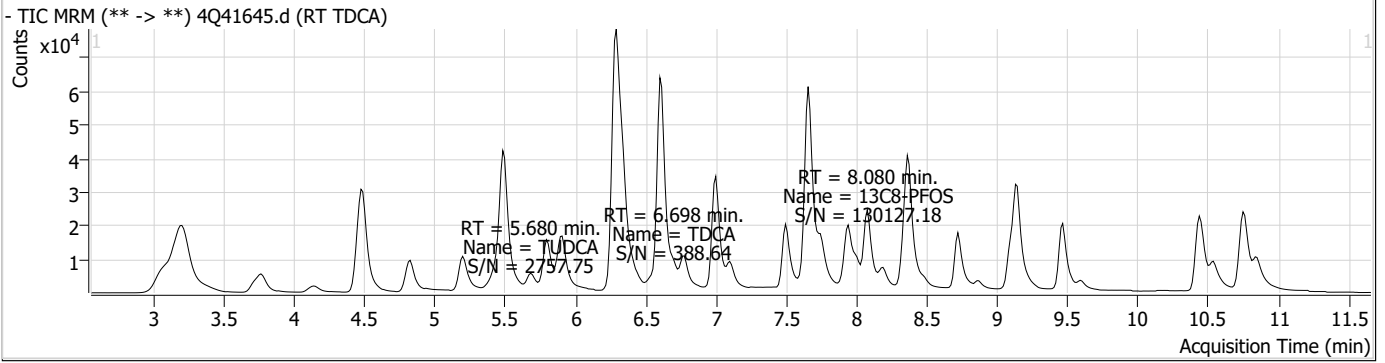
Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M8-PFOS	8.080	507.1 -> 79.9	13729	2.50 µg/L	0.000
13C4-PFOS	8.081	502.8 -> 79.9	14105	2.50 µg/L	0.000
System Monitoring Compounds					
13C8-PFOS	8.080	507.1 -> 79.9	13729	2.47 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.8%		
Target Compounds					
PFOS	8.082	498.9 -> 79.9 498.9 -> 98.8	13794 6982	2.94 µg/L m	85
TCDCa	6.536	498.9 -> 79.9	4407	6.96 ng/ml	100
TDCA	6.698	498.9 -> 79.9	5320	9.27 ng/ml	100
TUDCA	5.680	498.9 -> 79.9	7079	5.82 ng/ml	100

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.1
7



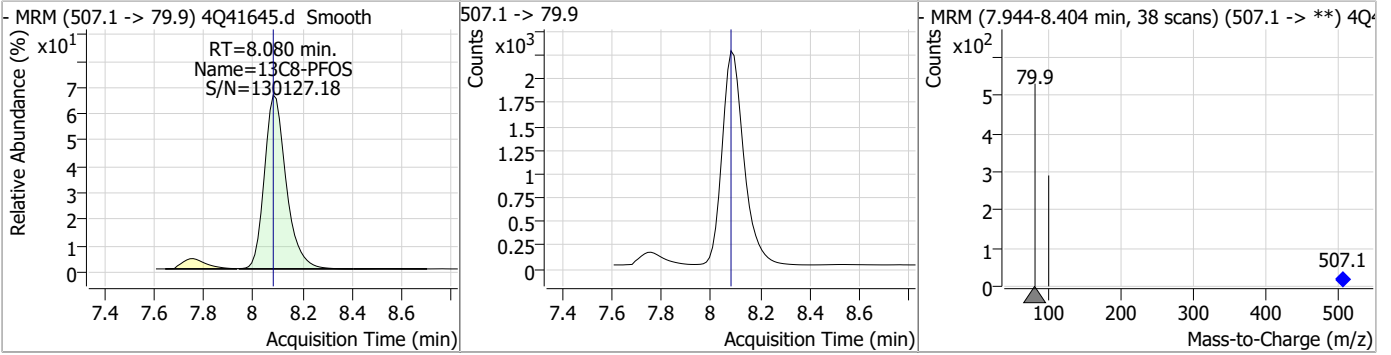
Perfluorinated Compounds by LC/MS/MS



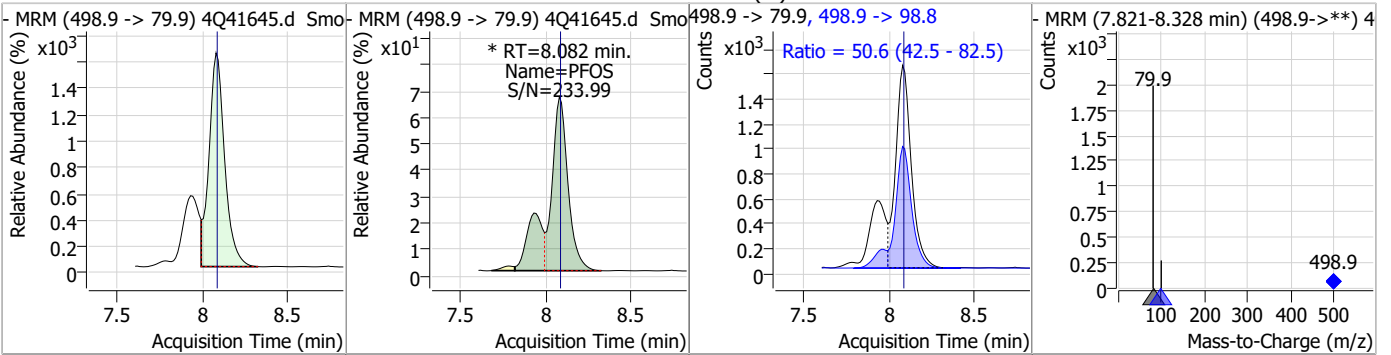
7.6.1
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C8-PFOS	2.47	8.08	0.00	13729				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	2.94	8.08	0.00	13794 (m)	498.9 -> 98.8	50.6	42.5	82.5



7.6.1
7



Manual Integration Approval Summary

Sample Number: S4Q596-RT Method: EPA DRAFT 1633
Lab FileID: 4Q41645.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 17:04 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanesulfonic acid	1763-23-1		8.08	Split peak

7.6.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41646.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 5:18:21 PM
 Sample Name : RT_BR_LN
 Vial : P1-B4
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.189	216.8 -> 171.9	139490	10.00 µg/L	-0.050
M5-PFPeA	4.512	268.3 -> 223.0	84057	5.00 µg/L	-0.062
M5-PFHxA	5.484	318.0 -> 273.0	66291	2.50 µg/L	-0.037
M4-PFHpA	6.330	367.1 -> 322.0	35902	2.50 µg/L	-0.012
M8-PFOA	7.000	421.1 -> 376.0	38586	2.50 µg/L	0.051
M9-PFNA	7.534	472.1 -> 427.0	21627	1.25 µg/L	0.038
M6-PFDA	7.992	519.1 -> 474.1	19310	1.25 µg/L	0.025
M7-PFUnDA	8.398	570.0 -> 525.1	20459	1.25 µg/L	0.012
M2-PFDoDA	8.780	615.1 -> 570.0	24286	1.25 µg/L	0.012
M2-PFTeDA	9.500	715.2 -> 670.0	19401	1.25 µg/L	0.012
M8-FOSA	9.534	506.1 -> 77.8	16191	2.50 µg/L	0.025
M3-PFBS	5.439	302.1 -> 79.9	14089	2.50 µg/L	-0.050
M3-PFHxS	7.117	402.1 -> 79.9	8253	2.50 µg/L	0.052
M8-PFOS	8.142	507.1 -> 79.9	11585	2.50 µg/L	0.025
M2-4:2FTS	5.210	329.1 -> 80.9	1431	5.00 µg/L	-0.049
M2-6:2FTS	6.761	429.1 -> 80.9	2191	5.00 µg/L	0.037
M2-8:2FTS	7.791	529.1 -> 80.9	3323	5.00 µg/L	0.025
M3-MeFOSAA	8.049	573.2 -> 419.0	15965	5.00 µg/L	0.012
M3-HFPO-DA	5.790	286.9 -> 168.9	31276	10.00 µg/L	-0.037
M5-EtFOSAA	8.246	589.2 -> 419.0	13383	5.00 µg/L	0.012
M7-MeFOSE	10.450	623.2 -> 58.9	60262	25.00 µg/L	0.037
M9-EtFOSE	10.721	639.2 -> 58.9	68975	25.00 µg/L	0.012
M5-EtFOSA	10.824	531.1 -> 219.0	8593	2.50 µg/L	0.012
M3-MeFOSA	10.541	515.0 -> 219.0	8242	2.50 µg/L	0.025
13C4-PFOS	8.143	502.8 -> 79.9	11539	2.50 µg/L	0.025
13C3-PFBA	3.193	216.0 -> 172.0	81514	5.00 µg/L	-0.050
18O2-PFHxS	7.116	403.0 -> 83.9	6122	2.50 µg/L	0.051
13C4-PFOA	7.000	417.1 -> 372.0	46752	2.50 µg/L	0.051
13C2-PFDA	7.992	515.1 -> 470.1	17774	1.25 µg/L	0.025
13C5-PFNA	7.534	468.0 -> 423.0	24260	1.25 µg/L	0.038
13C2-PFHxA	5.485	315.1 -> 270.0	61391	2.50 µg/L	-0.037
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1431	4.31 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 86.2%		
13C2-6:2FTS	6.761	429.1 -> 80.9	2191	4.66 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 93.1%		
13C2-8:2FTS	7.791	529.1 -> 80.9	3323	4.54 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 90.8%		
13C2-PFDoDA	8.780	615.1 -> 570.0	24286	1.29 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 103.4%		
13C2-PFTeDA	9.500	715.2 -> 670.0	19401	1.25 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.1%		
13C3-PFBS	5.439	302.1 -> 79.9	14089	2.47 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.9%		
13C3-PFHxS	7.117	402.1 -> 79.9	8253	2.48 µg/L	0.052

7.6.2
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.1%	
13C4-PFBA	3.189	216.8 -> 171.9	139490	9.96 µg/L	-0.050
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.6%	
13C4-PFHpA	6.330	367.1 -> 322.0	35902	2.46 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.6%	
13C5-PFHxA	5.484	318.0 -> 273.0	66291	2.49 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.5%	
13C5-PFPeA	4.512	268.3 -> 223.0	84057	5.02 µg/L	-0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C6-PFDA	7.992	519.1 -> 474.1	19310	1.27 µg/L	0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 101.4%	
13C7-PFUnDA	8.398	570.0 -> 525.1	20459	1.30 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 103.8%	
13C8-FOSA	9.534	506.1 -> 77.8	16191	2.52 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
13C8-PFOA	7.000	421.1 -> 376.0	38586	2.50 µg/L	0.051
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.8%	
13C8-PFOS	8.142	507.1 -> 79.9	11585	2.55 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.9%	
13C9-PFNA	7.534	472.1 -> 427.0	21627	1.27 µg/L	0.038
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.0%	
d3-MeFOSAA	8.049	573.2 -> 419.0	15965	4.95 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 99.1%	
13C3-HFPO-DA	5.790	286.9 -> 168.9	31276	10.06 µg/L	-0.037
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.6%	
d3-MeFOSA	10.541	515.0 -> 219.0	8242	2.52 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
d5-EtFOSAA	8.246	589.2 -> 419.0	13383	5.09 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.8%	
d7-MeFOSE	10.450	623.2 -> 58.9	60262	24.52 µg/L	0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 98.1%	
d9-EtFOSE	10.721	639.2 -> 58.9	68975	25.12 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 100.5%	
d5-EtFOSA	10.824	531.1 -> 219.0	8593	2.49 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.7%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	96876	49.72 µg/L	97
		327.1 -> 80.9	41467		
6:2FTS	6.762	427.1 -> 407.0	73465	46.32 µg/L	100
		427.1 -> 80.9	31935		
8:2FTS	7.792	527.1 -> 507.0	73173	48.91 µg/L	99
		527.1 -> 80.8	31475		
EtFOSAA	8.247	584.2 -> 419.1	25507	11.85 µg/L	96
		584.2 -> 526.0	11501		
FOSA	9.537	498.1 -> 77.9	175392	30.08 µg/L	98
		498.1 -> 478.0	4756		
MeFOSAA	8.062	570.1 -> 419.0	26337	12.01 µg/L	95
		570.1 -> 483.0	5422		
PFBA	3.196	212.8 -> 168.9	152011	50.61 µg/L	100
PFBS	5.440	298.7 -> 79.9	57066	11.32 µg/L	98
		298.7 -> 98.8	22074		
PFDA	7.992	512.9 -> 469.0	140279	12.69 µg/L	100
		512.9 -> 219.0	28295		
PFDoDA	8.780	613.1 -> 569.0	196213	12.43 µg/L	100
		613.1 -> 319.0	27646		
PFDS	8.933	599.0 -> 79.9	29414	12.04 µg/L	100

7.6.2
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.331	599.0 -> 98.8	14570	12.89	µg/L	99
		363.1 -> 319.0	233421			
PFHpS	7.673	363.1 -> 169.0	40552	11.35	µg/L	99
		449.0 -> 79.9	35939			
PFHxA	5.487	449.0 -> 98.9	19333	12.37	µg/L	100
		313.0 -> 269.0	250628			
PFHxS	7.118	313.0 -> 118.9	7164	10.97	µg/L	m
		398.7 -> 79.9	33032			
PFNA	7.535	398.7 -> 98.9	16708	25.04	µg/L	m
		463.0 -> 419.0	286115			
PFNS	8.550	463.0 -> 219.0	76107	11.52	µg/L	94
		548.8 -> 79.9	21155			
PFOA	7.001	548.8 -> 98.9	11466	27.01	µg/L	m
		413.0 -> 369.0	472321			
PFOS	8.143	413.0 -> 169.0	101064	10.69	µg/L	m
		498.9 -> 79.9	52360			
PFPeA	4.514	498.9 -> 98.8	25002	24.83	µg/L	100
		263.0 -> 219.0	400091			
PFPeS	6.394	349.1 -> 79.9	32656	11.77	µg/L	100
		349.1 -> 98.9	13864			
PFTeDA	9.501	713.1 -> 669.0	171563	12.75	µg/L	99
		713.1 -> 168.9	13699			
PFTrDA	9.166	663.0 -> 619.0	244948	12.95	µg/L	98
		663.0 -> 168.9	23157			
PFUnDA	8.399	563.1 -> 519.0	131461	12.51	µg/L	98
		563.1 -> 269.1	26332			
11Cl-PF3OUdS	9.205	630.9 -> 450.9	423608	47.51	µg/L	100
		632.9 -> 452.9	131866			
9Cl-PF3ONS	8.438	530.8 -> 351.0	505919	47.99	µg/L	98
		532.8 -> 353.0	154860			
ADONA	6.594	376.9 -> 250.9	986119	47.99	µg/L	99
		376.9 -> 84.8	265895			
HFPO-DA	5.791	284.9 -> 168.9	126342	51.32	µg/L	99
		284.9 -> 184.9	14595			
3:3FTCA	4.192	241.0 -> 177.0	53522	61.54	µg/L	100
		241.0 -> 117.0	4752			
5:3FTCA	6.283	341.0 -> 237.1	1068762	318.32	µg/L	99
		341.0 -> 217.0	753723			
7:3FTCA	7.699	441.0 -> 316.9	396028	316.76	µg/L	96
		441.0 -> 336.9	889919			
EtFOSA	10.825	526.0 -> 219.0	111458	31.75	µg/L	m
		526.0 -> 169.0	135213			
EtFOSE	10.747	630.0 -> 58.9	342872	140.35	µg/L	100
		511.9 -> 219.0	89643			
MeFOSA	10.555	511.9 -> 169.0	120469	30.14	µg/L	m
		616.1 -> 58.9	330194			
MeFOSE	10.462	699.1 -> 79.9	24781	143.51	µg/L	100
		699.1 -> 98.8	13596			
PFDoDS	9.640	295.0 -> 201.0	18768	11.97	µg/L	99
		295.0 -> 84.9	4880			
NFDHA	5.391	279.0 -> 85.1	229223	27.25	µg/L	96
		229.0 -> 84.9	195811			
PFMBA	4.842	314.8 -> 134.9	347030	25.37	µg/L	100
		314.8 -> 82.9	11881			
PFMPA	3.794			25.20	µg/L	100
PFEESA	5.897			22.65	µg/L	99

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.2
7

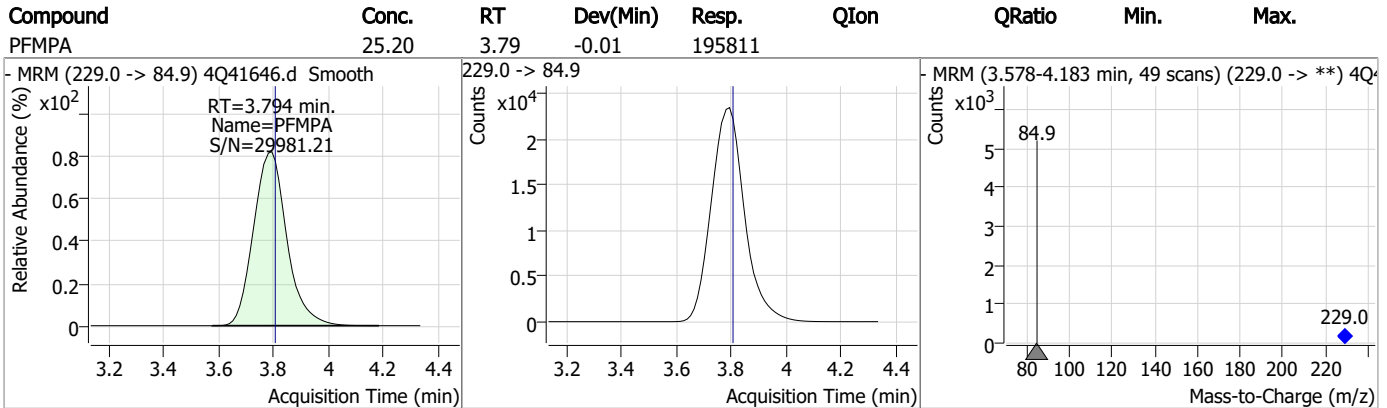
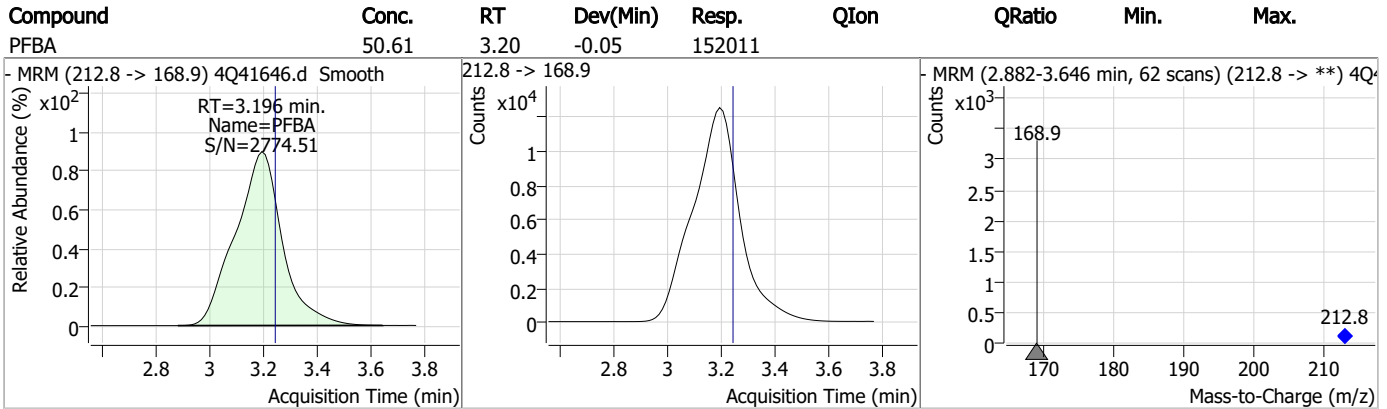
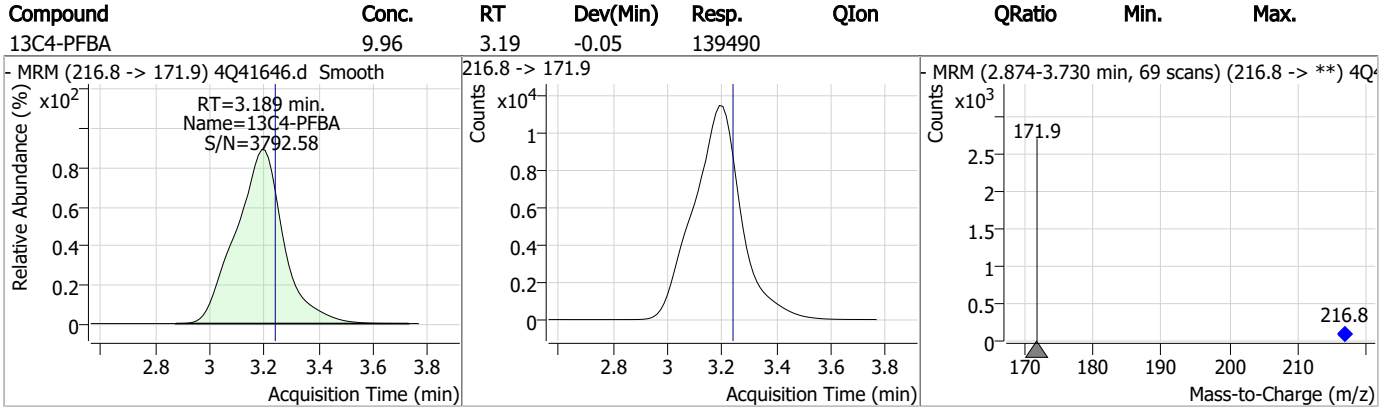
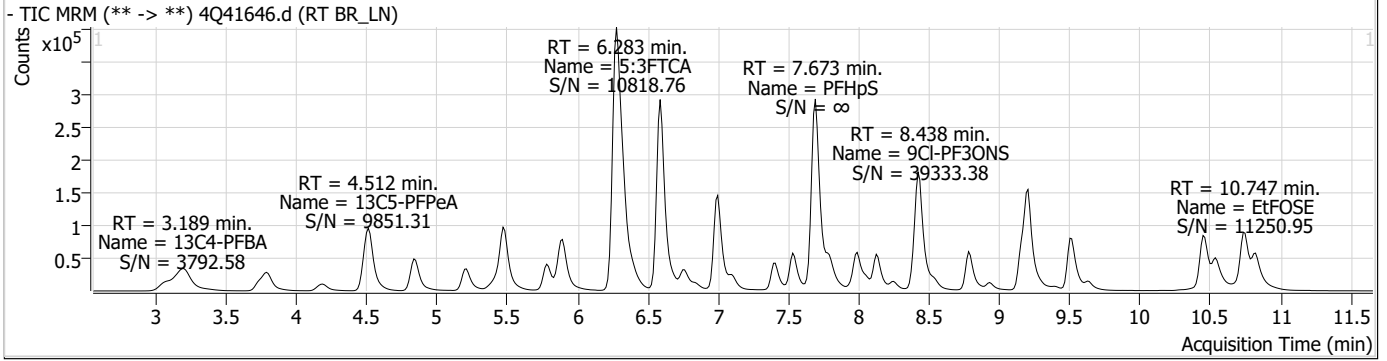
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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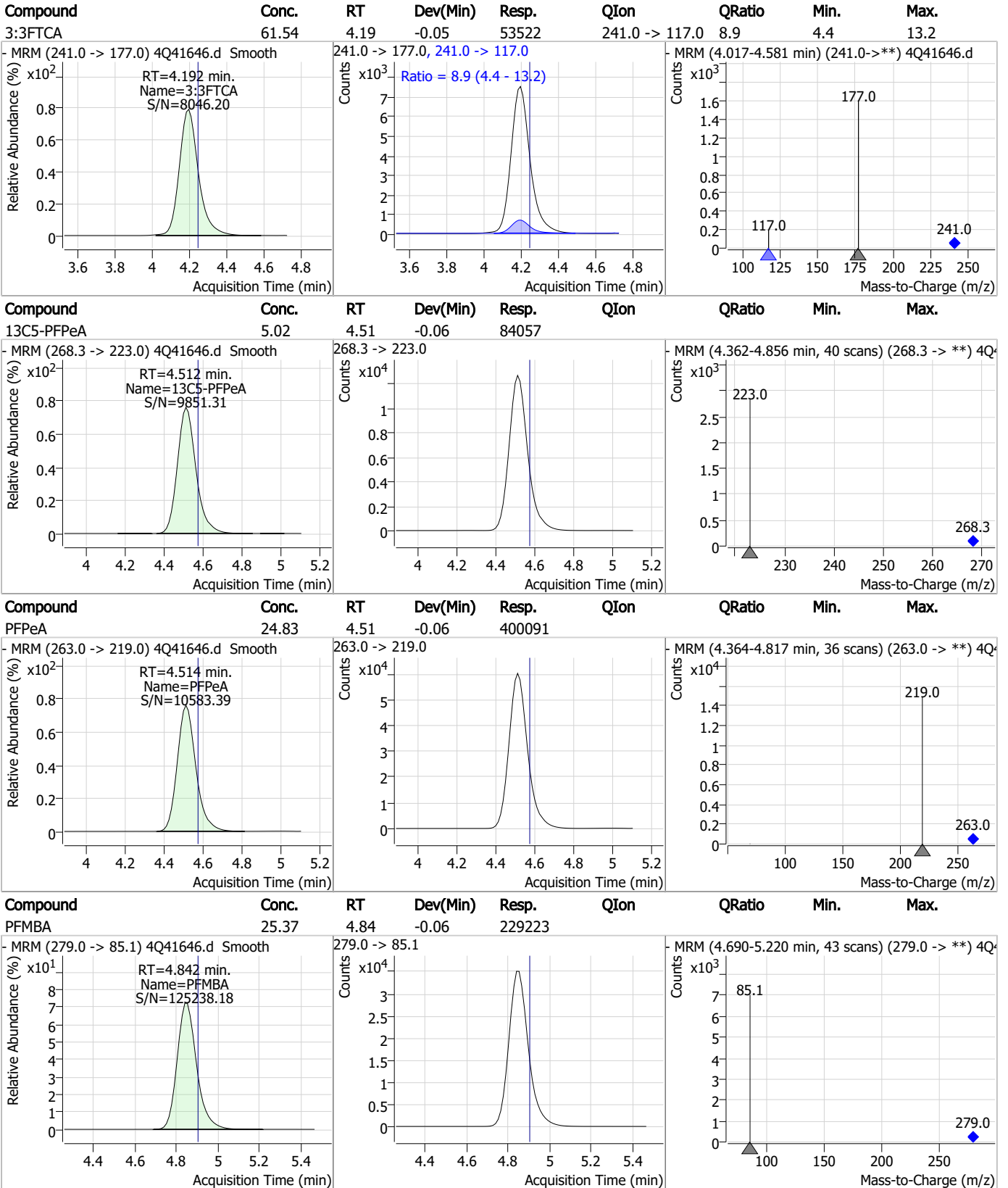
7.6.2

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Perfluorinated Compounds by LC/MS/MS



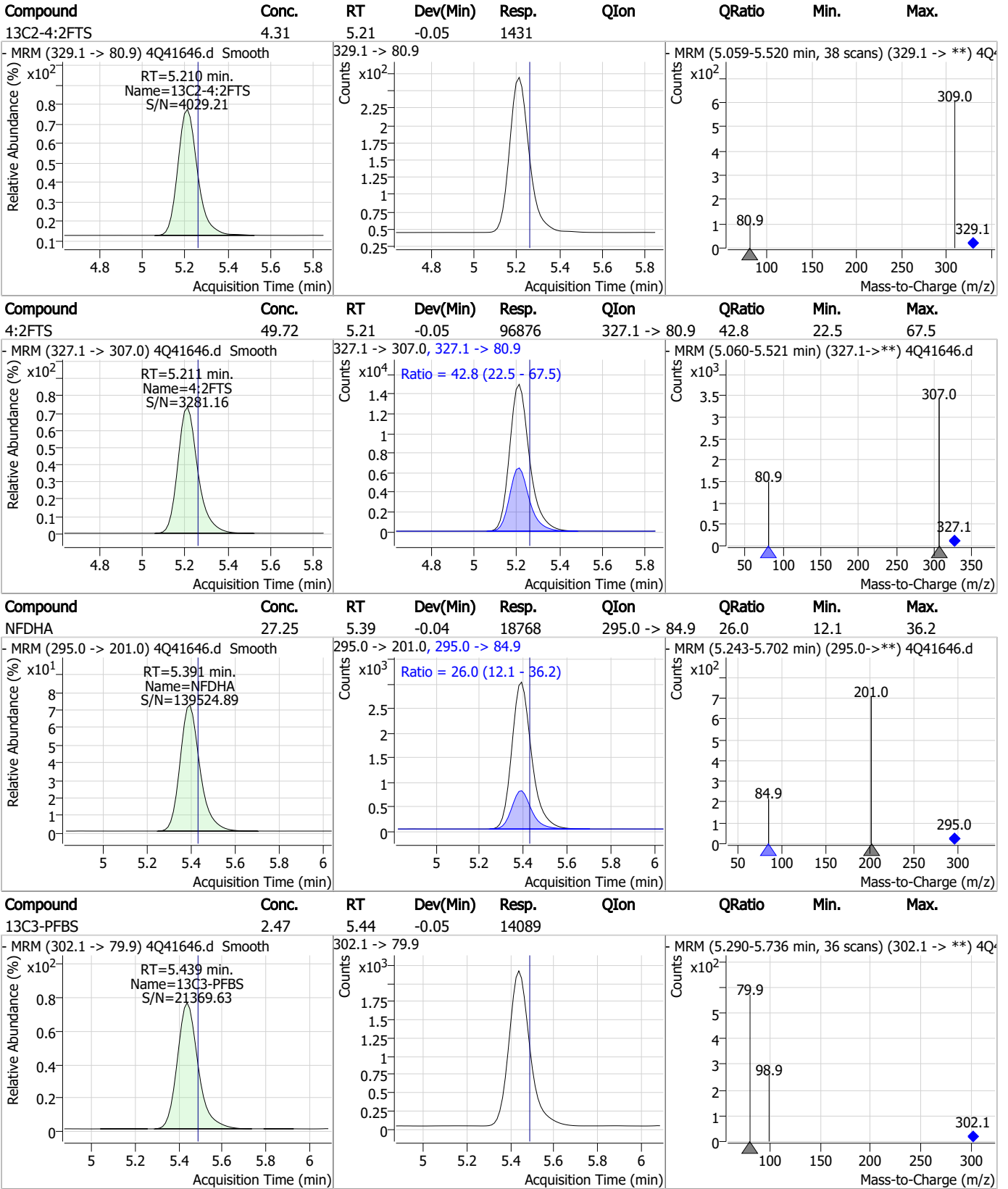
Perfluorinated Compounds by LC/MS/MS



7.6.2

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Perfluorinated Compounds by LC/MS/MS

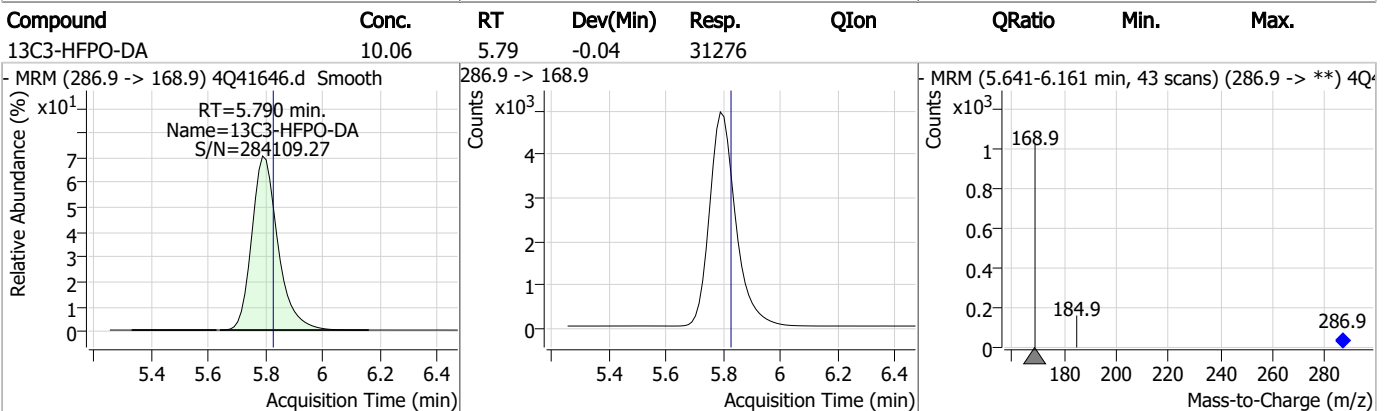
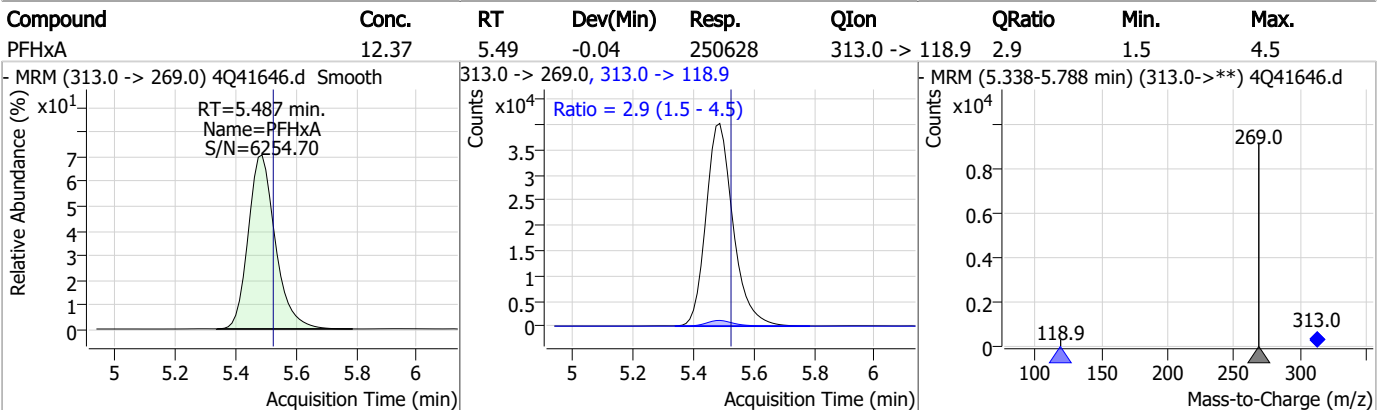
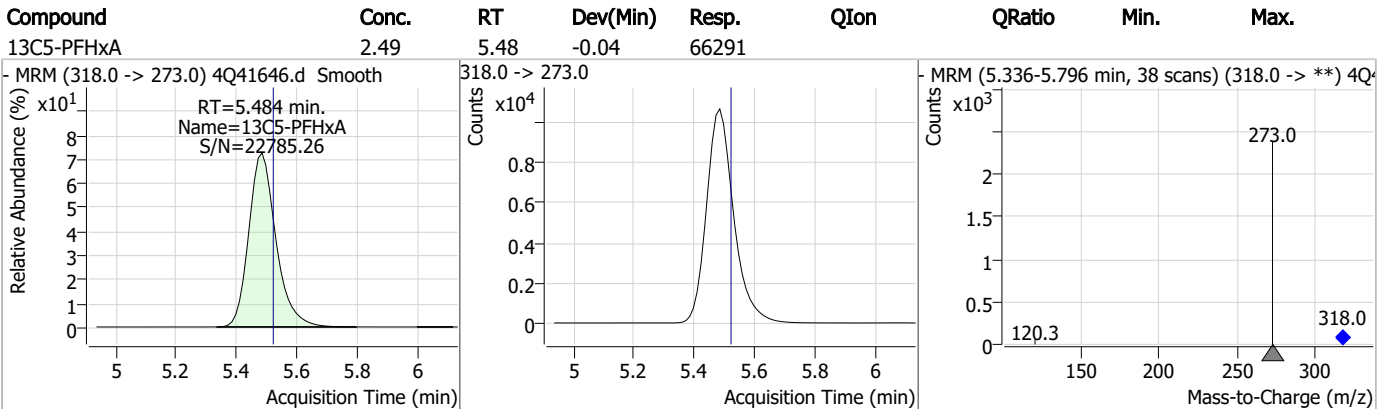
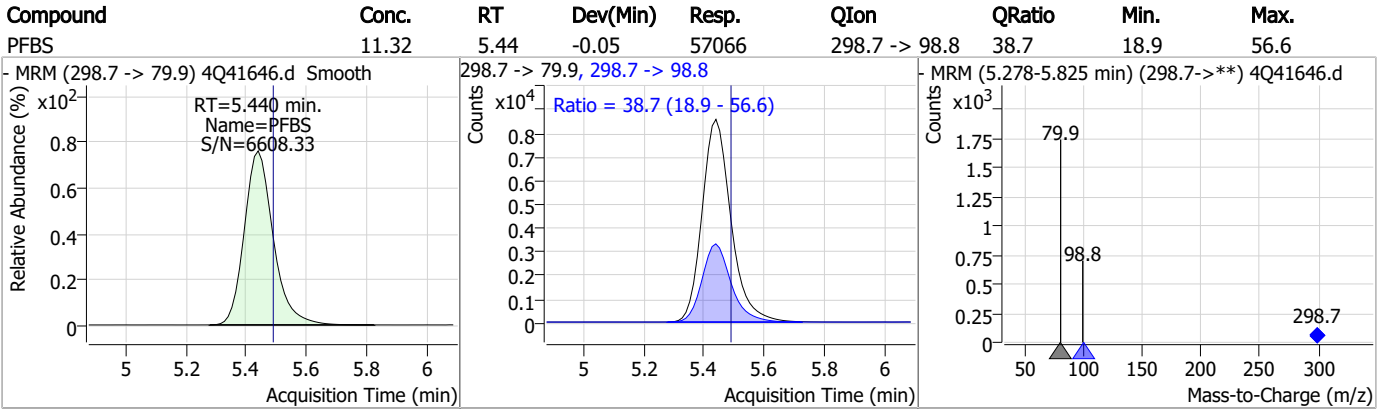


7.6.2

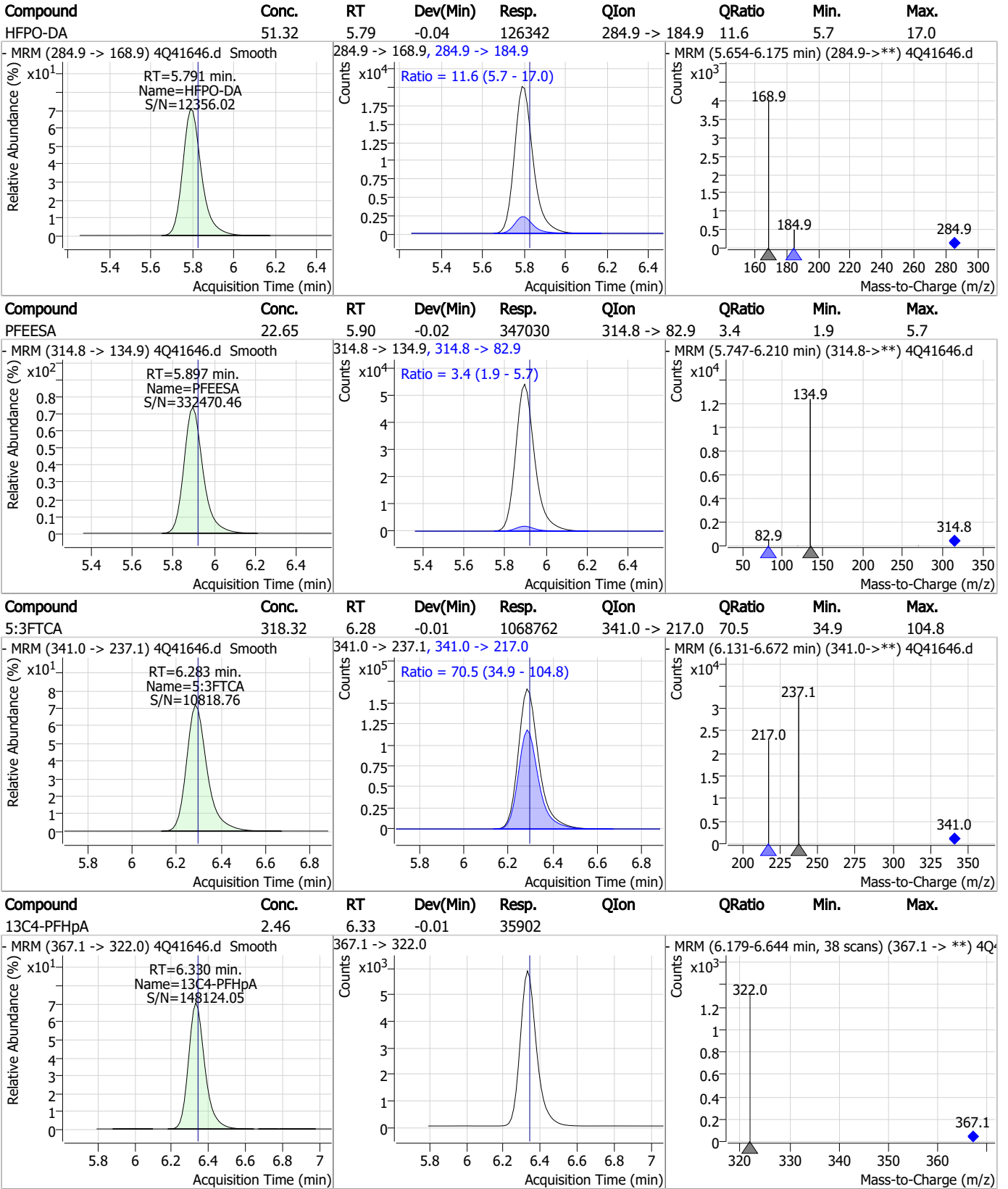
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Perfluorinated Compounds by LC/MS/MS

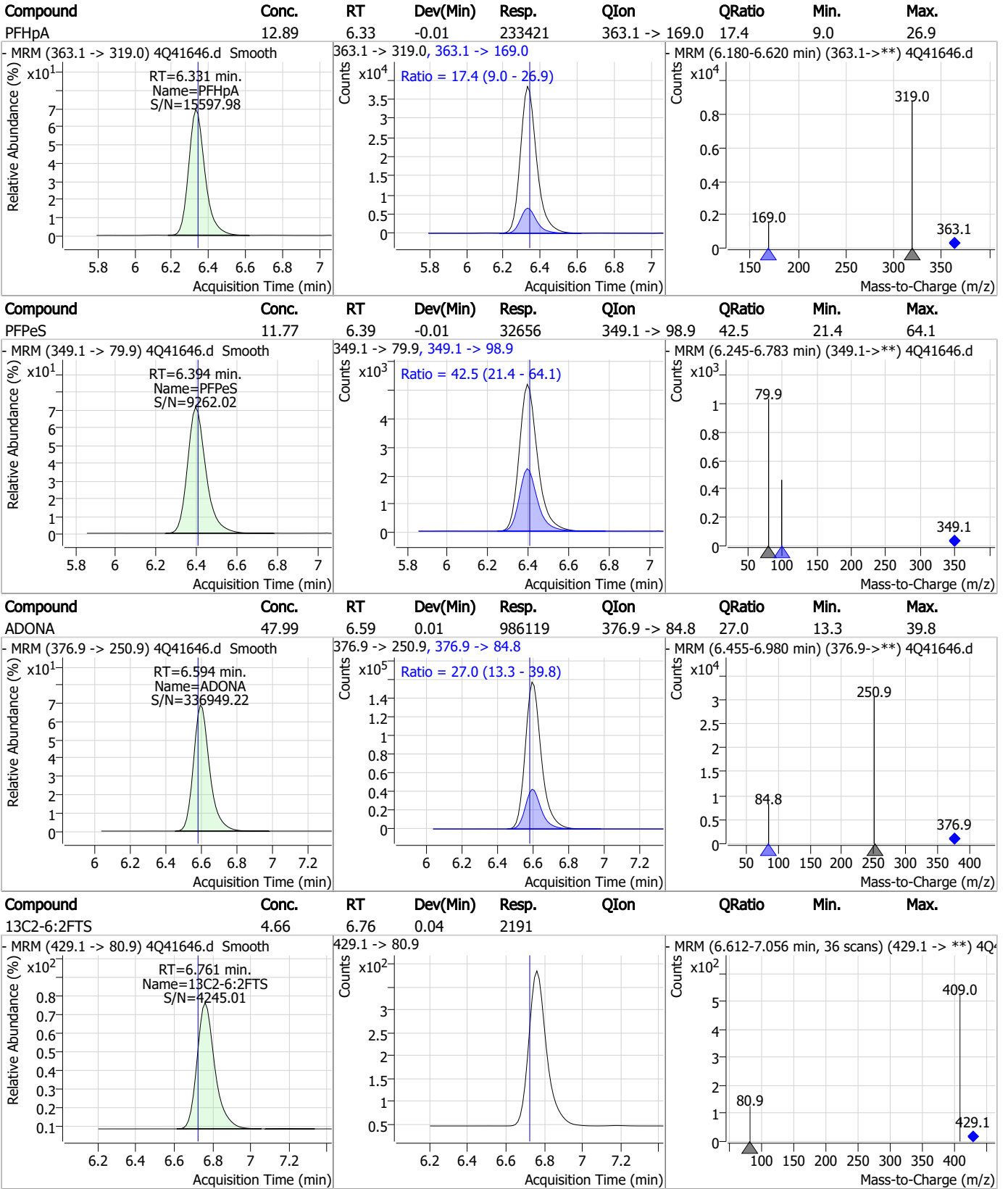


Perfluorinated Compounds by LC/MS/MS



7.6.2
7

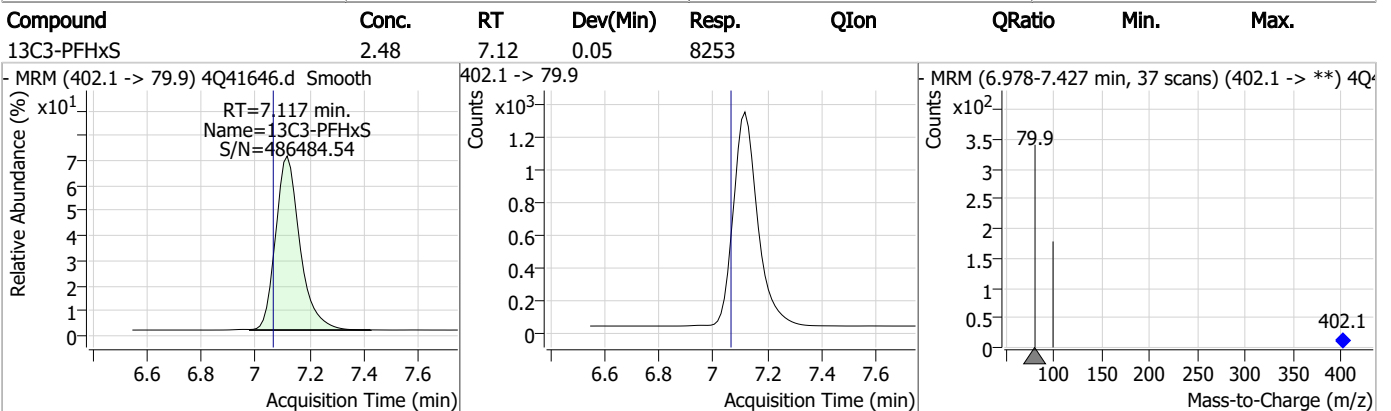
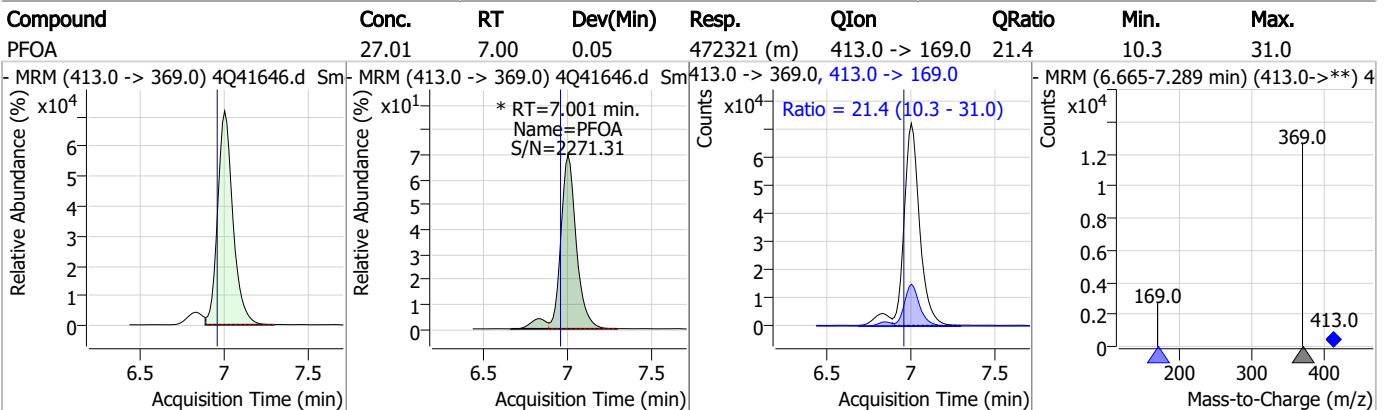
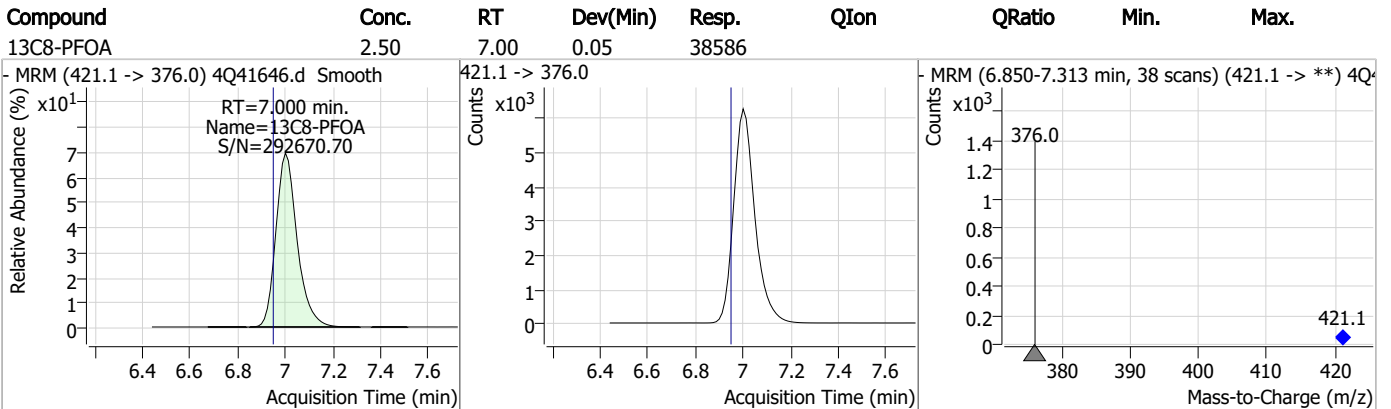
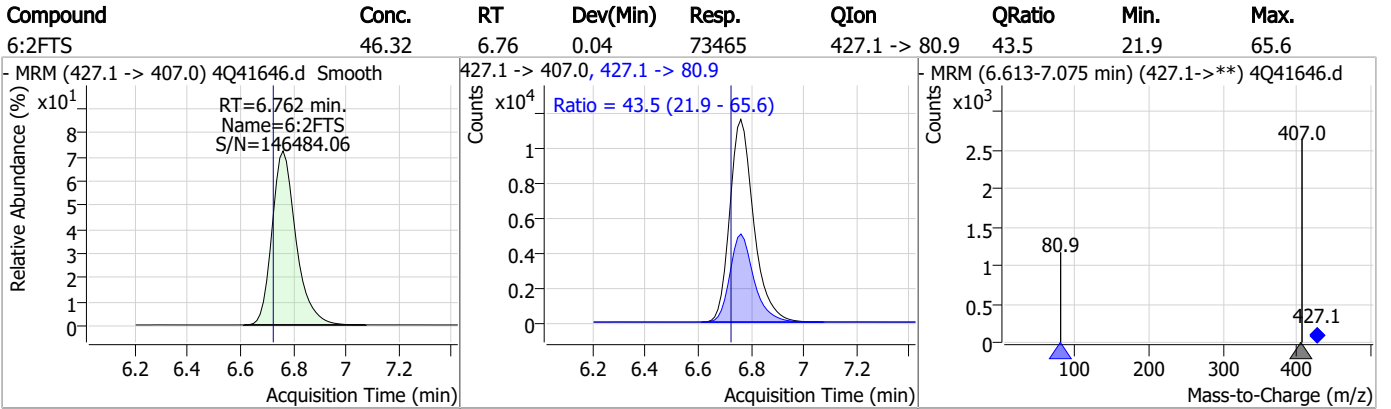
Perfluorinated Compounds by LC/MS/MS



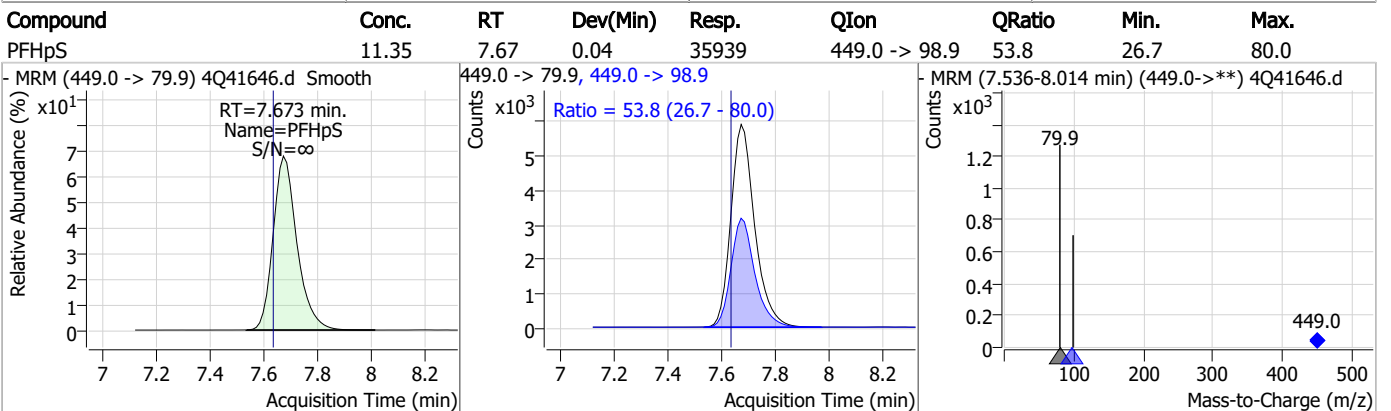
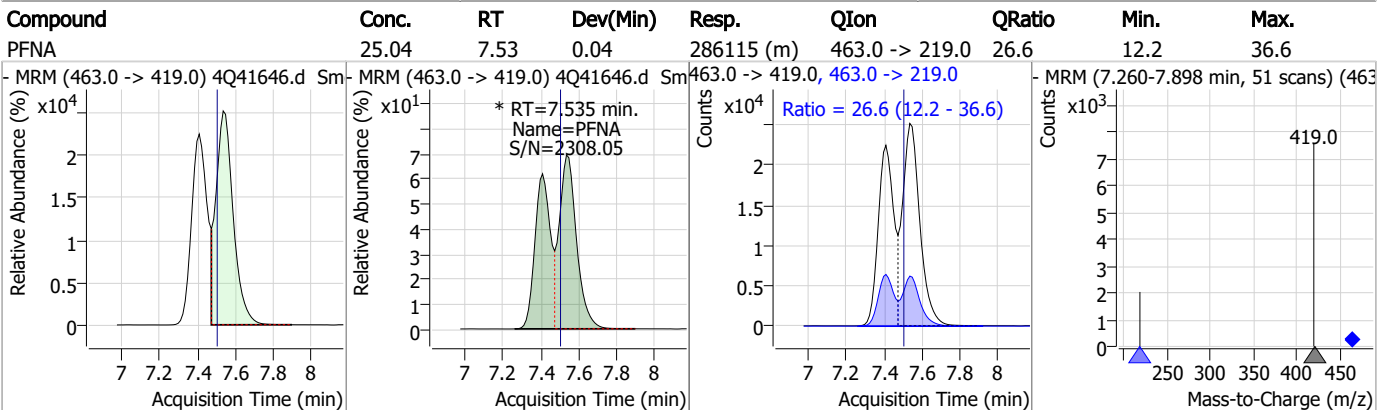
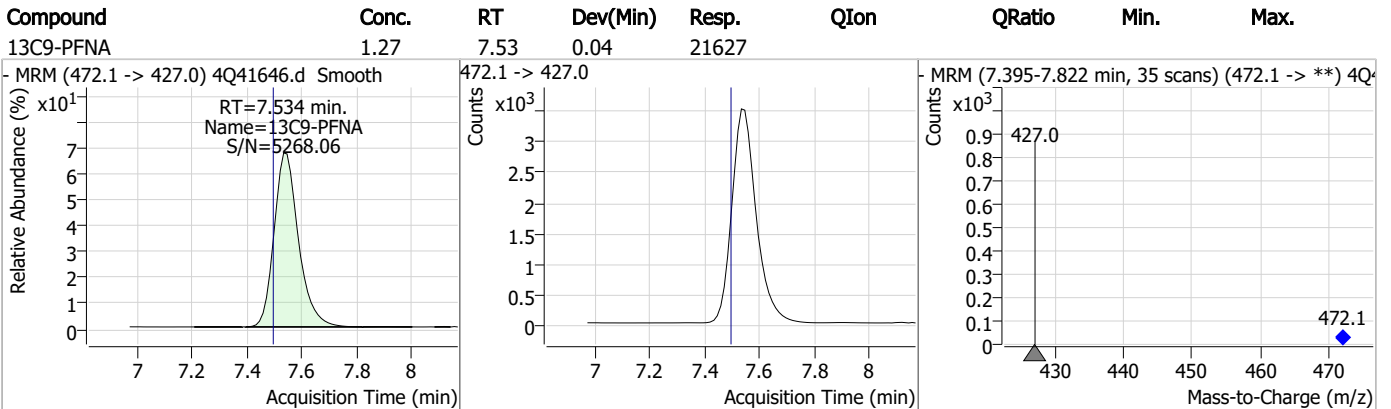
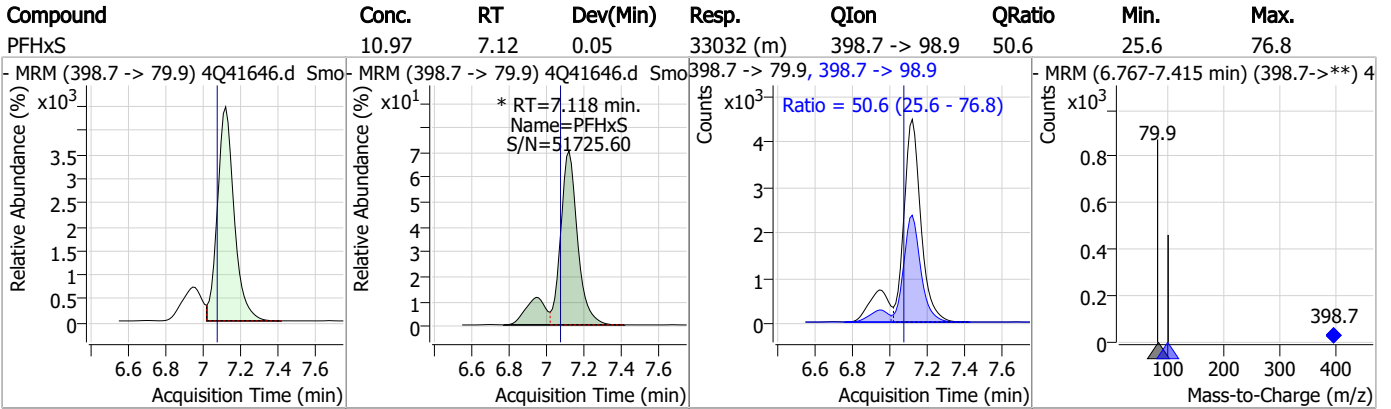
7.6.2

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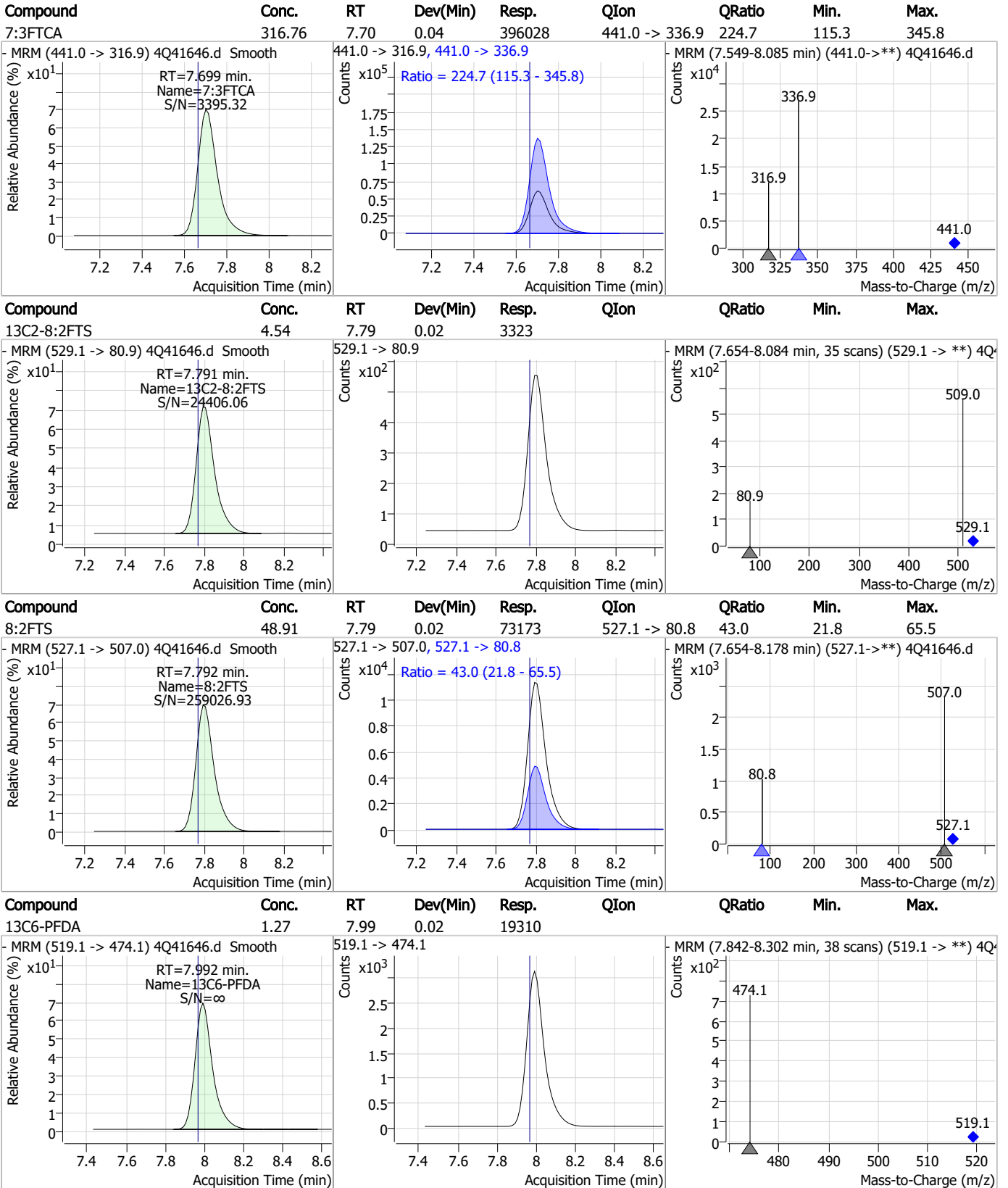
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

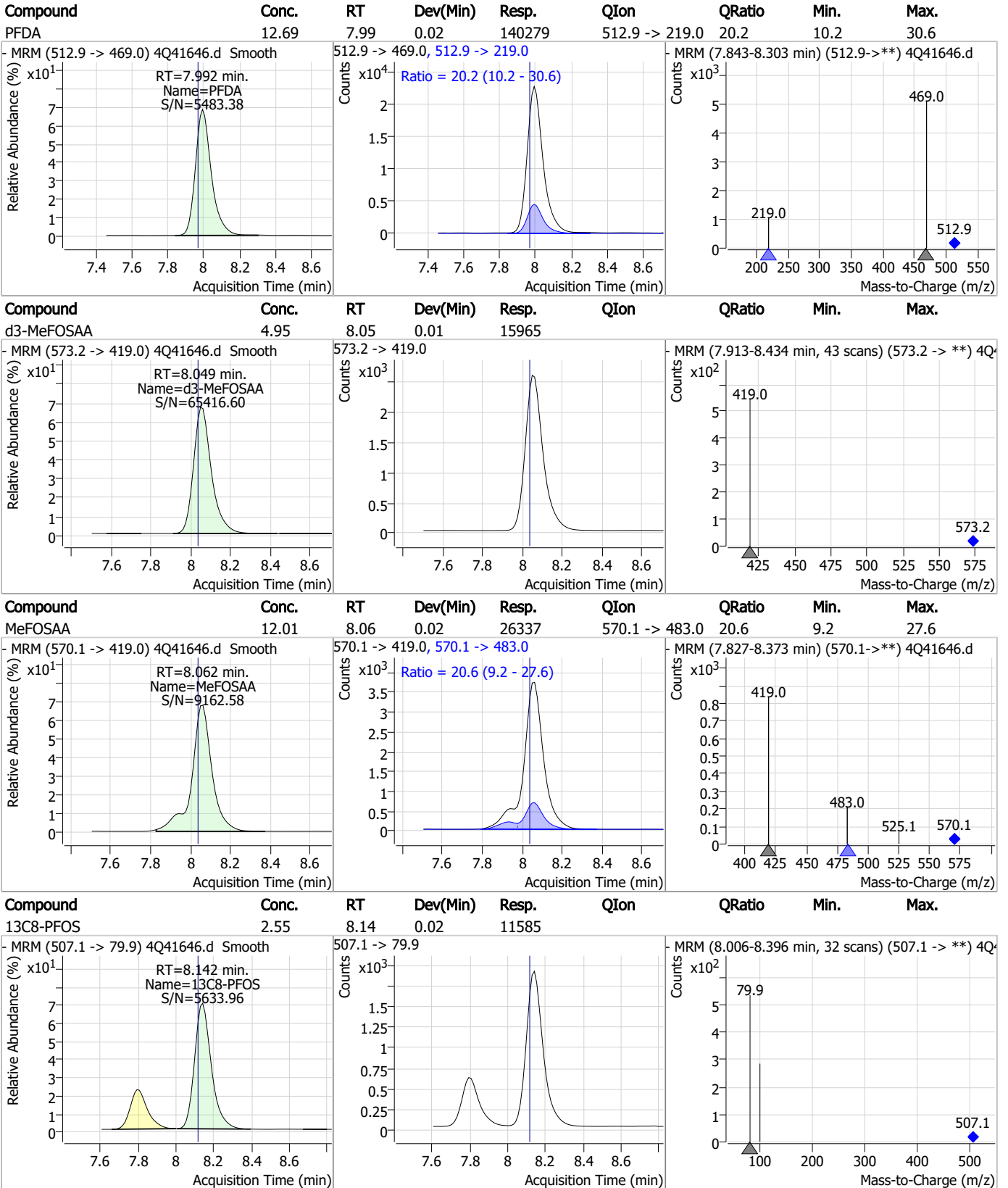


7.6.2

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Perfluorinated Compounds by LC/MS/MS

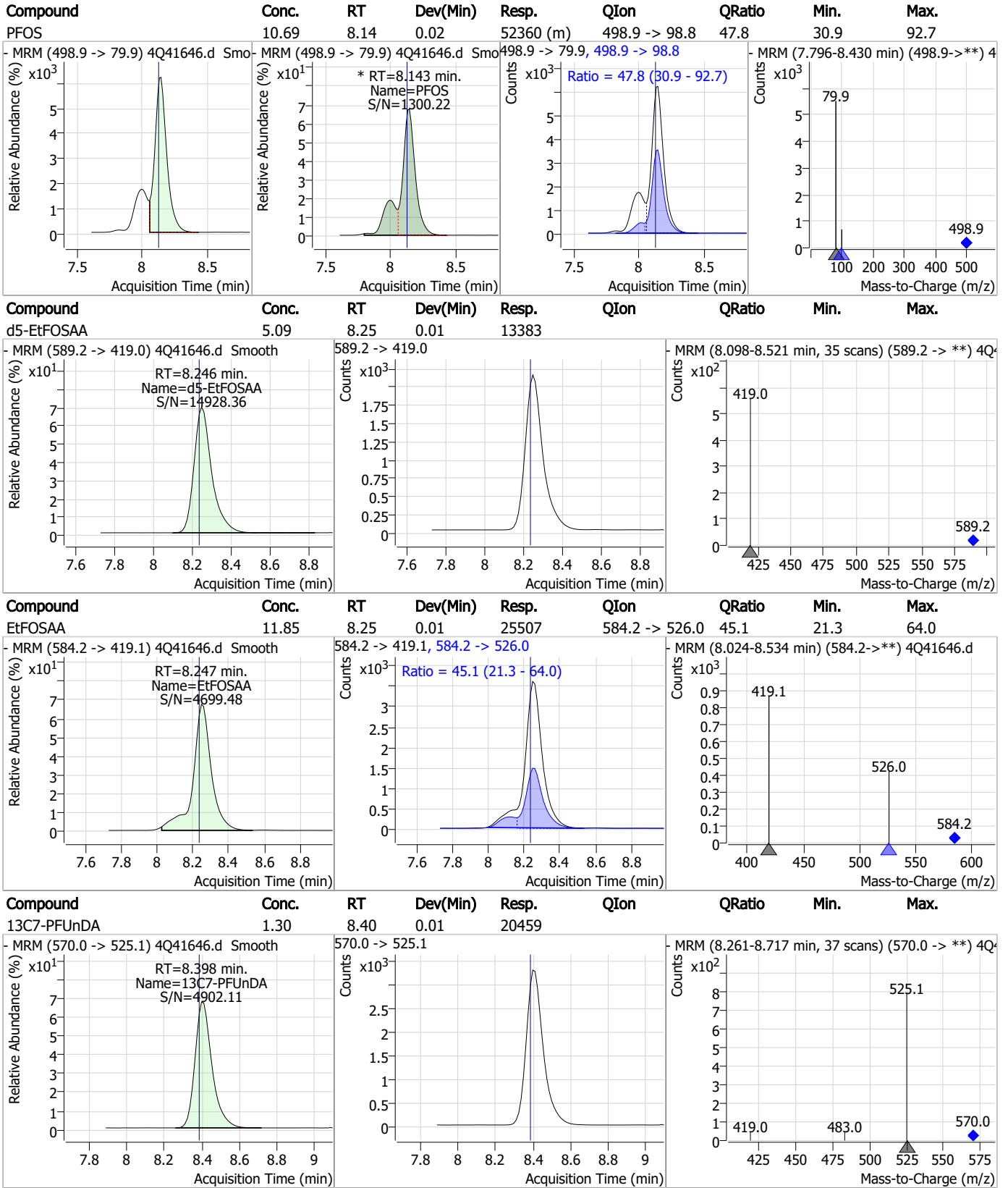


7.6.2

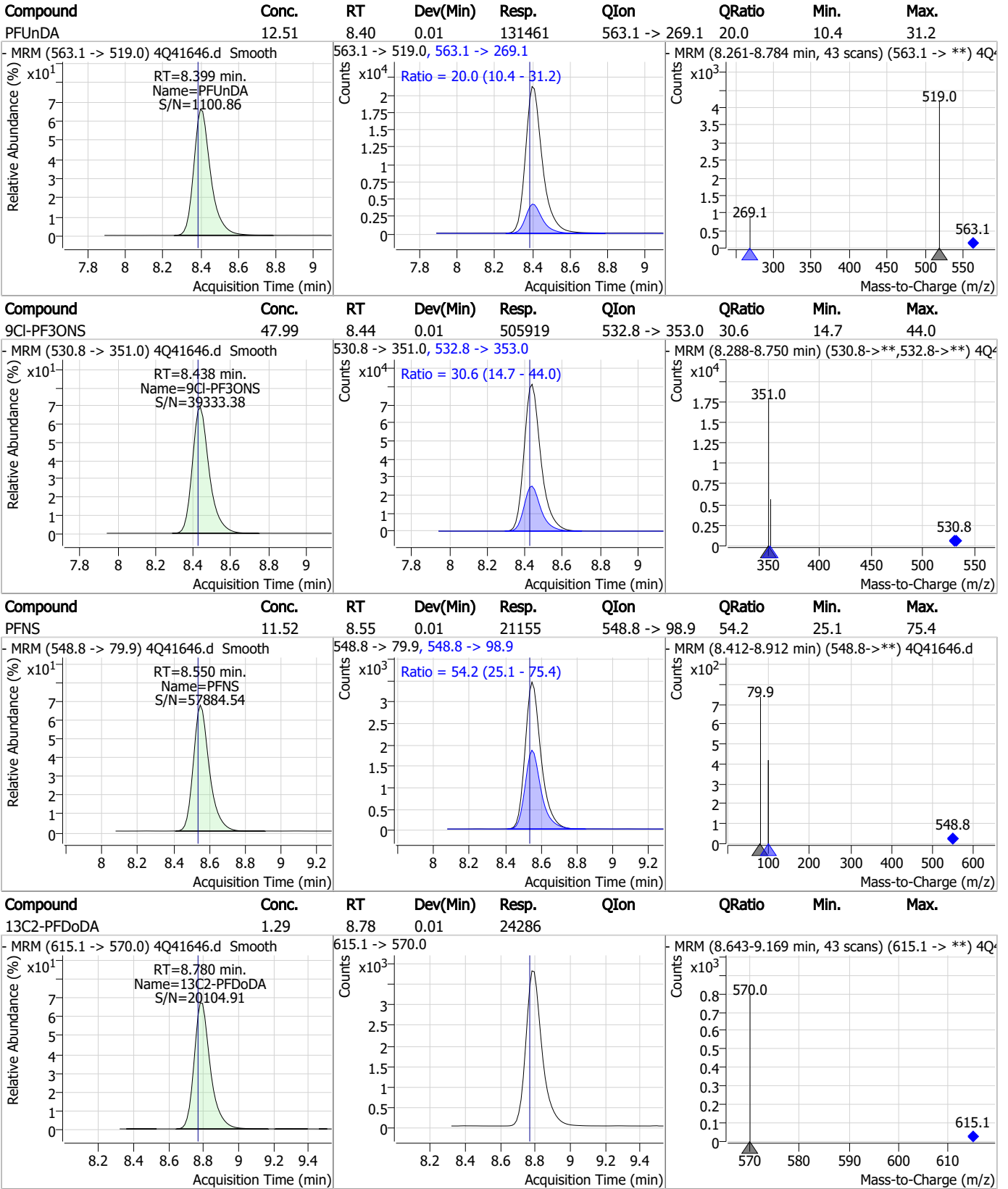
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Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

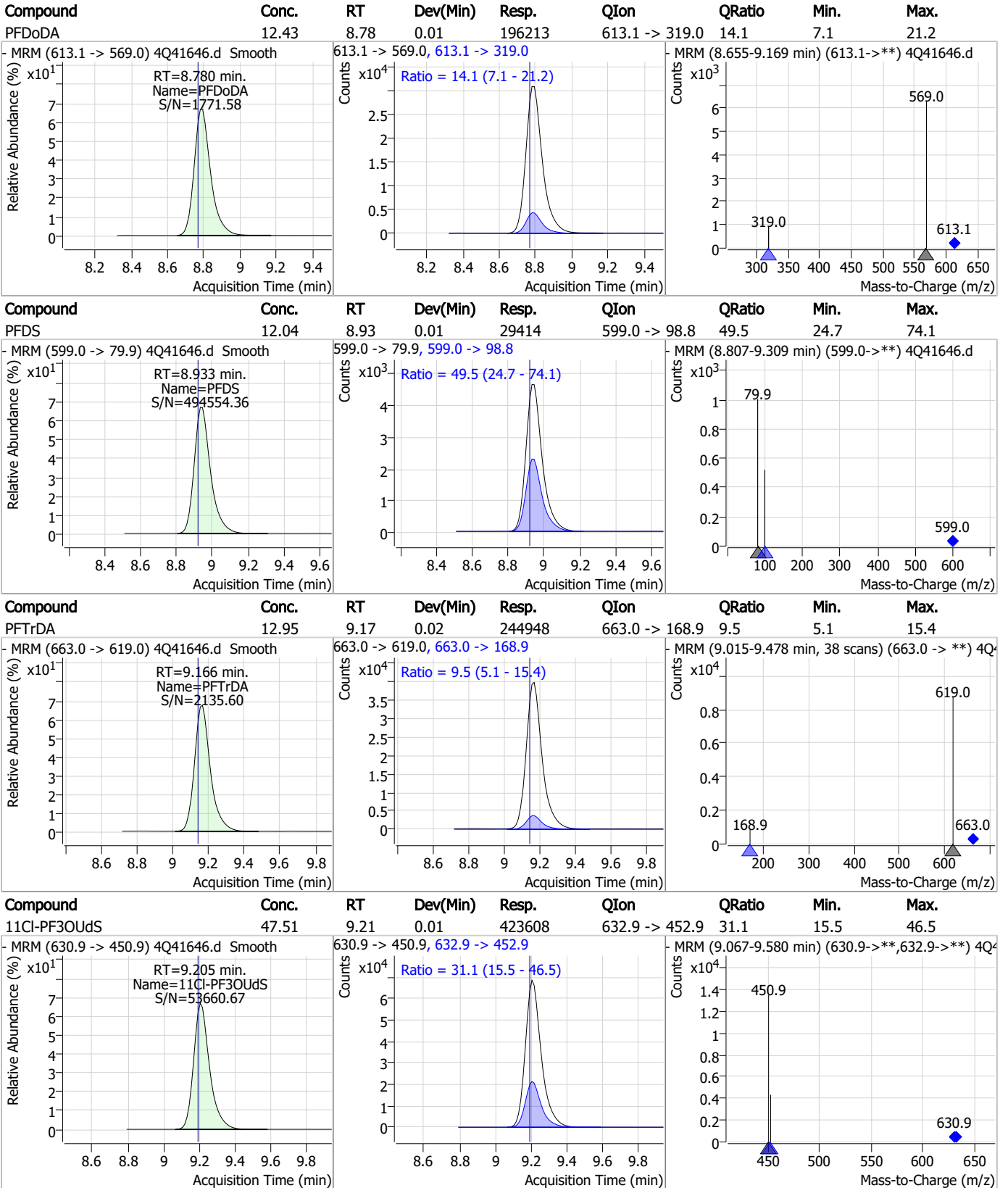


7.6.2

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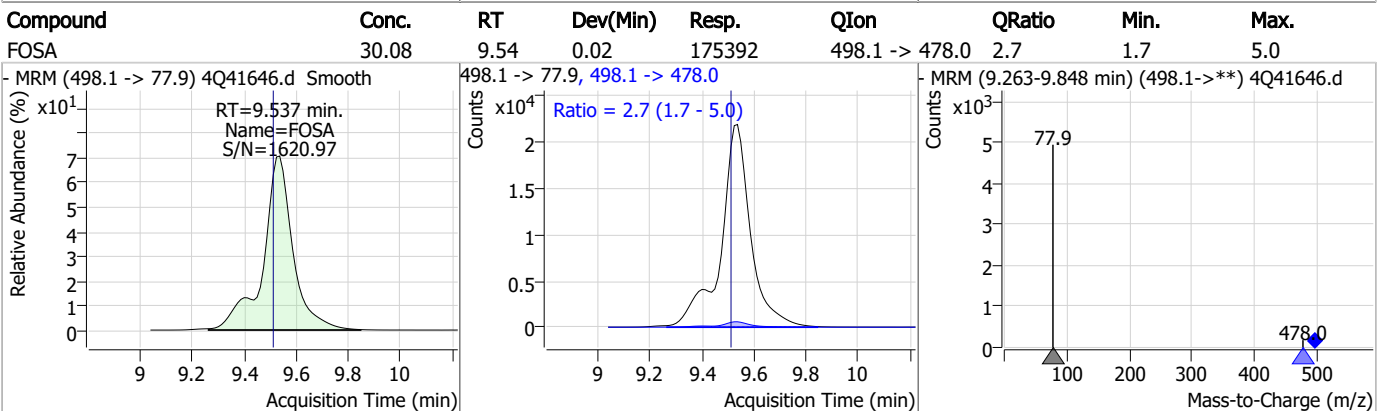
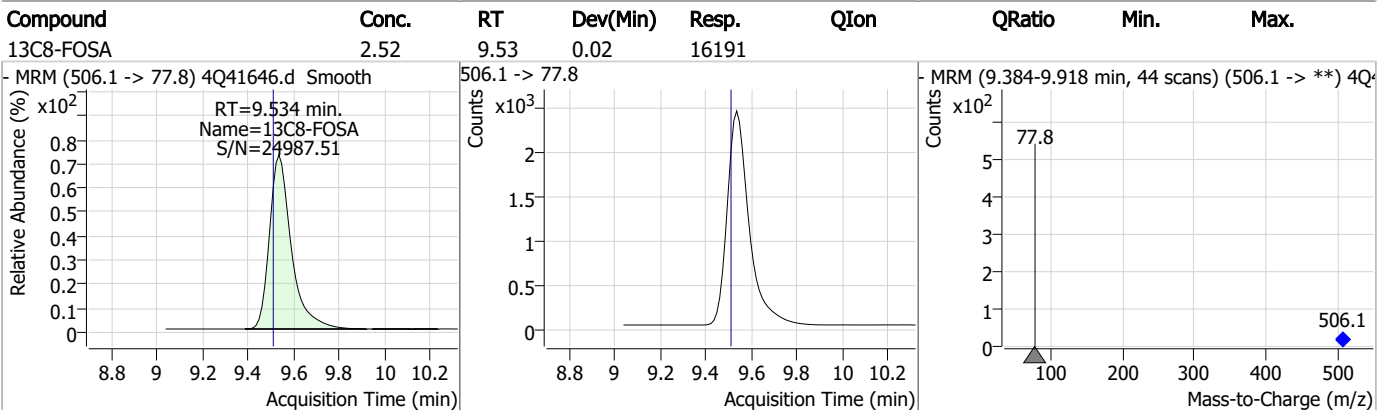
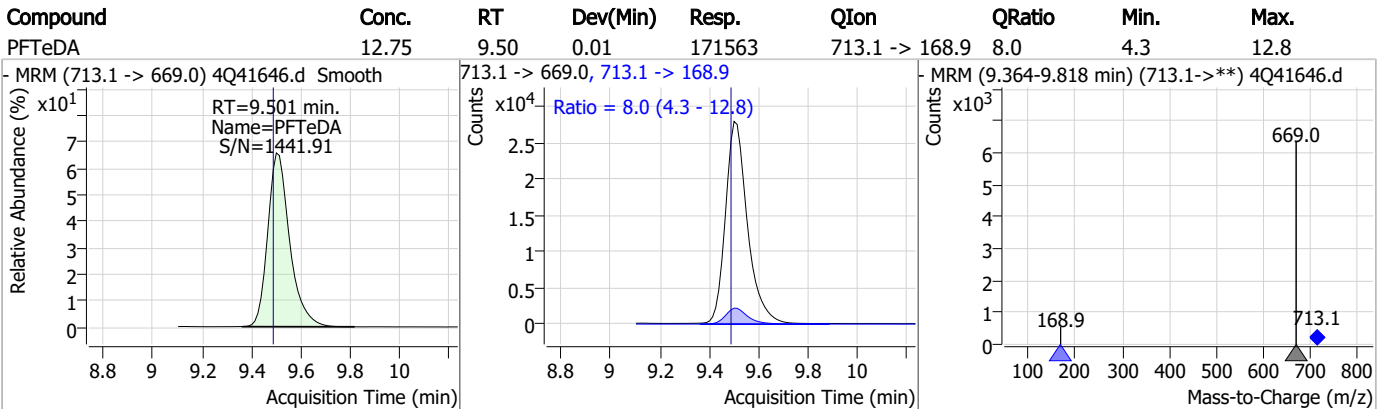
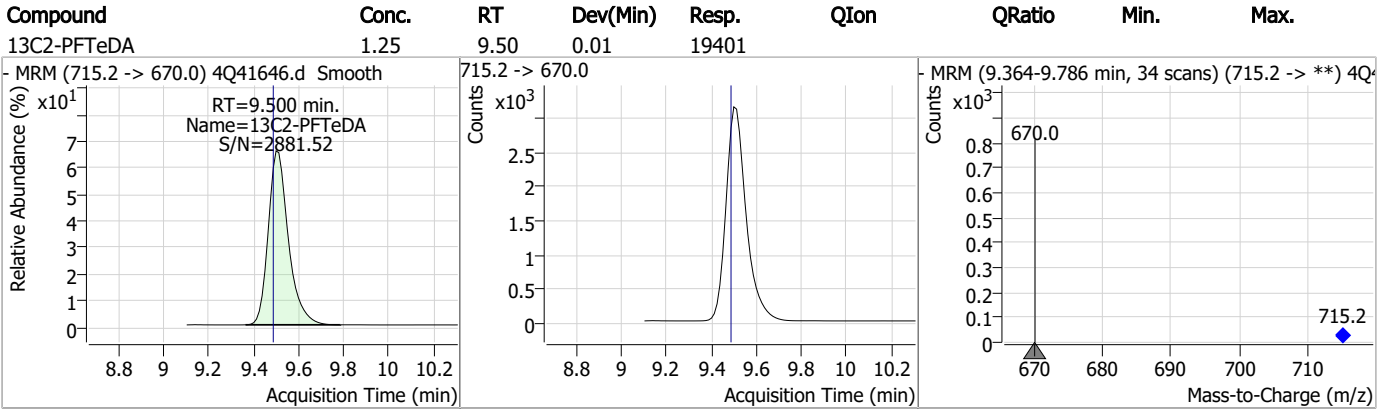
Perfluorinated Compounds by LC/MS/MS



7.6.2

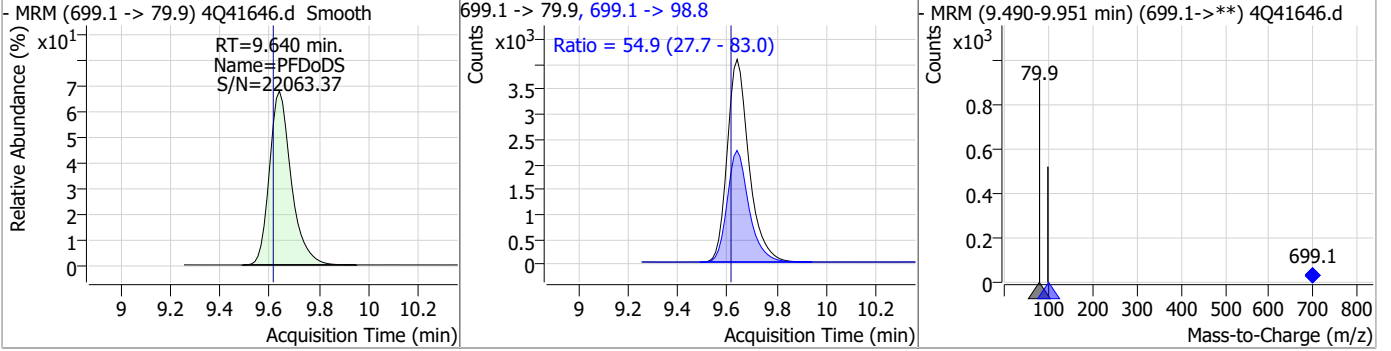
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Perfluorinated Compounds by LC/MS/MS

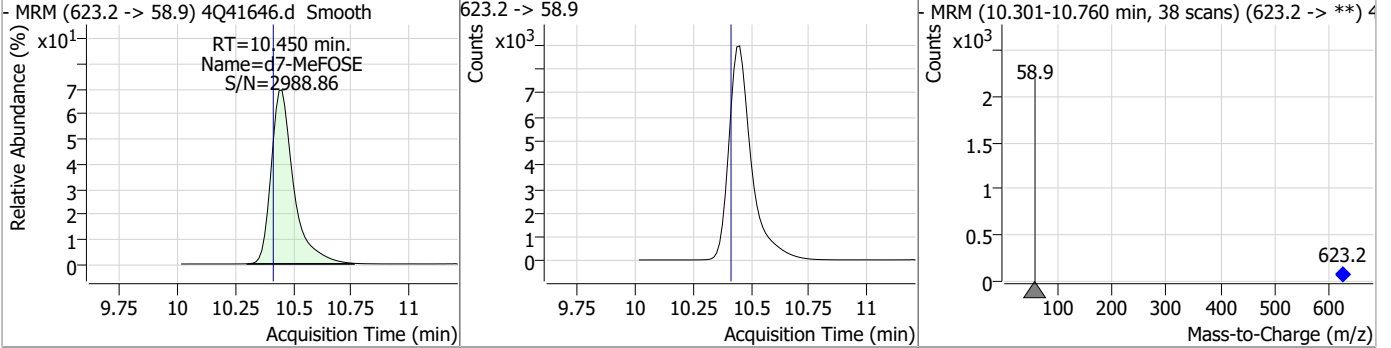


Perfluorinated Compounds by LC/MS/MS

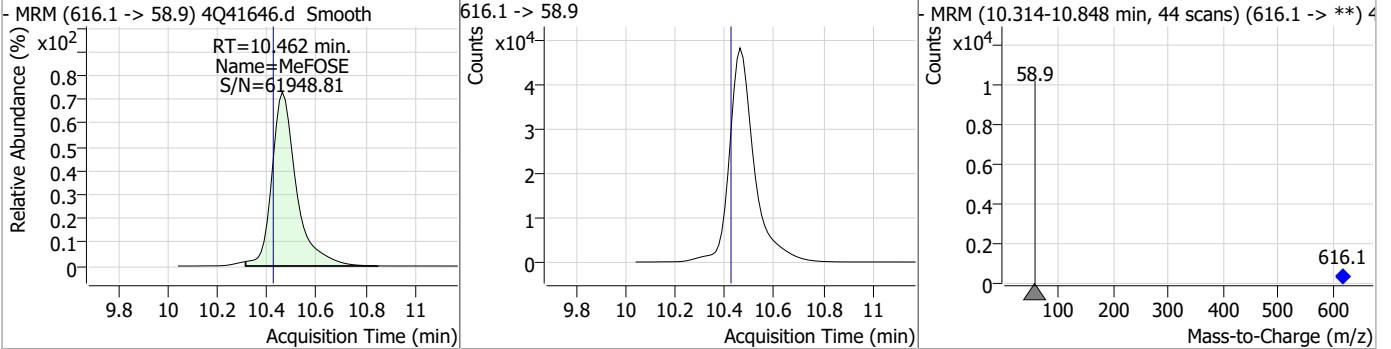
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	11.97	9.64	0.02	24781	699.1 -> 98.8	54.9	27.7	83.0



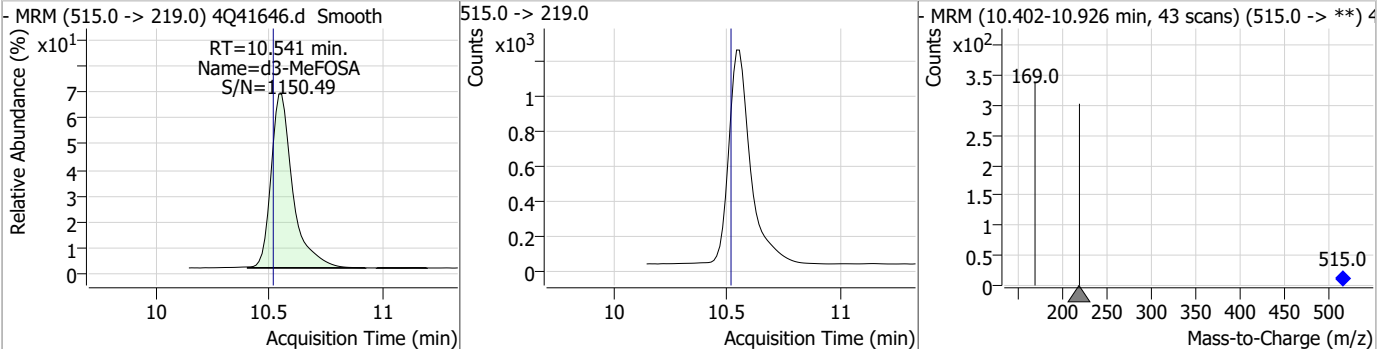
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	24.52	10.45	0.04	60262				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	143.51	10.46	0.04	330194				

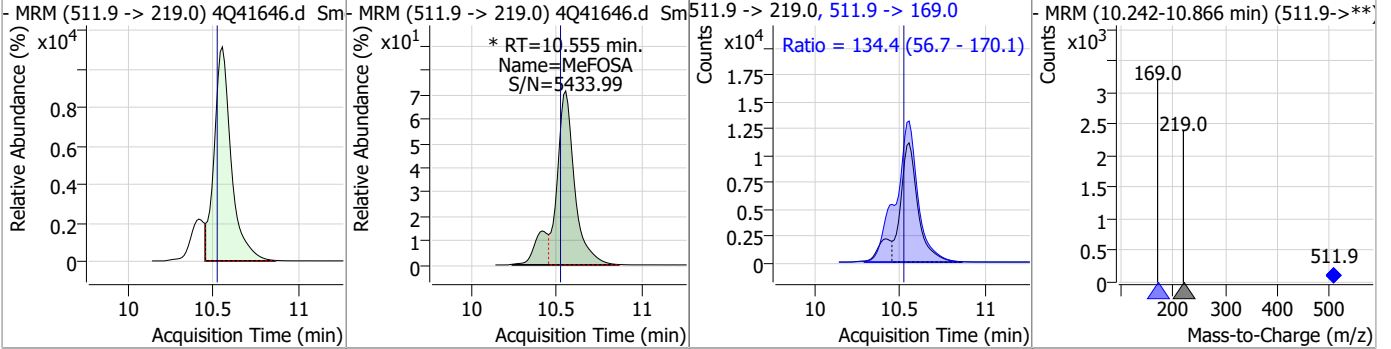


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.52	10.54	0.02	8242				

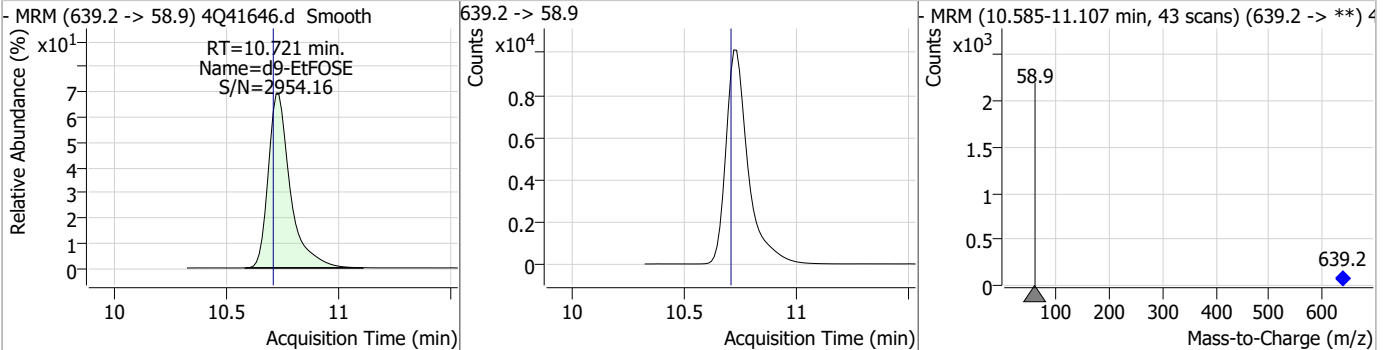


Perfluorinated Compounds by LC/MS/MS

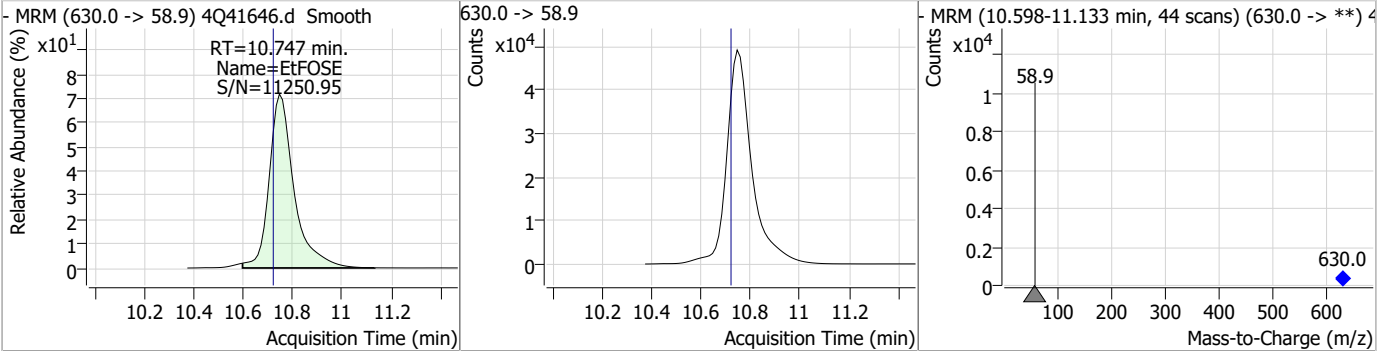
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	30.14	10.55	0.04	89643 (m)	511.9 -> 169.0	134.4	56.7	170.1



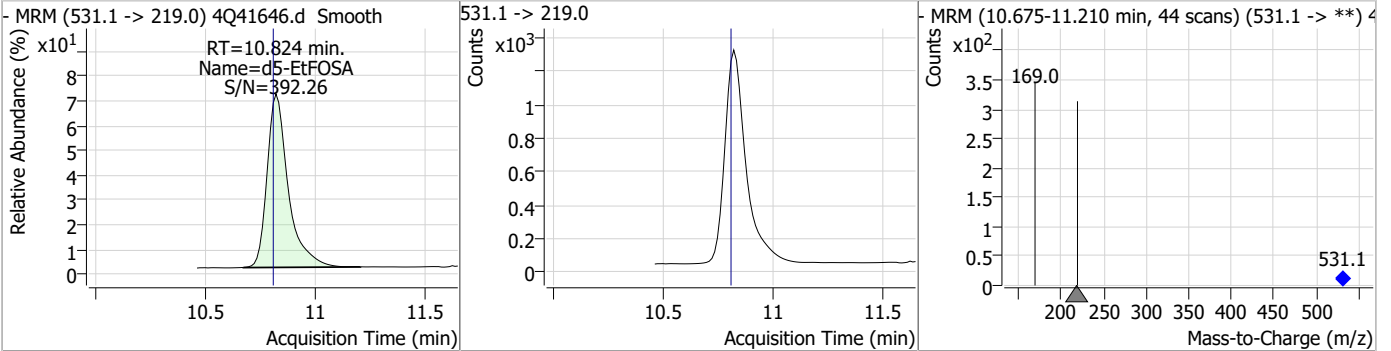
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	25.12	10.72	0.01	68975				



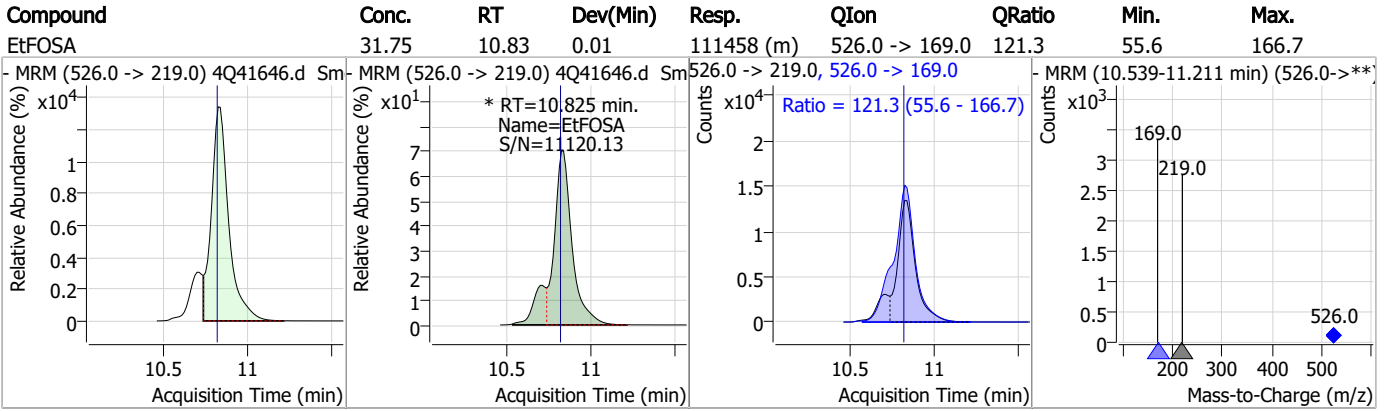
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	140.35	10.75	0.02	342872				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.49	10.82	0.01	8593				



Perfluorinated Compounds by LC/MS/MS



7.6.2

7

Manual Integration Approval Summary

Sample Number: S4Q596-RT Method: EPA DRAFT 1633
Lab FileID: 4Q41646.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 17:18 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		7.00	Split peak
Perfluorohexanesulfonic acid	355-46-4		7.12	Split peak
Perfluorononanoic acid	375-95-1		7.54	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak
MeFOSA	31506-32-8		10.55	Split peak
EtFOSA	4151-50-2		10.82	Split peak

7.6.2.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Natasha Gumtie
 03/08/23 10:59

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41703.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 4:49:09 PM
 Sample Name : RT TDCA
 Vial : P1-B3
 DA Method File : TDCA.quantmethod.xml
 Batch Name : s4q597_TDCA.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)	QValue
Internal Standards							
M8-PFOS	8.142	507.1 -> 79.9	15793	2.50	µg/L	0.000	
13C4-PFOS	8.143	502.8 -> 79.9	16598	2.50	µg/L	0.000	
System Monitoring Compounds							
13C8-PFOS	8.142	507.1 -> 79.9	15793	2.41	µg/L	0.000	
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 96.5%				
Target Compounds							
PFOS	8.143	498.9 -> 79.9	15417	2.86	µg/L	m	79
		498.9 -> 98.8	7127				
TCDCa	6.536	498.9 -> 79.9	5059	6.94	ng/ml		100
TDCA	6.698	498.9 -> 79.9	6450	9.77	ng/ml		100
TUDCA	5.705	498.9 -> 79.9	8554	6.11	ng/ml		100

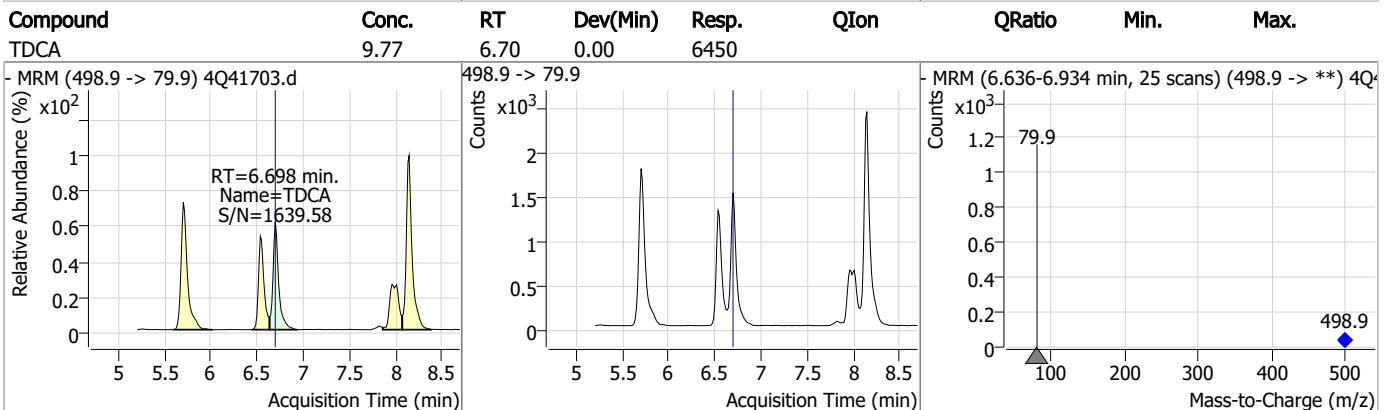
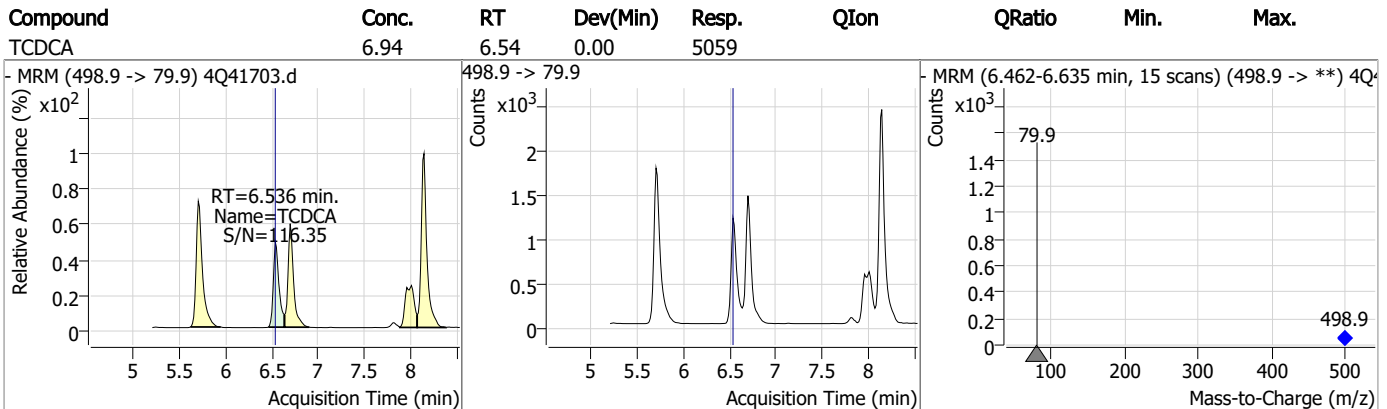
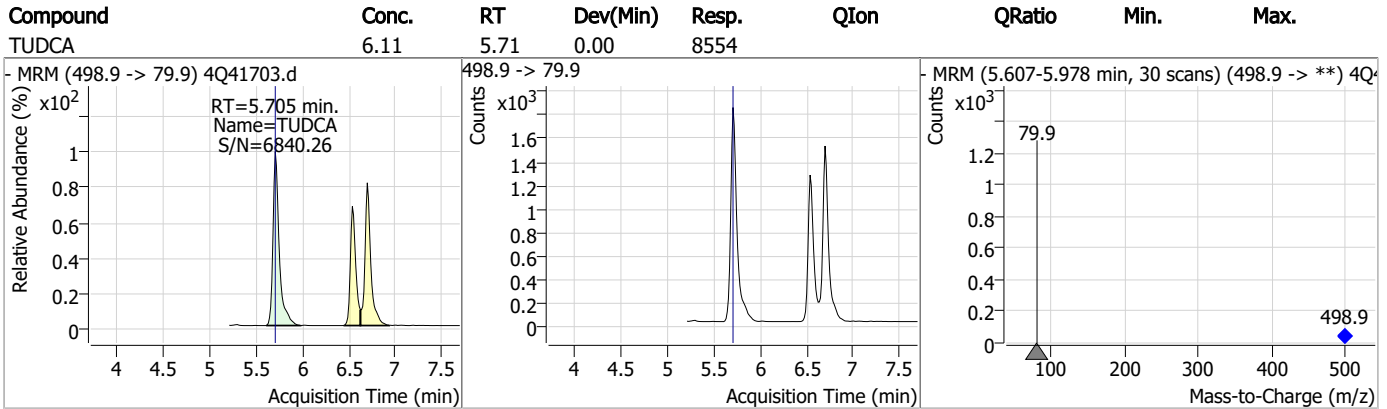
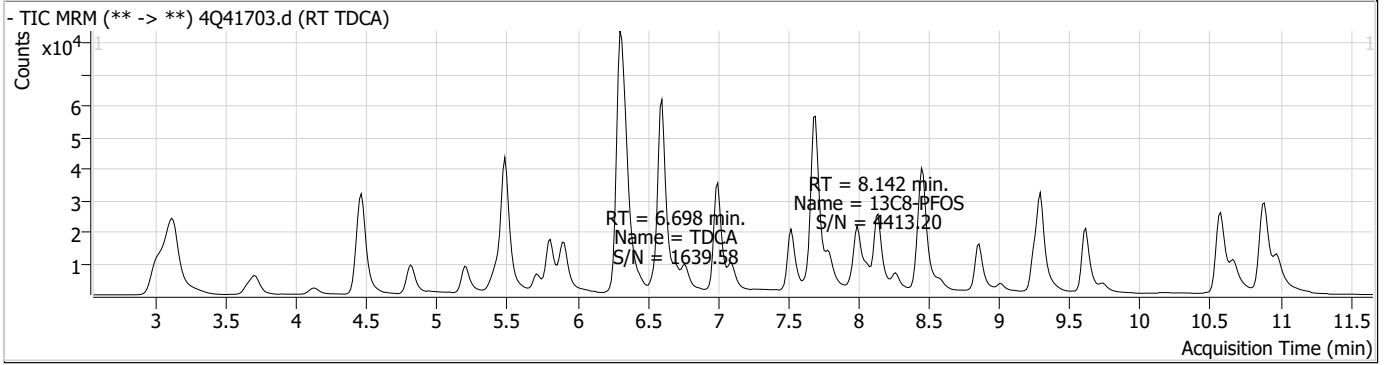
= Qualifier out of range, m = manually integrated, + = Area summed

7.6.3

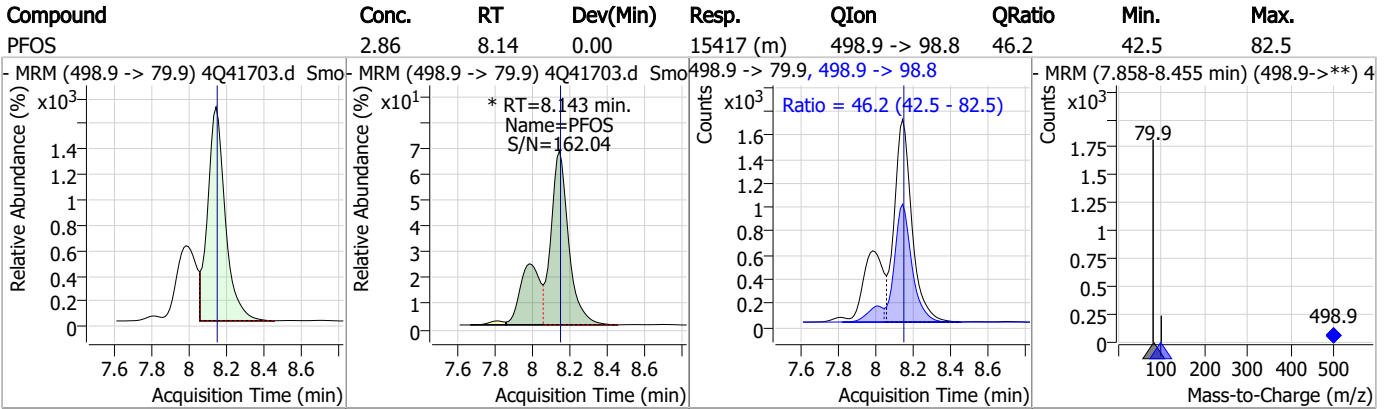
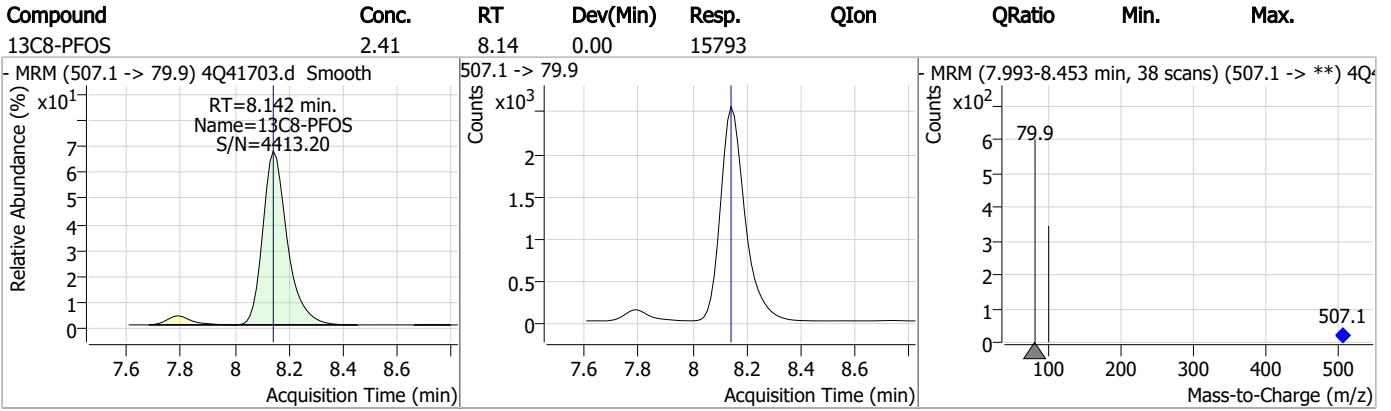
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Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



7.6.3

7



Manual Integration Approval Summary

Sample Number: S4Q597-RT Method: EPA DRAFT 1633
Lab FileID: 4Q41703.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 16:49 Supervisor approved: 03/08/23 10:59 Natasha Gumtie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak

7.6.3.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41704.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 5:03:15 PM
 Sample Name : RT_BR_LN
 Vial : P1-B4
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	148926	10.00 µg/L	0.041
M5-PFPeA	4.475	268.3 -> 223.0	81040	5.00 µg/L	0.012
M5-PFHxA	5.497	318.0 -> 273.0	68474	2.50 µg/L	-0.012
M4-PFHpA	6.355	367.1 -> 322.0	37672	2.50 µg/L	-0.012
M8-PFOA	7.000	421.1 -> 376.0	38550	2.50 µg/L	-0.025
M9-PFNA	7.521	472.1 -> 427.0	20807	1.25 µg/L	-0.025
M6-PFDA	7.992	519.1 -> 474.1	21559	1.25 µg/L	-0.037
M7-PFUnDA	8.435	570.0 -> 525.1	21300	1.25 µg/L	-0.038
M2-PFDoDA	8.856	615.1 -> 570.0	24410	1.25 µg/L	-0.050
M2-PFTeDA	9.612	715.2 -> 670.0	19276	1.25 µg/L	-0.062
M8-FOSA	9.620	506.1 -> 77.8	16383	2.50 µg/L	-0.037
M3-PFBS	5.439	302.1 -> 79.9	14854	2.50 µg/L	-0.012
M3-PFHxS	7.104	402.1 -> 79.9	9226	2.50 µg/L	-0.025
M8-PFOS	8.142	507.1 -> 79.9	12116	2.50 µg/L	-0.038
M2-4:2FTS	5.210	329.1 -> 80.9	1293	5.00 µg/L	-0.012
M2-6:2FTS	6.774	429.1 -> 80.9	1844	5.00 µg/L	-0.012
M2-8:2FTS	7.791	529.1 -> 80.9	2875	5.00 µg/L	-0.037
M3-MeFOSAA	8.062	573.2 -> 419.0	14384	5.00 µg/L	-0.037
M3-HFPO-DA	5.815	286.9 -> 168.9	35522	10.00 µg/L	-0.025
M5-EtFOSAA	8.259	589.2 -> 419.0	13057	5.00 µg/L	-0.037
M7-MeFOSE	10.561	623.2 -> 58.9	64473	25.00 µg/L	-0.075
M9-EtFOSE	10.871	639.2 -> 58.9	73959	25.00 µg/L	-0.087
M5-EtFOSA	10.986	531.1 -> 219.0	9582	2.50 µg/L	-0.087
M3-MeFOSA	10.678	515.0 -> 219.0	9100	2.50 µg/L	-0.075
13C4-PFOS	8.143	502.8 -> 79.9	12421	2.50 µg/L	-0.038
13C3-PFBA	3.155	216.0 -> 172.0	84188	5.00 µg/L	0.040
18O2-PFHxS	7.103	403.0 -> 83.9	6762	2.50 µg/L	-0.025
13C4-PFOA	7.001	417.1 -> 372.0	48127	2.50 µg/L	-0.025
13C2-PFDA	7.992	515.1 -> 470.1	18040	1.25 µg/L	-0.037
13C5-PFNA	7.522	468.0 -> 423.0	25433	1.25 µg/L	-0.025
13C2-PFHxA	5.498	315.1 -> 270.0	62425	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1293	3.53 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 70.5%		
13C2-6:2FTS	6.774	429.1 -> 80.9	1844	3.55 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 71.0%		
13C2-8:2FTS	7.791	529.1 -> 80.9	2875	3.56 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 71.1%		
13C2-PFDoDA	8.856	615.1 -> 570.0	24410	1.28 µg/L	-0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 102.4%		
13C2-PFTeDA	9.612	715.2 -> 670.0	19276	1.22 µg/L	-0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 98.0%		
13C3-PFBS	5.439	302.1 -> 79.9	14854	2.36 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 94.4%		
13C3-PFHxS	7.104	402.1 -> 79.9	9226	2.51 µg/L	-0.025

7.6.4
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C4-PFBA	3.152	216.8 -> 171.9	148926	10.29 µg/L	0.041
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 102.9%	
13C4-PFHpA	6.355	367.1 -> 322.0	37672	2.54 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.7%	
13C5-PFHxA	5.497	318.0 -> 273.0	68474	2.53 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.1%	
13C5-PFPeA	4.475	268.3 -> 223.0	81040	4.76 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 95.1%	
13C6-PFDA	7.992	519.1 -> 474.1	21559	1.39 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 111.6%	
13C7-PFUnDA	8.435	570.0 -> 525.1	21300	1.33 µg/L	-0.038
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 106.5%	
13C8-FOSA	9.620	506.1 -> 77.8	16383	2.37 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.9%	
13C8-PFOA	7.000	421.1 -> 376.0	38550	2.42 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.9%	
13C8-PFOS	8.142	507.1 -> 79.9	12116	2.48 µg/L	-0.038
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.0%	
13C9-PFNA	7.521	472.1 -> 427.0	20807	1.17 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 93.6%	
d3-MeFOSAA	8.062	573.2 -> 419.0	14384	4.15 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.9%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	35522	11.24 µg/L	-0.025
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 112.4%	
d3-MeFOSA	10.678	515.0 -> 219.0	9100	2.59 µg/L	-0.075
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.5%	
d5-EtFOSAA	8.259	589.2 -> 419.0	13057	4.61 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 92.2%	
d7-MeFOSE	10.561	623.2 -> 58.9	64473	24.37 µg/L	-0.075
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 97.5%	
d9-EtFOSE	10.871	639.2 -> 58.9	73959	25.02 µg/L	-0.087
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 100.1%	
d5-EtFOSA	10.986	531.1 -> 219.0	9582	2.58 µg/L	-0.087
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.2%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	83726	47.54 µg/L	96
		327.1 -> 80.9	35603		
6:2FTS	6.774	427.1 -> 407.0	64631	48.43 µg/L	99
		427.1 -> 80.9	27686		
8:2FTS	7.792	527.1 -> 507.0	65136	50.33 µg/L	100
		527.1 -> 80.8	28278		
EtFOSAA	8.272	584.2 -> 419.1	24504	11.67 µg/L	m 98
		584.2 -> 526.0	10788		
FOSA	9.624	498.1 -> 77.9	175763	29.79 µg/L	m 98
		498.1 -> 478.0	4859		
MeFOSAA	8.062	570.1 -> 419.0	24926	12.61 µg/L	97
		570.1 -> 483.0	4899		
PFBA	3.158	212.8 -> 168.9	162431	50.65 µg/L	100
PFBS	5.440	298.7 -> 79.9	61211	11.52 µg/L	99
		298.7 -> 98.8	23511		
PFDA	7.992	512.9 -> 469.0	154089	12.48 µg/L	98
		512.9 -> 219.0	29960		
PFDoDA	8.856	613.1 -> 569.0	194301	12.24 µg/L	99
		613.1 -> 319.0	28102		
PFDS	9.007	599.0 -> 79.9	30324	11.87 µg/L	98

7.64
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.355	599.0 -> 98.8	14474	12.68	µg/L	98
		363.1 -> 319.0	240954			
PFHpS	7.661	363.1 -> 169.0	41016	11.58	µg/L	97
		449.0 -> 79.9	38322			
PFHxA	5.500	449.0 -> 98.9	19671	12.29	µg/L	100
		313.0 -> 269.0	257273			
PFHxS	7.105	313.0 -> 118.9	7669	10.69	µg/L	m
		398.7 -> 79.9	35986			
PFNA	7.522	398.7 -> 98.9	18091	25.60	µg/L	m
		463.0 -> 419.0	281474			
PFNS	8.587	463.0 -> 219.0	76209	12.97	µg/L	98
		548.8 -> 79.9	24901			
PFOA	7.001	548.8 -> 98.9	12871	27.86	µg/L	m
		413.0 -> 369.0	486645			
PFOS	8.143	413.0 -> 169.0	101813	10.72	µg/L	m
		498.9 -> 79.9	54930			
PFPeA	4.477	498.9 -> 98.8	27472	26.39	µg/L	100
		263.0 -> 219.0	410025			
PFPeS	6.407	349.1 -> 79.9	34148	11.01	µg/L	99
		349.1 -> 98.9	14426			
PFTeDA	9.613	713.1 -> 669.0	172685	12.91	µg/L	99
		713.1 -> 168.9	14301			
PFTrDA	9.241	663.0 -> 619.0	232243	12.22	µg/L	98
		663.0 -> 168.9	22315			
PFUnDA	8.436	563.1 -> 519.0	134641	12.31	µg/L	97
		563.1 -> 269.1	25870			
11Cl-PF3OUdS	9.294	630.9 -> 450.9	435681	43.02	µg/L	100
		632.9 -> 452.9	135266			
9Cl-PF3ONS	8.463	530.8 -> 351.0	568862	47.51	µg/L	97
		532.8 -> 353.0	174831			
ADONA	6.606	376.9 -> 250.9	1049758	44.98	µg/L	99
		376.9 -> 84.8	281432			
HFPO-DA	5.816	284.9 -> 168.9	148260	53.02	µg/L	100
		284.9 -> 184.9	17009			
3:3FTCA	4.154	241.0 -> 177.0	56604	67.51	µg/L	99
		241.0 -> 117.0	5092			
5:3FTCA	6.320	341.0 -> 237.1	1090236	314.36	µg/L	98
		341.0 -> 217.0	779439			
7:3FTCA	7.699	441.0 -> 316.9	405486	313.99	µg/L	99
		441.0 -> 336.9	926246			
EtFOSA	11.000	526.0 -> 219.0	120871	30.88	µg/L	m
		526.0 -> 169.0	152190			
EtFOSE	10.896	630.0 -> 58.9	377098	143.96	µg/L	100
		511.9 -> 219.0	97158			
MeFOSA	10.679	511.9 -> 169.0	131089	29.59	µg/L	m
		616.1 -> 58.9	344409			
MeFOSE	10.587	699.1 -> 79.9	25989	139.91	µg/L	100
		699.1 -> 98.8	14494			
PFDoDS	9.740	295.0 -> 201.0	20349	12.00	µg/L	99
		295.0 -> 84.9	5107			
NFDHA	5.391	279.0 -> 85.1	237285	28.60	µg/L	98
		229.0 -> 84.9	206759			
PFMBA	4.829	314.8 -> 134.9	364879	27.60	µg/L	100
		314.8 -> 82.9	12513			
PFMPA	3.727			23.05	µg/L	99
PFEESA	5.909					

= Qualifier out of range, m = manually integrated, + = Area summed

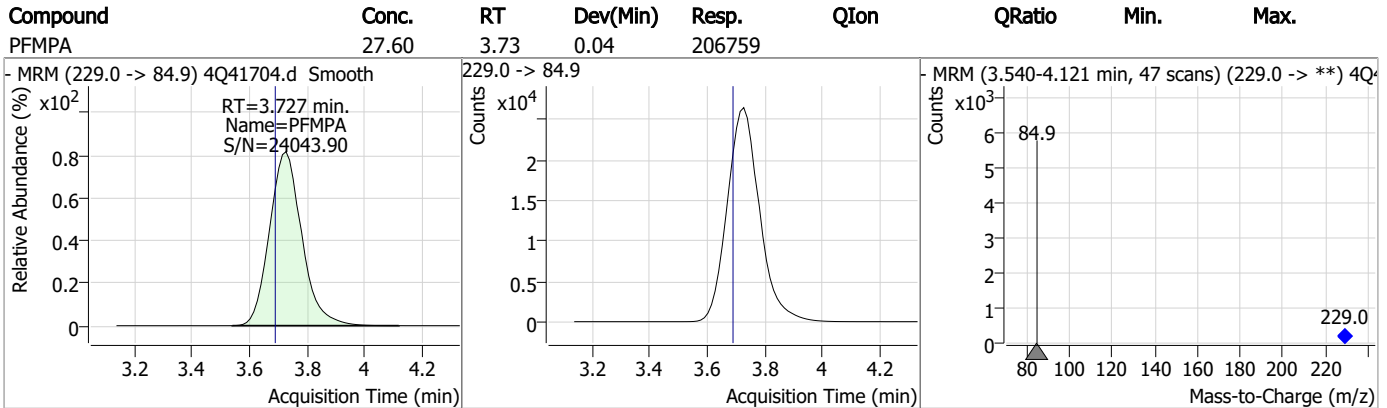
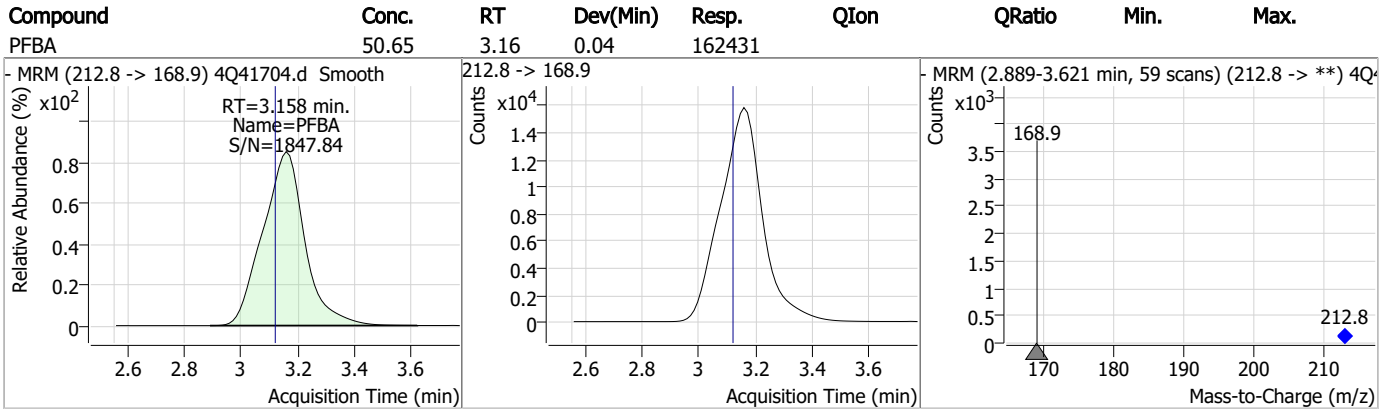
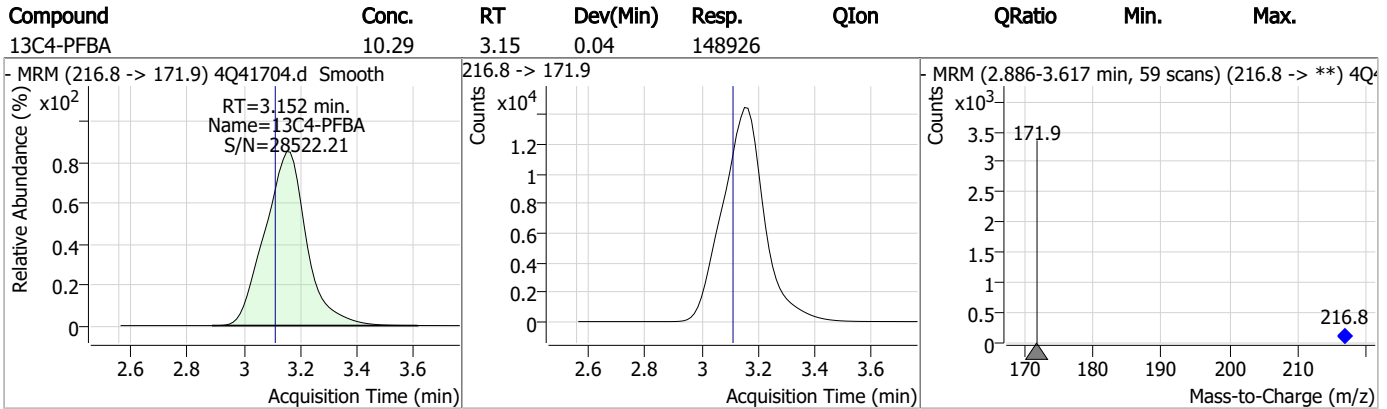
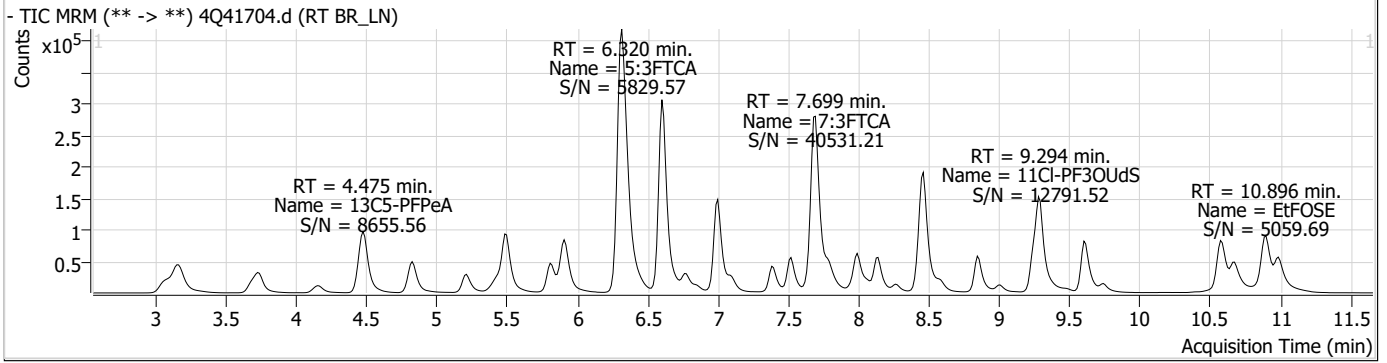
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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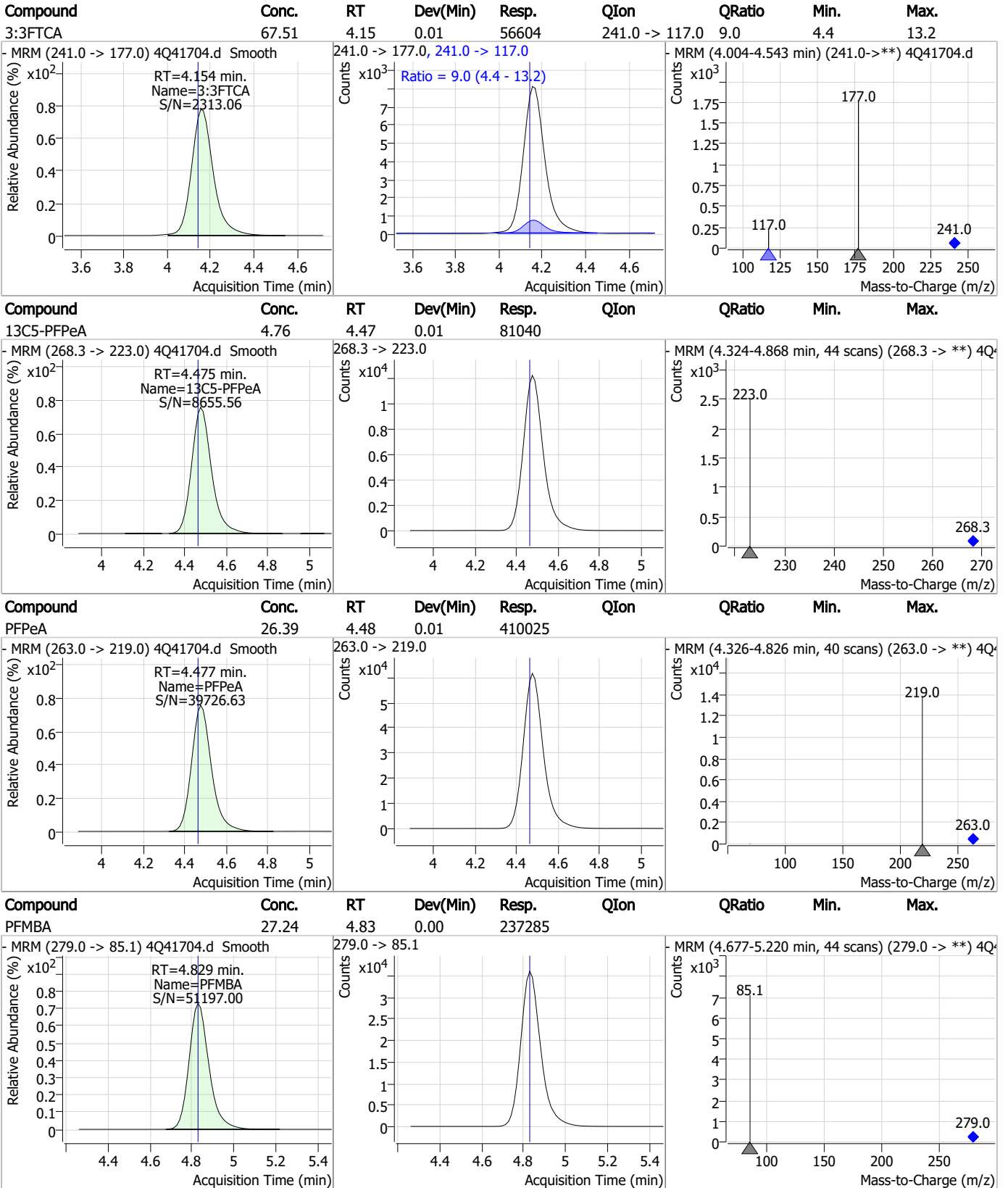
7.6.4

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Perfluorinated Compounds by LC/MS/MS



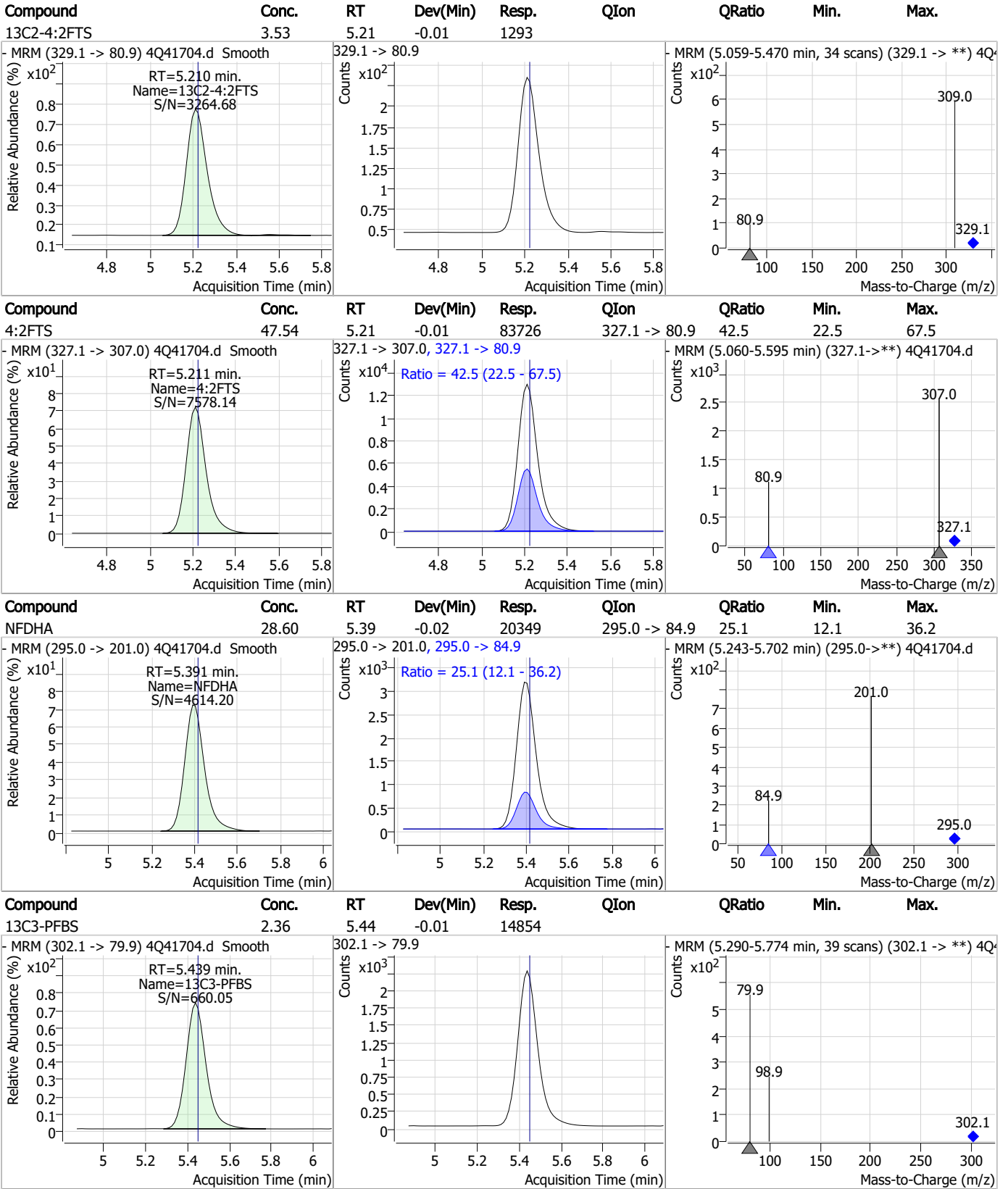
Perfluorinated Compounds by LC/MS/MS



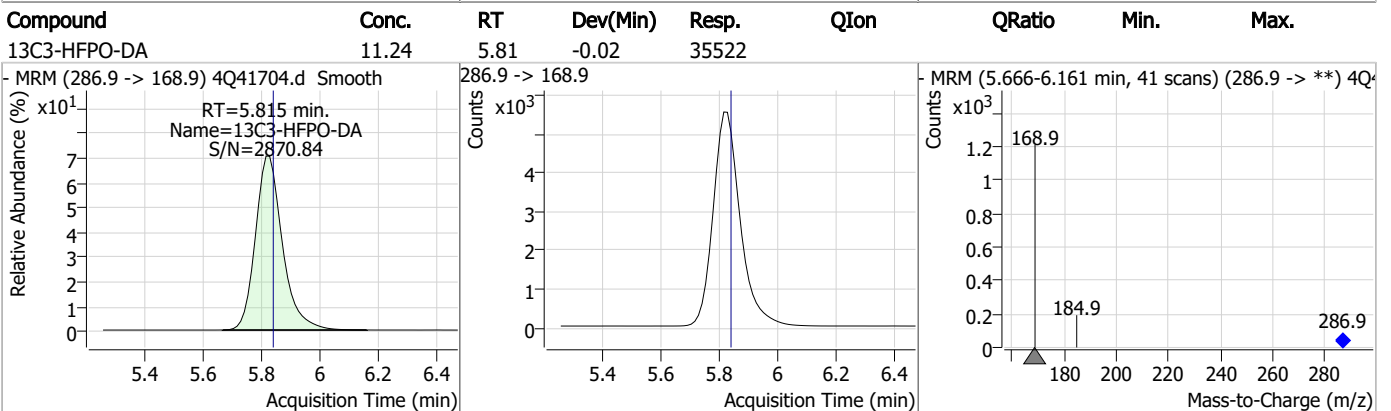
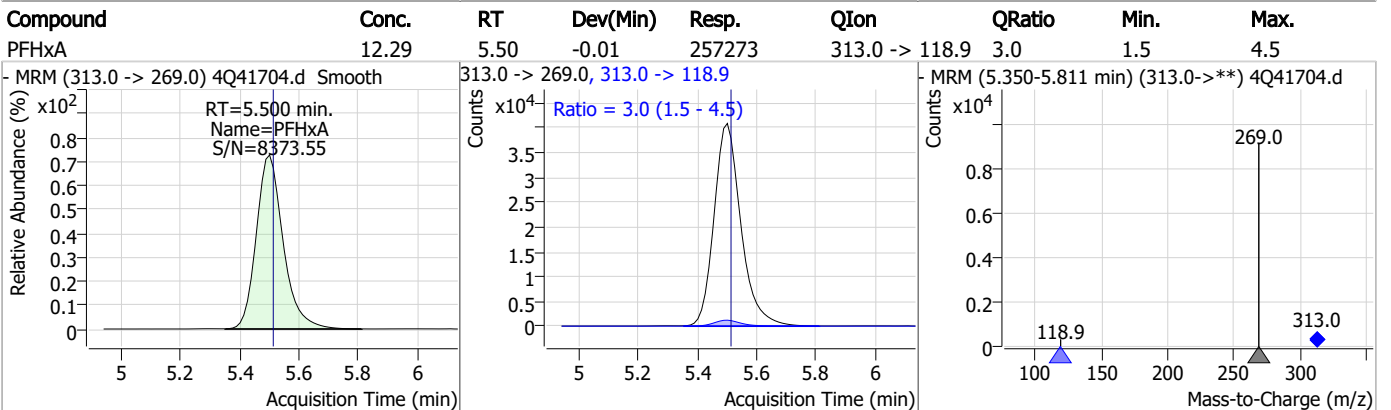
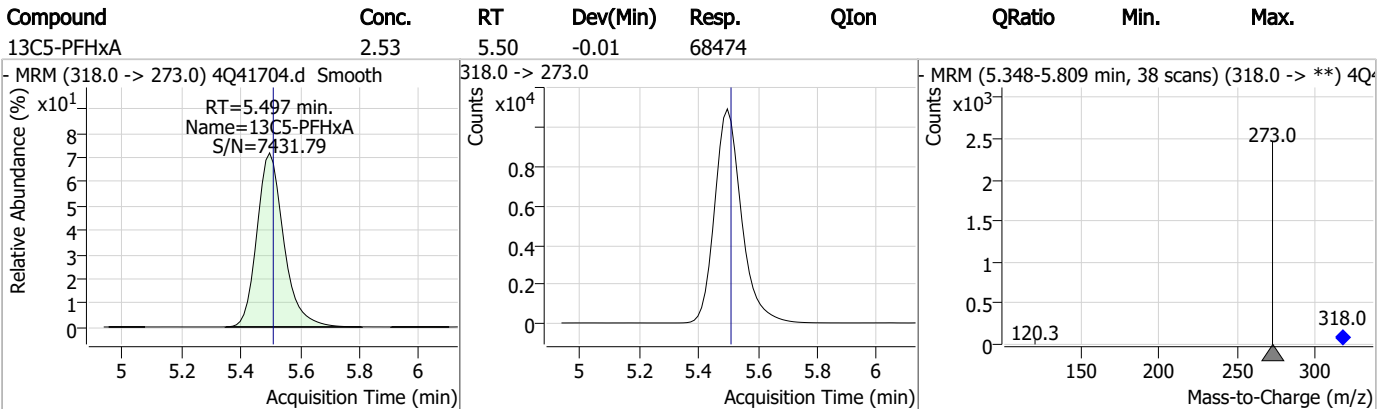
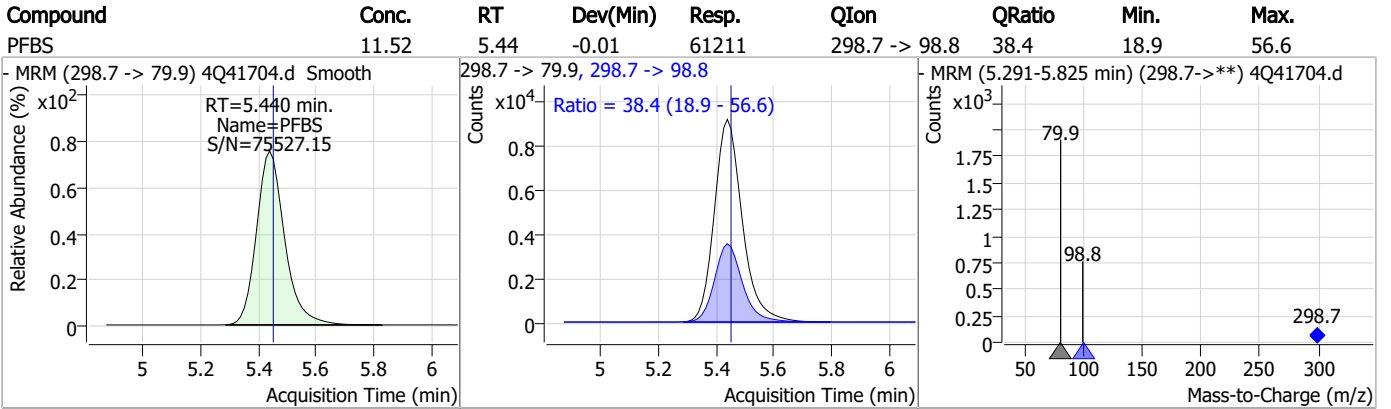
7.6.4

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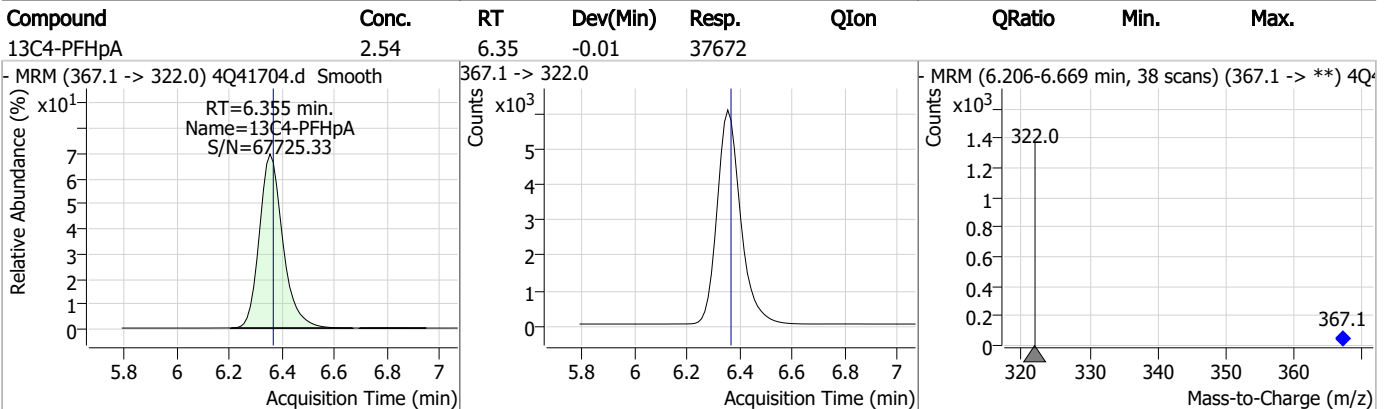
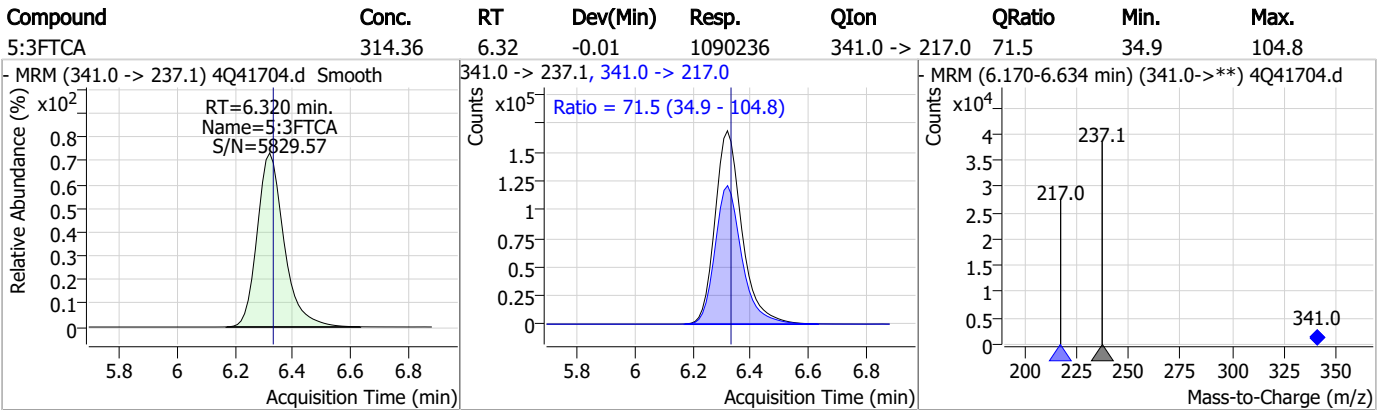
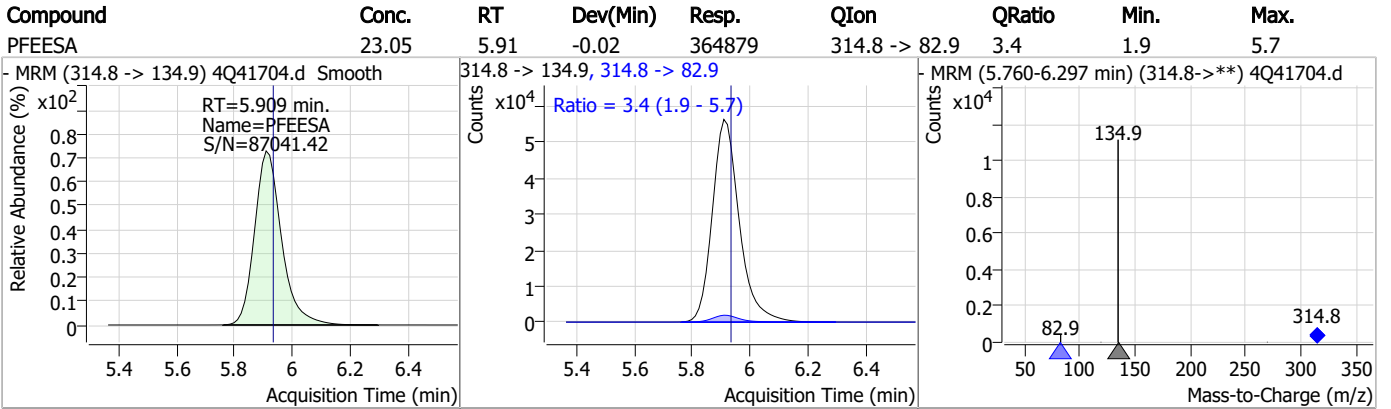
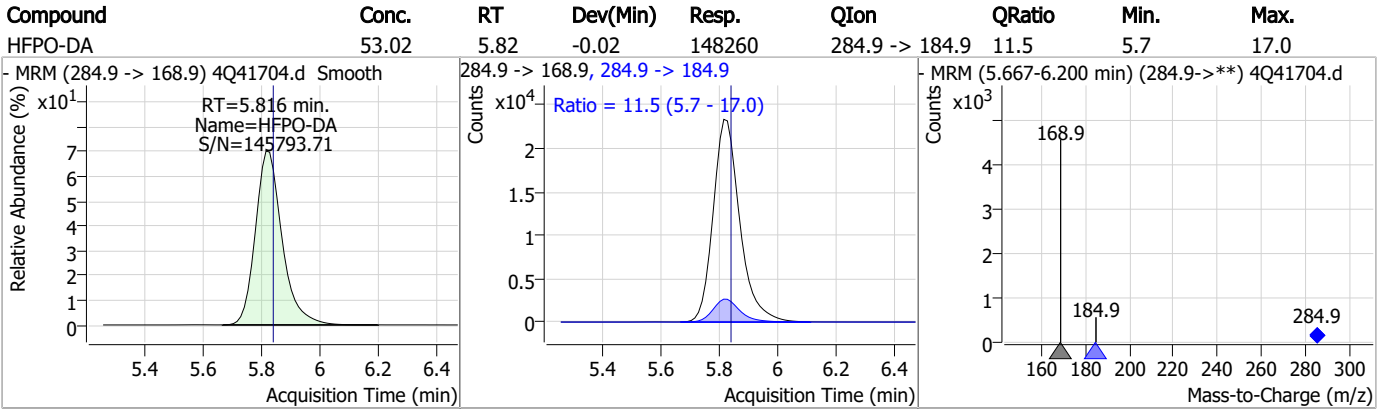
Perfluorinated Compounds by LC/MS/MS



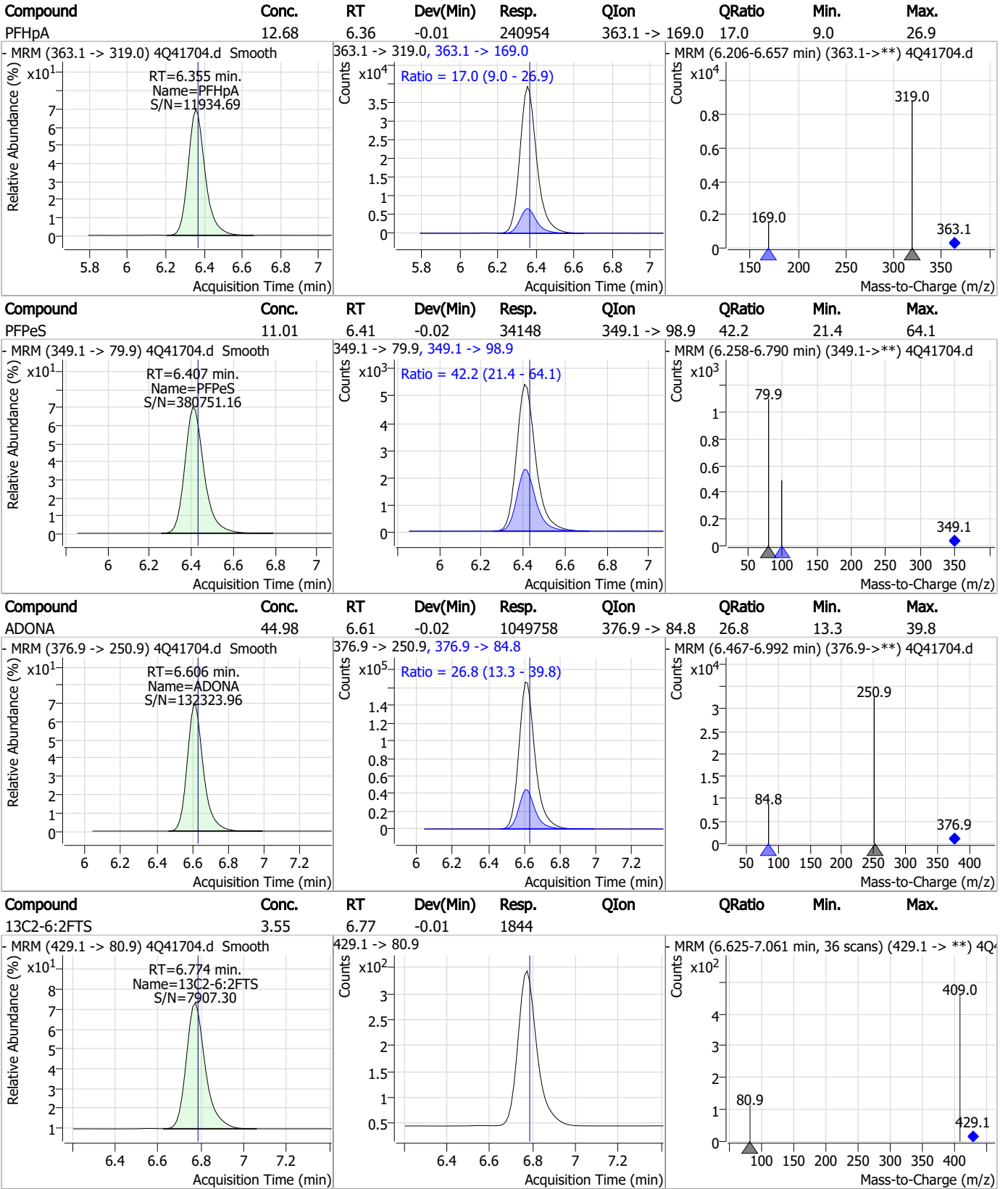
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



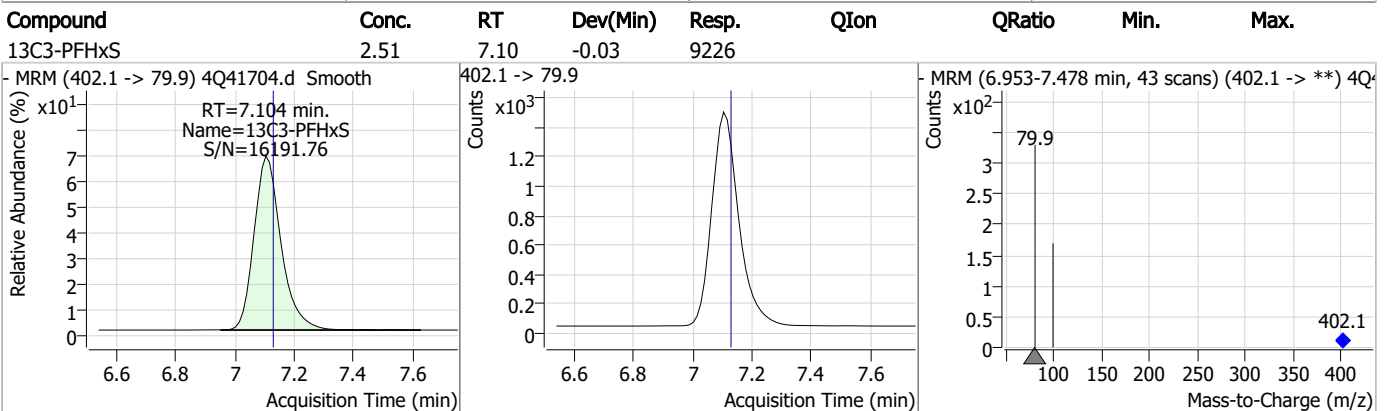
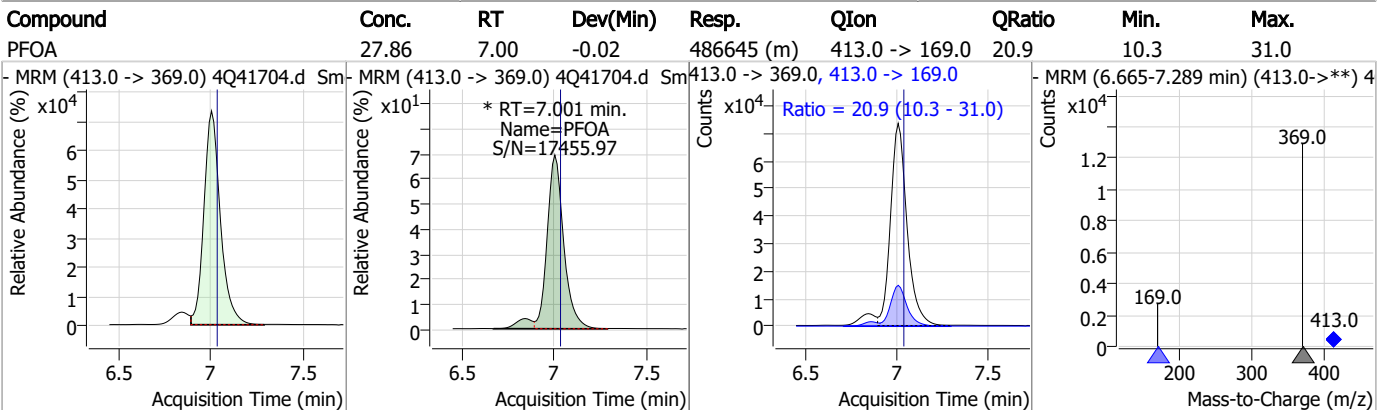
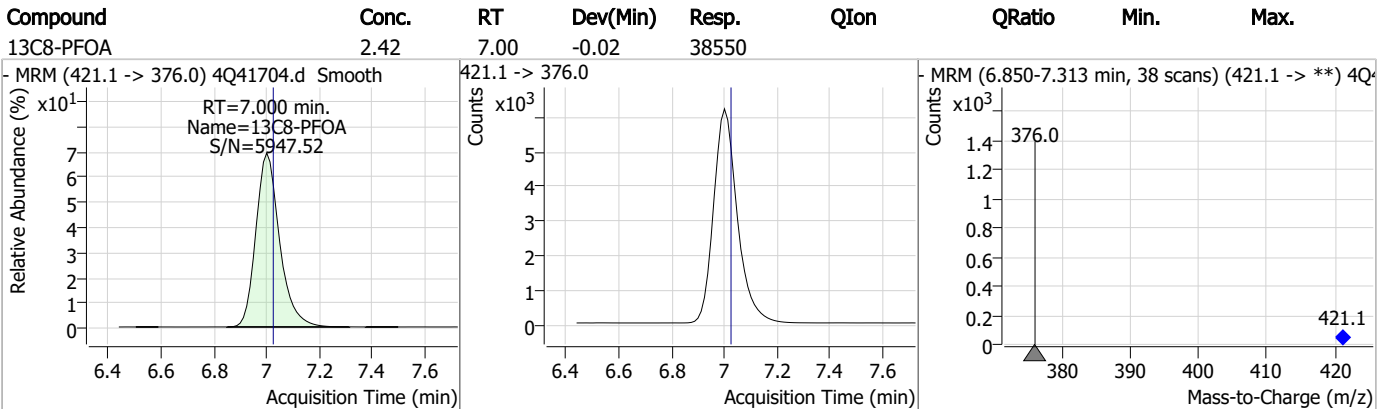
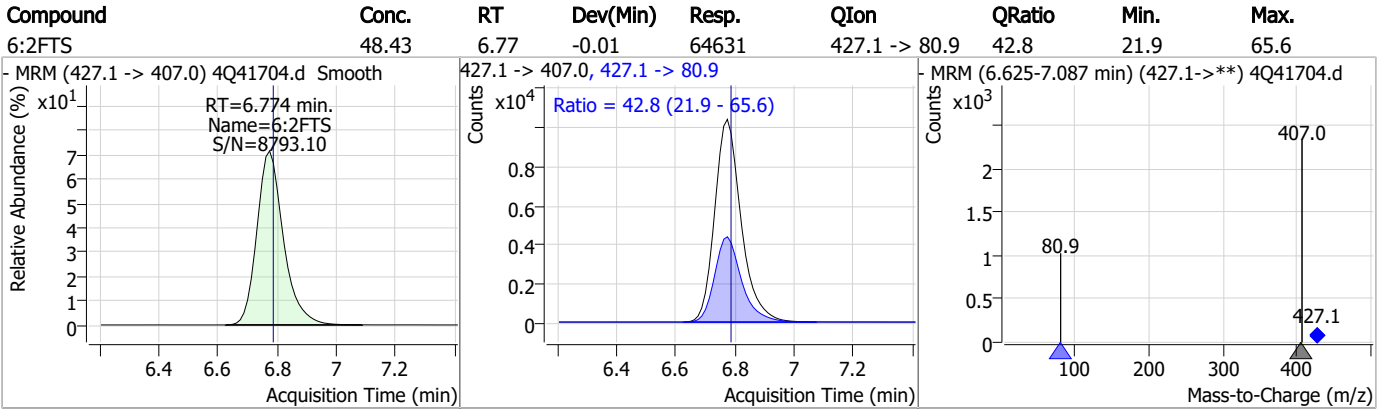
Perfluorinated Compounds by LC/MS/MS



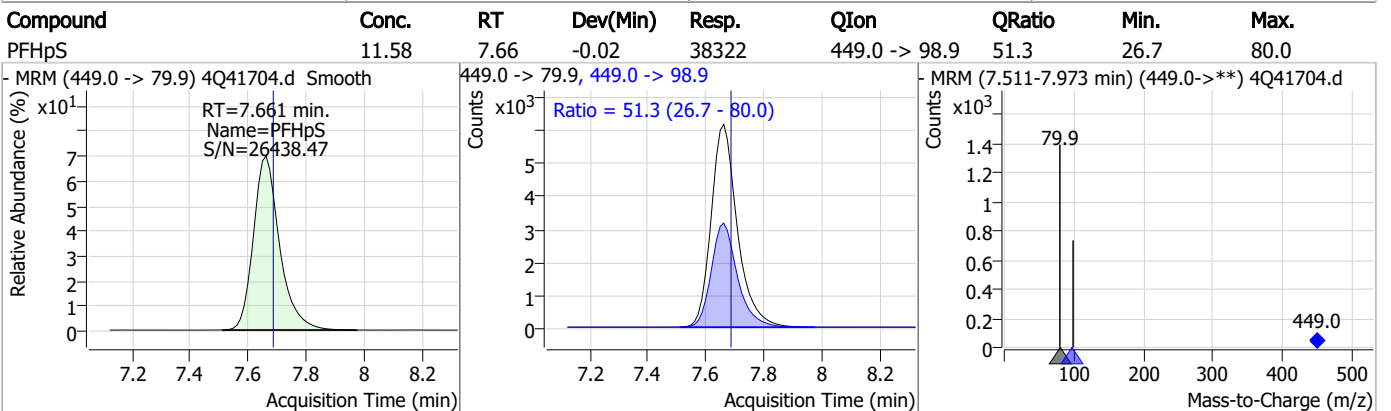
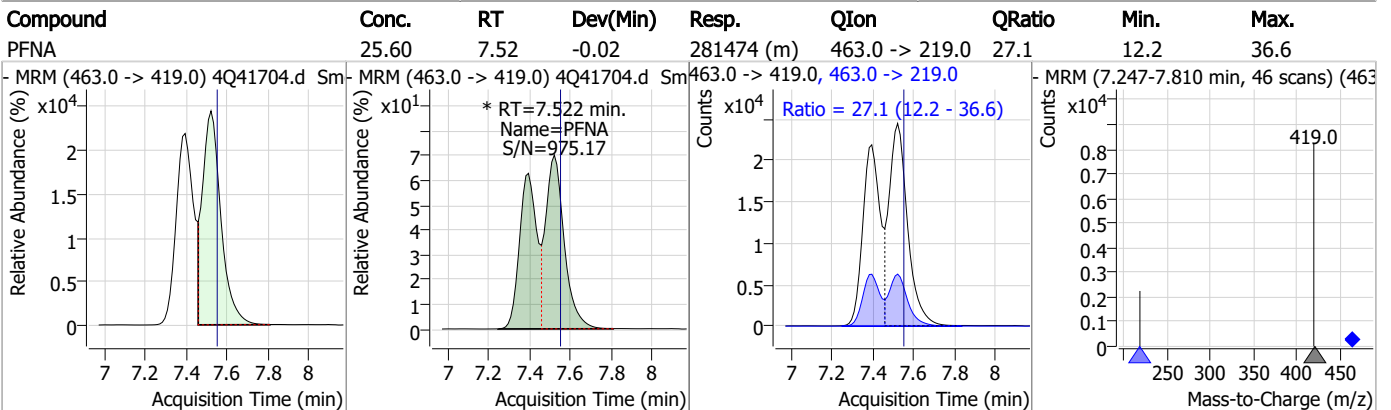
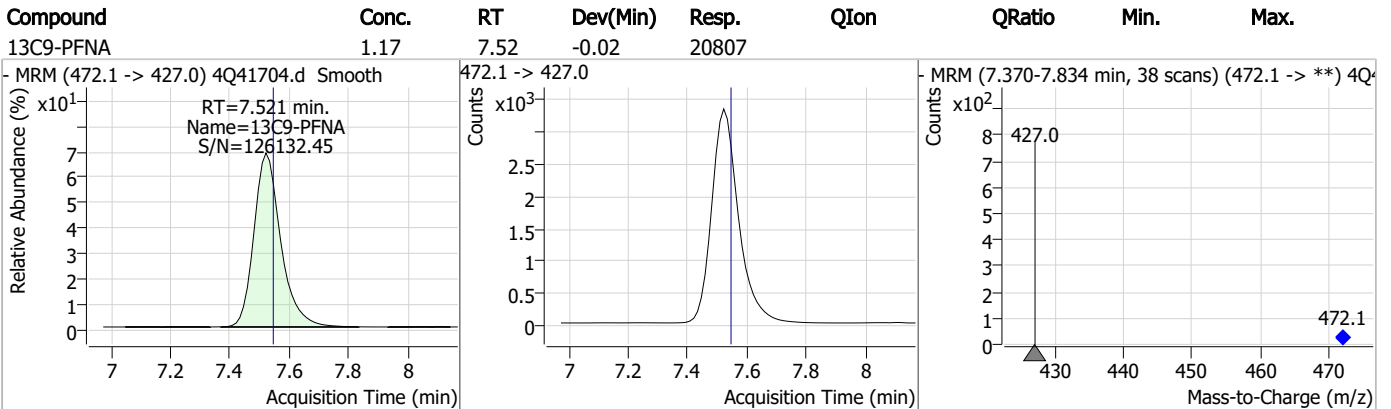
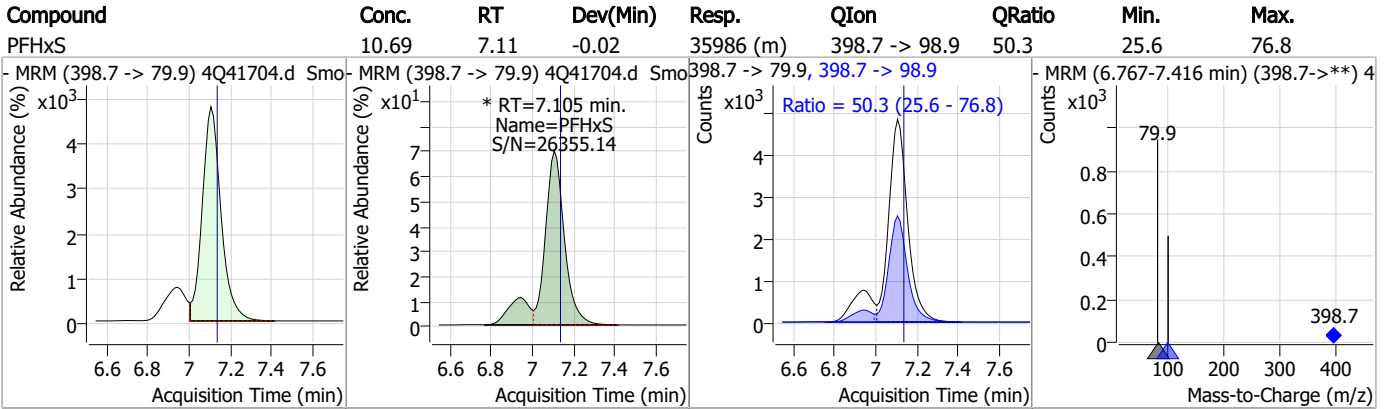
7.6.4

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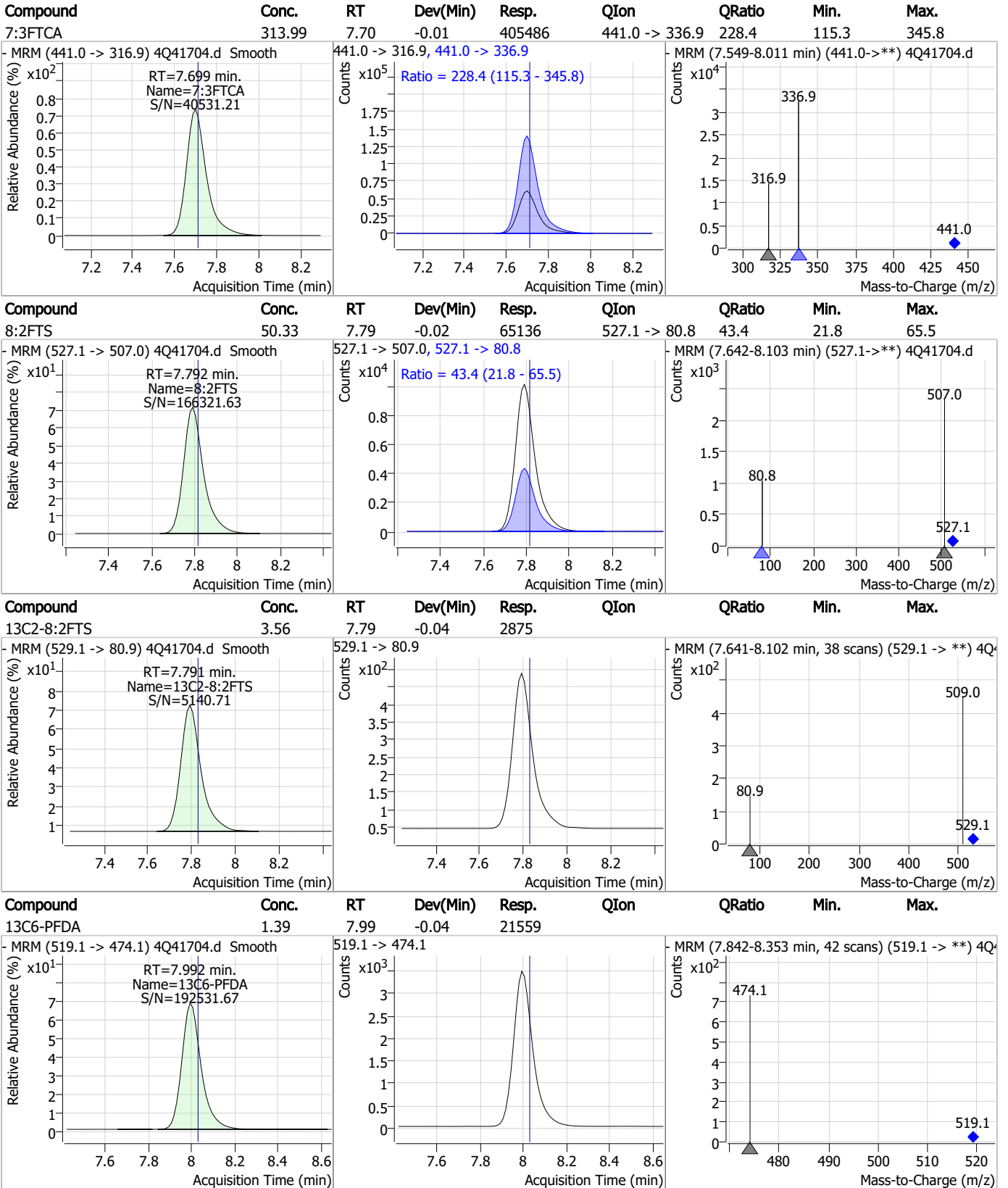
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



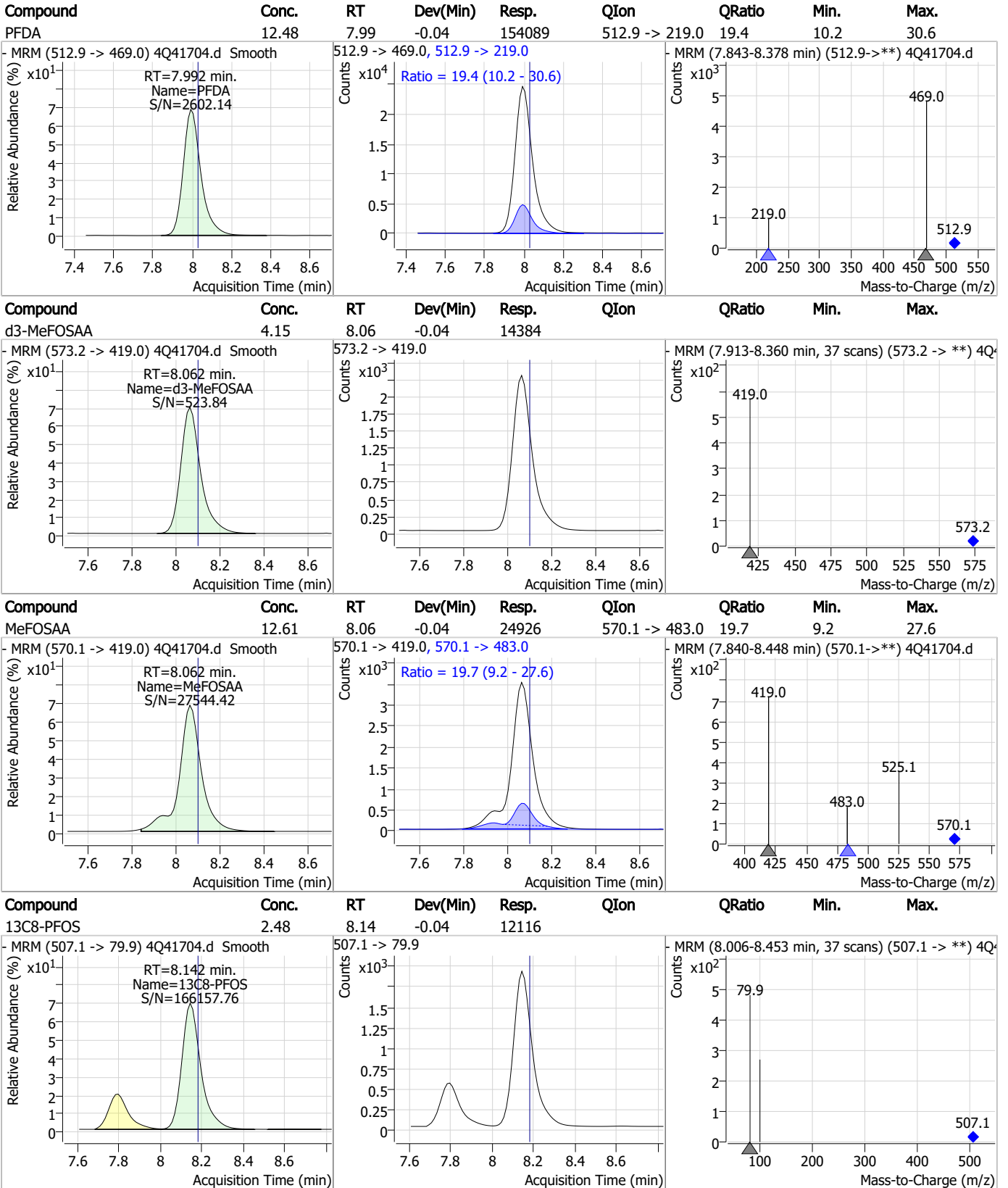
Perfluorinated Compounds by LC/MS/MS



7.6.4

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Perfluorinated Compounds by LC/MS/MS

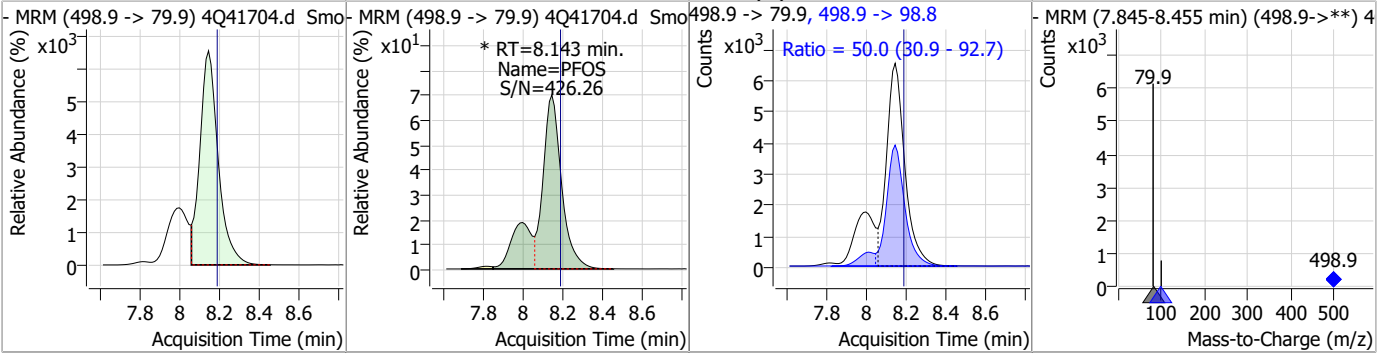


7.6.4

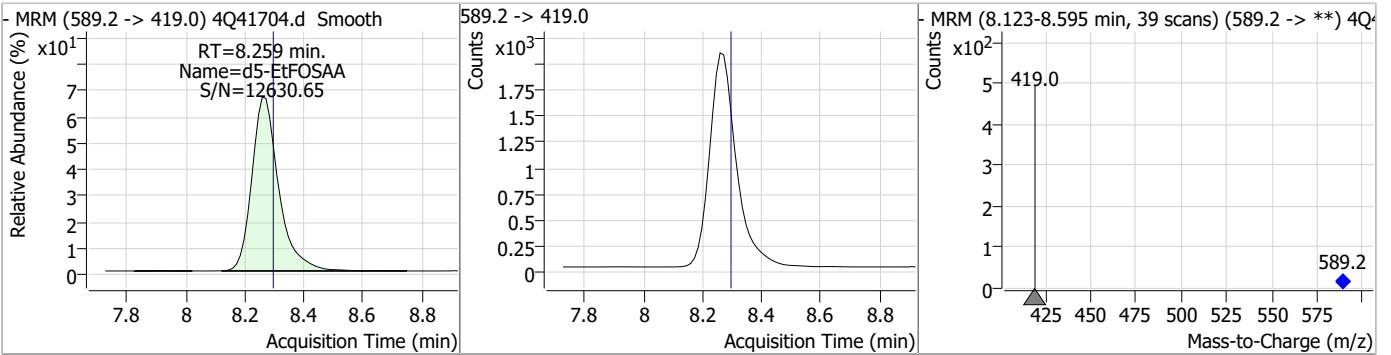
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Perfluorinated Compounds by LC/MS/MS

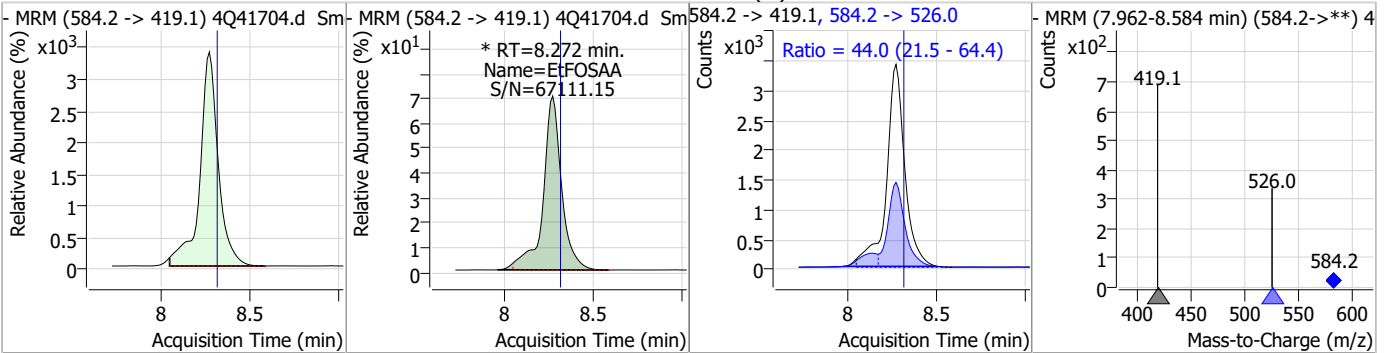
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	10.72	8.14	-0.04	54930 (m)	498.9 -> 98.8	50.0	30.9	92.7



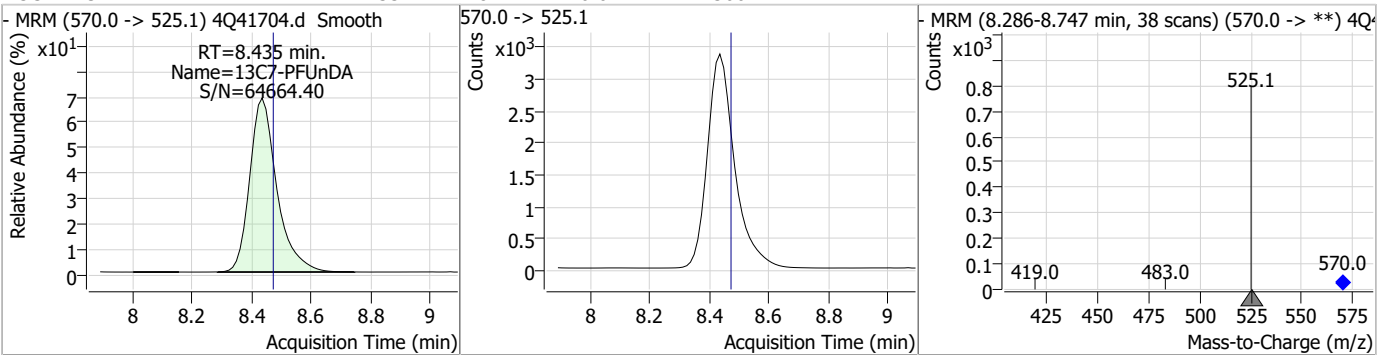
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	4.61	8.26	-0.04	13057				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	11.67	8.27	-0.04	24504 (m)	584.2 -> 526.0	44.0	21.5	64.4

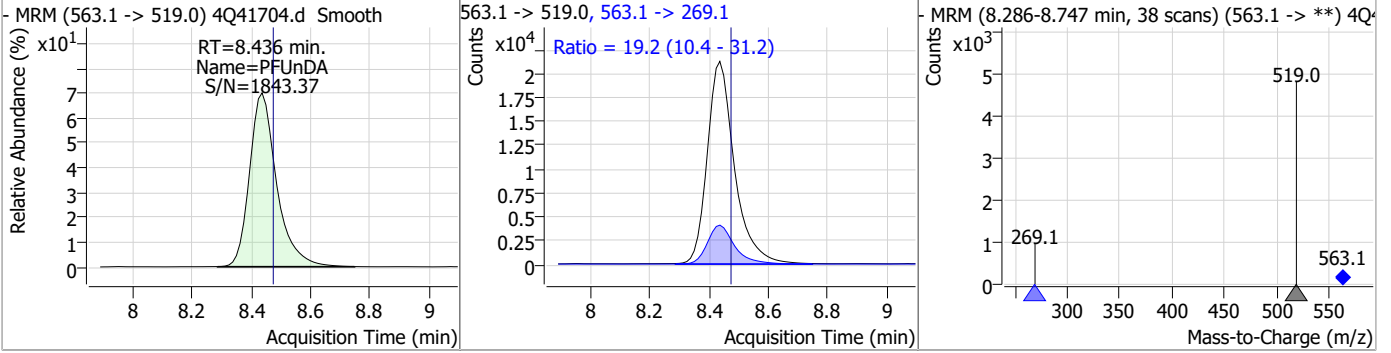


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C7-PFUnDA	1.33	8.44	-0.04	21300				

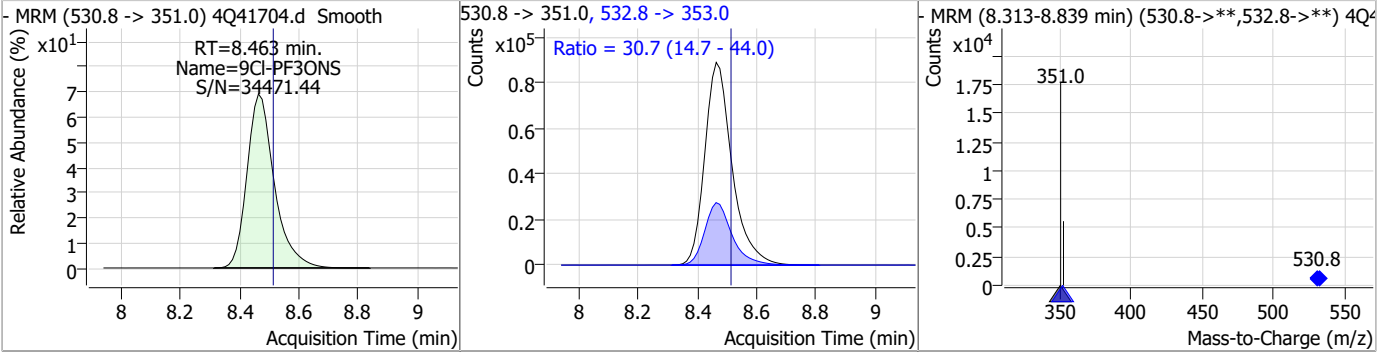


Perfluorinated Compounds by LC/MS/MS

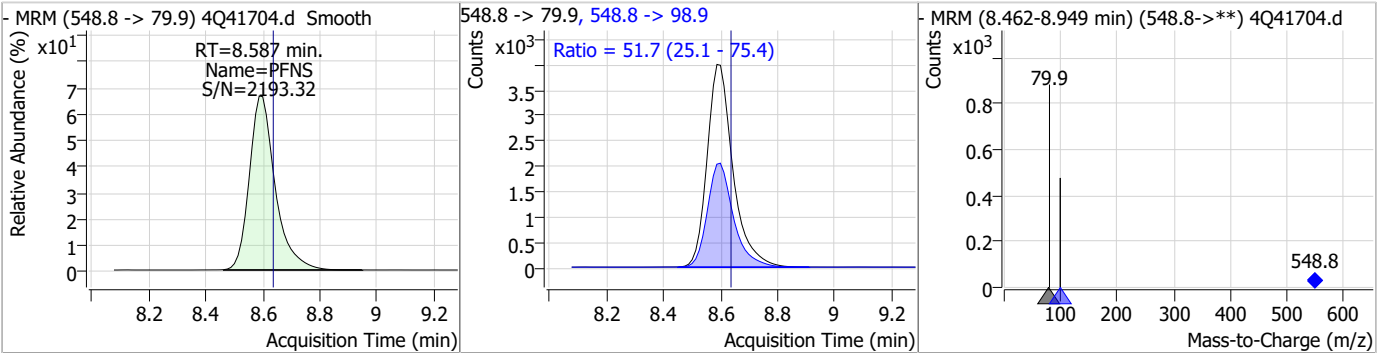
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	12.31	8.44	-0.04	134641	563.1 -> 269.1	19.2	10.4	31.2



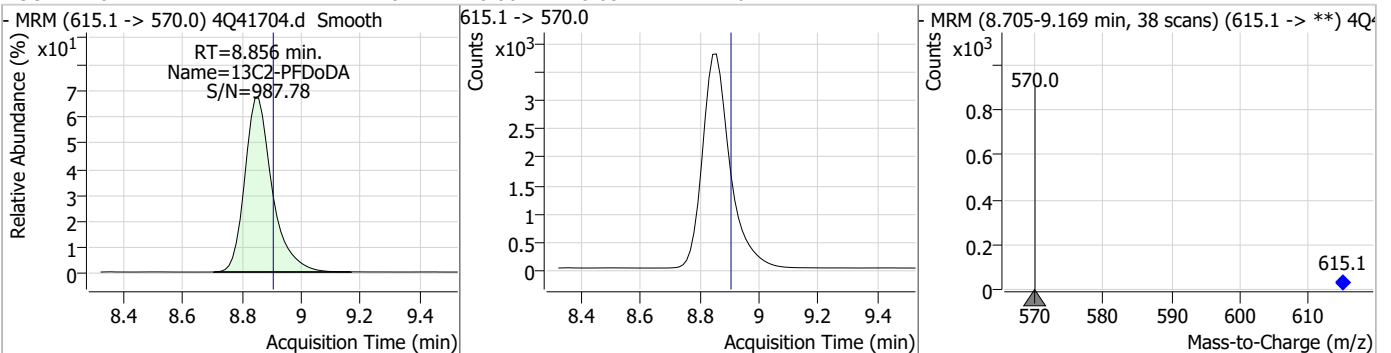
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	47.51	8.46	-0.05	568862	532.8 -> 353.0	30.7	14.7	44.0



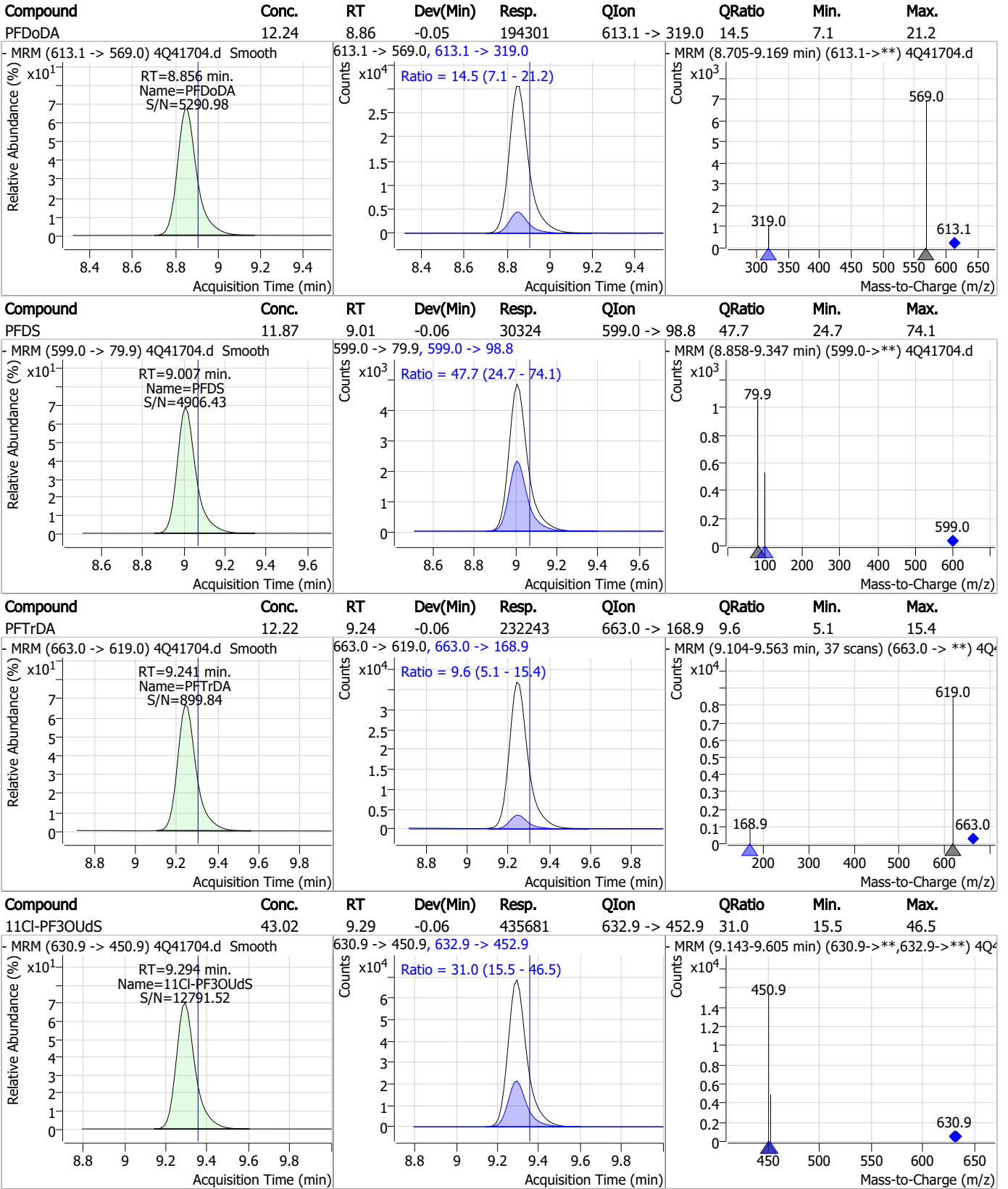
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	12.97	8.59	-0.05	24901	548.8 -> 98.9	51.7	25.1	75.4



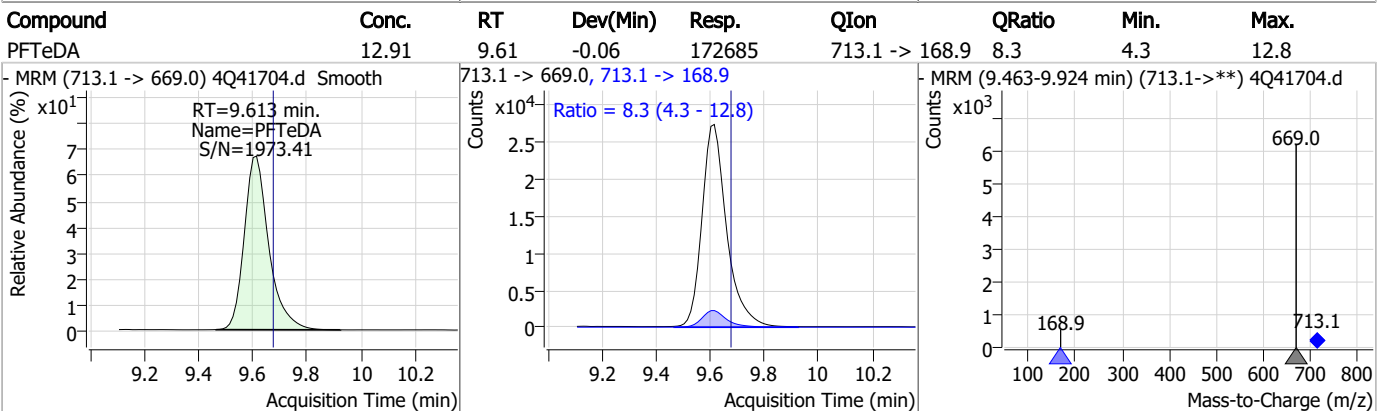
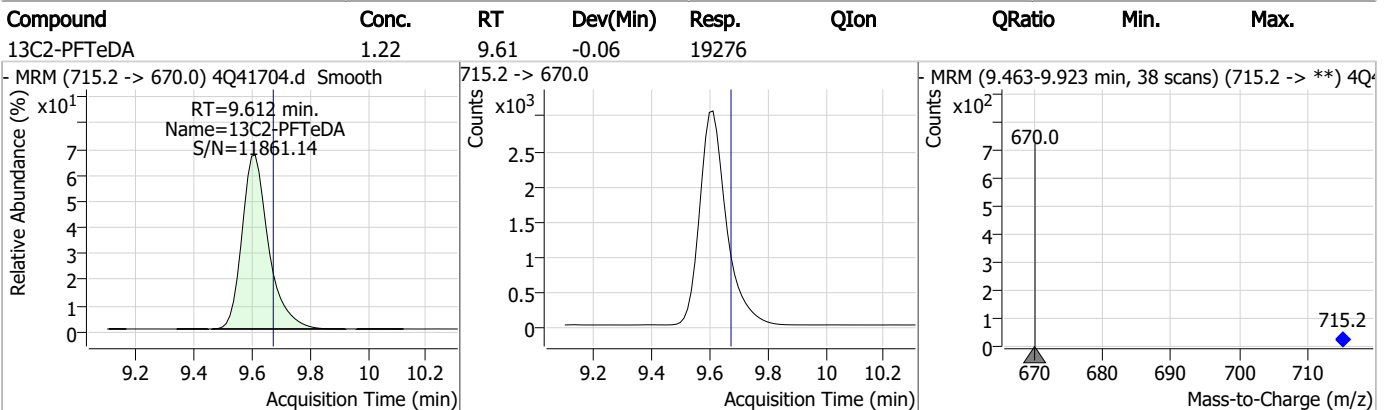
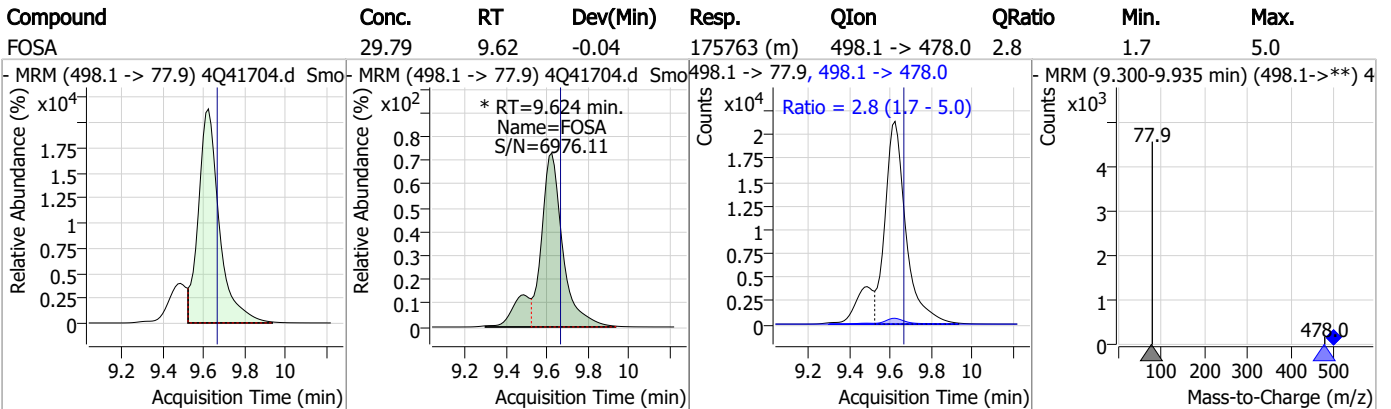
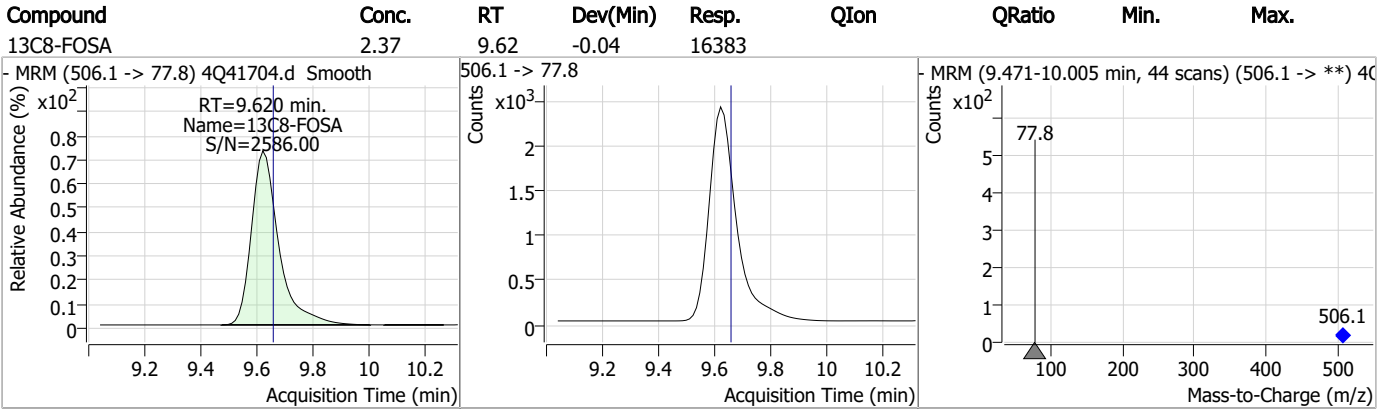
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA	1.28	8.86	-0.05	24410	615.1 -> 570.0	-	-	-



Perfluorinated Compounds by LC/MS/MS

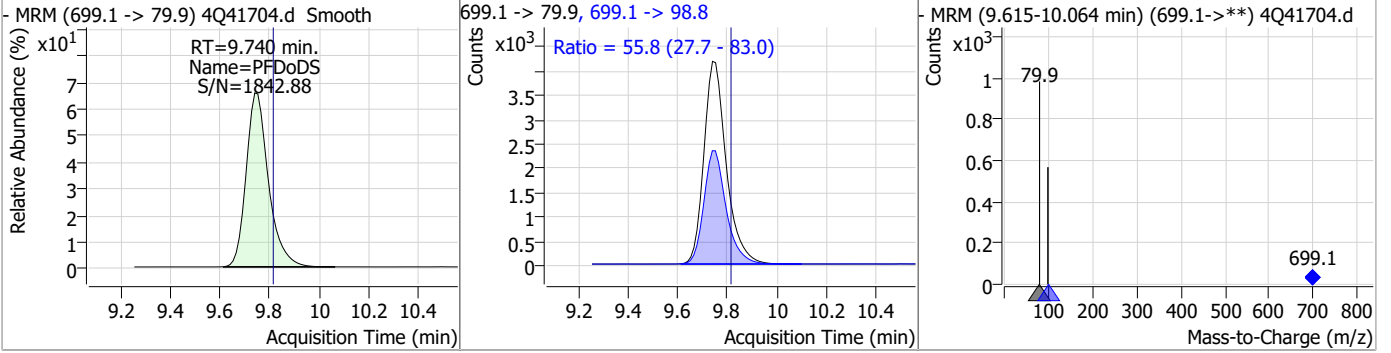


Perfluorinated Compounds by LC/MS/MS

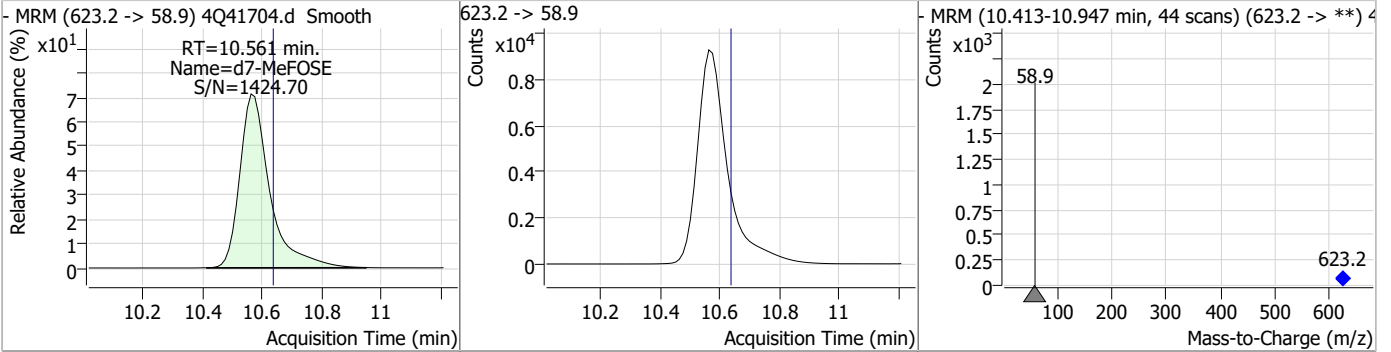


Perfluorinated Compounds by LC/MS/MS

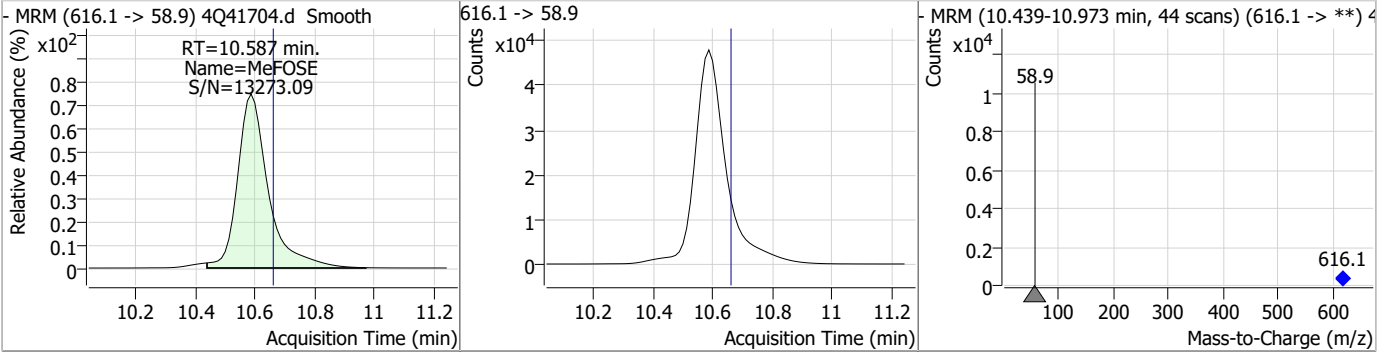
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFD _o DS	12.00	9.74	-0.07	25989	699.1 -> 98.8	55.8	27.7	83.0



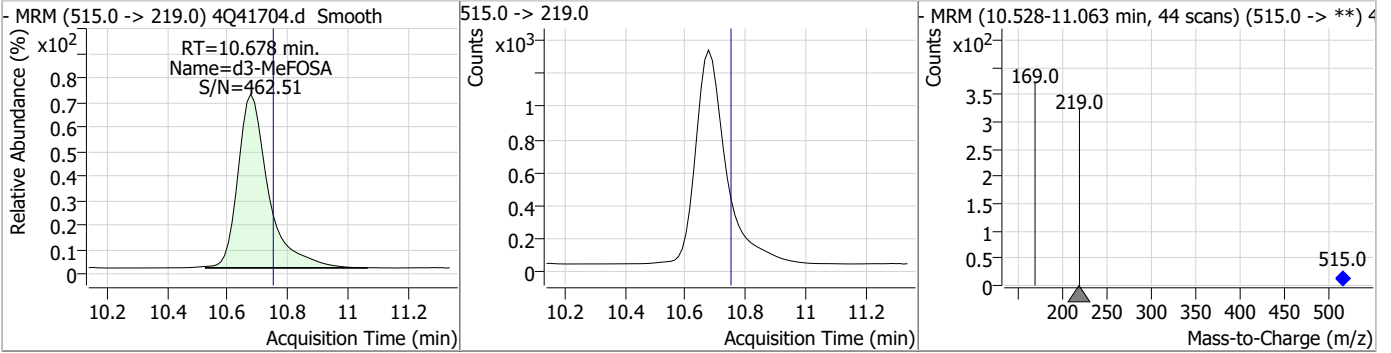
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	24.37	10.56	-0.07	64473				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	139.91	10.59	-0.07	344409				



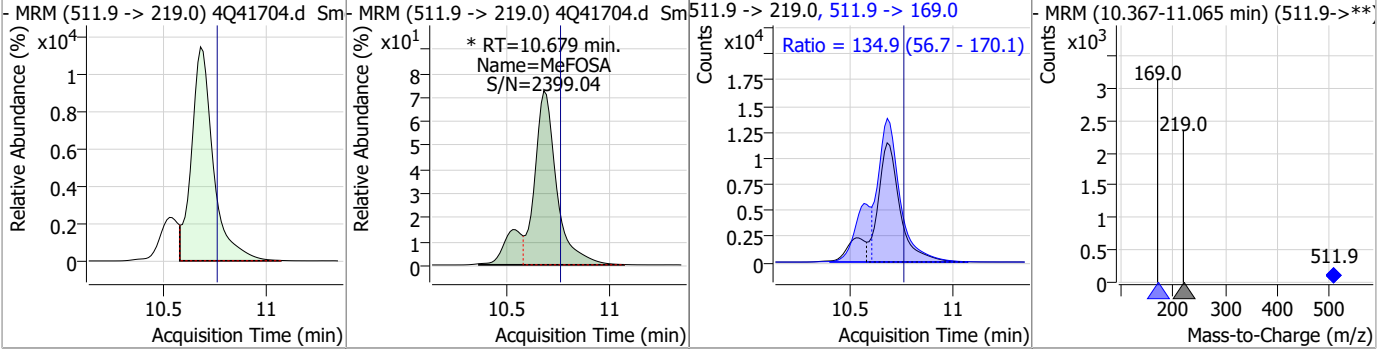
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.59	10.68	-0.07	9100				



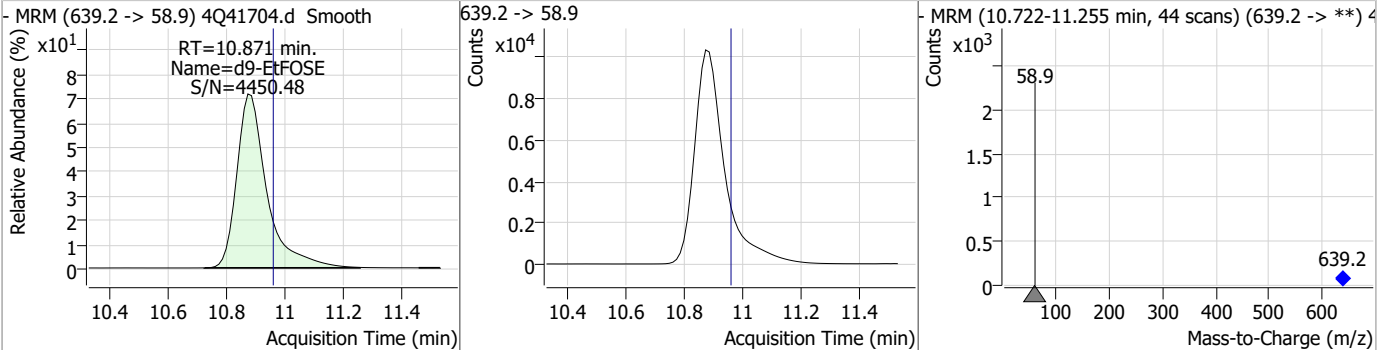
7.6.4
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Perfluorinated Compounds by LC/MS/MS

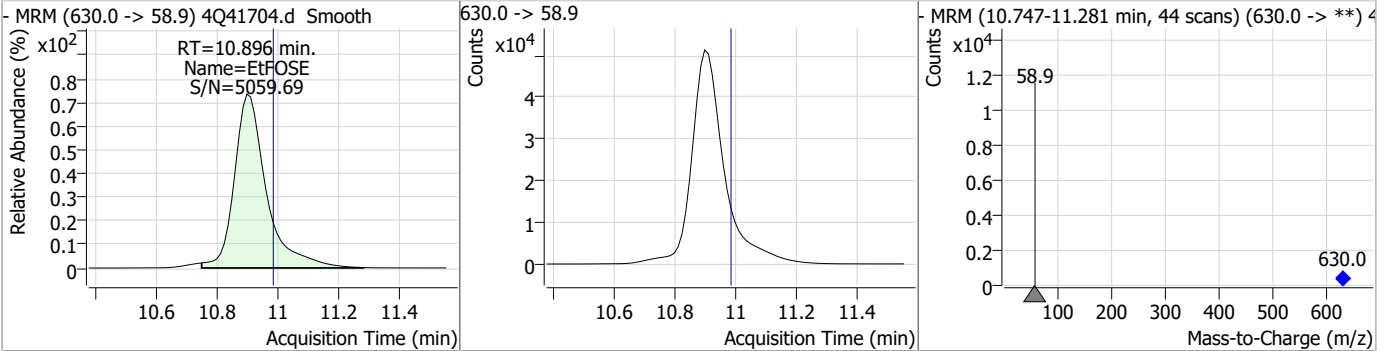
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	29.59	10.68	-0.07	97158 (m)	511.9 -> 169.0	134.9	56.7	170.1



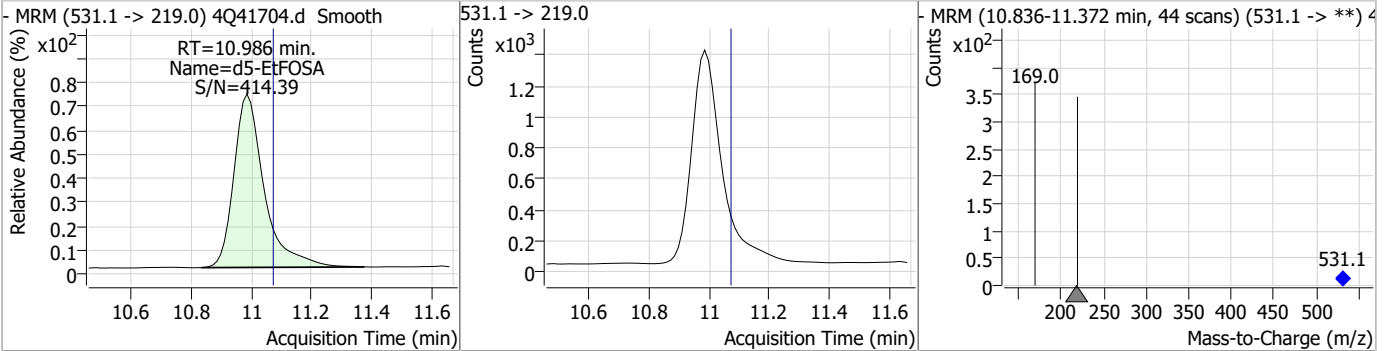
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	25.02	10.87	-0.09	73959				



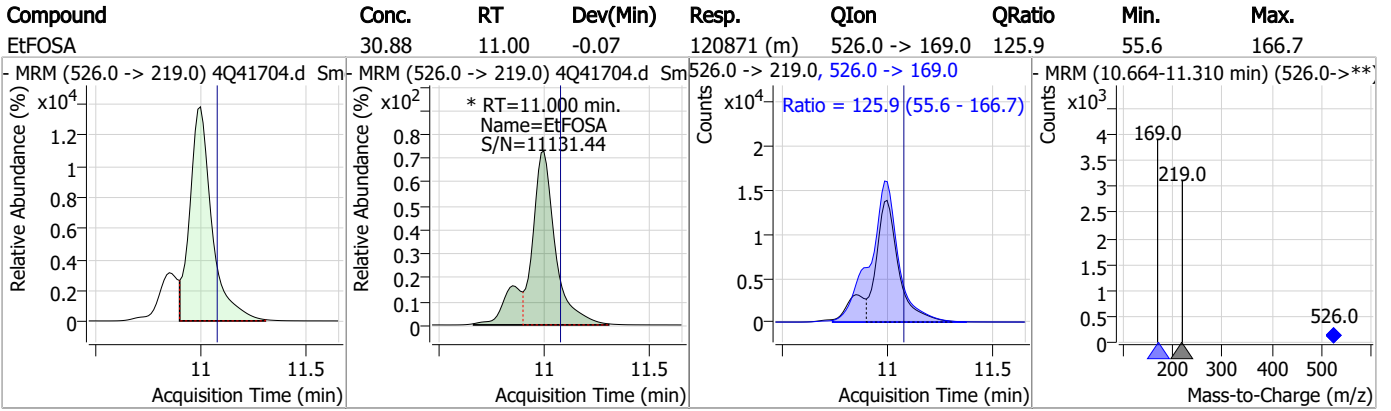
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	143.96	10.90	-0.09	377098				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.58	10.99	-0.09	9582				



Perfluorinated Compounds by LC/MS/MS



7.6.4

7

Manual Integration Approval Summary

Sample Number: S4Q597-RT
Lab FileID: 4Q41704.D
Injection Time: 03/06/23 17:03

Method: EPA DRAFT 1633
Analyst approved: 03/07/23 15:27 Anna Ludwig
Supervisor approved: 03/08/23 10:59 Natasha Guntie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		7.00	Split peak
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
Perfluorononanoic acid	375-95-1		7.52	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak
EtFOSAA	2991-50-6		8.27	Split peak
PFOSA	754-91-6		9.62	Split peak
MeFOSA	31506-32-8		10.68	Split peak
EtFOSA	4151-50-2		11.00	Split peak

7.6.4.1

7

QQQ Check Tune Report



Instrument Name LCMS4-Q
MS Model G6470A
MS Instrument Serial SG2004G105
Software_Firmware Version 10.0.142, FW: A.00.08.100
Tune Date & Time 28 February 2023 10:59:32
Data Path D:\MassHunter\Tune\QQQ\G6470A\atunes.TUNE.XML
Ion Source AJS ESI
Ionization Mode AJS ESI
Tuned Resolution All
Vacuum Pressure 1.62E+0 [R] (Torr); 3.50E-5 [H] (Torr)

Source Parameters

Parameter	Negative
Gas Temp (°C)	300
Gas Flow (l/min)	8
Nebulizer (psi)	15
Capillary (V)	4000
Nozzle Voltage (V)	1500
Sheath Gas Temp (°C)	250
Sheath Gas Flow (l/min)	7

7.7.1

7

QQQ Check Tune Report



Negative Results

Analyzer: MS1 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	113.00	0.01	Pass	0.70	0.66	-0.04	Pass	150254
302.00	302.02	0.02	Pass	0.70	0.66	-0.04	Pass	266036
601.98	602.02	0.04	Pass	0.70	0.68	-0.02	Pass	440690
1033.99	1034.05	0.06	Pass	0.70	0.67	-0.03	Pass	563970
1633.95	1633.98	0.03	Pass	0.70	0.68	-0.02	Pass	1112993
2233.91	2233.91	0.00	Pass	0.70	0.71	0.01	Pass	746161

Analyzer: MS2 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.08	0.08	Pass	0.70	0.60	-0.10	Pass	36581
112.99	112.98	-0.01	Pass	0.70	0.70	0.00	Pass	127397
302.00	302.00	0.00	Pass	0.70	0.68	-0.02	Pass	197839
601.98	601.98	0.00	Pass	0.70	0.69	-0.01	Pass	281651
1033.99	1033.95	-0.04	Pass	0.70	0.72	0.02	Pass	153536
1633.95	1633.84	-0.11	Pass	0.70	0.75	0.05	Pass	189675
2233.91	2233.73	-0.18	Pass	0.70	0.74	0.04	Pass	75841

Analyzer: MS1 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	113.02	0.03	Pass	1.20	1.19	-0.01	Pass	204999
302.00	301.98	-0.02	Pass	1.20	1.40	0.20	Pass	350843
601.98	602.00	0.02	Pass	1.20	1.43	0.23	Pass	770561
1033.99	1034.02	0.03	Pass	1.20	1.50	0.30	Pass	1129235
1633.95	1633.94	-0.01	Pass	1.20	1.34	0.14	Pass	2986134
2233.91	2233.87	-0.04	Pass	1.20	1.21	0.01	Pass	1675013

Analyzer: MS2 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.09	0.09	Pass	1.20	1.11	-0.09	Pass	49597
112.99	112.96	-0.03	Pass	1.20	1.24	0.04	Pass	180482
302.00	302.01	0.01	Pass	1.20	1.46	0.26	Pass	299569
601.98	602.00	0.02	Pass	1.20	1.53	0.33	Pass	527758
1033.99	1033.94	-0.05	Pass	1.20	1.58	0.38	Pass	320661
1633.95	1633.78	-0.17	Pass	1.20	1.54	0.34	Pass	533773
2233.91	2233.83	-0.08	Pass	1.20	1.43	0.23	Pass	261412

Analyzer: MS1 Polarity: Negative Width: Widest

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.95	-0.04	Pass	2.50	2.52	0.02	Pass	278309
302.00	302.01	0.01	Pass	2.50	2.69	0.19	Pass	420137
601.98	602.07	0.09	Pass	2.50	2.70	0.20	Pass	1056591
1033.99	1034.04	0.05	Pass	2.50	2.69	0.19	Pass	1887884
1633.95	1633.96	0.01	Pass	2.50	2.57	0.07	Pass	5964538
2233.91	2233.80	-0.11	Pass	2.50	2.38	-0.12	Pass	4482998

Analyzer: MS2 Polarity: Negative Width: Widest

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.06	0.06	Pass	2.50	2.33	-0.17	Pass	64326
112.99	112.98	-0.01	Pass	2.50	2.49	-0.01	Pass	228432
302.00	302.00	0.00	Pass	2.50	2.68	0.18	Pass	382796
601.98	601.99	0.01	Pass	2.50	2.81	0.31	Pass	723207
1033.99	1033.94	-0.05	Pass	2.50	2.84	0.34	Pass	487537
1633.95	1633.85	-0.10	Pass	2.50	2.69	0.19	Pass	972364
2233.91	2233.84	-0.07	Pass	2.50	2.45	-0.05	Pass	662186

7.7.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41648.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 5:46:26 PM
 Sample Name : ic596-1
 Vial : P1-A2
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.189	216.8 -> 171.9	145897	10.00 µg/L	-0.050
M5-PFPeA	4.487	268.3 -> 223.0	86328	5.00 µg/L	-0.087
M5-PFHxA	5.472	318.0 -> 273.0	68466	2.50 µg/L	-0.050
M4-PFHpA	6.330	367.1 -> 322.0	37528	2.50 µg/L	-0.012
M8-PFOA	6.975	421.1 -> 376.0	41253	2.50 µg/L	0.026
M9-PFNA	7.534	472.1 -> 427.0	22837	1.25 µg/L	0.038
M6-PFDA	7.979	519.1 -> 474.1	19397	1.25 µg/L	0.012
M7-PFUnDA	8.398	570.0 -> 525.1	20672	1.25 µg/L	0.012
M2-PFDoDA	8.793	615.1 -> 570.0	24482	1.25 µg/L	0.026
M2-PFTeDA	9.525	715.2 -> 670.0	20286	1.25 µg/L	0.037
M8-FOSA	9.534	506.1 -> 77.8	16493	2.50 µg/L	0.025
M3-PFBS	5.426	302.1 -> 79.9	14656	2.50 µg/L	-0.062
M3-PFHxS	7.104	402.1 -> 79.9	8642	2.50 µg/L	0.039
M8-PFOS	8.130	507.1 -> 79.9	11988	2.50 µg/L	0.012
M2-4:2FTS	5.196	329.1 -> 80.9	1749	5.00 µg/L	-0.064
M2-6:2FTS	6.736	429.1 -> 80.9	2596	5.00 µg/L	0.012
M2-8:2FTS	7.791	529.1 -> 80.9	4038	5.00 µg/L	0.025
M3-MeFOSAA	8.049	573.2 -> 419.0	16595	5.00 µg/L	0.012
M3-HFPO-DA	5.802	286.9 -> 168.9	32260	10.00 µg/L	-0.025
M5-EtFOSAA	8.234	589.2 -> 419.0	13826	5.00 µg/L	0.000
M7-MeFOSE	10.462	623.2 -> 58.9	66451	25.00 µg/L	0.049
M9-EtFOSE	10.746	639.2 -> 58.9	71849	25.00 µg/L	0.037
M5-EtFOSA	10.849	531.1 -> 219.0	8435	2.50 µg/L	0.037
M3-MeFOSA	10.566	515.0 -> 219.0	8305	2.50 µg/L	0.050
13C4-PFOS	8.130	502.8 -> 79.9	11753	2.50 µg/L	0.012
13C3-PFBA	3.180	216.0 -> 172.0	84520	5.00 µg/L	-0.062
18O2-PFHxS	7.103	403.0 -> 83.9	6592	2.50 µg/L	0.039
13C4-PFOA	6.976	417.1 -> 372.0	48210	2.50 µg/L	0.026
13C2-PFDA	7.980	515.1 -> 470.1	18482	1.25 µg/L	0.012
13C5-PFNA	7.534	468.0 -> 423.0	26188	1.25 µg/L	0.038
13C2-PFHxA	5.473	315.1 -> 270.0	62947	2.50 µg/L	-0.050
System Monitoring Compounds					
13C2-4:2FTS	5.196	329.1 -> 80.9	1749	4.89 µg/L	-0.064
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 97.8%		
13C2-6:2FTS	6.736	429.1 -> 80.9	2596	5.12 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 102.5%		
13C2-8:2FTS	7.791	529.1 -> 80.9	4038	5.12 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 102.4%		
13C2-PFDoDA	8.793	615.1 -> 570.0	24482	1.25 µg/L	0.026
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.2%		
13C2-PFTeDA	9.525	715.2 -> 670.0	20286	1.26 µg/L	0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.6%		
13C3-PFBS	5.426	302.1 -> 79.9	14656	2.39 µg/L	-0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 95.6%		
13C3-PFHxS	7.104	402.1 -> 79.9	8642	2.41 µg/L	0.039

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.4%	
13C4-PFBA	3.189	216.8 -> 171.9	145897	10.04 µg/L	-0.050
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C4-PFHpA	6.330	367.1 -> 322.0	37528	2.51 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.5%	
13C5-PFHxA	5.472	318.0 -> 273.0	68466	2.51 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C5-PFPeA	4.487	268.3 -> 223.0	86328	5.02 µg/L	-0.087
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.5%	
13C6-PFDA	7.979	519.1 -> 474.1	19397	1.23 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.0%	
13C7-PFUnDA	8.398	570.0 -> 525.1	20672	1.26 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 100.9%	
13C8-FOSA	9.534	506.1 -> 77.8	16493	2.52 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
13C8-PFOA	6.975	421.1 -> 376.0	41253	2.59 µg/L	0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.5%	
13C8-PFOS	8.130	507.1 -> 79.9	11988	2.59 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.6%	
13C9-PFNA	7.534	472.1 -> 427.0	22837	1.25 µg/L	0.038
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.7%	
d3-MeFOSAA	8.049	573.2 -> 419.0	16595	5.06 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.1%	
13C3-HFPO-DA	5.802	286.9 -> 168.9	32260	10.12 µg/L	-0.025
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 101.2%	
d3-MeFOSA	10.566	515.0 -> 219.0	8305	2.50 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.8%	
d5-EtFOSAA	8.234	589.2 -> 419.0	13826	5.16 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 103.2%	
d7-MeFOSE	10.462	623.2 -> 58.9	66451	26.55 µg/L	0.049
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 106.2%	
d9-EtFOSE	10.746	639.2 -> 58.9	71849	25.69 µg/L	0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 102.8%	
d5-EtFOSA	10.849	531.1 -> 219.0	8435	2.40 µg/L	0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.0%	
Target Compounds					QValue
4:2FTS	5.197	327.1 -> 307.0	1793	0.75 µg/L	97
		327.1 -> 80.9	767		
6:2FTS	6.737	427.1 -> 407.0	1693	0.90 µg/L	95
		427.1 -> 80.9	686		
8:2FTS	7.792	527.1 -> 507.0	1222	0.67 µg/L	88
		527.1 -> 80.8	630		
EtFOSAA	8.235	584.2 -> 419.1	471	0.21 µg/L	m 98
		584.2 -> 526.0	194		
FOSA	9.537	498.1 -> 77.9	1116	0.19 µg/L	98
		498.1 -> 478.0	43		
MeFOSAA	8.050	570.1 -> 419.0	492	0.22 µg/L	m 97
		570.1 -> 483.0	97		
PFBA	3.183	212.8 -> 168.9	2526	0.80 µg/L	100
PFBS	5.427	298.7 -> 79.9	887	0.17 µg/L	95
		298.7 -> 98.8	361		
PFDA	7.980	512.9 -> 469.0	2210	0.20 µg/L	93
		512.9 -> 219.0	519		
PFDODA	8.794	613.1 -> 569.0	2981	0.19 µg/L	97
		613.1 -> 319.0	393		
PFDS	8.933	599.0 -> 79.9	486	0.19 µg/L	99

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	243			
PFHpA	6.331	363.1 -> 319.0	3997	0.21	µg/L	98
		363.1 -> 169.0	679			
PFHpS	7.673	449.0 -> 79.9	629	0.19	µg/L	98
		449.0 -> 98.9	326			
PFHxA	5.475	313.0 -> 269.0	4575	0.22	µg/L	99
		313.0 -> 118.9	157			
PFHxS	7.105	398.7 -> 79.9	733	0.23	µg/L	m 93
		398.7 -> 98.9	413			
PFNA	7.535	463.0 -> 419.0	1913	0.16	µg/L	m 79
		463.0 -> 219.0	666			
PFNS	8.550	548.8 -> 79.9	387	0.20	µg/L	69
		548.8 -> 98.9	113			
PFOA	6.977	413.0 -> 369.0	3908	0.21	µg/L	m 99
		413.0 -> 169.0	795			
PFOS	8.131	498.9 -> 79.9	1204	0.24	µg/L	m 91
		498.9 -> 98.8	657			
PFPeA	4.489	263.0 -> 219.0	6765	0.41	µg/L	100
PFPeS	6.394	349.1 -> 79.9	518	0.18	µg/L	98
		349.1 -> 98.9	227			
PFTeDA	9.525	713.1 -> 669.0	2762	0.20	µg/L	m 100
		713.1 -> 168.9	232			
PFTrDA	9.154	663.0 -> 619.0	3657	0.19	µg/L	97
		663.0 -> 168.9	419			
PFUnDA	8.399	563.1 -> 519.0	2116	0.20	µg/L	m 97
		563.1 -> 269.1	468			
11Cl-PF3OUdS	9.193	630.9 -> 450.9	7093	0.77	µg/L	97
		632.9 -> 452.9	2332			
9Cl-PF3ONS	8.425	530.8 -> 351.0	7832	0.72	µg/L	95
		532.8 -> 353.0	2490			
ADONA	6.581	376.9 -> 250.9	15727	0.74	µg/L	98
		376.9 -> 84.8	3967			
HFPO-DA	5.803	284.9 -> 168.9	1875	0.74	µg/L	98
		284.9 -> 184.9	200			
3:3FTCA	4.167	241.0 -> 177.0	820	0.92	µg/L	89
		241.0 -> 117.0	105			
5:3FTCA	6.283	341.0 -> 237.1	16916	4.88	µg/L	99
		341.0 -> 217.0	11743			
7:3FTCA	7.686	441.0 -> 316.9	6192	4.80	µg/L	99
		441.0 -> 336.9	14371			
EtFOSA	10.863	526.0 -> 219.0	674	0.20	µg/L	86
		526.0 -> 169.0	846			
EtFOSE	10.772	630.0 -> 58.9	5105	2.01	µg/L	100
MeFOSA	10.567	511.9 -> 219.0	574	0.19	µg/L	97
		511.9 -> 169.0	632			
MeFOSE	10.475	616.1 -> 58.9	4937	1.95	µg/L	100
PFDoDS	9.665	699.1 -> 79.9	356	0.17	µg/L	81
		699.1 -> 98.8	246			
NFDHA	5.378	295.0 -> 201.0	278	0.39	µg/L	99
		295.0 -> 84.9	65			
PFMBA	4.829	279.0 -> 85.1	3555	0.38	µg/L	100
PFMPA	3.782	229.0 -> 84.9	3087	0.39	µg/L	100
PFEESA	5.909	314.8 -> 134.9	5585	0.35	µg/L	99
		314.8 -> 82.9	222			

= Qualifier out of range, m = manually integrated, + = Area summed

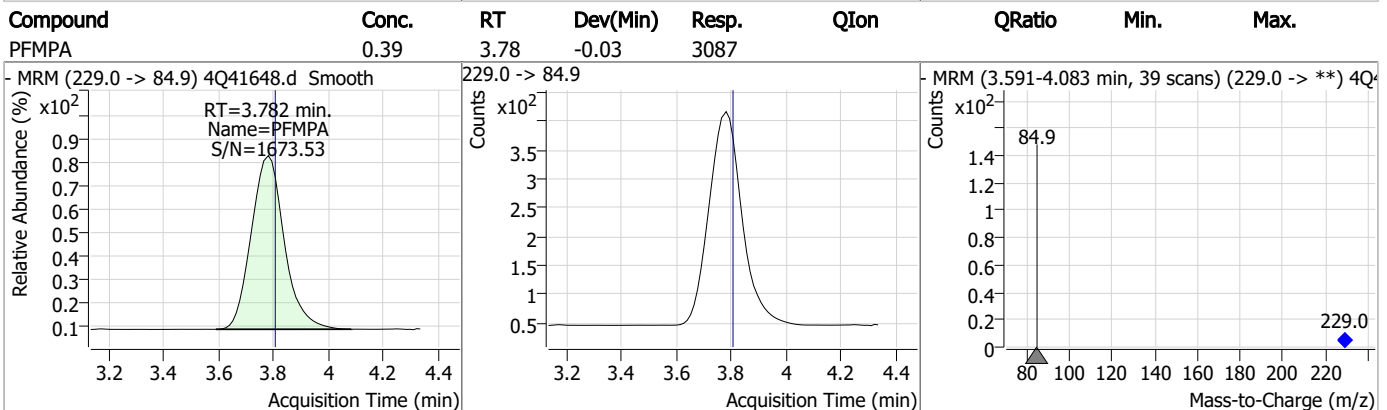
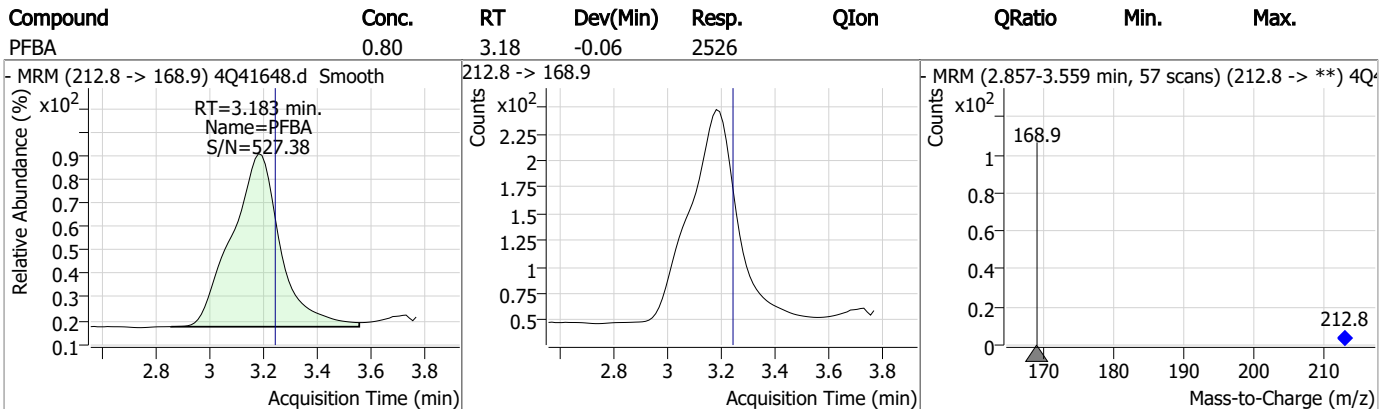
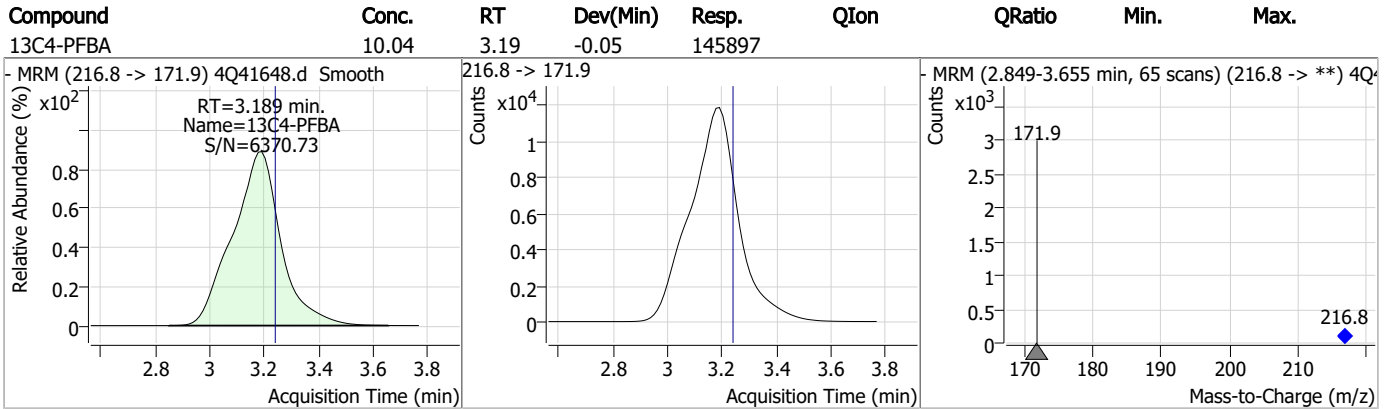
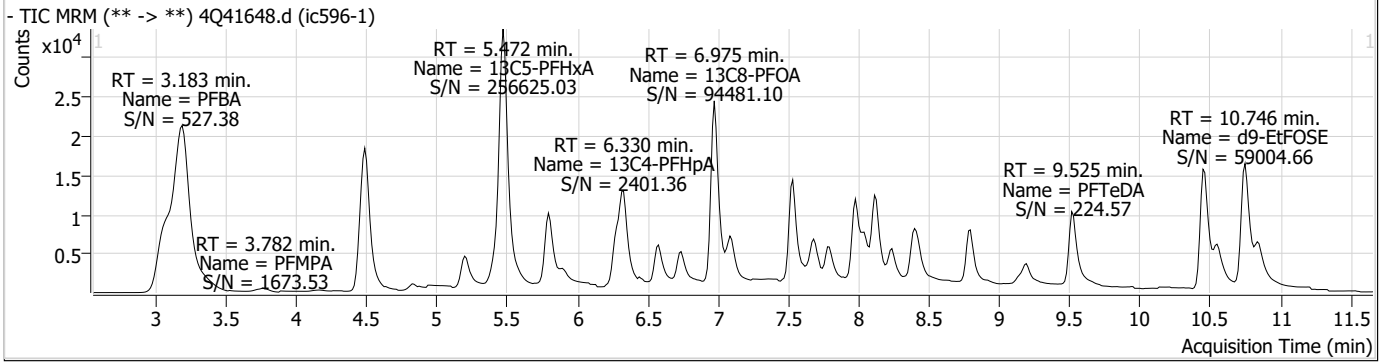
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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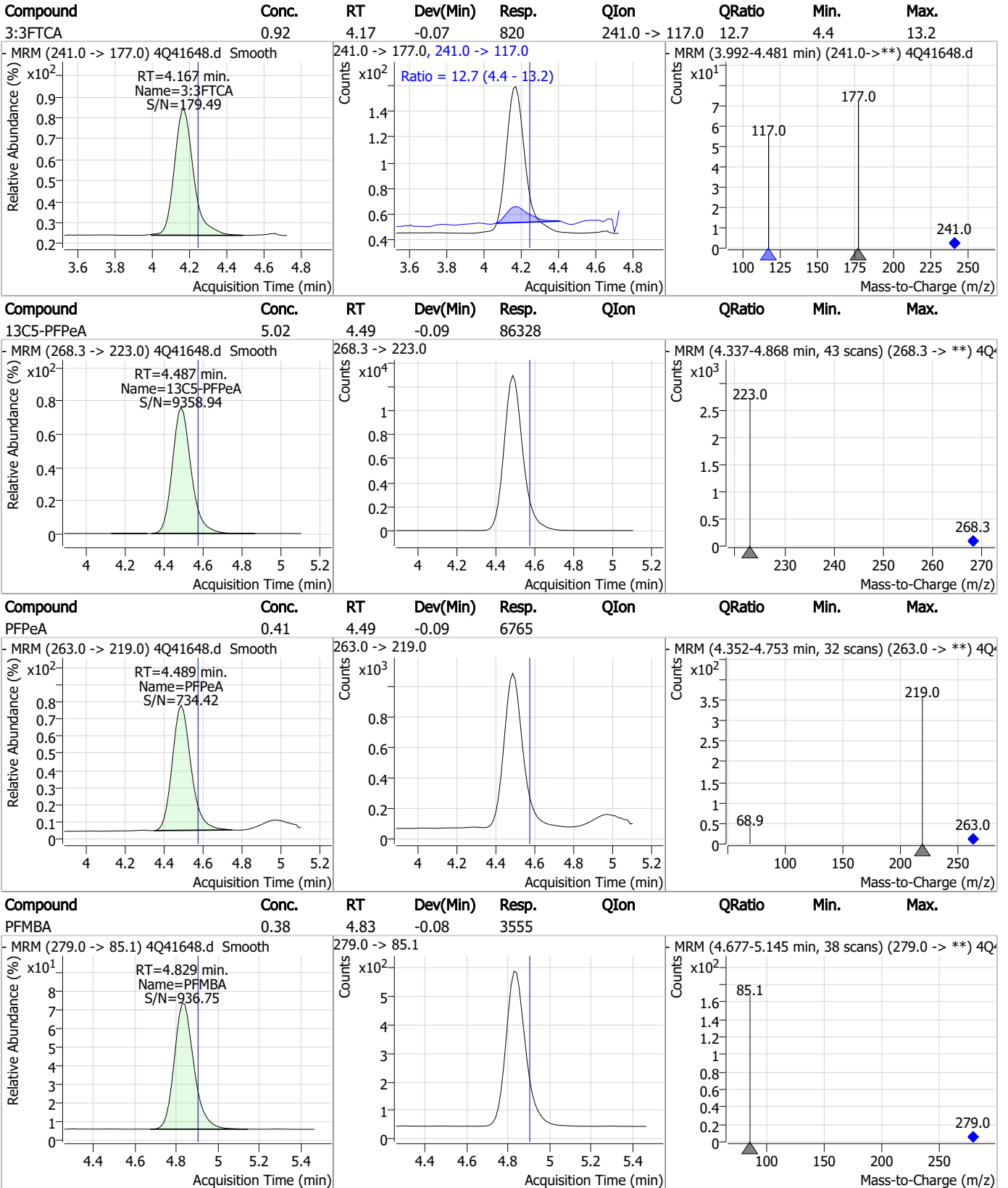
7.7.2
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Perfluorinated Compounds by LC/MS/MS



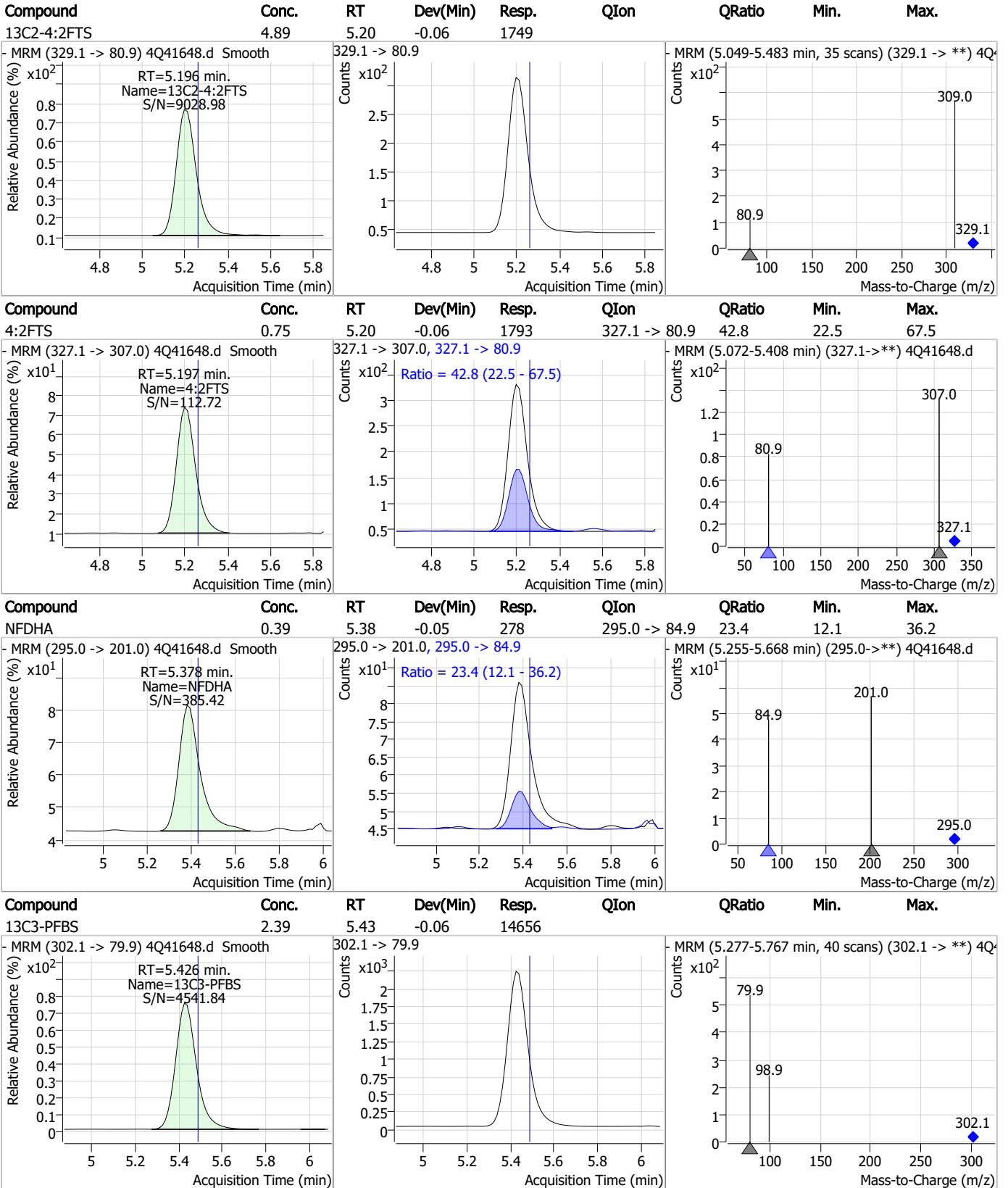
Perfluorinated Compounds by LC/MS/MS



7.7.2

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Perfluorinated Compounds by LC/MS/MS

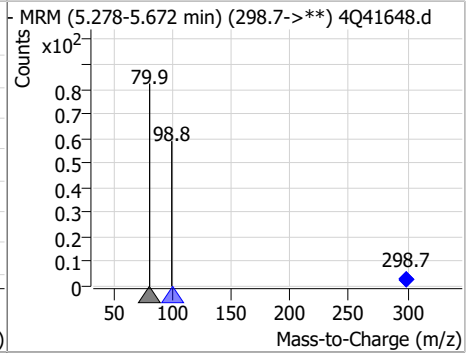
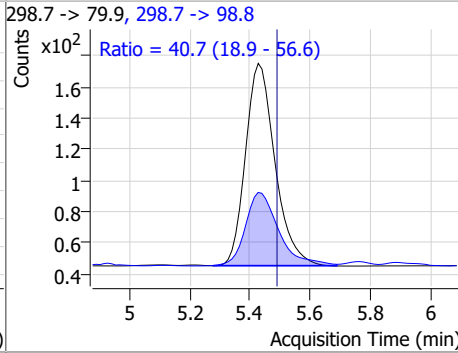
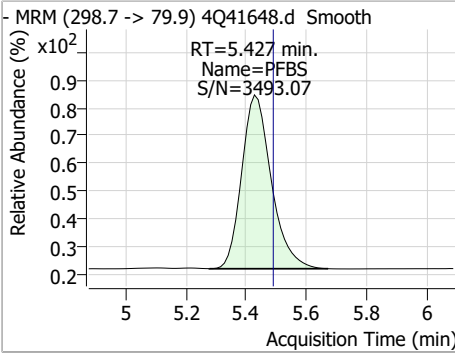


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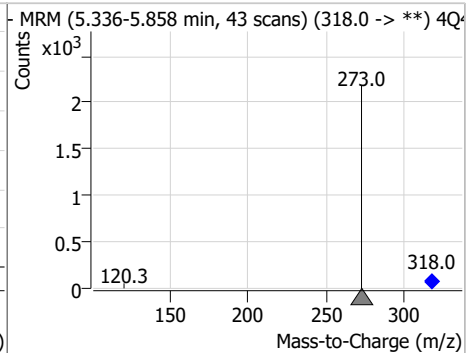
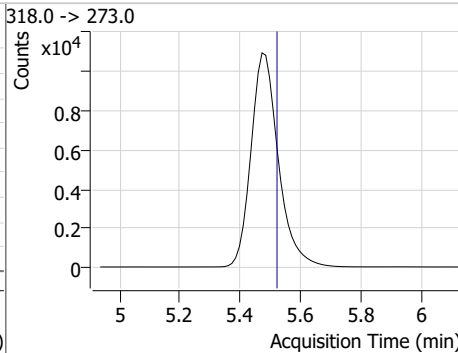
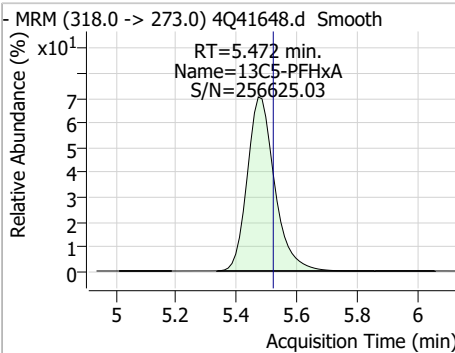
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Perfluorinated Compounds by LC/MS/MS

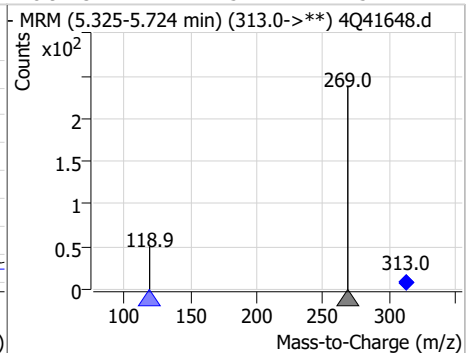
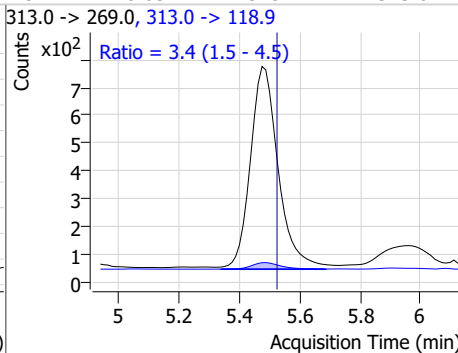
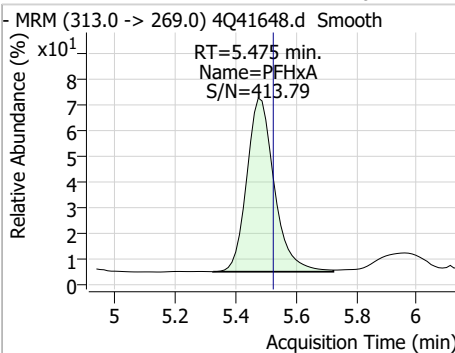
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	0.17	5.43	-0.06	887	298.7 -> 98.8	40.7	18.9	56.6



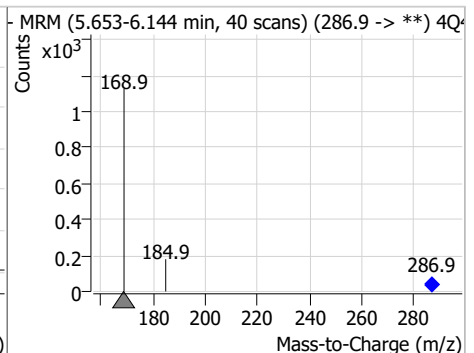
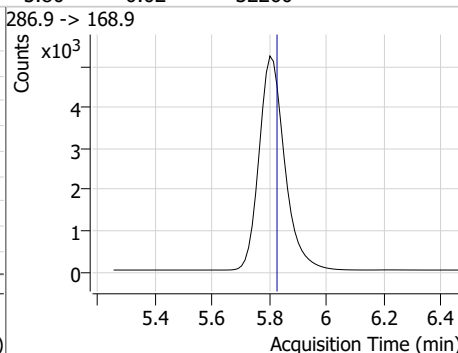
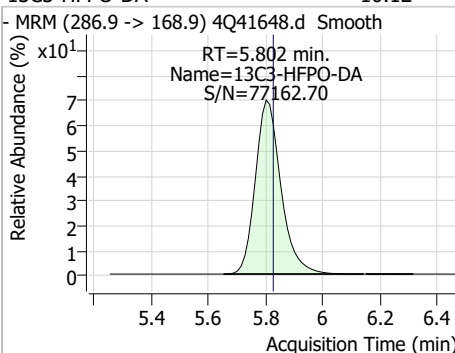
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFHxA	2.51	5.47	-0.05	68466				



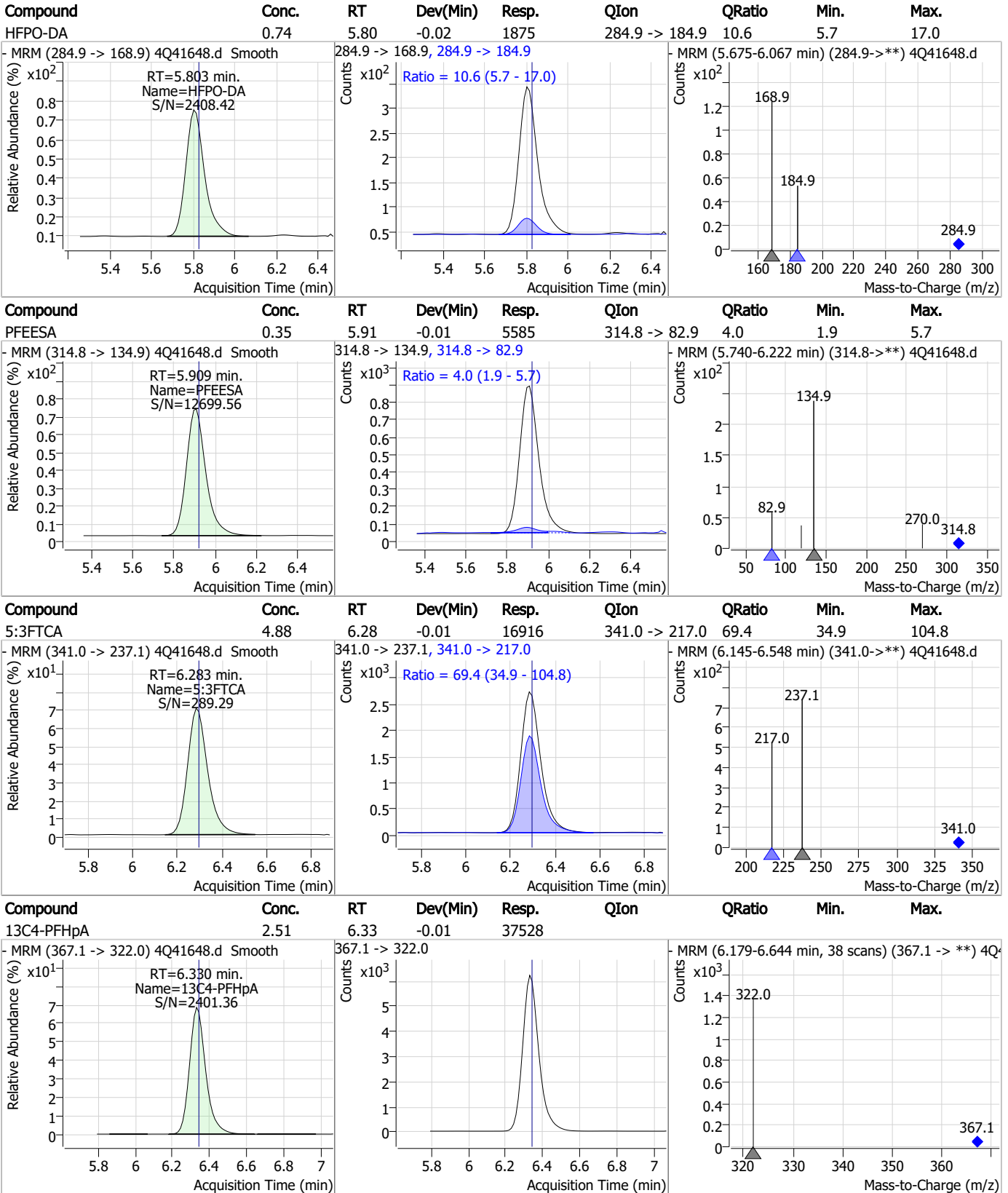
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	0.22	5.47	-0.05	4575	313.0 -> 118.9	3.4	1.5	4.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	10.12	5.80	-0.02	32260				



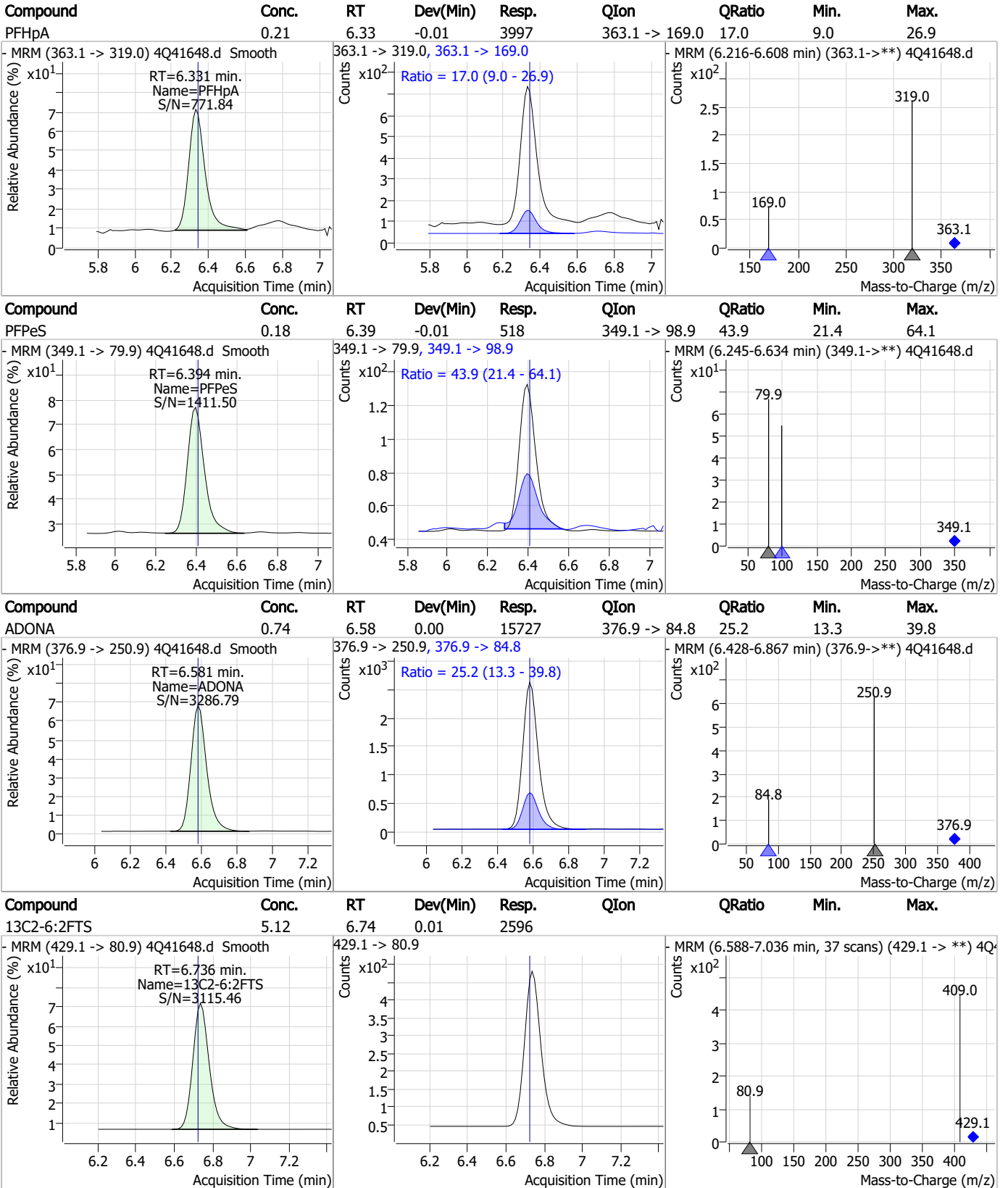
Perfluorinated Compounds by LC/MS/MS



7.7.2

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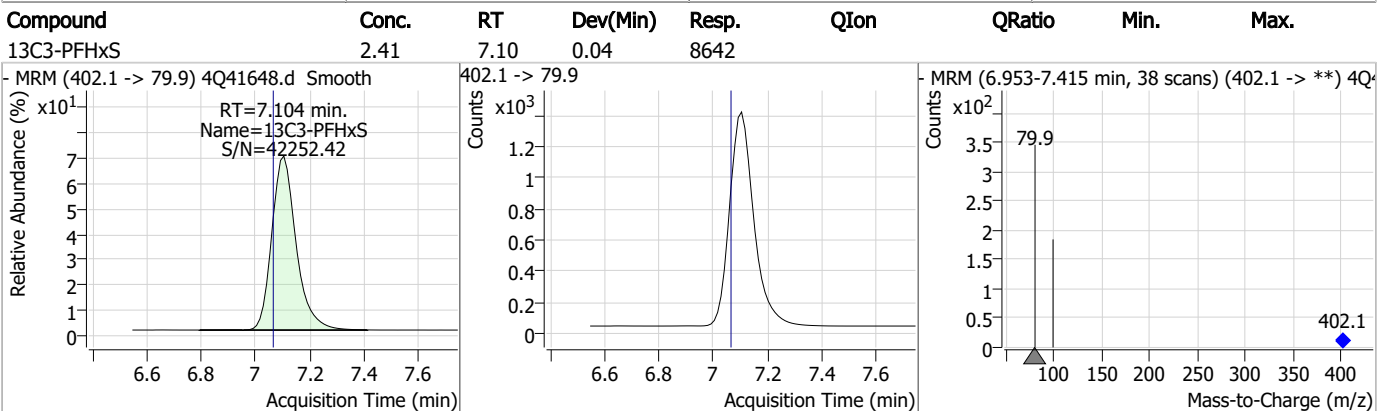
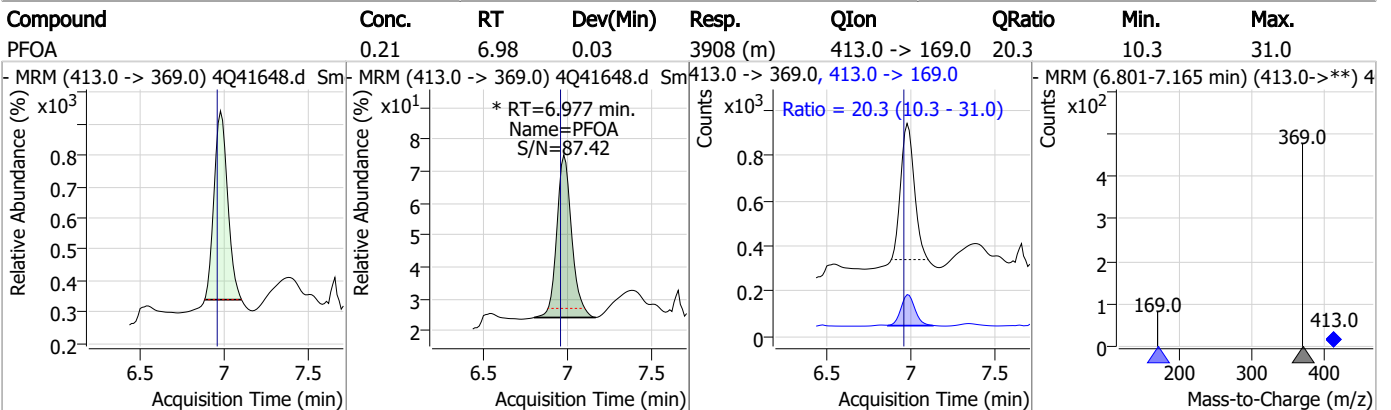
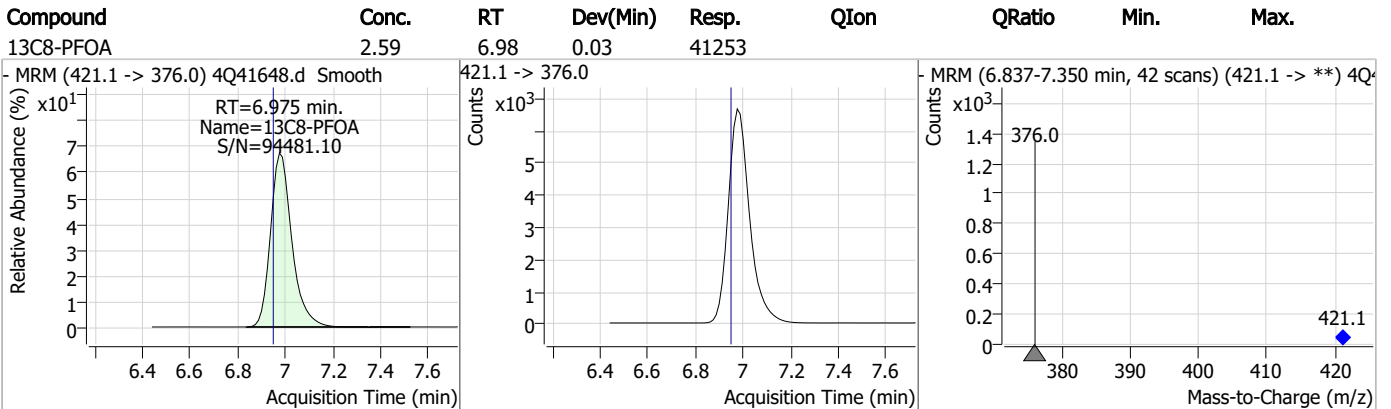
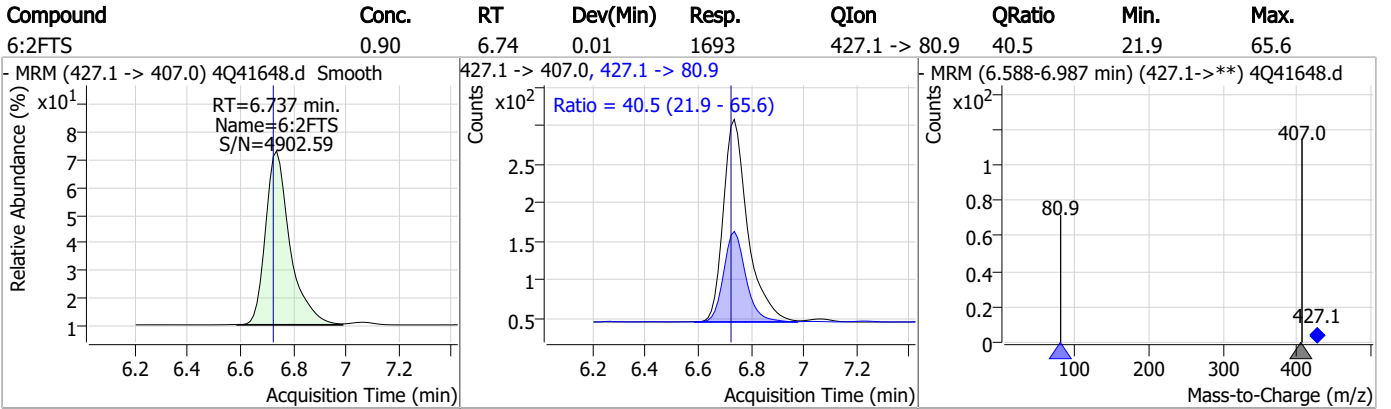
Perfluorinated Compounds by LC/MS/MS



7.7.2

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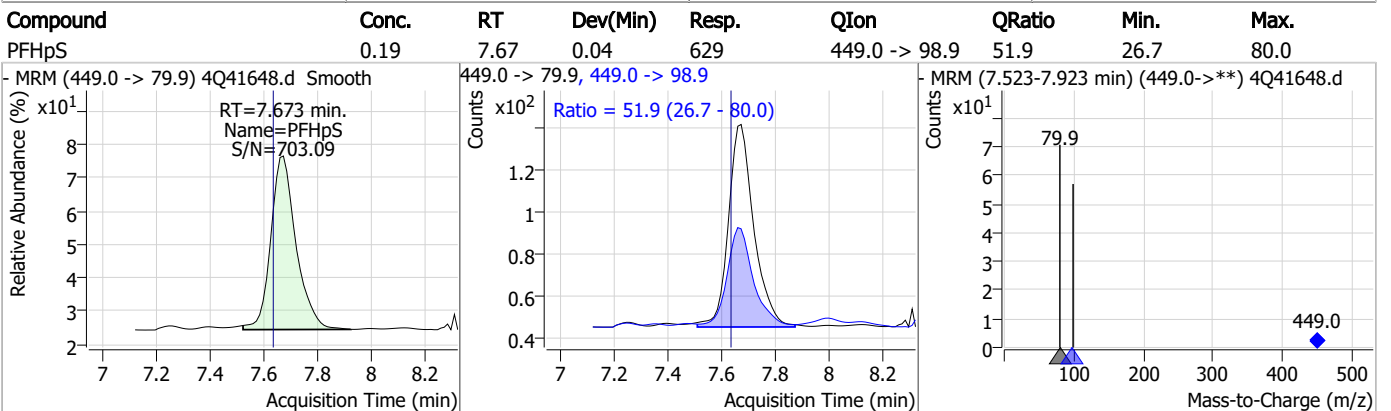
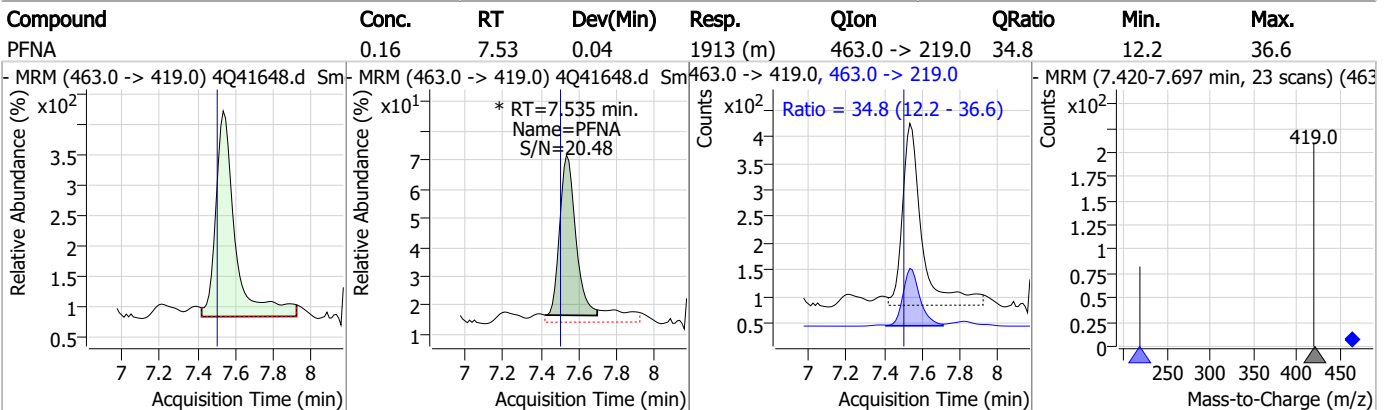
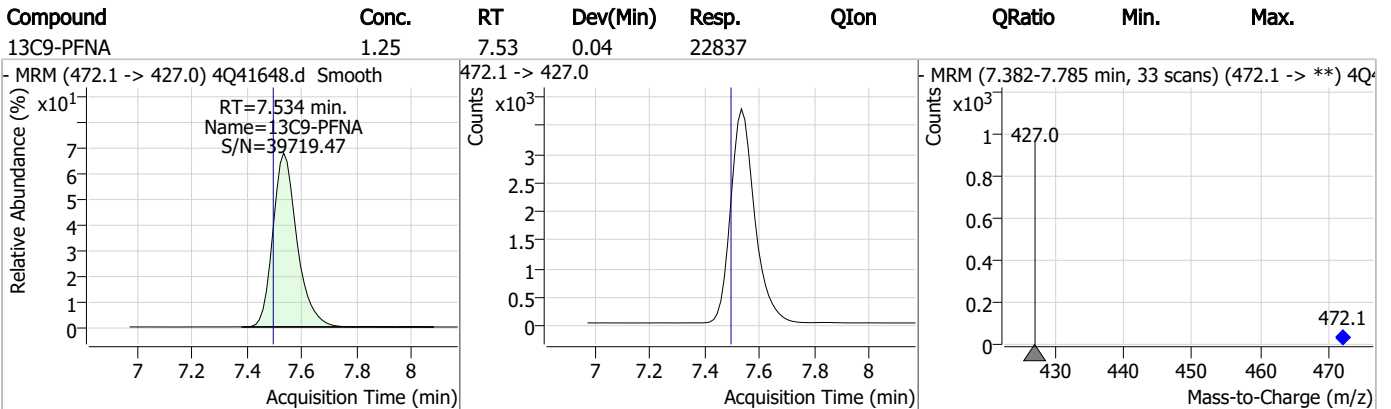
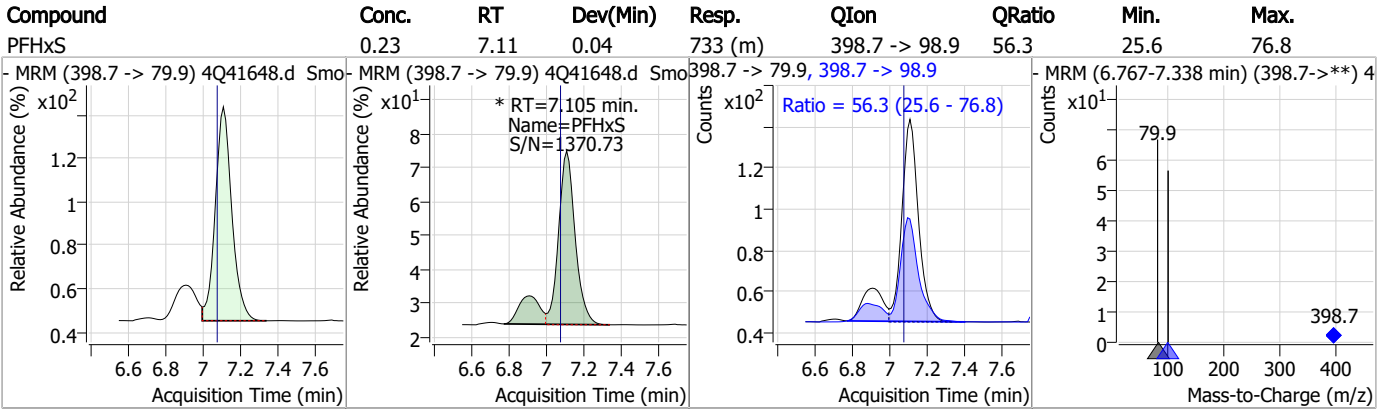
Perfluorinated Compounds by LC/MS/MS



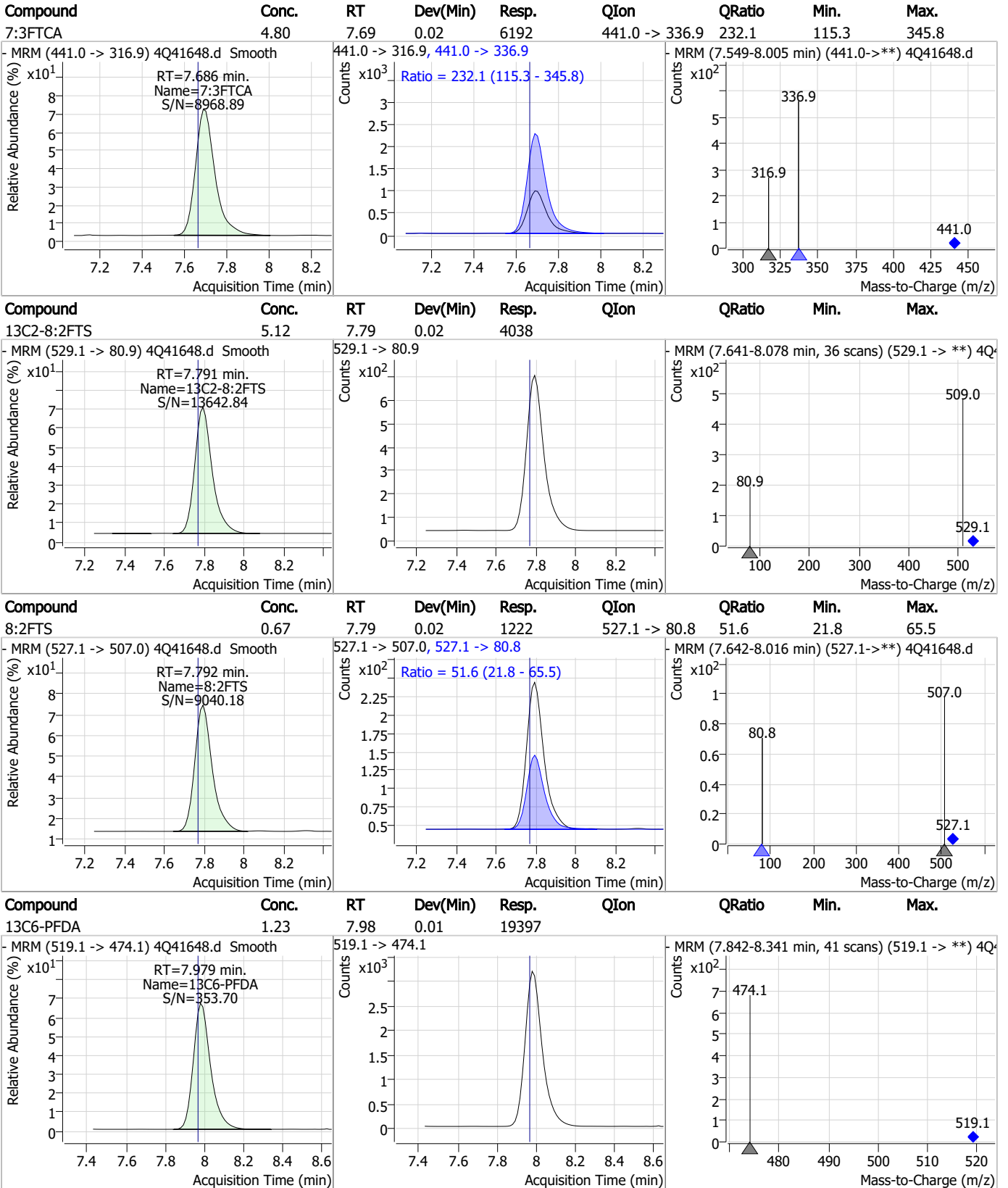
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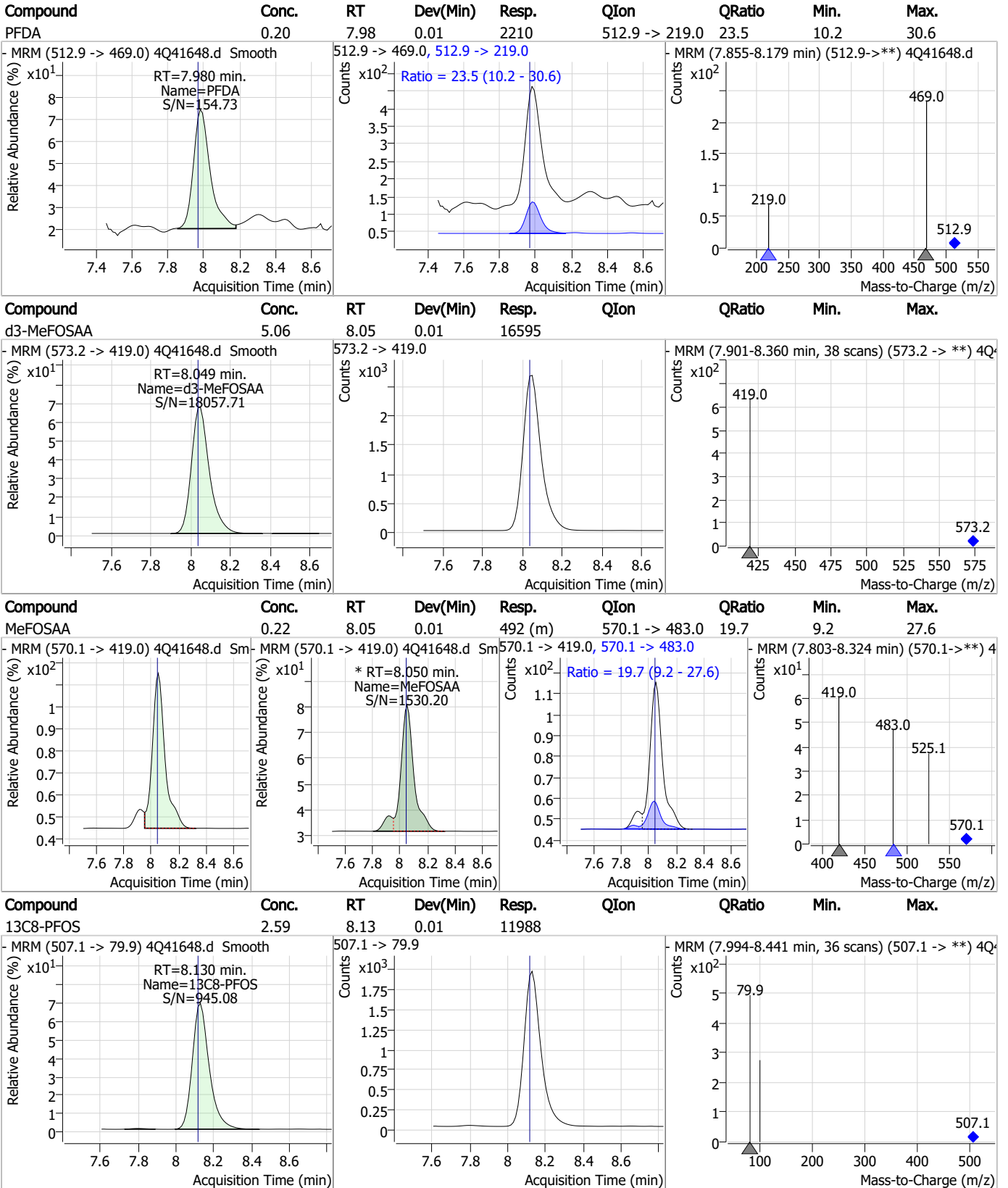
Perfluorinated Compounds by LC/MS/MS



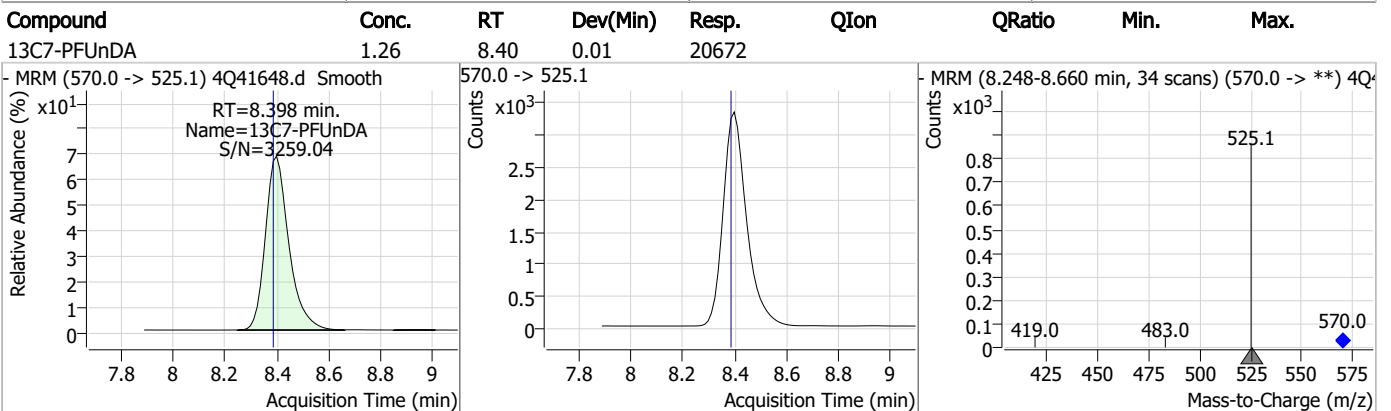
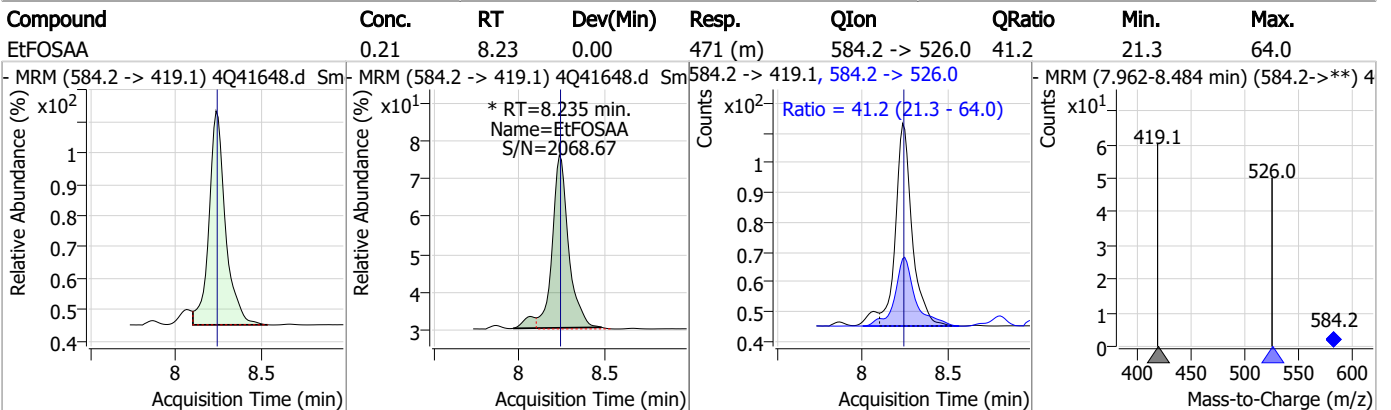
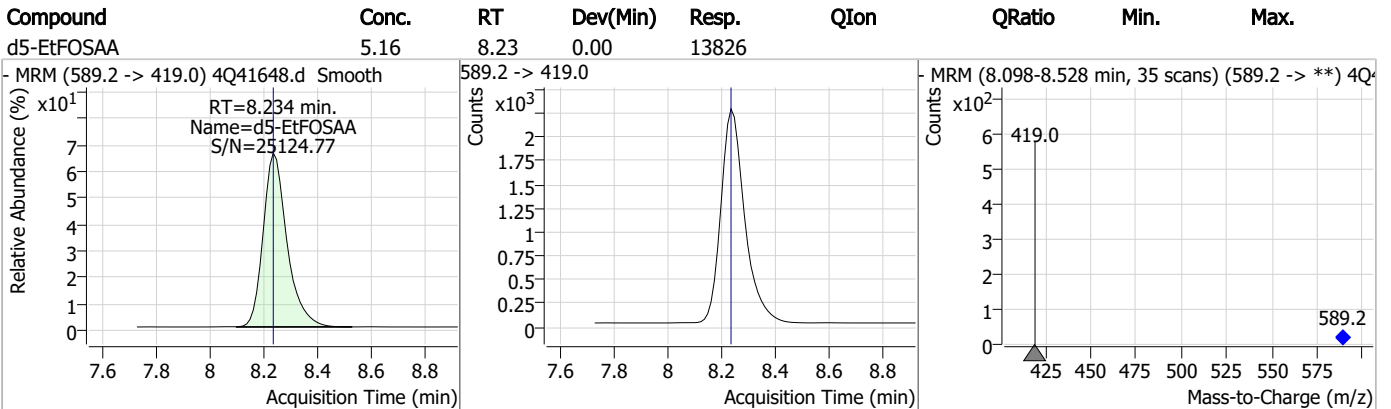
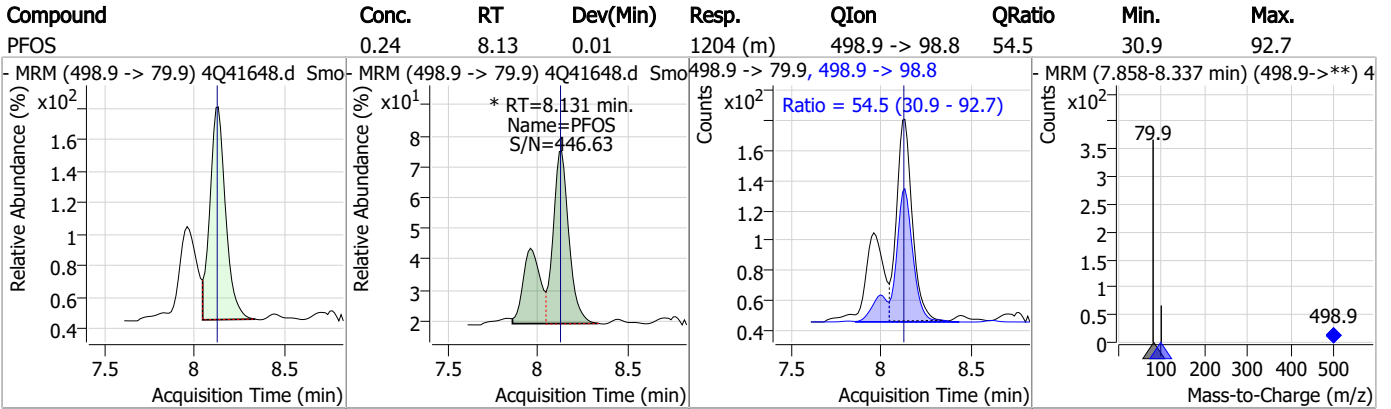
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

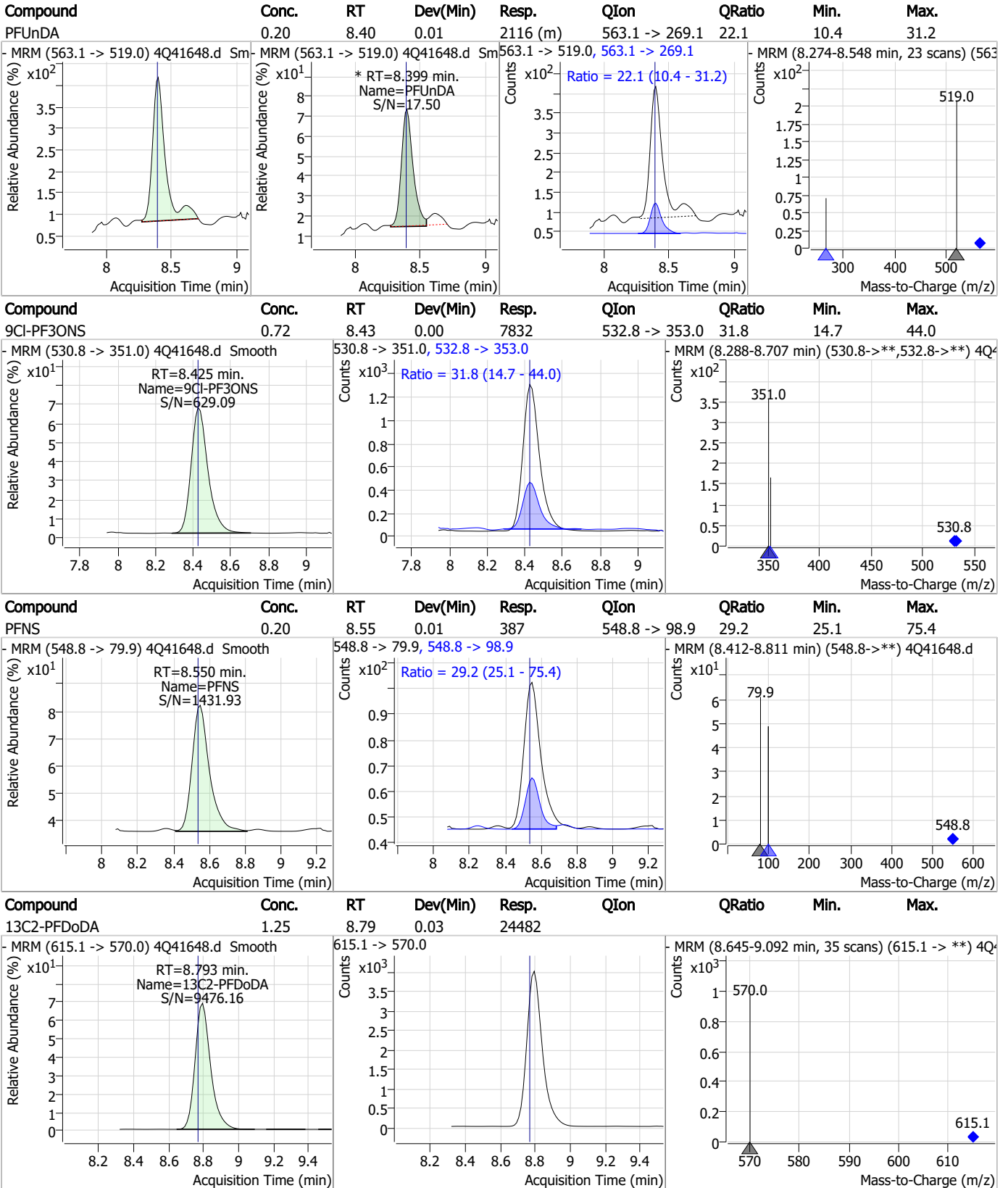


7.7.2

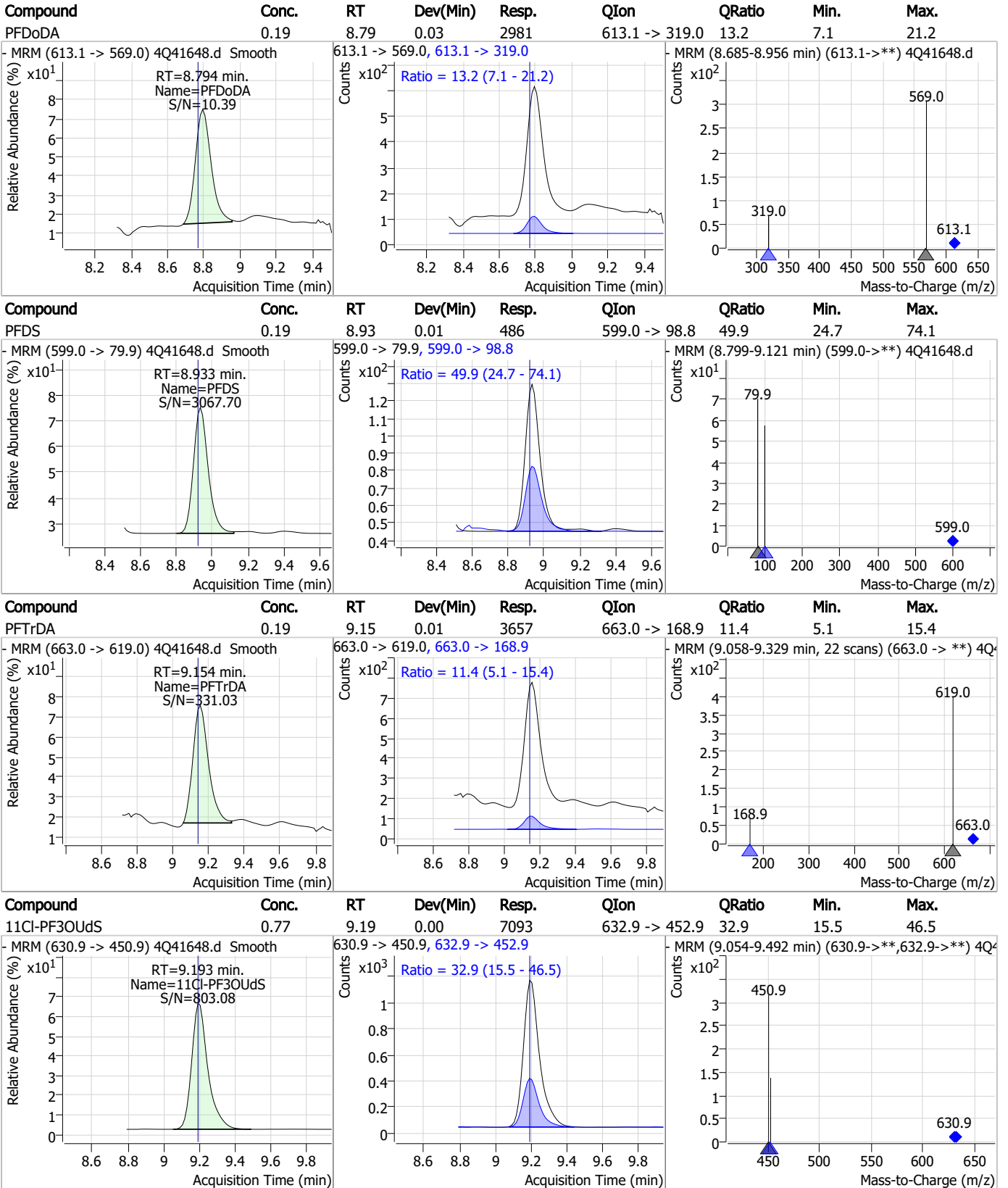
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Perfluorinated Compounds by LC/MS/MS



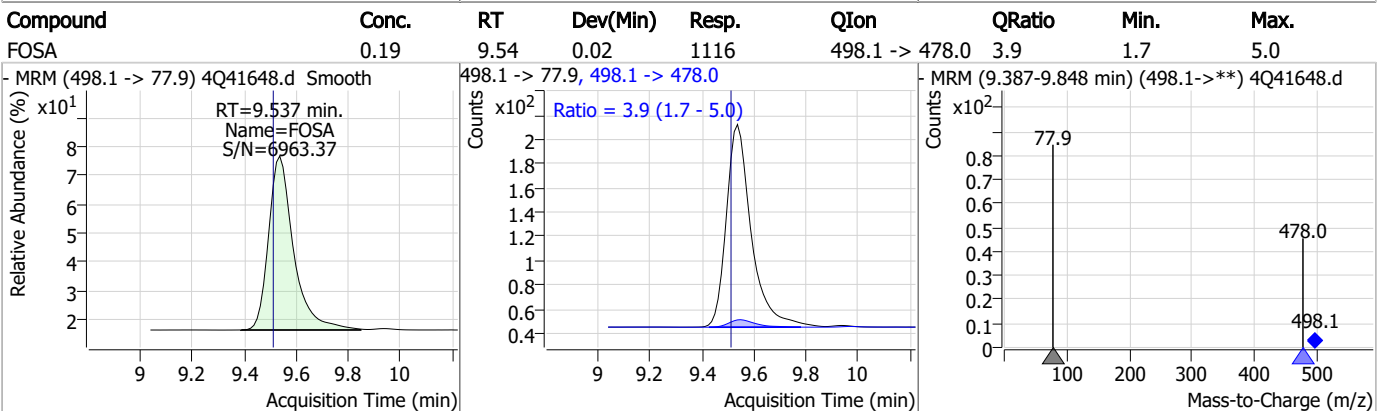
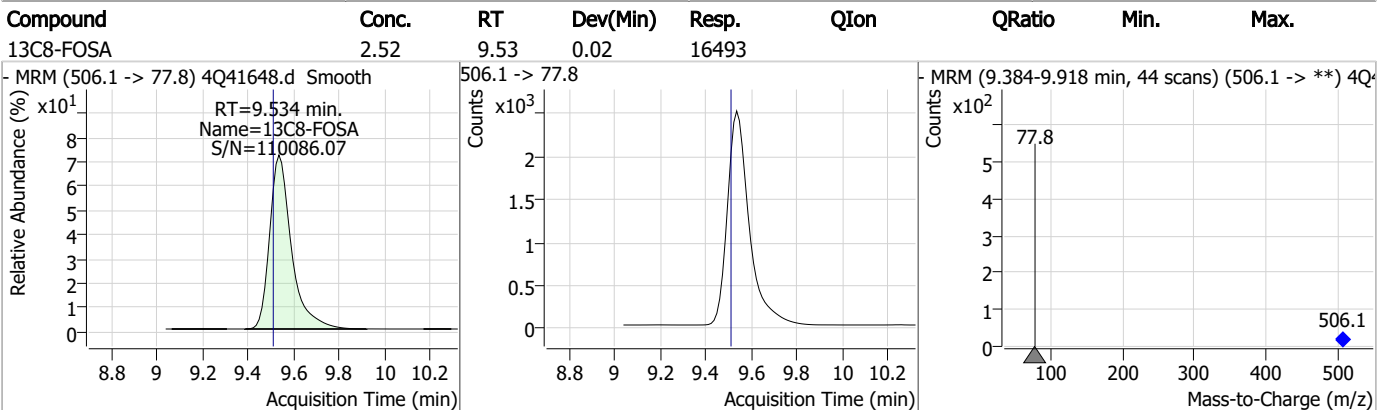
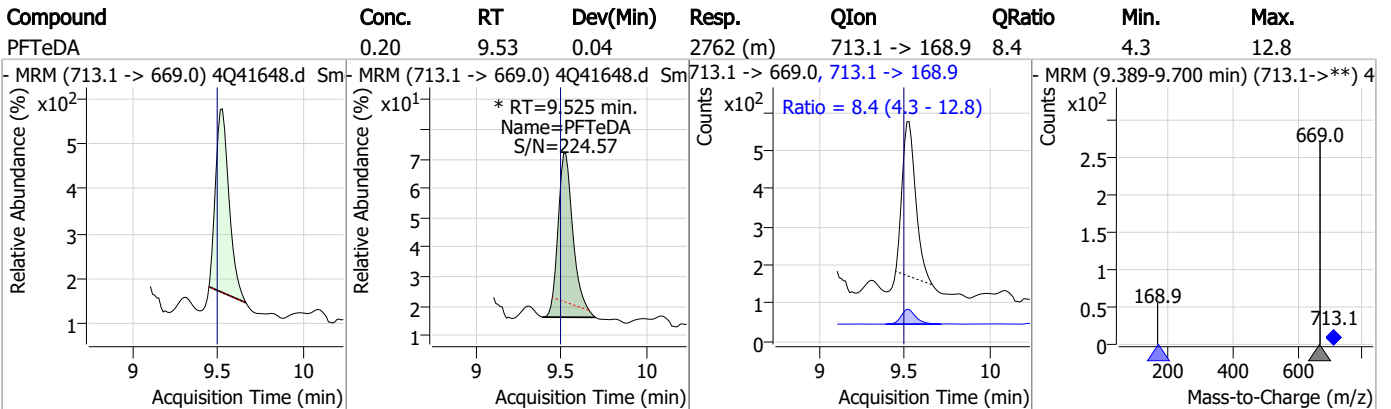
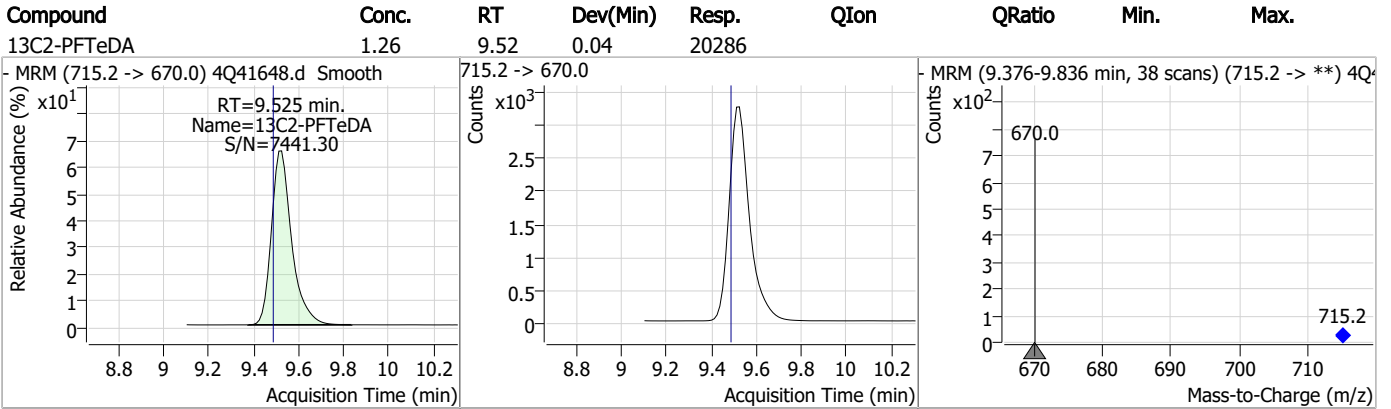
Perfluorinated Compounds by LC/MS/MS



7.7.2

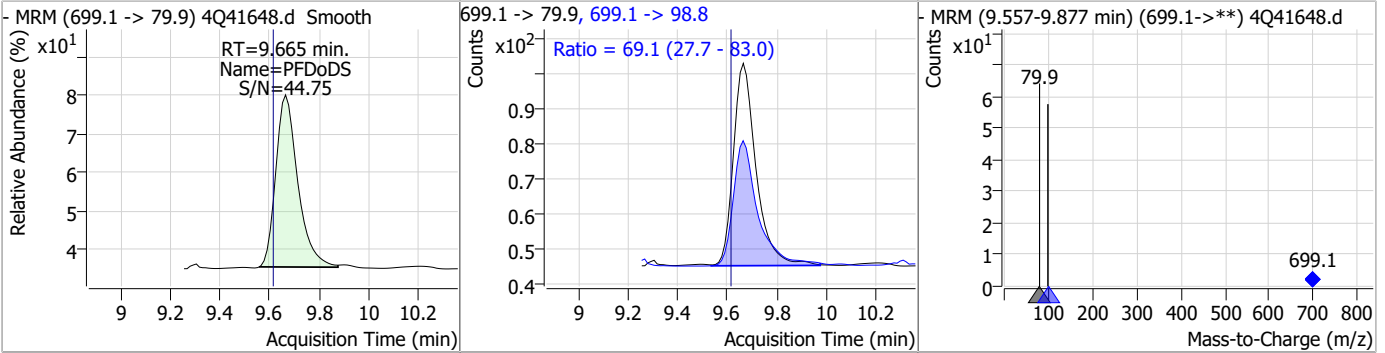
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Perfluorinated Compounds by LC/MS/MS

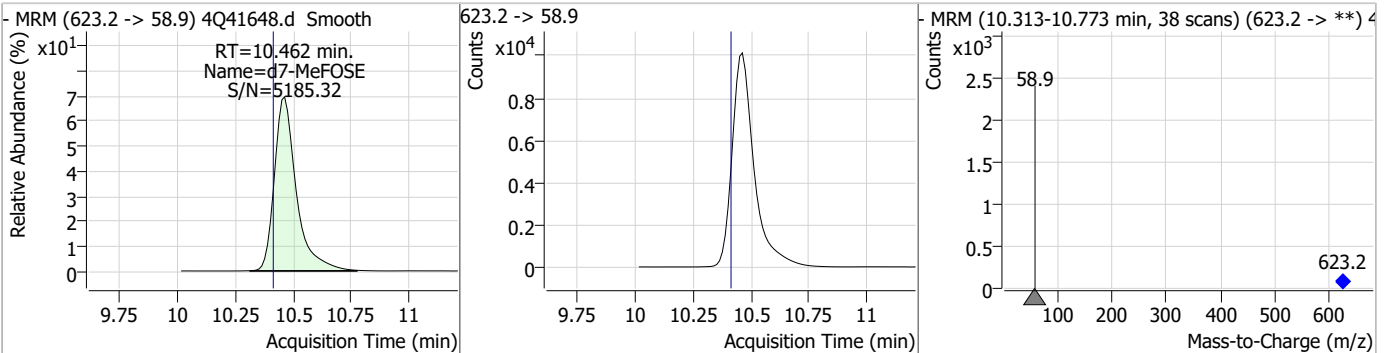


Perfluorinated Compounds by LC/MS/MS

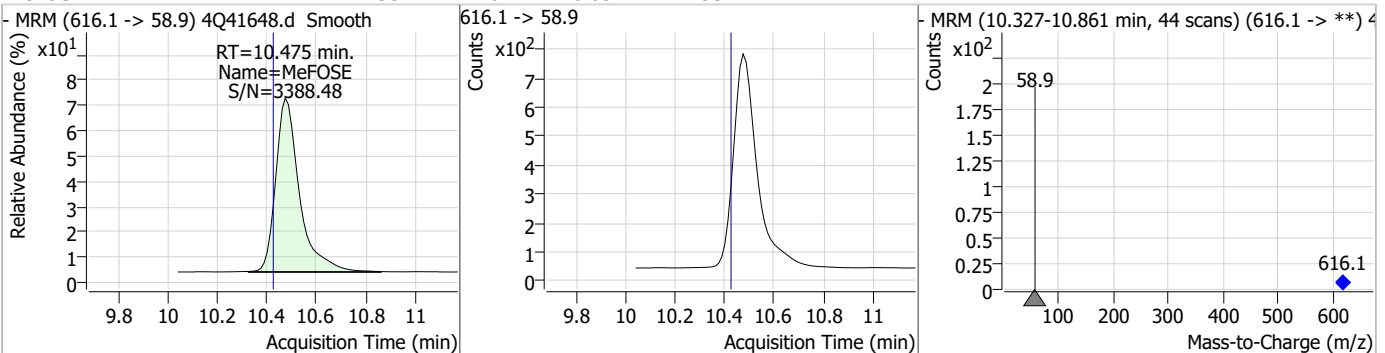
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	0.17	9.66	0.05	356	699.1 -> 98.8	69.1	27.7	83.0



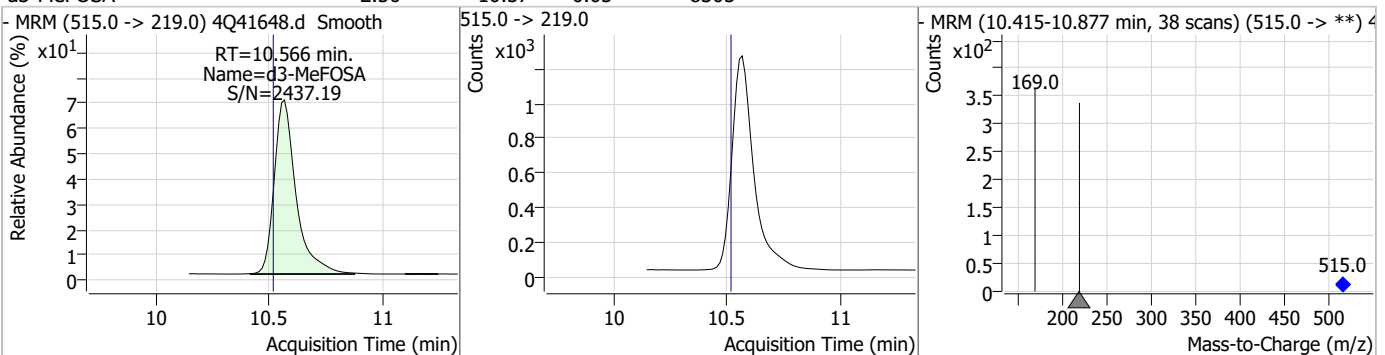
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	26.55	10.46	0.05	66451				



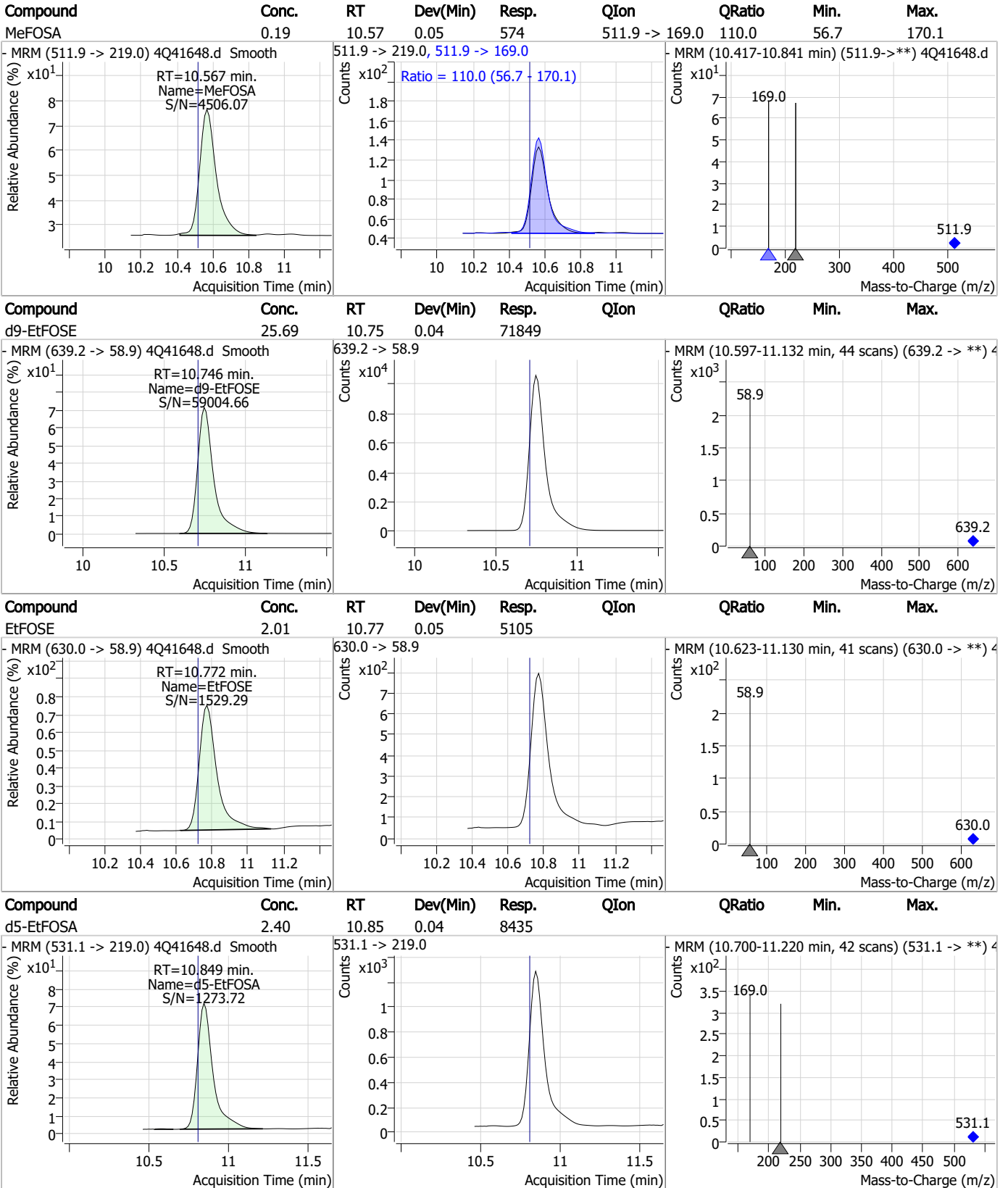
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	1.95	10.47	0.05	4937				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.50	10.57	0.05	8305				



Perfluorinated Compounds by LC/MS/MS

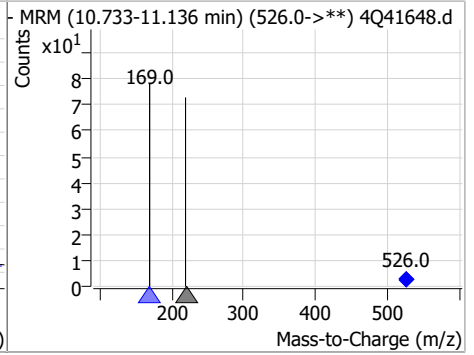
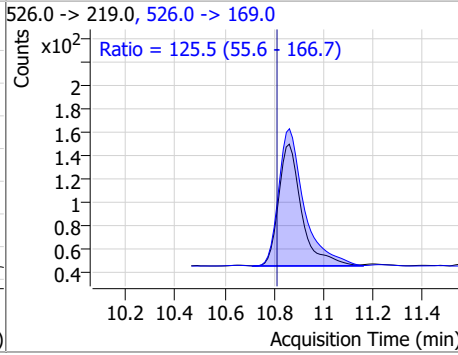
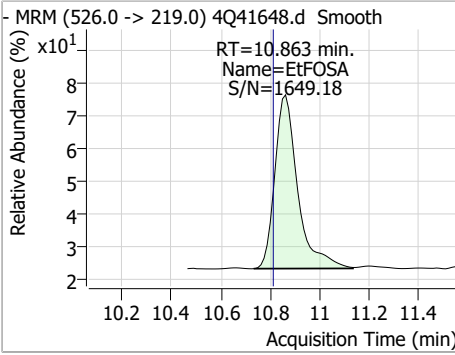


7.7.2

7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	0.20	10.86	0.05	674	526.0 -> 169.0	125.5	55.6	166.7



7.7.2

7

Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41648.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 17:46 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		6.98	Split peak
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
Perfluorononanoic acid	375-95-1		7.54	Poorly defined baseline
MeFOSAA	2355-31-9		8.05	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.13	Split peak
EtFOSAA	2991-50-6		8.23	Split peak
Perfluoroundecanoic acid	2058-94-8		8.40	Poorly defined baseline
Perfluorotetradecanoic acid	376-06-7		9.53	Poorly defined baseline

7.7.2.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41649.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 6:00:30 PM
 Sample Name : ic596-2
 Vial : P1-A3
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.227	216.8 -> 171.9	150459	10.00 µg/L	-0.013
M5-PFPeA	4.512	268.3 -> 223.0	89227	5.00 µg/L	-0.062
M5-PFHxA	5.484	318.0 -> 273.0	69159	2.50 µg/L	-0.037
M4-PFHpA	6.342	367.1 -> 322.0	38146	2.50 µg/L	0.000
M8-PFOA	6.988	421.1 -> 376.0	41822	2.50 µg/L	0.039
M9-PFNA	7.521	472.1 -> 427.0	22341	1.25 µg/L	0.026
M6-PFDA	7.992	519.1 -> 474.1	20083	1.25 µg/L	0.025
M7-PFUnDA	8.423	570.0 -> 525.1	21007	1.25 µg/L	0.037
M2-PFDoDA	8.831	615.1 -> 570.0	24512	1.25 µg/L	0.063
M2-PFTeDA	9.550	715.2 -> 670.0	21232	1.25 µg/L	0.062
M8-FOSA	9.570	506.1 -> 77.8	16792	2.50 µg/L	0.062
M3-PFBS	5.439	302.1 -> 79.9	14347	2.50 µg/L	-0.050
M3-PFHxS	7.104	402.1 -> 79.9	8987	2.50 µg/L	0.039
M8-PFOS	8.142	507.1 -> 79.9	12007	2.50 µg/L	0.025
M2-4:2FTS	5.210	329.1 -> 80.9	1887	5.00 µg/L	-0.049
M2-6:2FTS	6.761	429.1 -> 80.9	2699	5.00 µg/L	0.037
M2-8:2FTS	7.791	529.1 -> 80.9	4163	5.00 µg/L	0.025
M3-MeFOSAA	8.049	573.2 -> 419.0	17318	5.00 µg/L	0.012
M3-HFPO-DA	5.815	286.9 -> 168.9	31968	10.00 µg/L	-0.012
M5-EtFOSAA	8.259	589.2 -> 419.0	14428	5.00 µg/L	0.025
M7-MeFOSE	10.474	623.2 -> 58.9	67404	25.00 µg/L	0.061
M9-EtFOSE	10.771	639.2 -> 58.9	73777	25.00 µg/L	0.062
M5-EtFOSA	10.861	531.1 -> 219.0	9054	2.50 µg/L	0.050
M3-MeFOSA	10.578	515.0 -> 219.0	8405	2.50 µg/L	0.062
13C4-PFOS	8.143	502.8 -> 79.9	12333	2.50 µg/L	0.025
13C3-PFBA	3.218	216.0 -> 172.0	87300	5.00 µg/L	-0.025
18O2-PFHxS	7.103	403.0 -> 83.9	6404	2.50 µg/L	0.039
13C4-PFOA	6.988	417.1 -> 372.0	49586	2.50 µg/L	0.038
13C2-PFDA	7.992	515.1 -> 470.1	19056	1.25 µg/L	0.025
13C5-PFNA	7.522	468.0 -> 423.0	25908	1.25 µg/L	0.026
13C2-PFHxA	5.485	315.1 -> 270.0	63614	2.50 µg/L	-0.037
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1887	5.43 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 108.6%		
13C2-6:2FTS	6.761	429.1 -> 80.9	2699	5.48 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 109.7%		
13C2-8:2FTS	7.791	529.1 -> 80.9	4163	5.44 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 108.7%		
13C2-PFDoDA	8.831	615.1 -> 570.0	24512	1.22 µg/L	0.063
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 97.3%		
13C2-PFTeDA	9.550	715.2 -> 670.0	21232	1.28 µg/L	0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 102.1%		
13C3-PFBS	5.439	302.1 -> 79.9	14347	2.41 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 96.3%		
13C3-PFHxS	7.104	402.1 -> 79.9	8987	2.58 µg/L	0.039

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.2%	
13C4-PFBA	3.227	216.8 -> 171.9	150459	10.03 µg/L	-0.013
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C4-PFHpA	6.342	367.1 -> 322.0	38146	2.53 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.1%	
13C5-PFHxA	5.484	318.0 -> 273.0	69159	2.51 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.2%	
13C5-PFPeA	4.512	268.3 -> 223.0	89227	5.14 µg/L	-0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 102.8%	
13C6-PFDA	7.992	519.1 -> 474.1	20083	1.23 µg/L	0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.4%	
13C7-PFUnDA	8.423	570.0 -> 525.1	21007	1.24 µg/L	0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.4%	
13C8-FOSA	9.570	506.1 -> 77.8	16792	2.45 µg/L	0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.9%	
13C8-PFOA	6.988	421.1 -> 376.0	41822	2.55 µg/L	0.039
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.0%	
13C8-PFOS	8.142	507.1 -> 79.9	12007	2.47 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.8%	
13C9-PFNA	7.521	472.1 -> 427.0	22341	1.23 µg/L	0.026
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.6%	
d3-MeFOSAA	8.049	573.2 -> 419.0	17318	5.03 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.6%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	31968	9.93 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.3%	
d3-MeFOSA	10.578	515.0 -> 219.0	8405	2.41 µg/L	0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.3%	
d5-EtFOSAA	8.259	589.2 -> 419.0	14428	5.13 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 102.6%	
d7-MeFOSE	10.474	623.2 -> 58.9	67404	25.66 µg/L	0.061
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 102.6%	
d9-EtFOSE	10.771	639.2 -> 58.9	73777	25.14 µg/L	0.062
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 100.6%	
d5-EtFOSA	10.861	531.1 -> 219.0	9054	2.46 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.2%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	4158	1.62 µg/L	97
		327.1 -> 80.9	1801		
6:2FTS	6.762	427.1 -> 407.0	3261	1.67 µg/L	93
		427.1 -> 80.9	1566		
8:2FTS	7.792	527.1 -> 507.0	3561	1.90 µg/L	94
		527.1 -> 80.8	1410		
EtFOSAA	8.259	584.2 -> 419.1	1119	0.48 µg/L	90
		584.2 -> 526.0	546		
FOSA	9.574	498.1 -> 77.9	2818	0.47 µg/L	99
		498.1 -> 478.0	98		
MeFOSAA	8.050	570.1 -> 419.0	986	0.41 µg/L	m 88
		570.1 -> 483.0	234		
PFBA	3.221	212.8 -> 168.9	5650	1.74 µg/L	100
PFBS	5.452	298.7 -> 79.9	2001	0.39 µg/L	91
		298.7 -> 98.8	861		
PFDA	7.980	512.9 -> 469.0	4908	0.43 µg/L	98
		512.9 -> 219.0	947		
PFDODA	8.832	613.1 -> 569.0	7476	0.47 µg/L	99
		613.1 -> 319.0	1040		
PFDS	8.983	599.0 -> 79.9	1056	0.42 µg/L	96

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	493			
PFHpA	6.343	363.1 -> 319.0	8216	0.43	µg/L	100
		363.1 -> 169.0	1486			
PFHpS	7.673	449.0 -> 79.9	1458	0.44	µg/L	98
		449.0 -> 98.9	756			
PFHxA	5.487	313.0 -> 269.0	8929	0.42	µg/L	100
		313.0 -> 118.9	267			
PFHxS	7.105	398.7 -> 79.9	1406	0.43	µg/L	m 92
		398.7 -> 98.9	803			
PFNA	7.522	463.0 -> 419.0	5677	0.48	µg/L	89
		463.0 -> 219.0	1067			
PFNS	8.587	548.8 -> 79.9	786	0.41	µg/L	93
		548.8 -> 98.9	357			
PFOA	6.989	413.0 -> 369.0	8525	0.45	µg/L	m 100
		413.0 -> 169.0	1746			
PFOS	8.143	498.9 -> 79.9	2459	0.48	µg/L	m 91
		498.9 -> 98.8	1350			
PFPeA	4.514	263.0 -> 219.0	14575	0.85	µg/L	100
PFPeS	6.407	349.1 -> 79.9	1326	0.44	µg/L	86
		349.1 -> 98.9	449			
PFTeDA	9.550	713.1 -> 669.0	5809	0.39	µg/L	98
		713.1 -> 168.9	527			
PFTrDA	9.203	663.0 -> 619.0	8467	0.44	µg/L	100
		663.0 -> 168.9	881			
PFUnDA	8.423	563.1 -> 519.0	4703	0.44	µg/L	m 96
		563.1 -> 269.1	1056			
11CI-PF3OUdS	9.256	630.9 -> 450.9	15991	1.75	µg/L	99
		632.9 -> 452.9	4826			
9CI-PF3ONS	8.463	530.8 -> 351.0	17174	1.59	µg/L	95
		532.8 -> 353.0	5505			
ADONA	6.606	376.9 -> 250.9	35699	1.70	µg/L	99
		376.9 -> 84.8	9568			
HFPO-DA	5.816	284.9 -> 168.9	4474	1.78	µg/L	90
		284.9 -> 184.9	668			
3:3FTCA	4.179	241.0 -> 177.0	2017	2.19	µg/L	99
		241.0 -> 117.0	173			
5:3FTCA	6.296	341.0 -> 237.1	38796	11.08	µg/L	99
		341.0 -> 217.0	27393			
7:3FTCA	7.686	441.0 -> 316.9	14899	11.42	µg/L	98
		441.0 -> 336.9	34882			
EtFOSA	10.875	526.0 -> 219.0	1594	0.43	µg/L	96
		526.0 -> 169.0	1840			
EtFOSE	10.784	630.0 -> 58.9	11442	4.38	µg/L	100
MeFOSA	10.592	511.9 -> 219.0	1474	0.49	µg/L	93
		511.9 -> 169.0	1560			
MeFOSE	10.500	616.1 -> 58.9	11251	4.37	µg/L	100
PFDoDS	9.690	699.1 -> 79.9	937	0.44	µg/L	97
		699.1 -> 98.8	495			
NFDHA	5.391	295.0 -> 201.0	646	0.90	µg/L	87
		295.0 -> 84.9	196			
PFMBA	4.854	279.0 -> 85.1	8228	0.86	µg/L	100
PFMPA	3.765	229.0 -> 84.9	6947	0.84	µg/L	100
PFEESA	5.909	314.8 -> 134.9	12323	0.77	µg/L	99
		314.8 -> 82.9	506			

= Qualifier out of range, m = manually integrated, + = Area summed

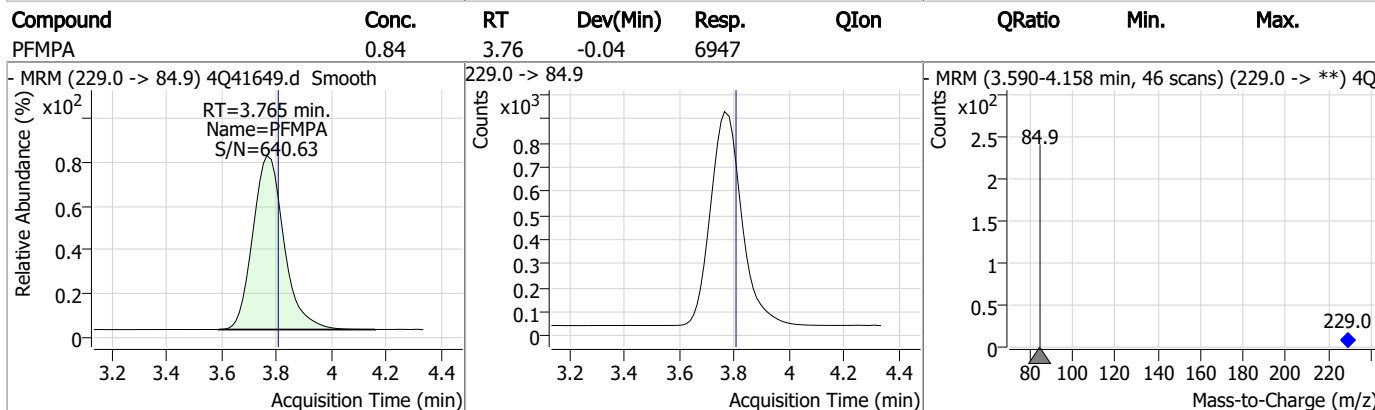
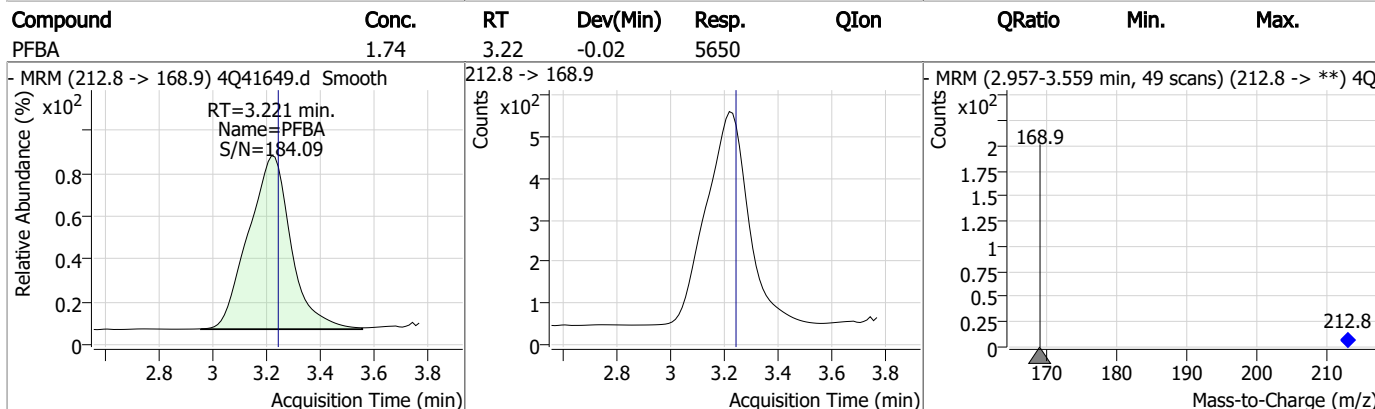
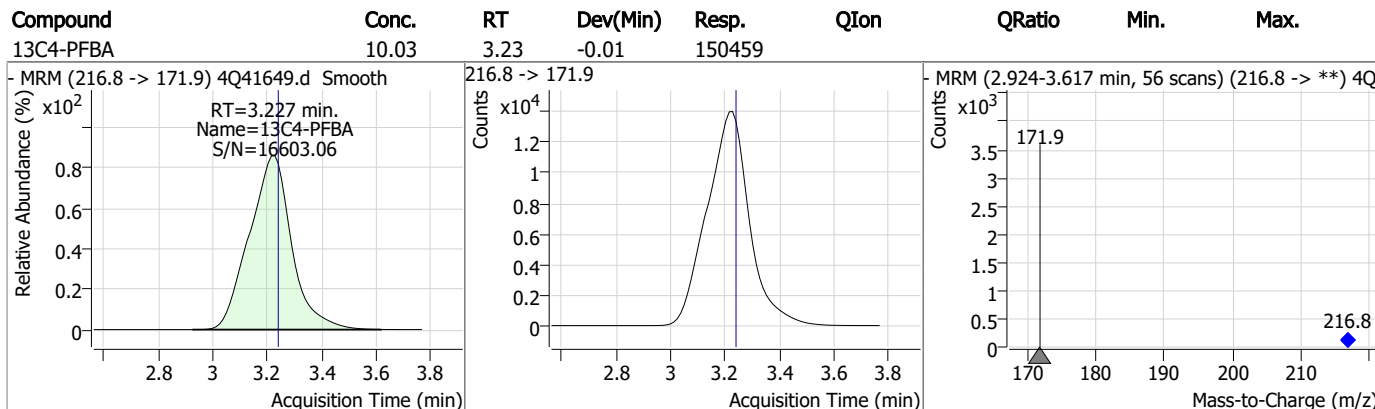
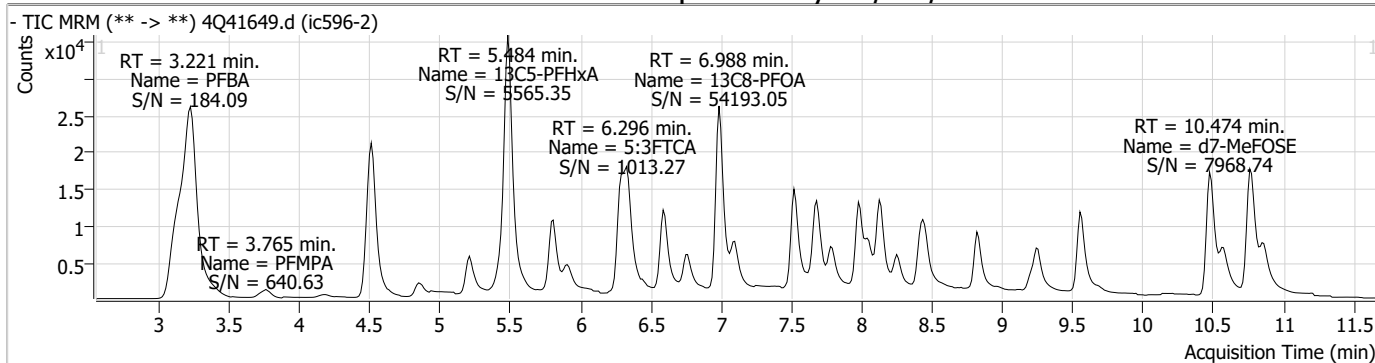
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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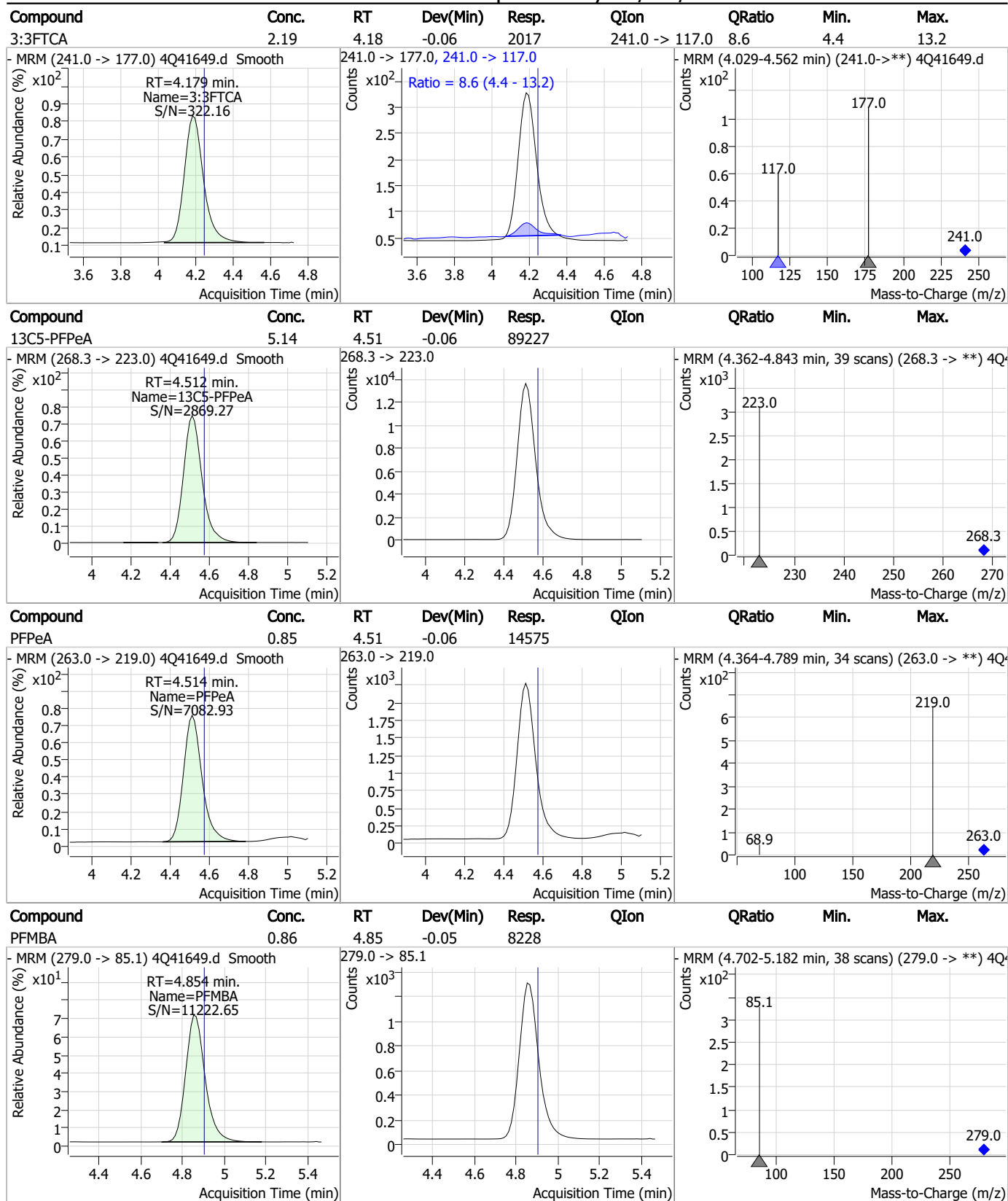
7.7.3

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Perfluorinated Compounds by LC/MS/MS



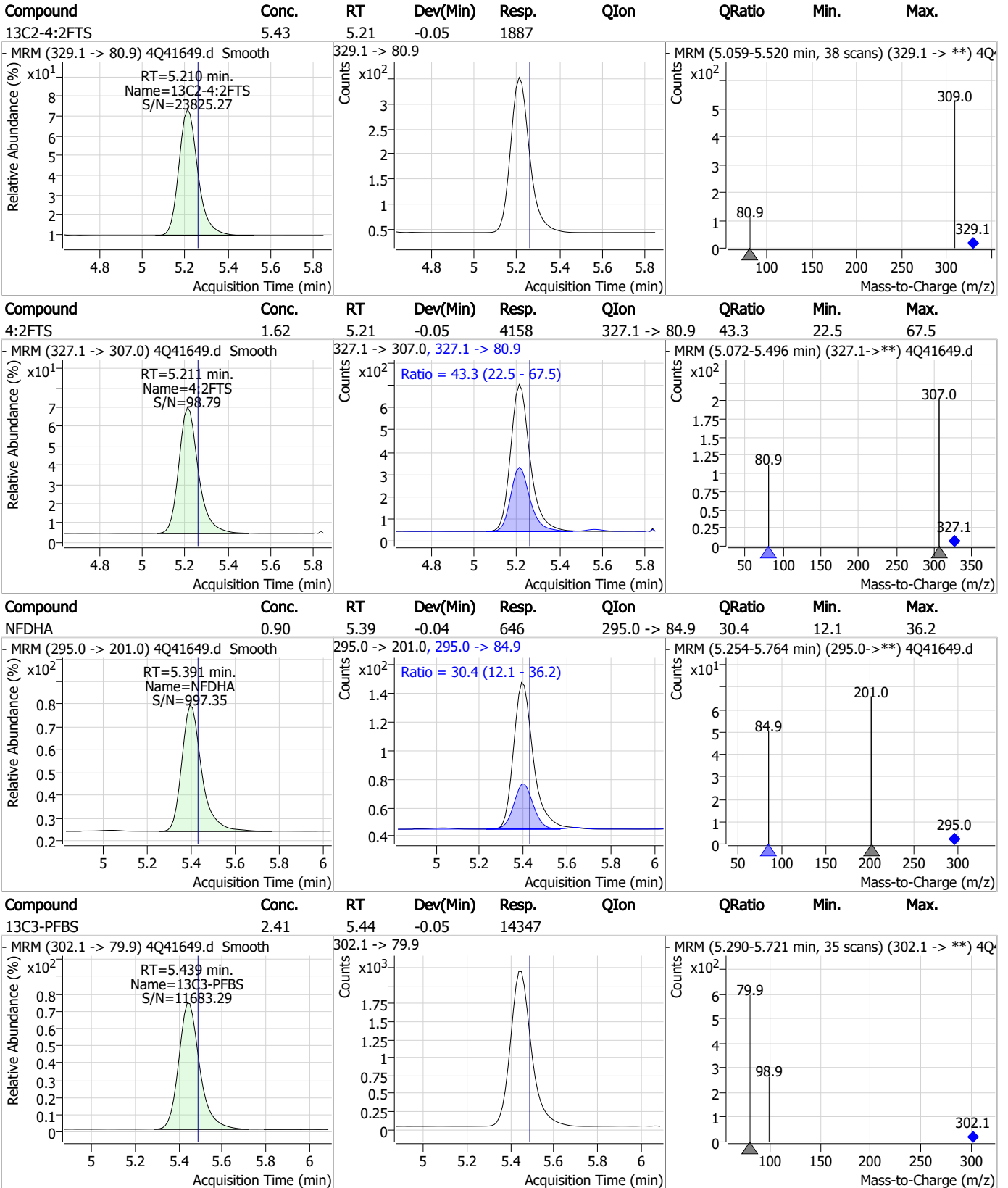
Perfluorinated Compounds by LC/MS/MS



7.7.3

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Perfluorinated Compounds by LC/MS/MS

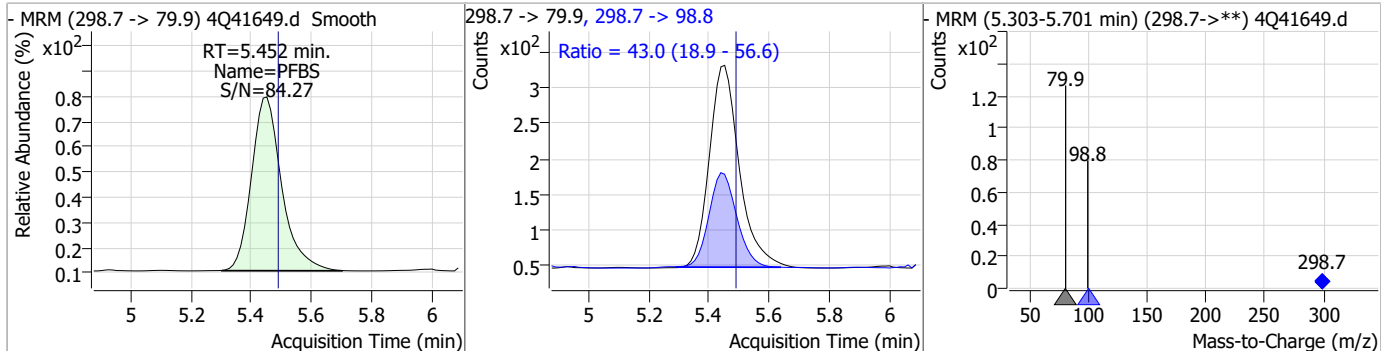


7.7.3

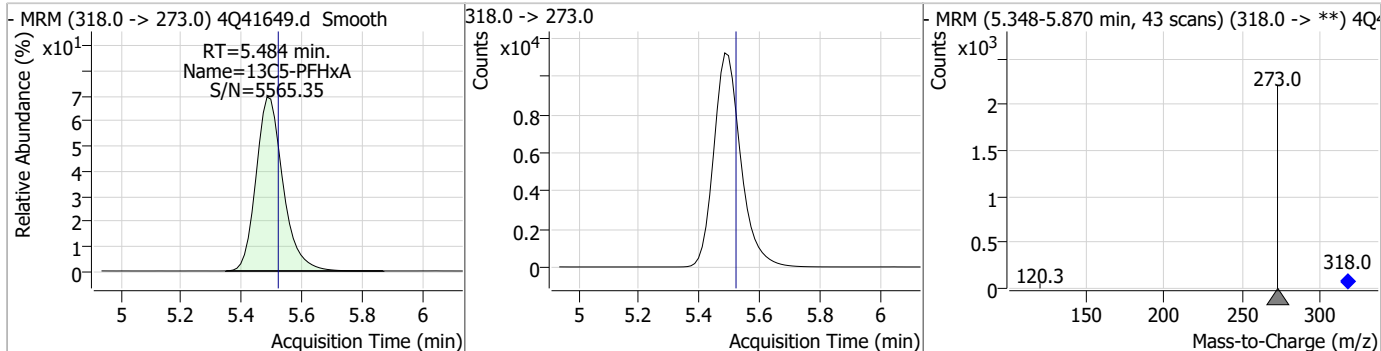
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Perfluorinated Compounds by LC/MS/MS

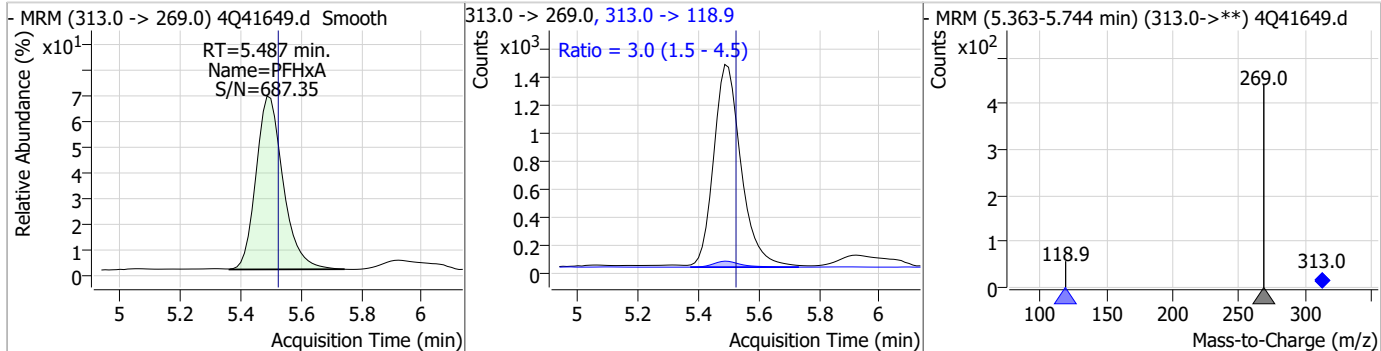
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	0.39	5.45	-0.04	2001	298.7 -> 98.8	43.0	18.9	56.6



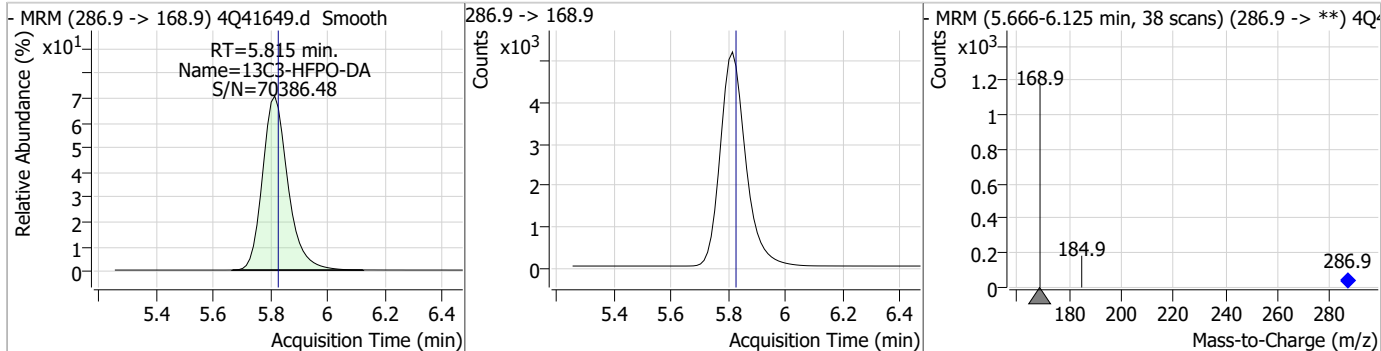
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFHxA	2.51	5.48	-0.04	69159				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	0.42	5.49	-0.04	8929	313.0 -> 118.9	3.0	1.5	4.5

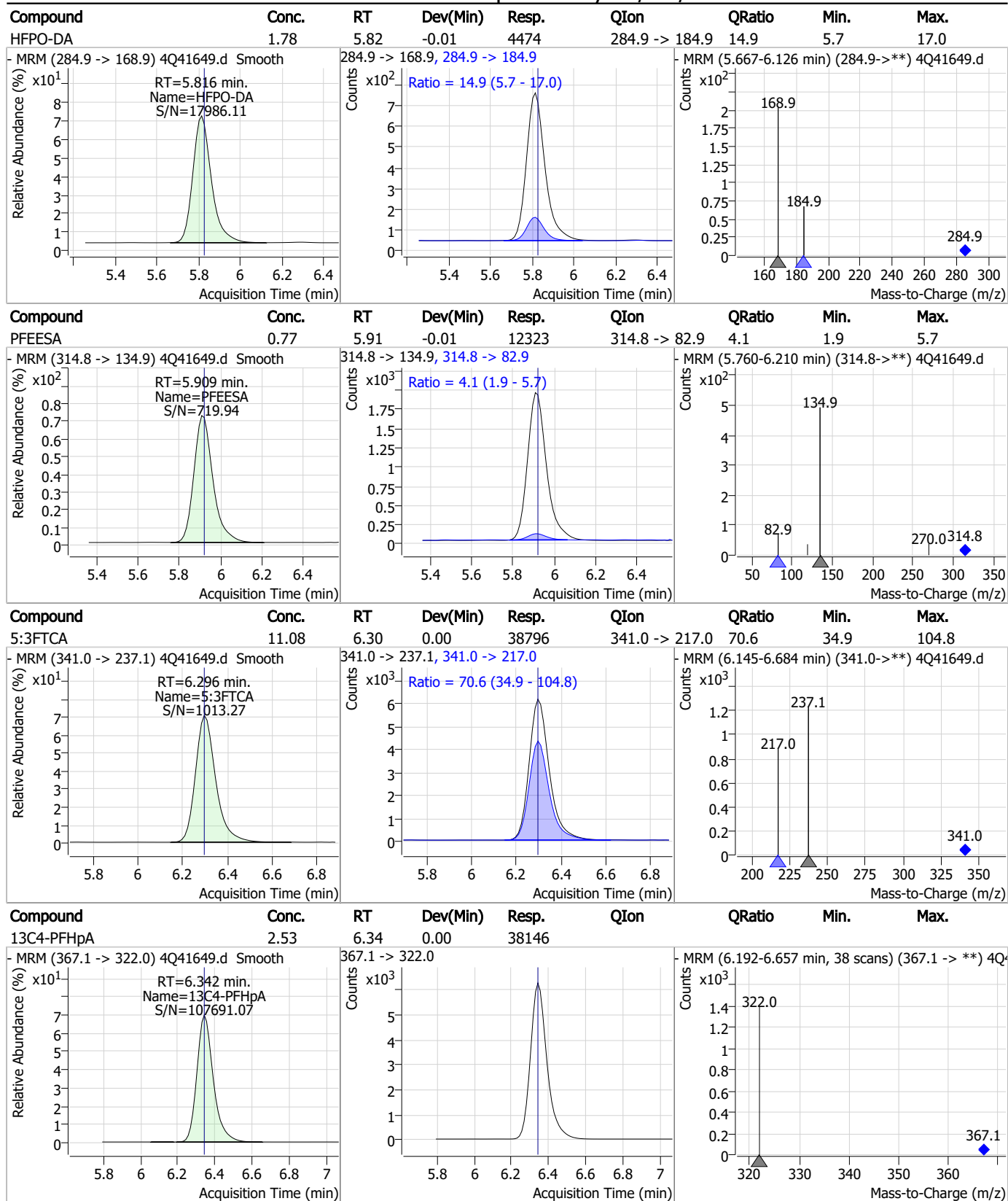


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	9.93	5.81	-0.01	31968				



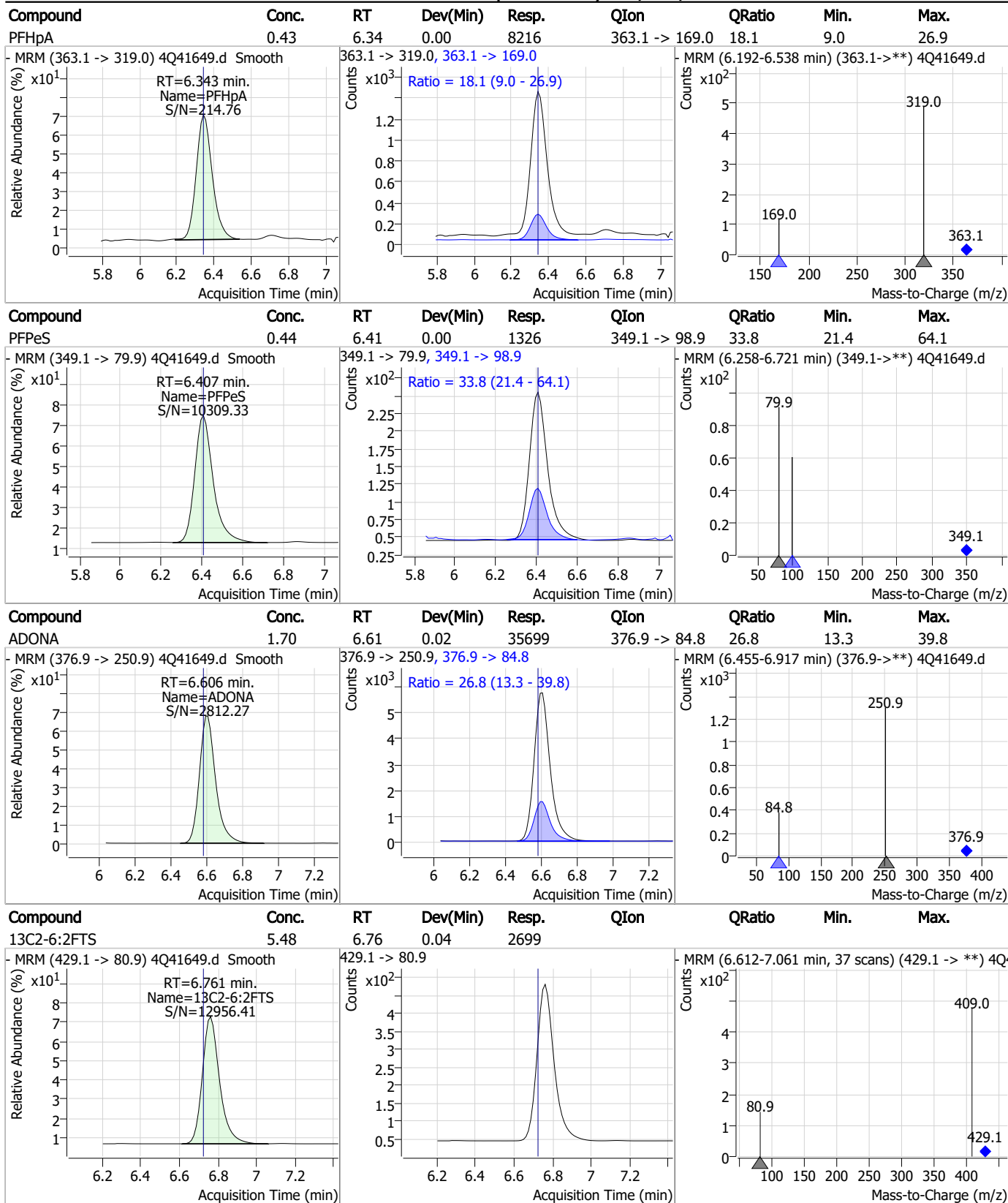
7.7.3
7

Perfluorinated Compounds by LC/MS/MS



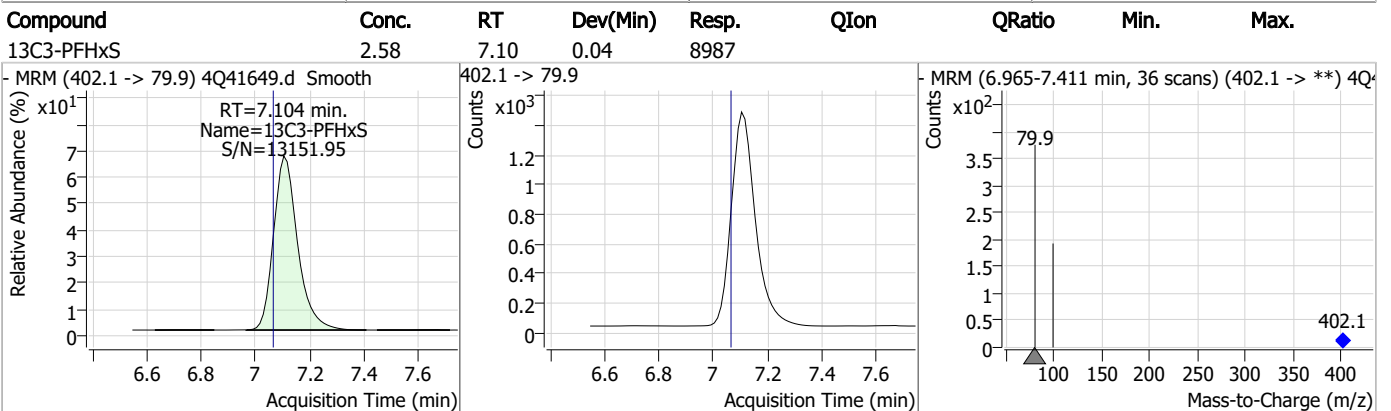
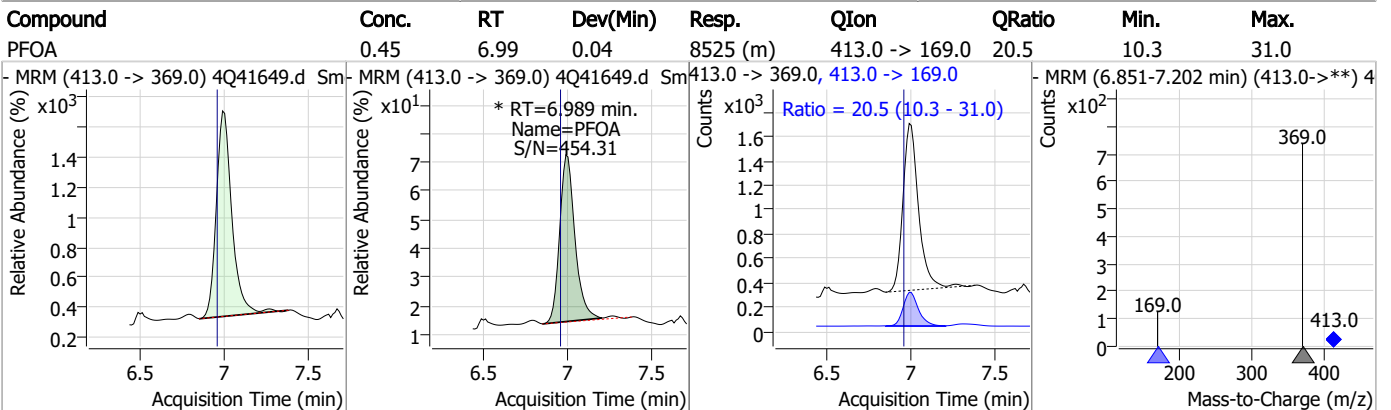
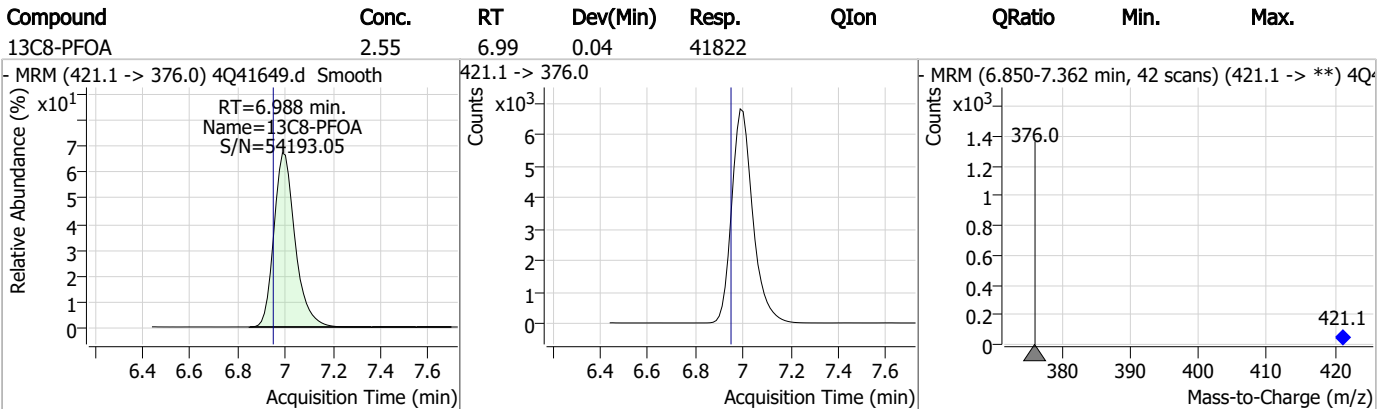
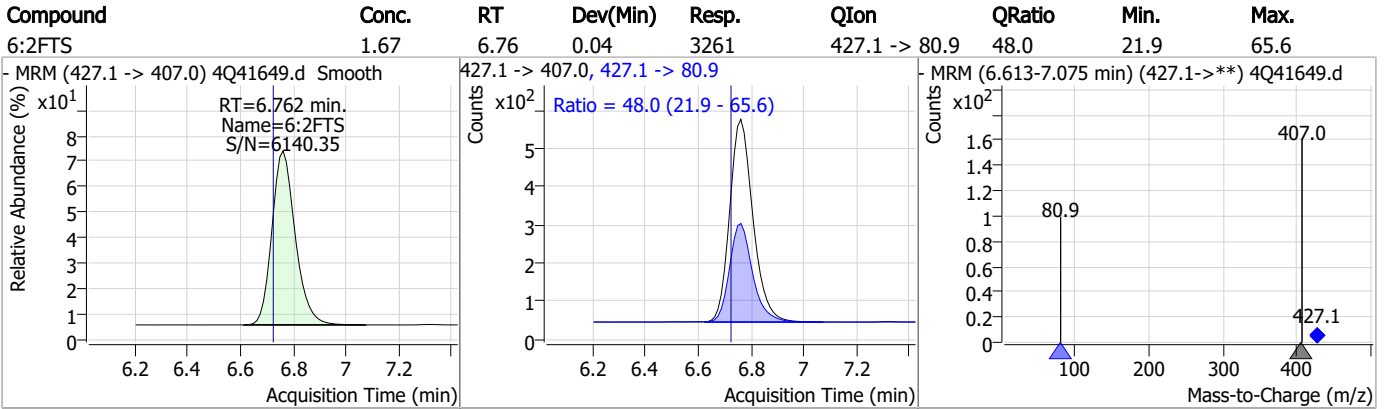
7.7.3
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Perfluorinated Compounds by LC/MS/MS



7.7.3
7

Perfluorinated Compounds by LC/MS/MS

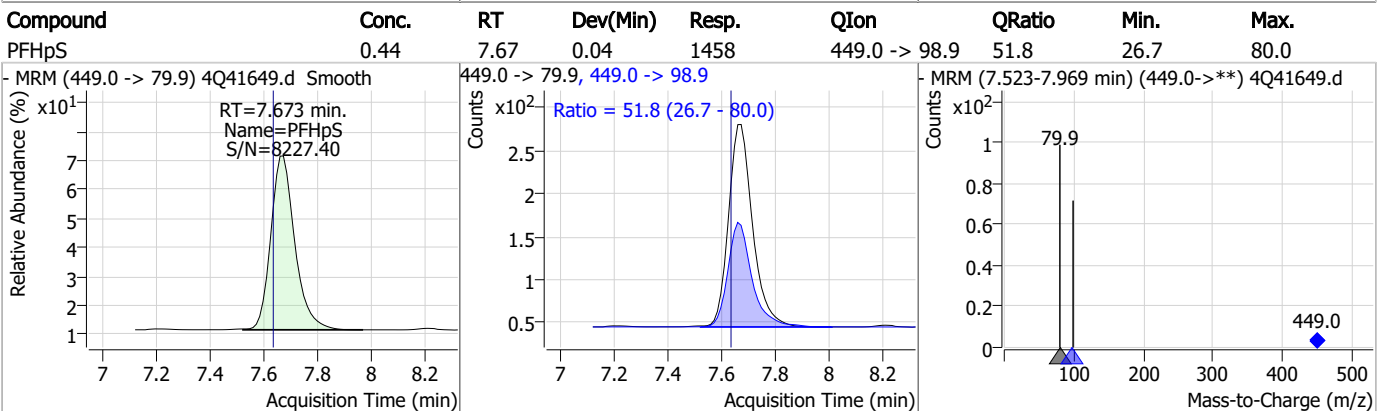
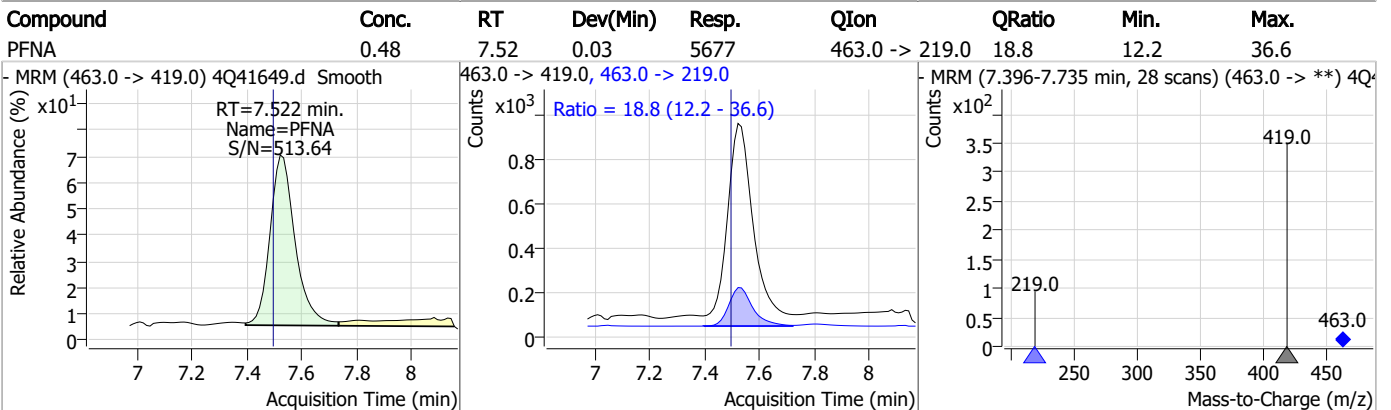
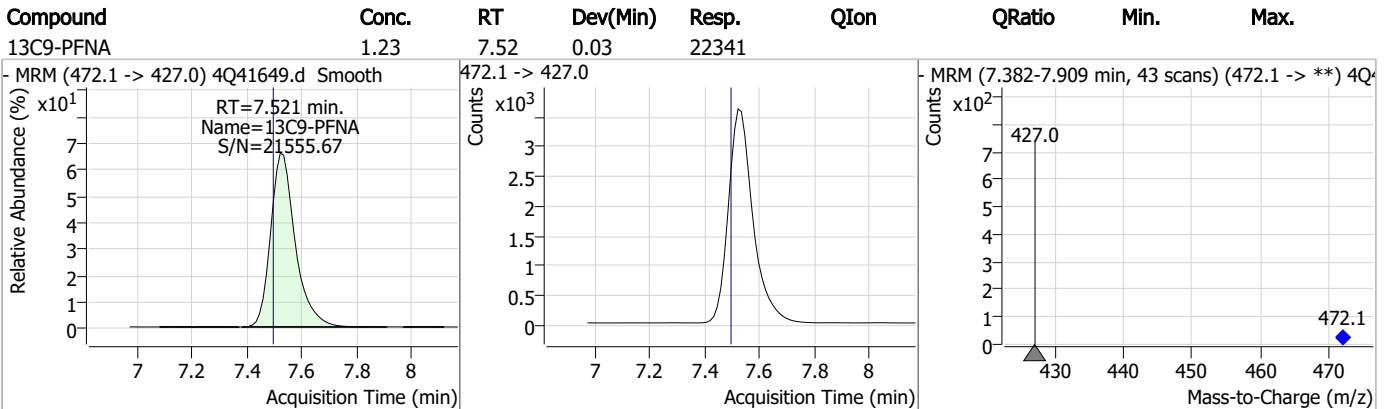
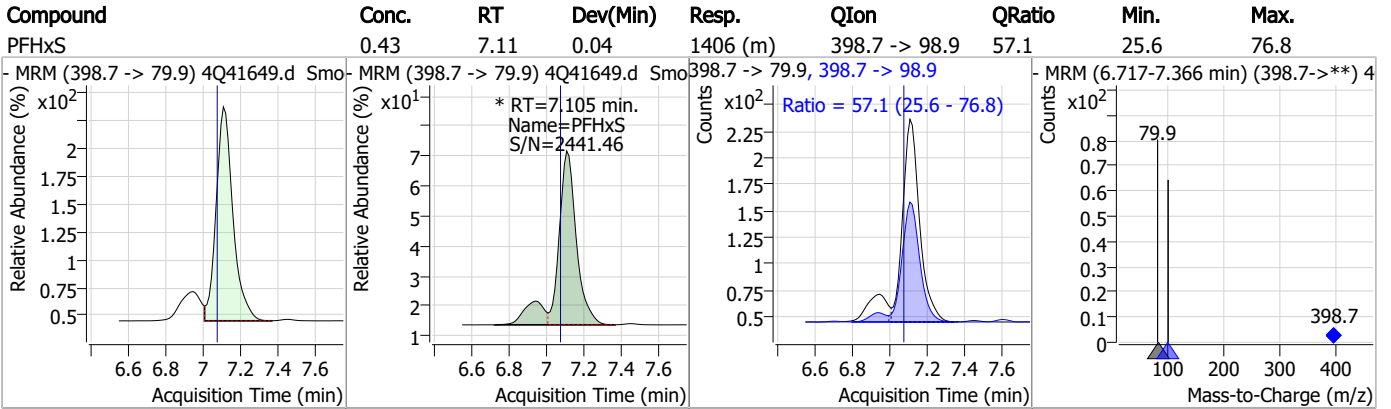


7.7.3

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Perfluorinated Compounds by LC/MS/MS

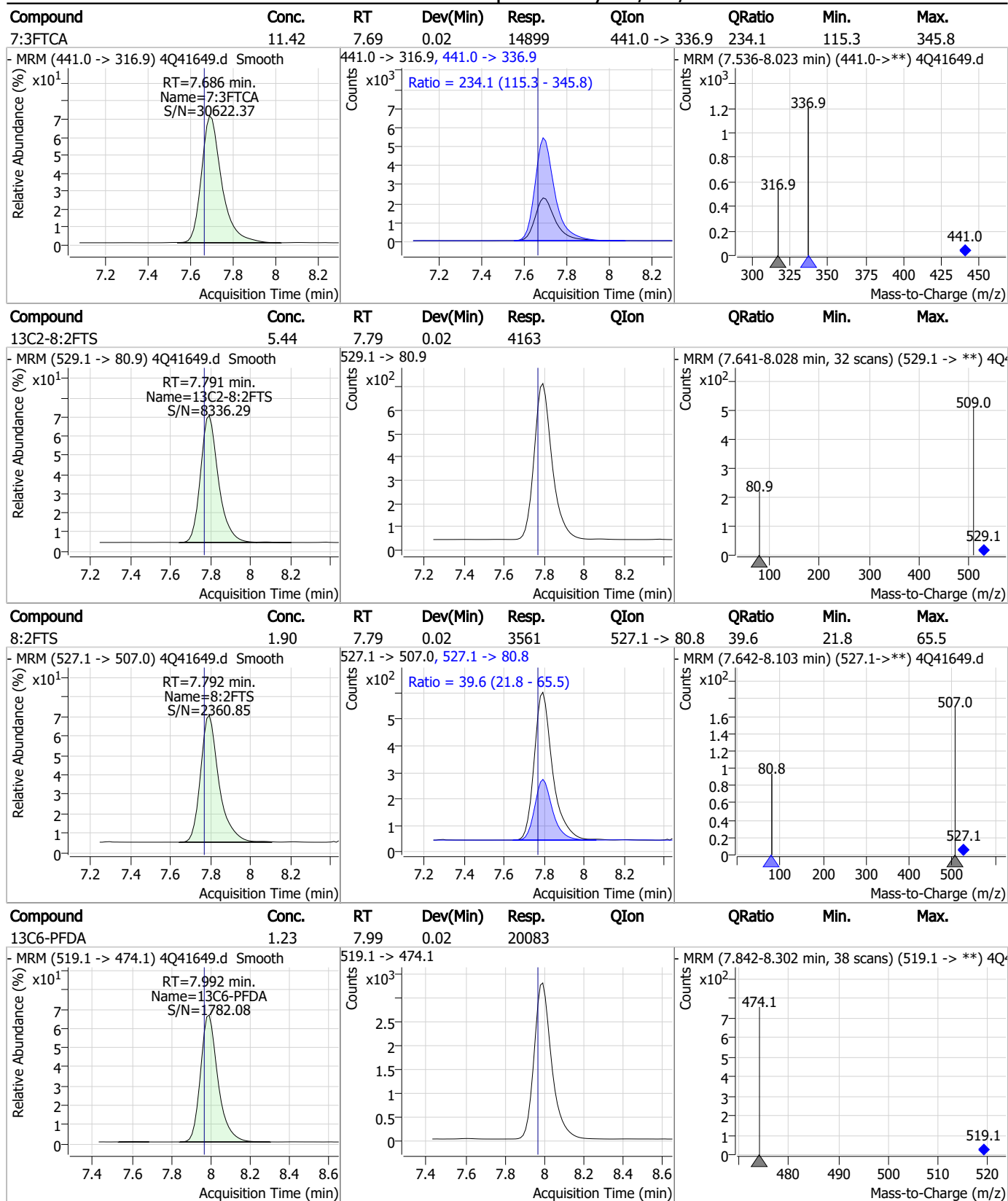


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Perfluorinated Compounds by LC/MS/MS

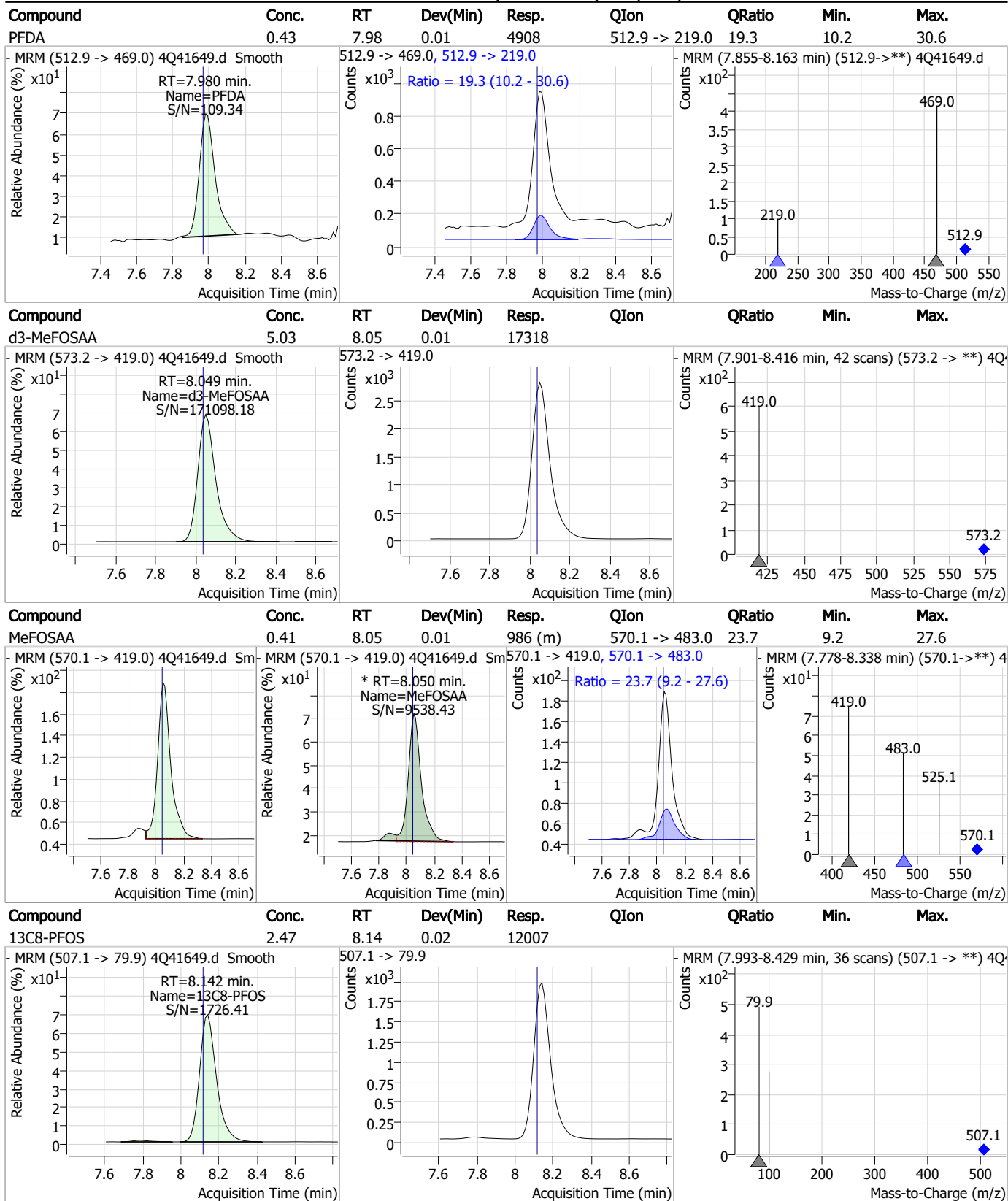


7.7.3

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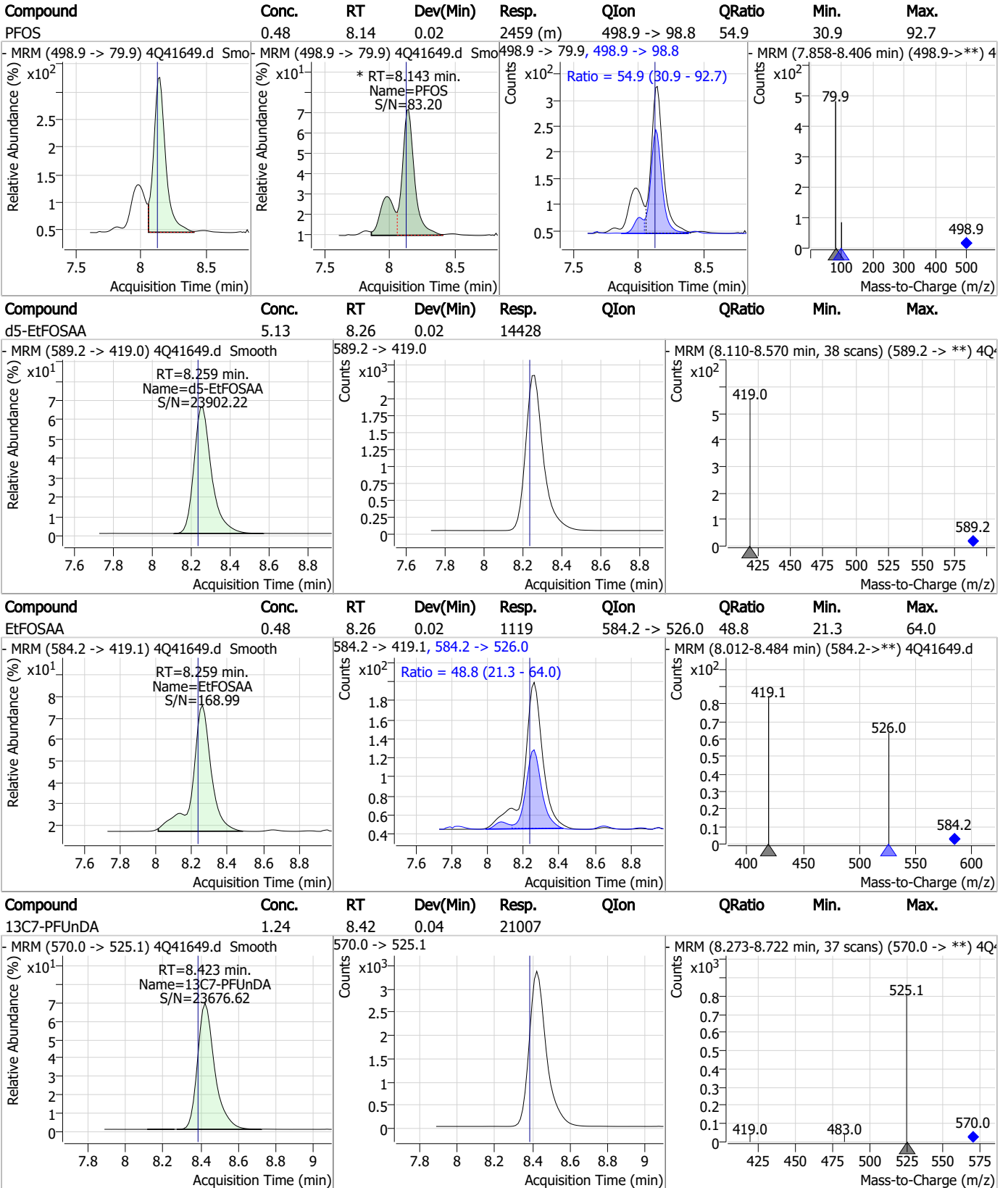
Perfluorinated Compounds by LC/MS/MS



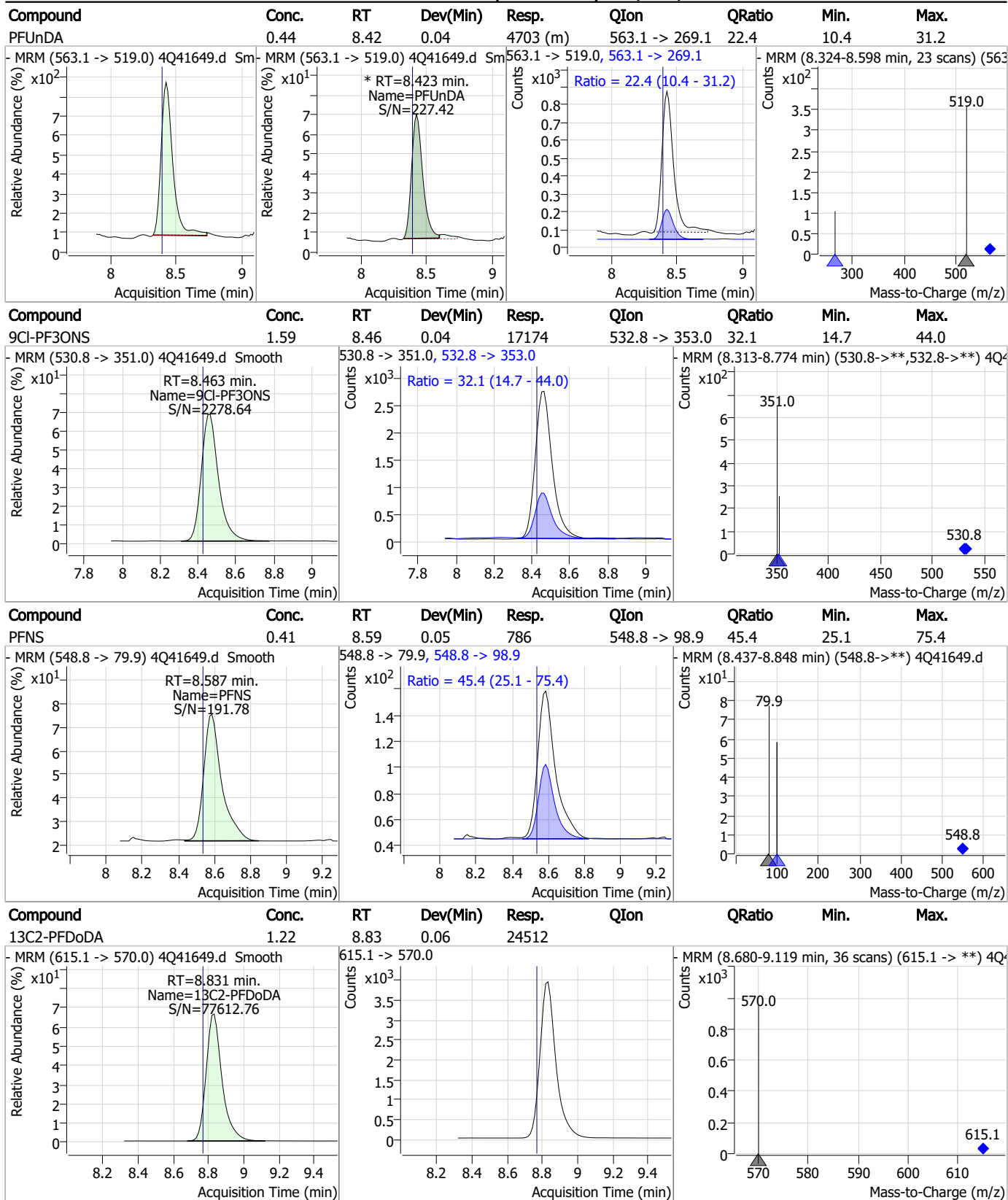
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Perfluorinated Compounds by LC/MS/MS

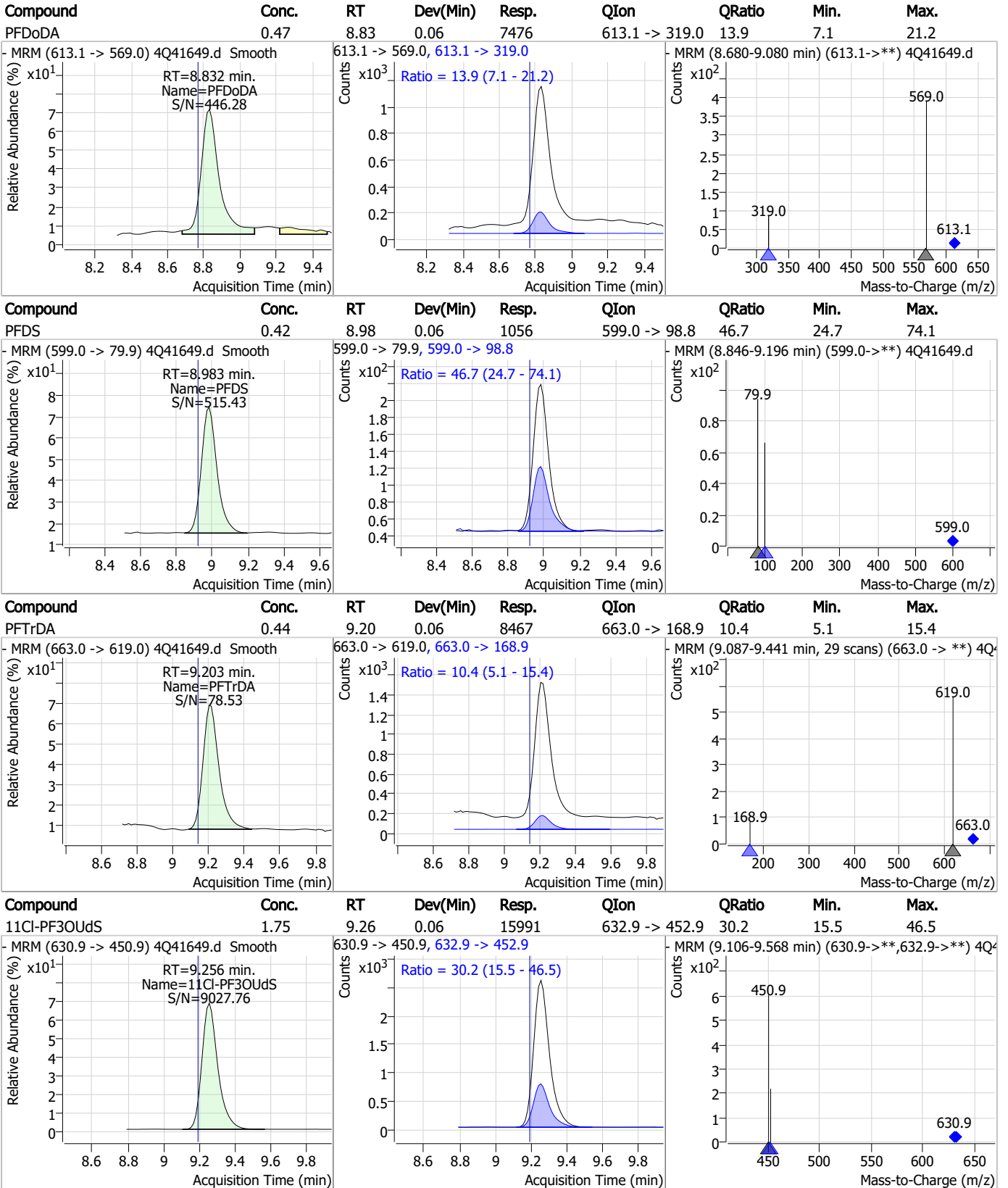


Perfluorinated Compounds by LC/MS/MS



7.7.3
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Perfluorinated Compounds by LC/MS/MS

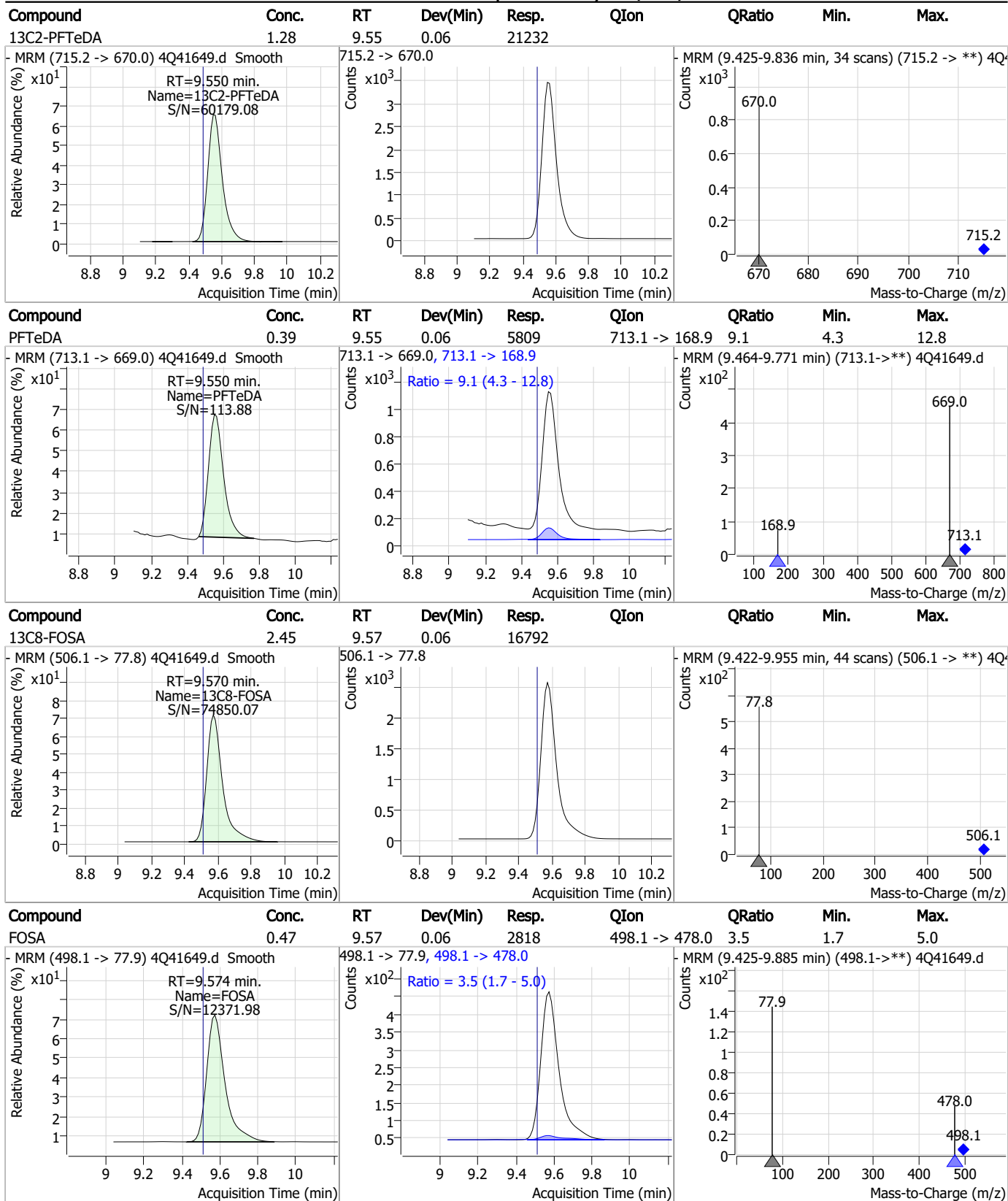


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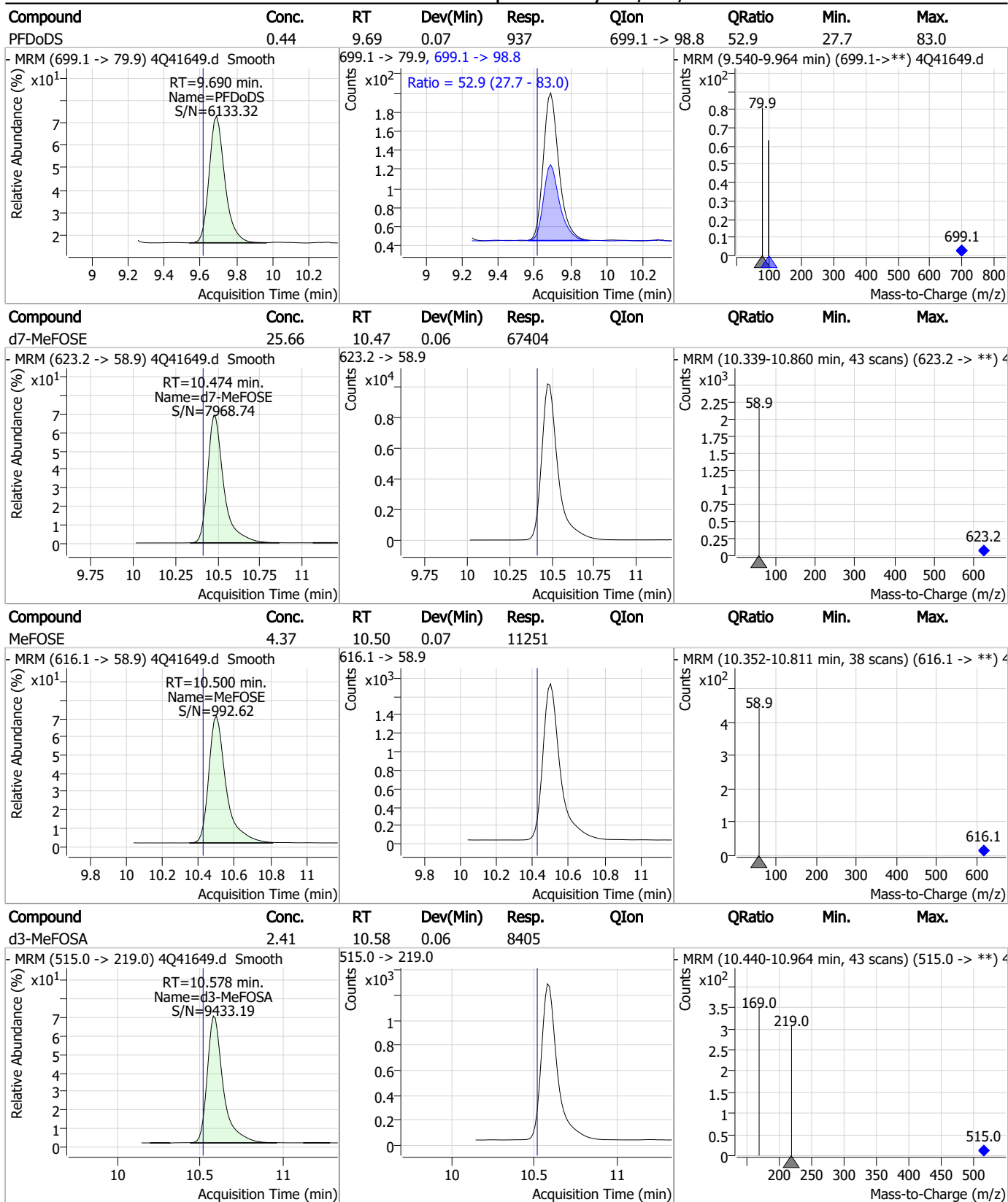


Perfluorinated Compounds by LC/MS/MS



7.7.3
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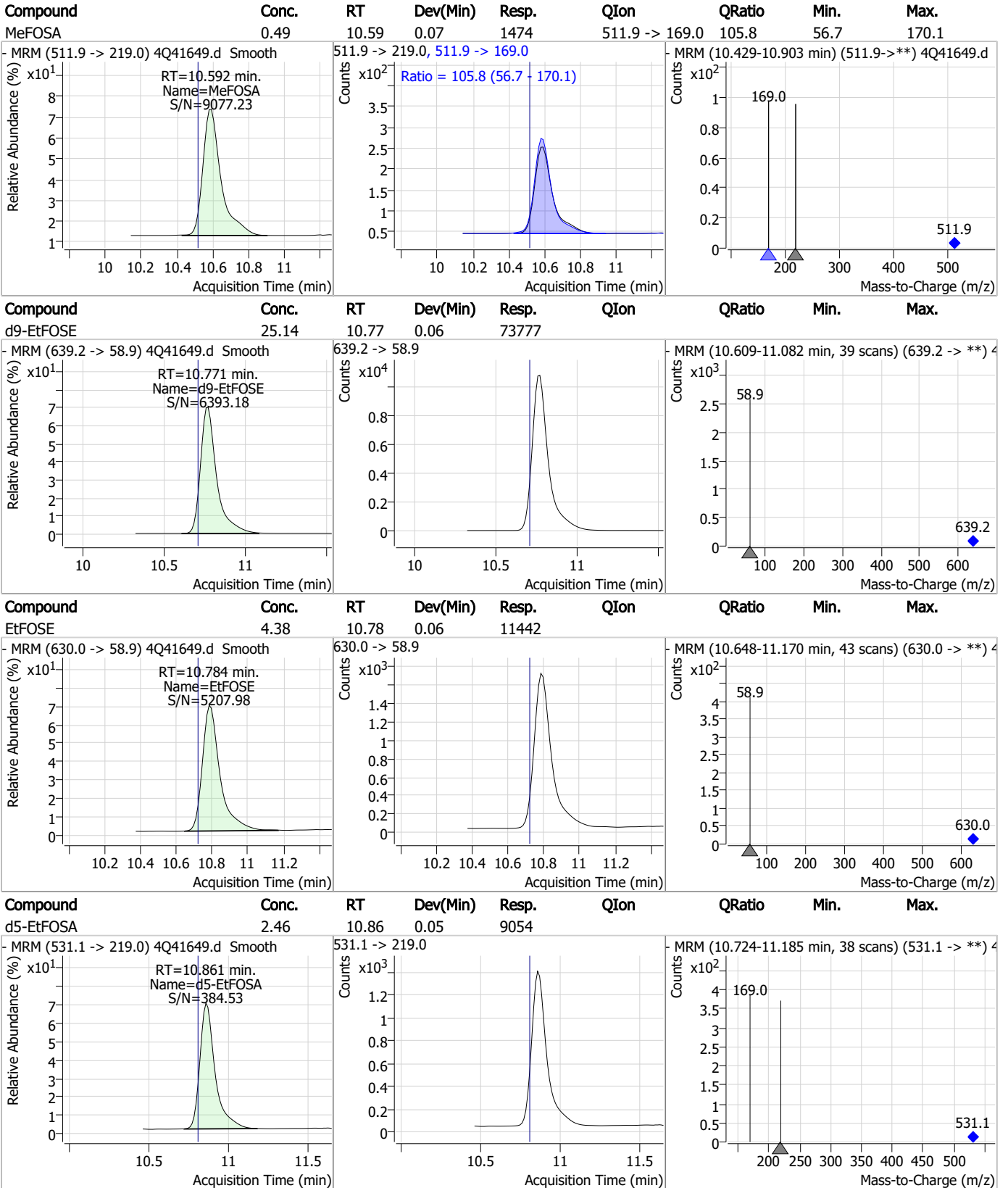
Perfluorinated Compounds by LC/MS/MS



7.7.3

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Perfluorinated Compounds by LC/MS/MS



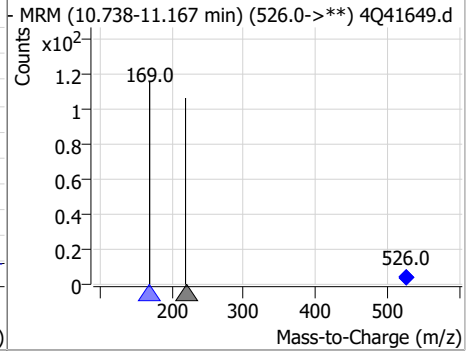
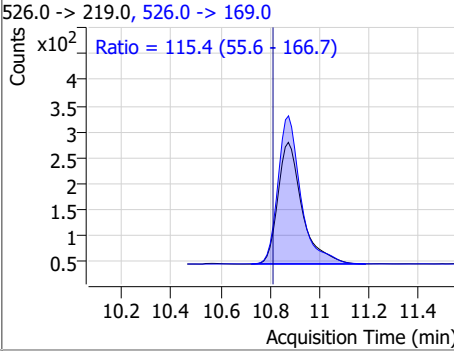
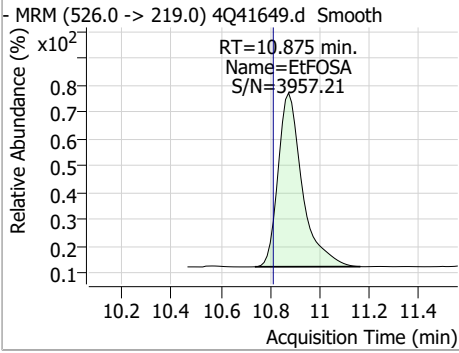
7.7.3

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Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	0.43	10.88	0.06	1594	526.0 -> 169.0	115.4	55.6	166.7



7.7.3

7

Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41649.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 18:00 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		6.99	Split peak
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
MeFOSAA	2355-31-9		8.05	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak
Perfluoroundecanoic acid	2058-94-8		8.42	Poorly defined baseline

7.7.3.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41650.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 6:14:32 PM
 Sample Name : ic596-3
 Vial : P1-A4
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.189	216.8 -> 171.9	146014	10.00 µg/L	-0.050
M5-PFPeA	4.524	268.3 -> 223.0	89811	5.00 µg/L	-0.050
M5-PFHxA	5.509	318.0 -> 273.0	71691	2.50 µg/L	-0.012
M4-PFHpA	6.367	367.1 -> 322.0	37953	2.50 µg/L	0.025
M8-PFOA	6.988	421.1 -> 376.0	40446	2.50 µg/L	0.039
M9-PFNA	7.483	472.1 -> 427.0	22857	1.25 µg/L	-0.012
M6-PFDA	7.905	519.1 -> 474.1	19921	1.25 µg/L	-0.062
M7-PFUnDA	8.361	570.0 -> 525.1	20892	1.25 µg/L	-0.025
M2-PFDoDA	8.780	615.1 -> 570.0	24727	1.25 µg/L	0.012
M2-PFTeDA	9.550	715.2 -> 670.0	20304	1.25 µg/L	0.062
M8-FOSA	9.545	506.1 -> 77.8	16901	2.50 µg/L	0.037
M3-PFBS	5.464	302.1 -> 79.9	14921	2.50 µg/L	-0.025
M3-PFHxS	7.104	402.1 -> 79.9	8690	2.50 µg/L	0.039
M8-PFOS	8.068	507.1 -> 79.9	11828	2.50 µg/L	-0.050
M2-4:2FTS	5.235	329.1 -> 80.9	1918	5.00 µg/L	-0.024
M2-6:2FTS	6.749	429.1 -> 80.9	2611	5.00 µg/L	0.025
M2-8:2FTS	7.715	529.1 -> 80.9	4053	5.00 µg/L	-0.051
M3-MeFOSAA	7.975	573.2 -> 419.0	17015	5.00 µg/L	-0.062
M3-HFPO-DA	5.827	286.9 -> 168.9	33042	10.00 µg/L	0.000
M5-EtFOSAA	8.184	589.2 -> 419.0	14269	5.00 µg/L	-0.049
M7-MeFOSE	10.462	623.2 -> 58.9	65298	25.00 µg/L	0.049
M9-EtFOSE	10.759	639.2 -> 58.9	71924	25.00 µg/L	0.050
M5-EtFOSA	10.861	531.1 -> 219.0	8797	2.50 µg/L	0.050
M3-MeFOSA	10.566	515.0 -> 219.0	7990	2.50 µg/L	0.050
13C4-PFOS	8.068	502.8 -> 79.9	12470	2.50 µg/L	-0.050
13C3-PFBA	3.193	216.0 -> 172.0	85440	5.00 µg/L	-0.050
18O2-PFHxS	7.103	403.0 -> 83.9	6179	2.50 µg/L	0.039
13C4-PFOA	6.988	417.1 -> 372.0	50394	2.50 µg/L	0.038
13C2-PFDA	7.905	515.1 -> 470.1	18901	1.25 µg/L	-0.062
13C5-PFNA	7.484	468.0 -> 423.0	25600	1.25 µg/L	-0.012
13C2-PFHxA	5.510	315.1 -> 270.0	64055	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.235	329.1 -> 80.9	1918	5.72 µg/L	-0.024
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 114.5%		
13C2-6:2FTS	6.749	429.1 -> 80.9	2611	5.50 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 110.0%		
13C2-8:2FTS	7.715	529.1 -> 80.9	4053	5.48 µg/L	-0.051
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 109.7%		
13C2-PFDoDA	8.780	615.1 -> 570.0	24727	1.24 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.0%		
13C2-PFTeDA	9.550	715.2 -> 670.0	20304	1.23 µg/L	0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 98.5%		
13C3-PFBS	5.464	302.1 -> 79.9	14921	2.60 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 103.8%		
13C3-PFHxS	7.104	402.1 -> 79.9	8690	2.59 µg/L	0.039

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.4%	
13C4-PFBA	3.189	216.8 -> 171.9	146014	9.94 µg/L	-0.050
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.4%	
13C4-PFHpA	6.367	367.1 -> 322.0	37953	2.50 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.9%	
13C5-PFHxA	5.509	318.0 -> 273.0	71691	2.58 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.2%	
13C5-PFPeA	4.524	268.3 -> 223.0	89811	5.14 µg/L	-0.050
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 102.7%	
13C6-PFDA	7.905	519.1 -> 474.1	19921	1.23 µg/L	-0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.4%	
13C7-PFUnDA	8.361	570.0 -> 525.1	20892	1.25 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.7%	
13C8-FOSA	9.545	506.1 -> 77.8	16901	2.44 µg/L	0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.5%	
13C8-PFOA	6.988	421.1 -> 376.0	40446	2.43 µg/L	0.039
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.1%	
13C8-PFOS	8.068	507.1 -> 79.9	11828	2.41 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.3%	
13C9-PFNA	7.483	472.1 -> 427.0	22857	1.28 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.1%	
d3-MeFOSAA	7.975	573.2 -> 419.0	17015	4.89 µg/L	-0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 97.7%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	33042	10.19 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 101.9%	
d3-MeFOSA	10.566	515.0 -> 219.0	7990	2.26 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.5%	
d5-EtFOSAA	8.184	589.2 -> 419.0	14269	5.02 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.4%	
d7-MeFOSE	10.462	623.2 -> 58.9	65298	24.59 µg/L	0.049
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 98.3%	
d9-EtFOSE	10.759	639.2 -> 58.9	71924	24.24 µg/L	0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 97.0%	
d5-EtFOSA	10.861	531.1 -> 219.0	8797	2.36 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.4%	
Target Compounds					QValue
4:2FTS	5.236	327.1 -> 307.0	11998	4.59 µg/L	96
		327.1 -> 80.9	5092		
6:2FTS	6.762	427.1 -> 407.0	8486	4.49 µg/L	99
		427.1 -> 80.9	3680		
8:2FTS	7.716	527.1 -> 507.0	8005	4.39 µg/L	96
		527.1 -> 80.8	3723		
EtFOSAA	8.185	584.2 -> 419.1	2495	1.09 µg/L	m 91
		584.2 -> 526.0	1209		
FOSA	9.549	498.1 -> 77.9	7308	1.20 µg/L	98
		498.1 -> 478.0	195		
MeFOSAA	7.976	570.1 -> 419.0	3038	1.30 µg/L	m 98
		570.1 -> 483.0	584		
PFBA	3.183	212.8 -> 168.9	14796	4.71 µg/L	100
PFBS	5.465	298.7 -> 79.9	5614	1.05 µg/L	95
		298.7 -> 98.8	2288		
PFDA	7.905	512.9 -> 469.0	13450	1.18 µg/L	98
		512.9 -> 219.0	2869		
PFDODA	8.768	613.1 -> 569.0	18869	1.17 µg/L	100
		613.1 -> 319.0	2675		
PFDS	8.933	599.0 -> 79.9	2856	1.14 µg/L	91

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	1227			
PFHpA	6.368	363.1 -> 319.0	21936	1.15	µg/L	97
		363.1 -> 169.0	3679			
PFHpS	7.611	449.0 -> 79.9	3695	1.14	µg/L	99
		449.0 -> 98.9	1949			
PFHxA	5.512	313.0 -> 269.0	24952	1.14	µg/L	98
		313.0 -> 118.9	927			
PFHxS	7.105	398.7 -> 79.9	3173	1.00	µg/L	m 95
		398.7 -> 98.9	1735			
PFNA	7.484	463.0 -> 419.0	14302	1.18	µg/L	m 96
		463.0 -> 219.0	3755			
PFNS	8.525	548.8 -> 79.9	1896	1.01	µg/L	90
		548.8 -> 98.9	1088			
PFOA	6.989	413.0 -> 369.0	21517	1.17	µg/L	98
		413.0 -> 169.0	4644			
PFOS	8.069	498.9 -> 79.9	5373	1.07	µg/L	m 88
		498.9 -> 98.8	2829			
PFPeA	4.527	263.0 -> 219.0	39632	2.30	µg/L	100
PFPeS	6.419	349.1 -> 79.9	3184	1.09	µg/L	99
		349.1 -> 98.9	1375			
PFTeDA	9.550	713.1 -> 669.0	16986	1.21	µg/L	100
		713.1 -> 168.9	1462			
PFTrDA	9.179	663.0 -> 619.0	22900	1.19	µg/L	98
		663.0 -> 168.9	2181			
PFUnDA	8.361	563.1 -> 519.0	12995	1.21	µg/L	m 99
		563.1 -> 269.1	2655			
11Cl-PF3OUdS	9.230	630.9 -> 450.9	41913	4.45	µg/L	99
		632.9 -> 452.9	13287			
9Cl-PF3ONS	8.400	530.8 -> 351.0	49046	4.40	µg/L	99
		532.8 -> 353.0	14725			
ADONA	6.606	376.9 -> 250.9	97218	4.48	µg/L	99
		376.9 -> 84.8	26247			
HFPO-DA	5.828	284.9 -> 168.9	11962	4.60	µg/L	100
		284.9 -> 184.9	1356			
3:3FTCA	4.192	241.0 -> 177.0	5222	5.62	µg/L	98
		241.0 -> 117.0	500			
5:3FTCA	6.320	341.0 -> 237.1	107314	29.55	µg/L	100
		341.0 -> 217.0	74741			
7:3FTCA	7.636	441.0 -> 316.9	39204	28.99	µg/L	97
		441.0 -> 336.9	92557			
EtFOSA	10.875	526.0 -> 219.0	4260	1.19	µg/L	98
		526.0 -> 169.0	4642			
EtFOSE	10.784	630.0 -> 58.9	30563	12.00	µg/L	100
MeFOSA	10.567	511.9 -> 219.0	3601	1.25	µg/L	95
		511.9 -> 169.0	3878			
MeFOSE	10.475	616.1 -> 58.9	29870	11.98	µg/L	100
PFDoDS	9.689	699.1 -> 79.9	2469	1.17	µg/L	95
		699.1 -> 98.8	1451			
NFDHA	5.415	295.0 -> 201.0	1646	2.21	µg/L	80
		295.0 -> 84.9	563			
PFMBA	4.867	279.0 -> 85.1	21766	2.25	µg/L	100
PFMPA	3.782	229.0 -> 84.9	18657	2.25	µg/L	100
PFEESA	5.934	314.8 -> 134.9	33063	2.00	µg/L	99
		314.8 -> 82.9	1111			

= Qualifier out of range, m = manually integrated, + = Area summed

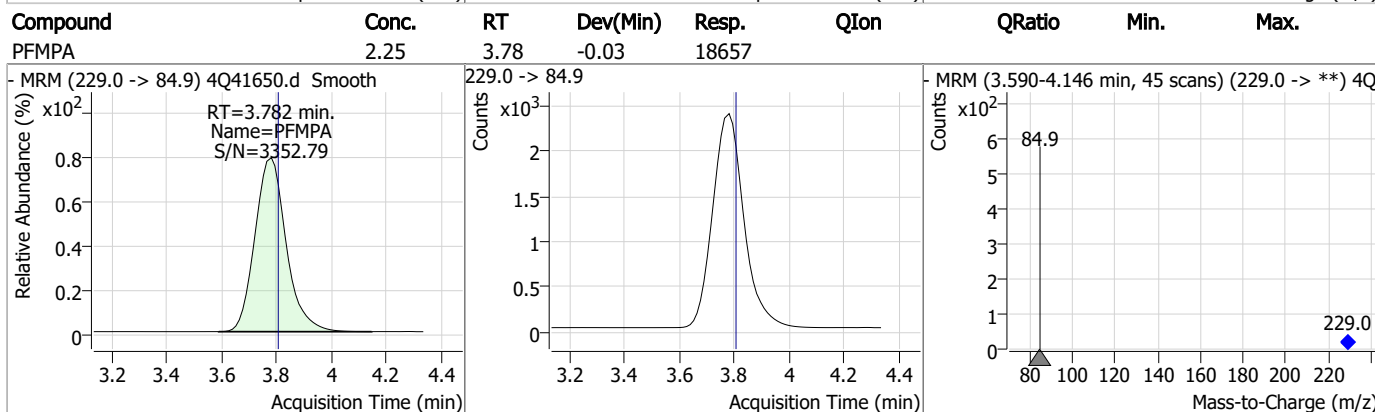
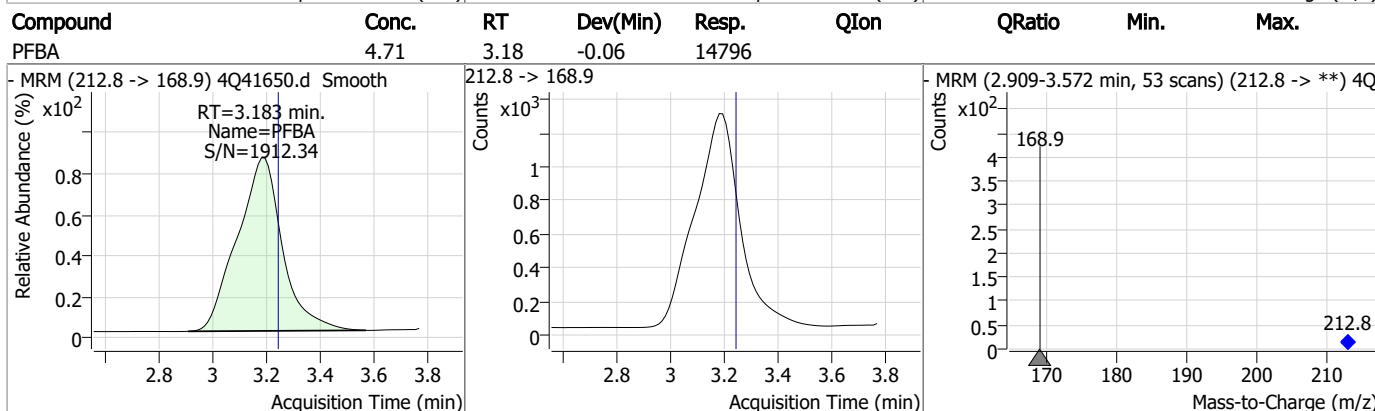
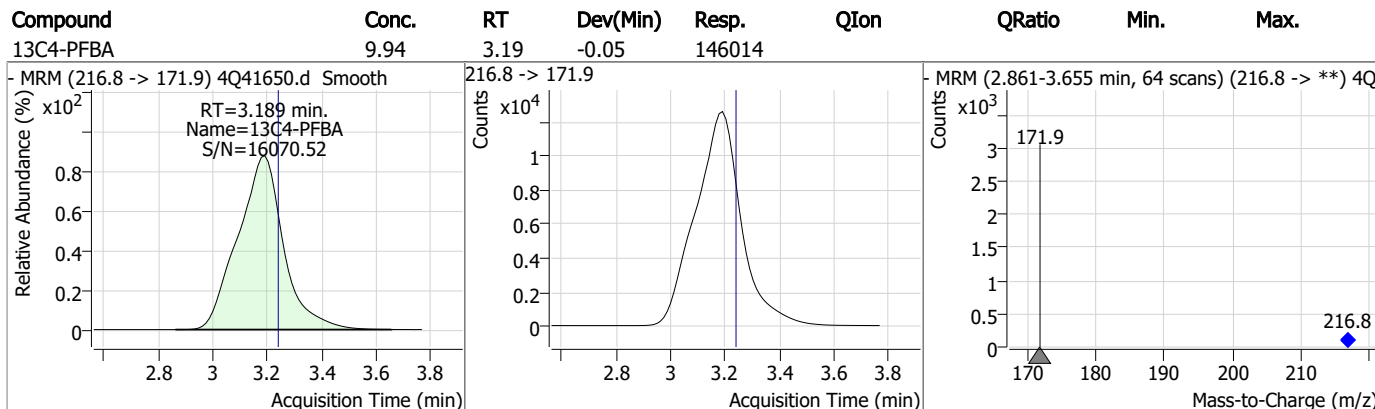
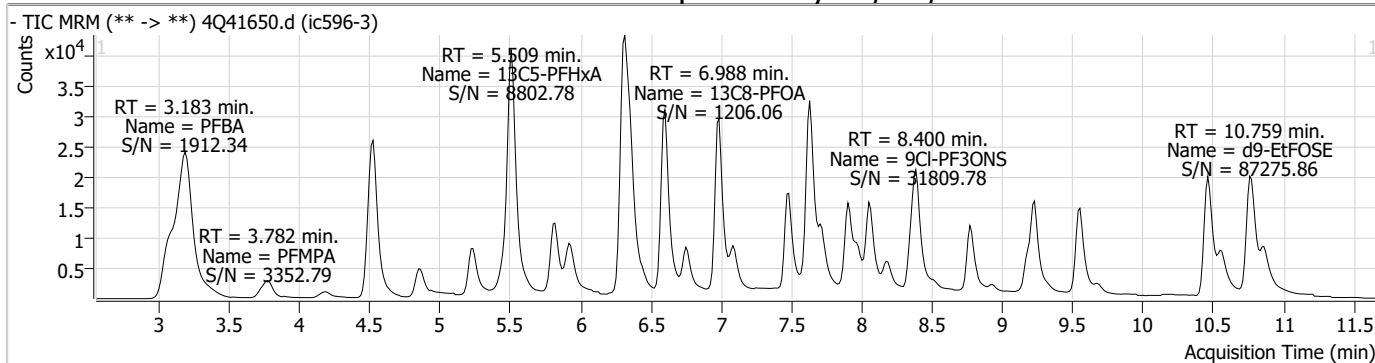
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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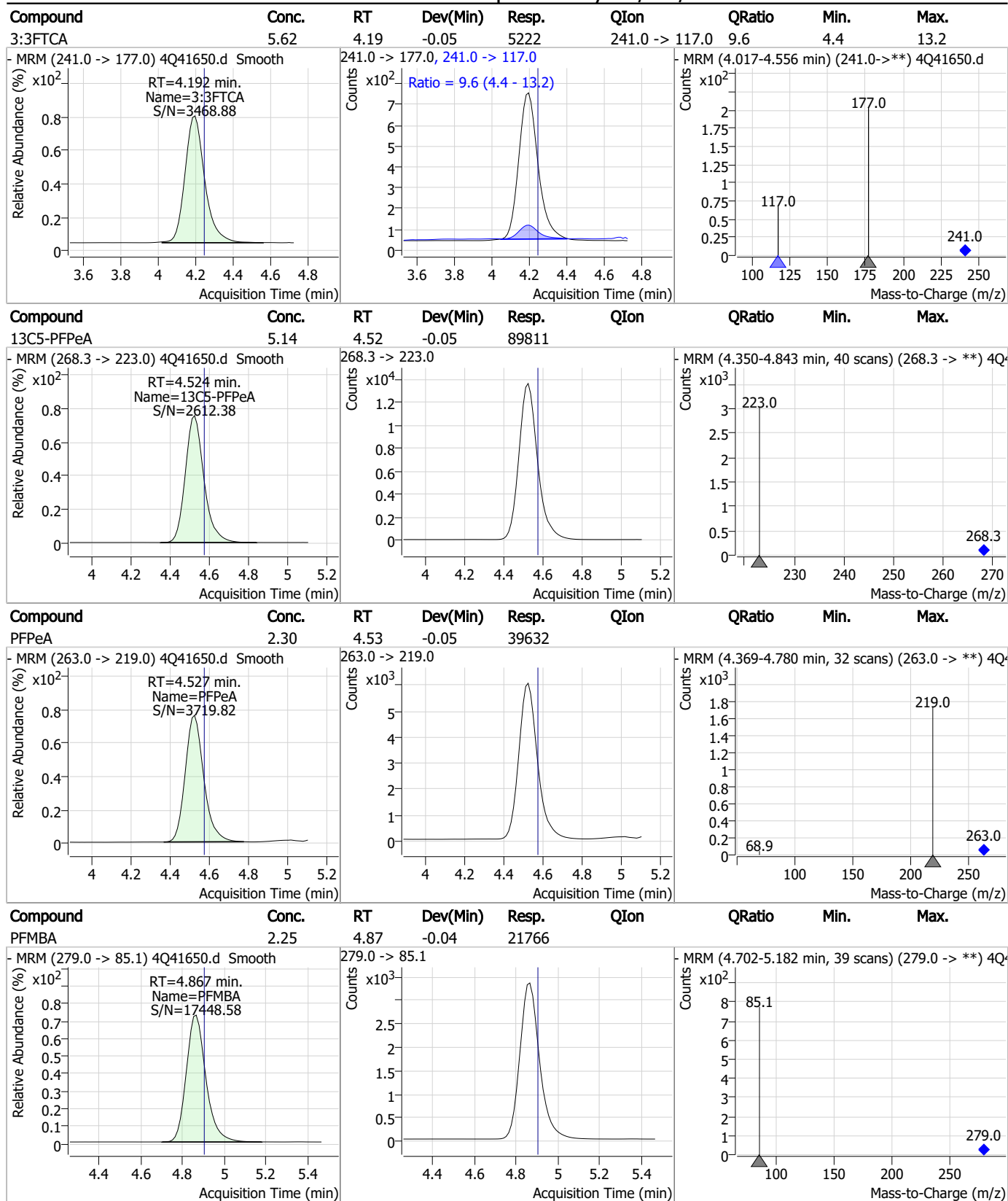
7.7.4

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Perfluorinated Compounds by LC/MS/MS

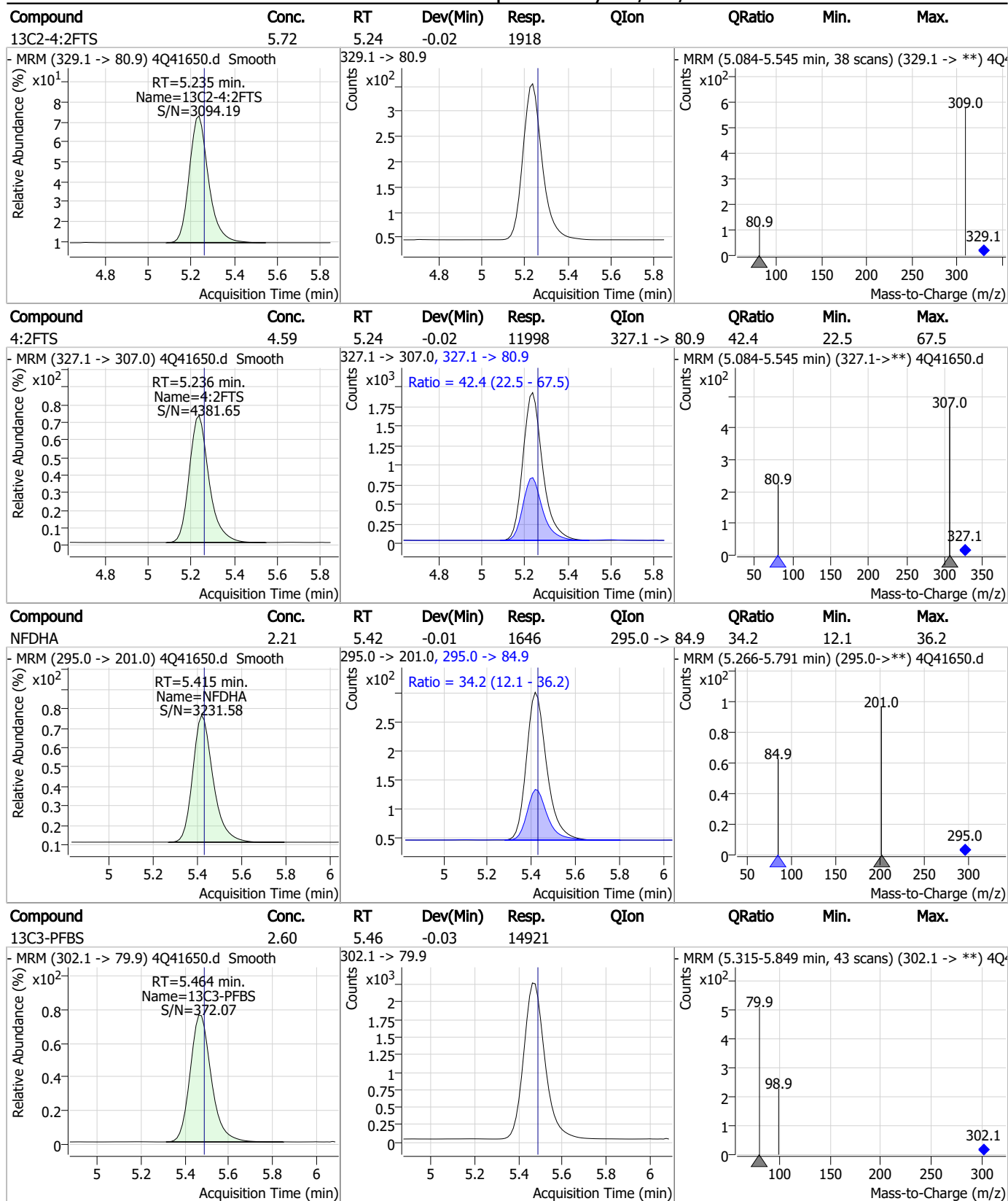


Perfluorinated Compounds by LC/MS/MS



7.7.4
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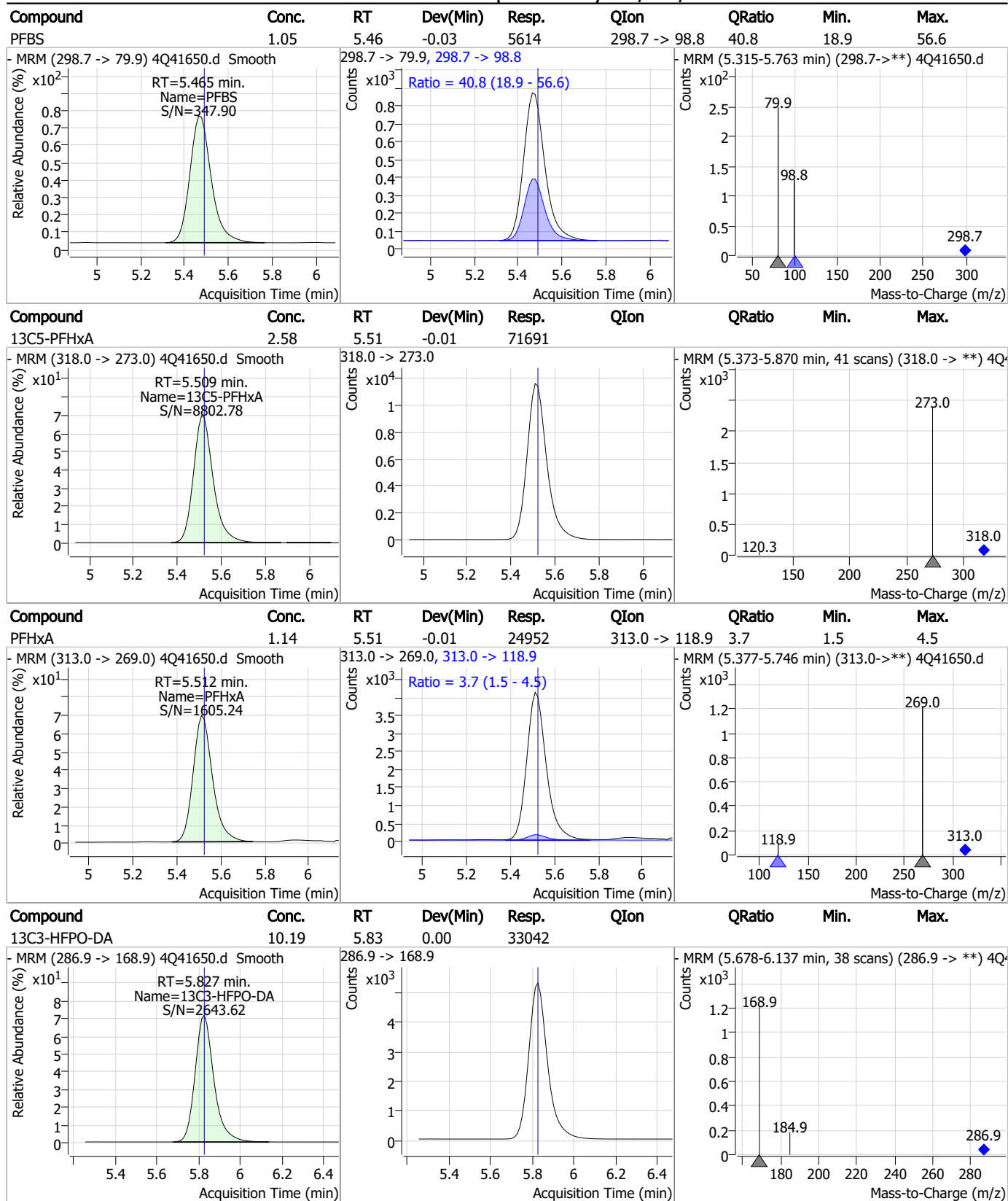
Perfluorinated Compounds by LC/MS/MS



7.7.4

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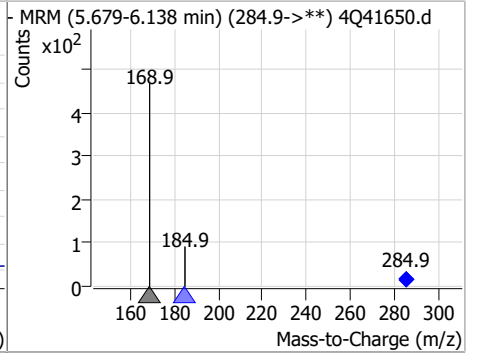
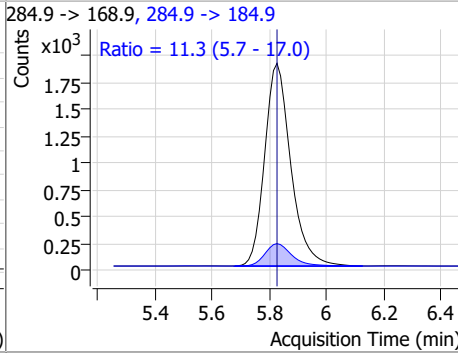
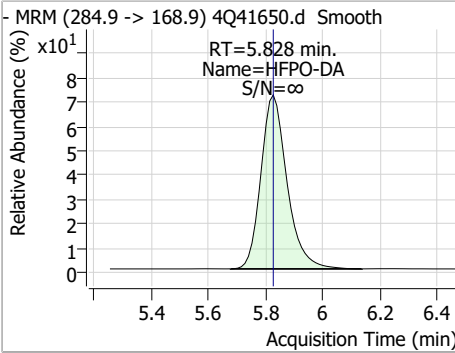
Perfluorinated Compounds by LC/MS/MS



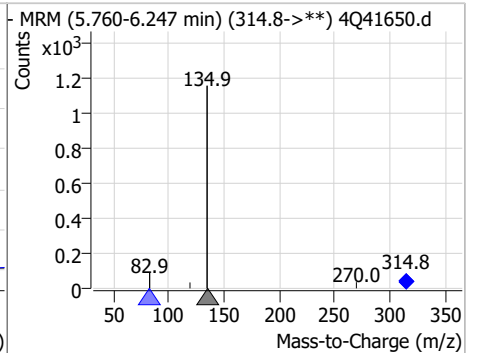
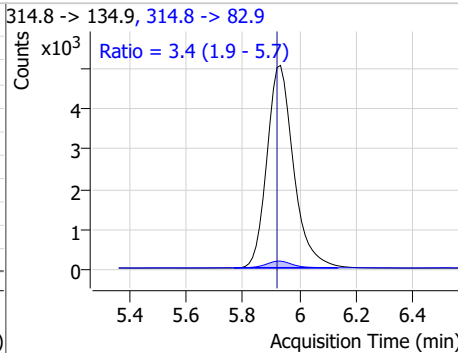
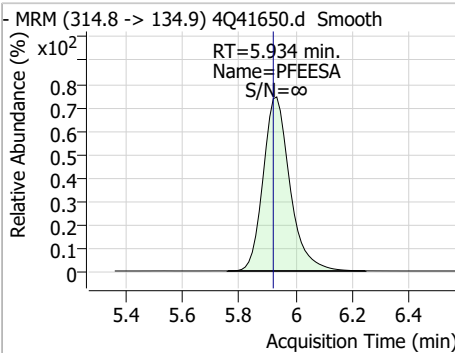
7.7.4
7

Perfluorinated Compounds by LC/MS/MS

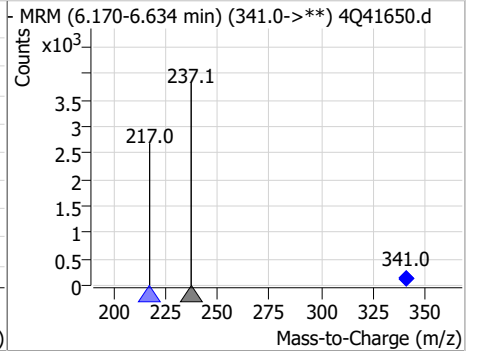
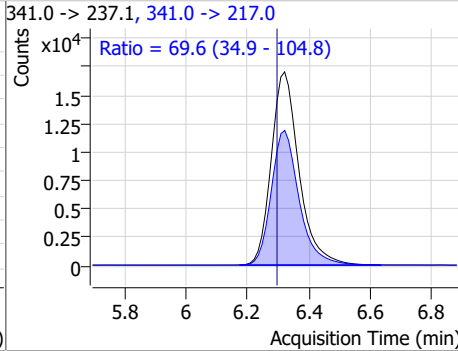
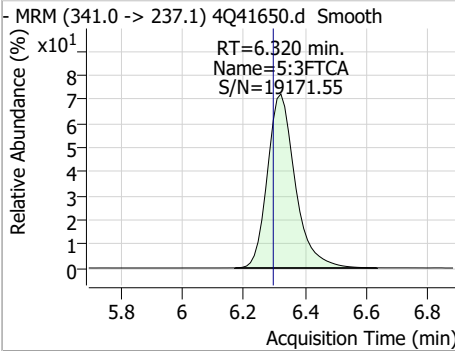
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	4.60	5.83	0.00	11962	284.9 -> 184.9	11.3	5.7	17.0



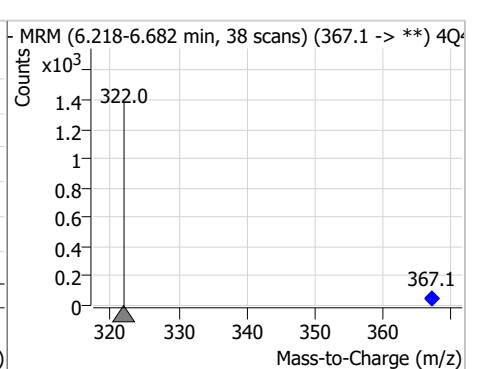
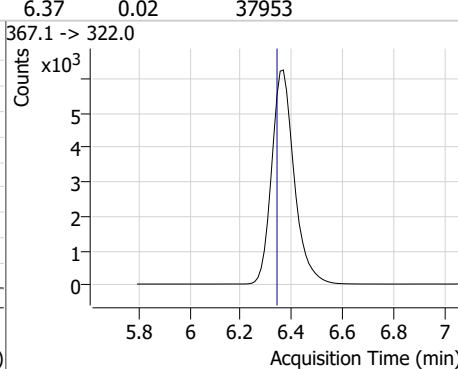
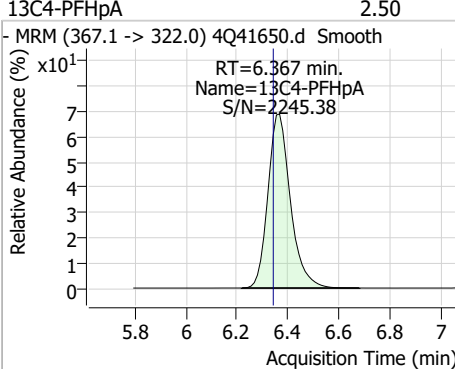
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFEESA	2.00	5.93	0.01	33063	314.8 -> 82.9	3.4	1.9	5.7



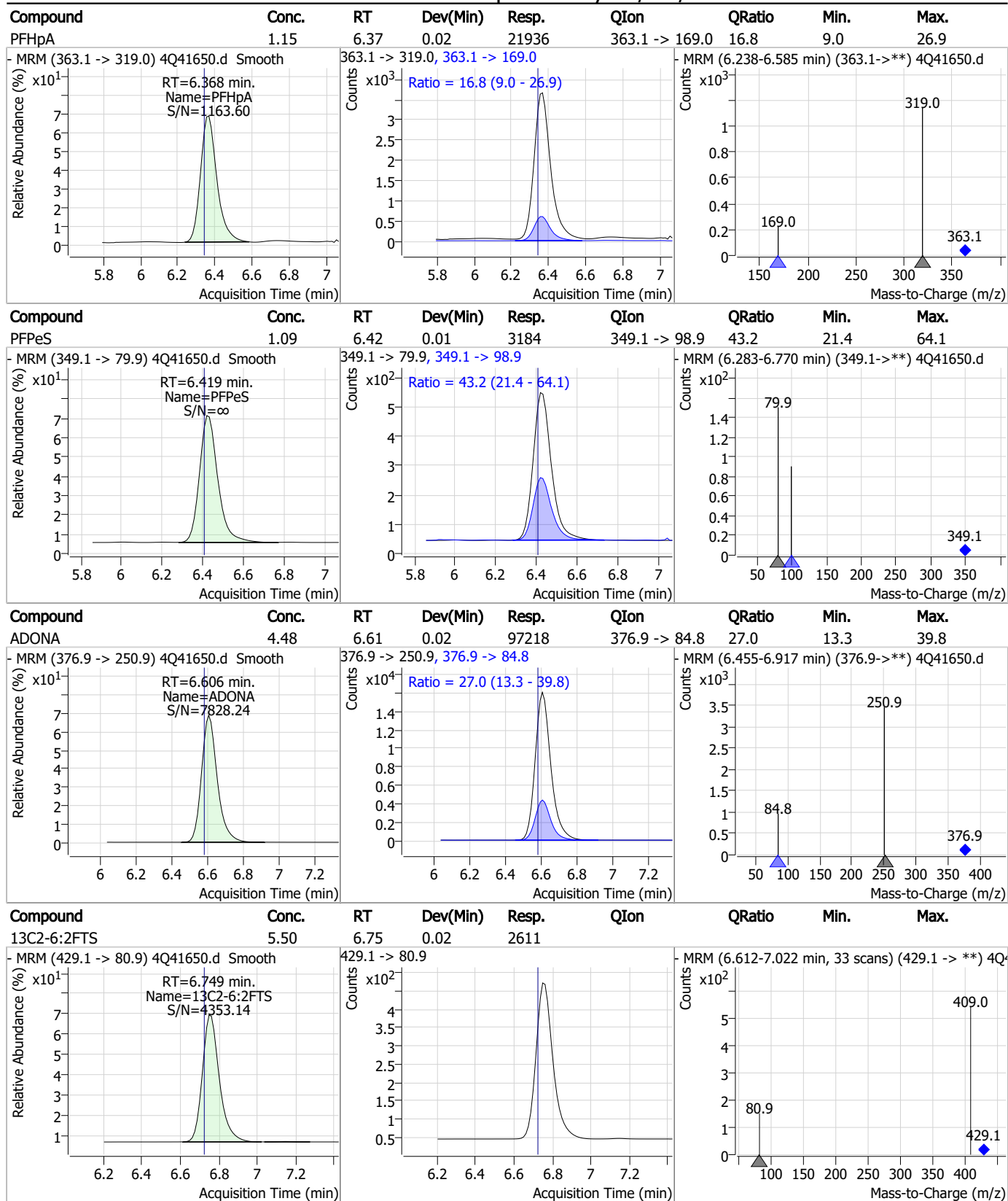
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
5:3FTCA	29.55	6.32	0.02	107314	341.0 -> 217.0	69.6	34.9	104.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C4-PFHpA	2.50	6.37	0.02	37953				

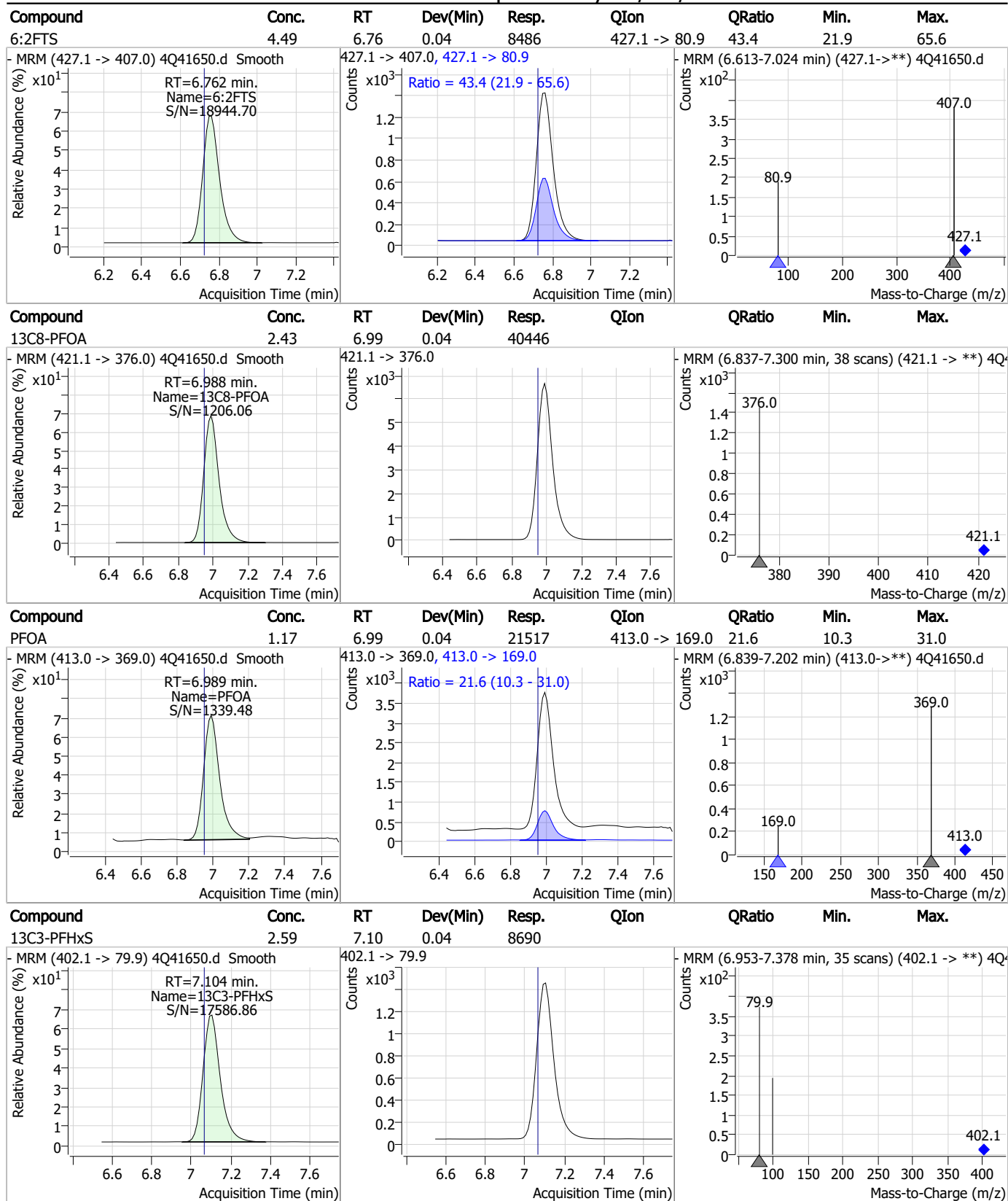


Perfluorinated Compounds by LC/MS/MS



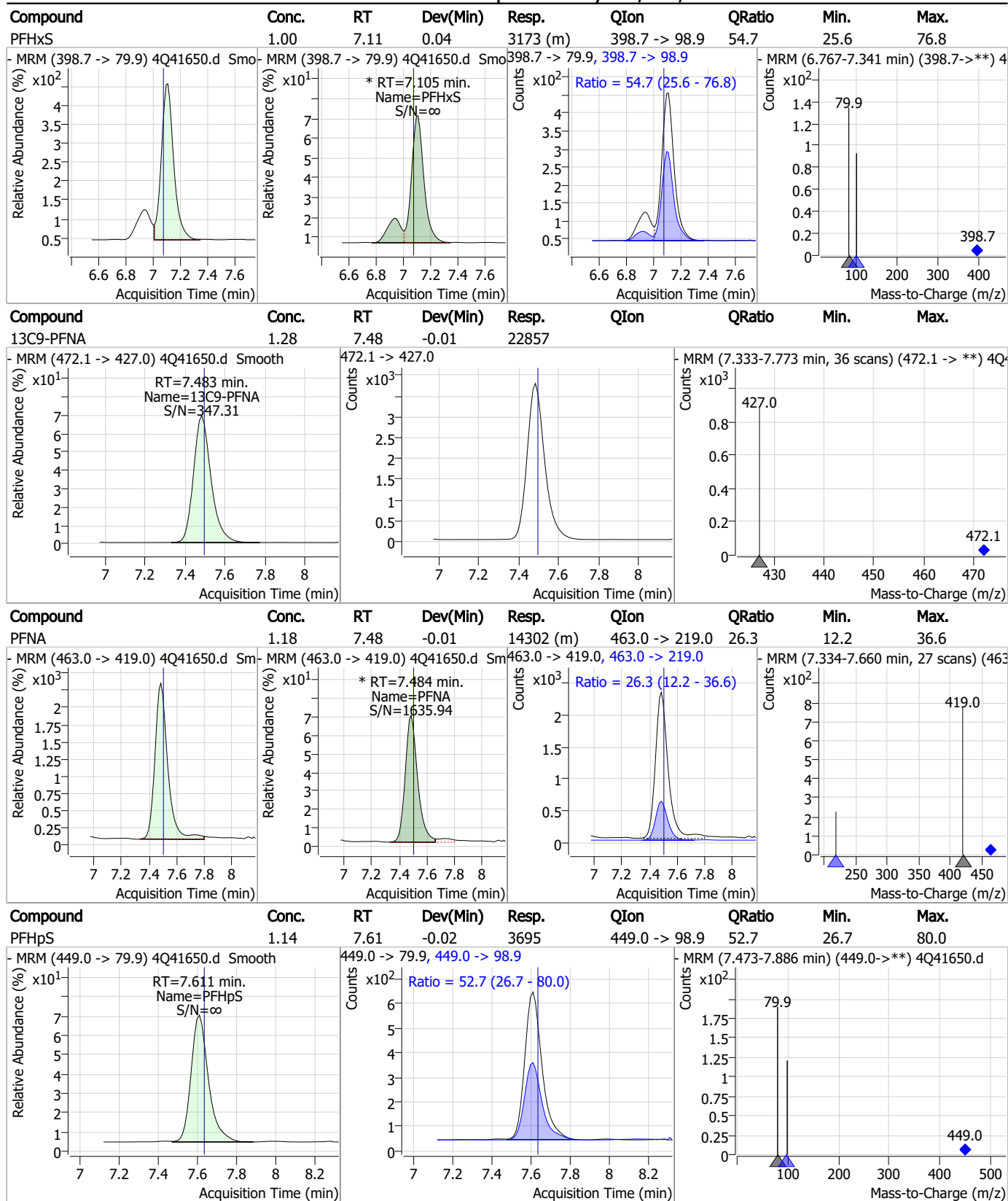
7.7.4
7

Perfluorinated Compounds by LC/MS/MS



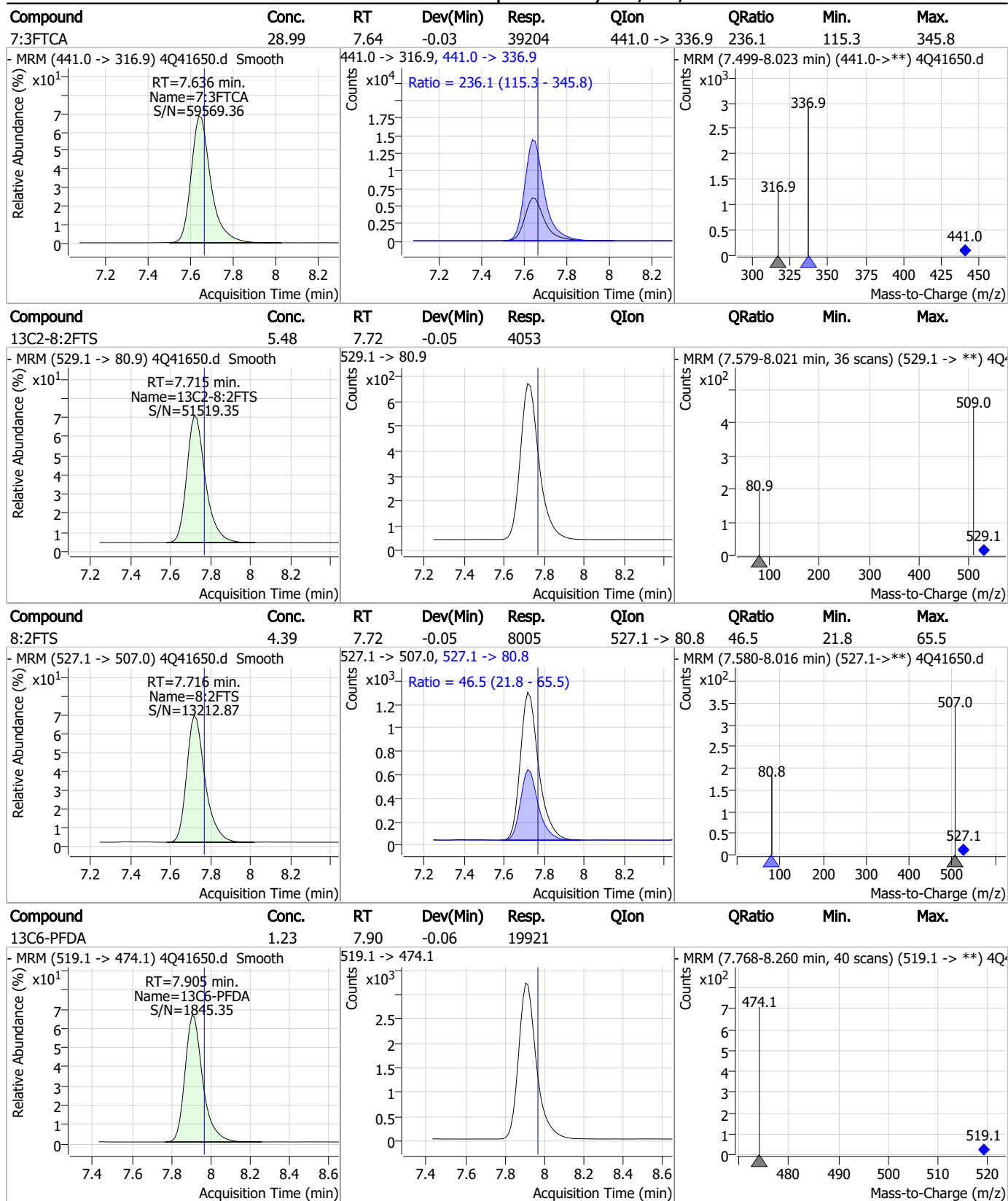
7.7.4
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Perfluorinated Compounds by LC/MS/MS



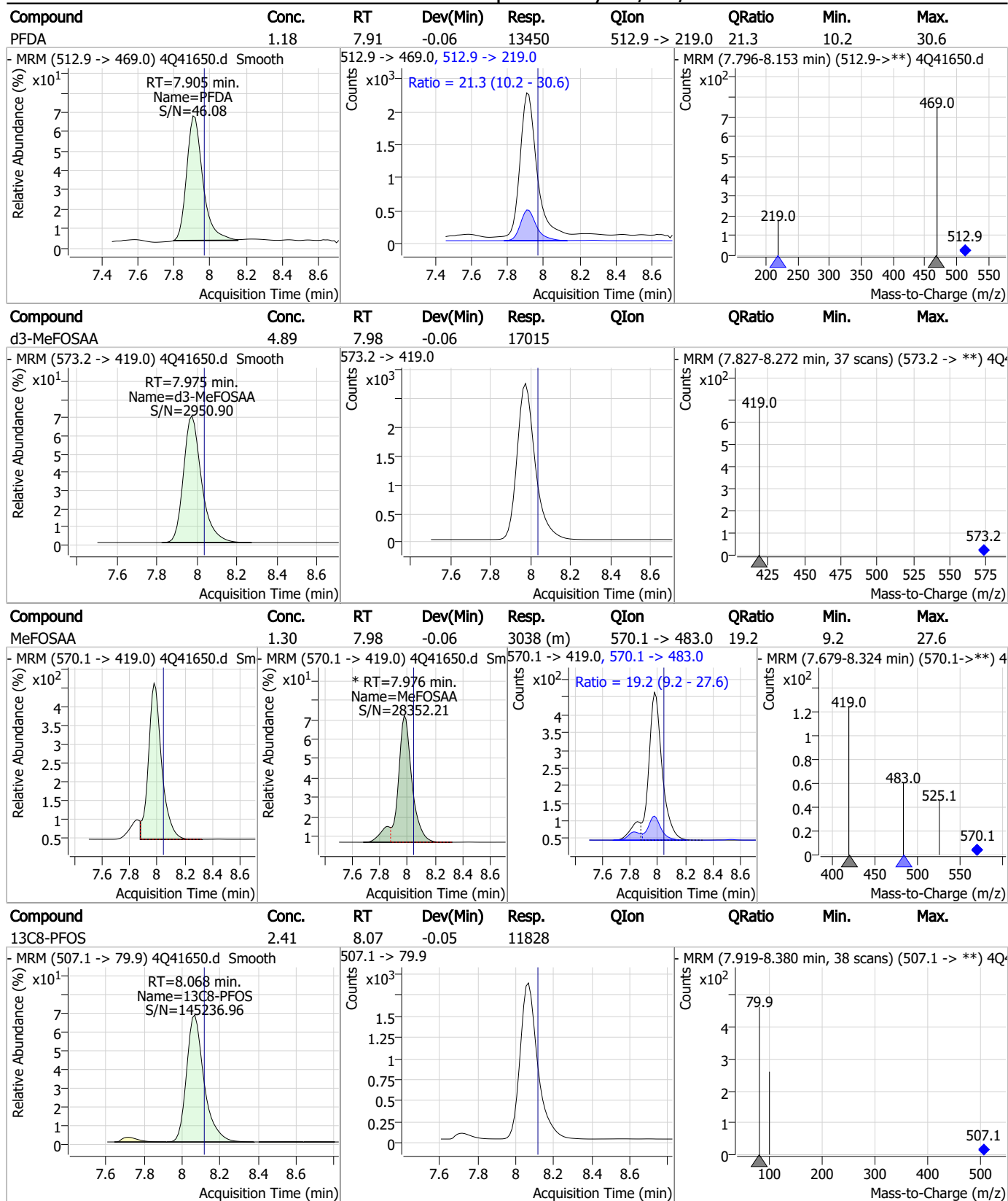
7.7.4
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Perfluorinated Compounds by LC/MS/MS



7.7.4
7

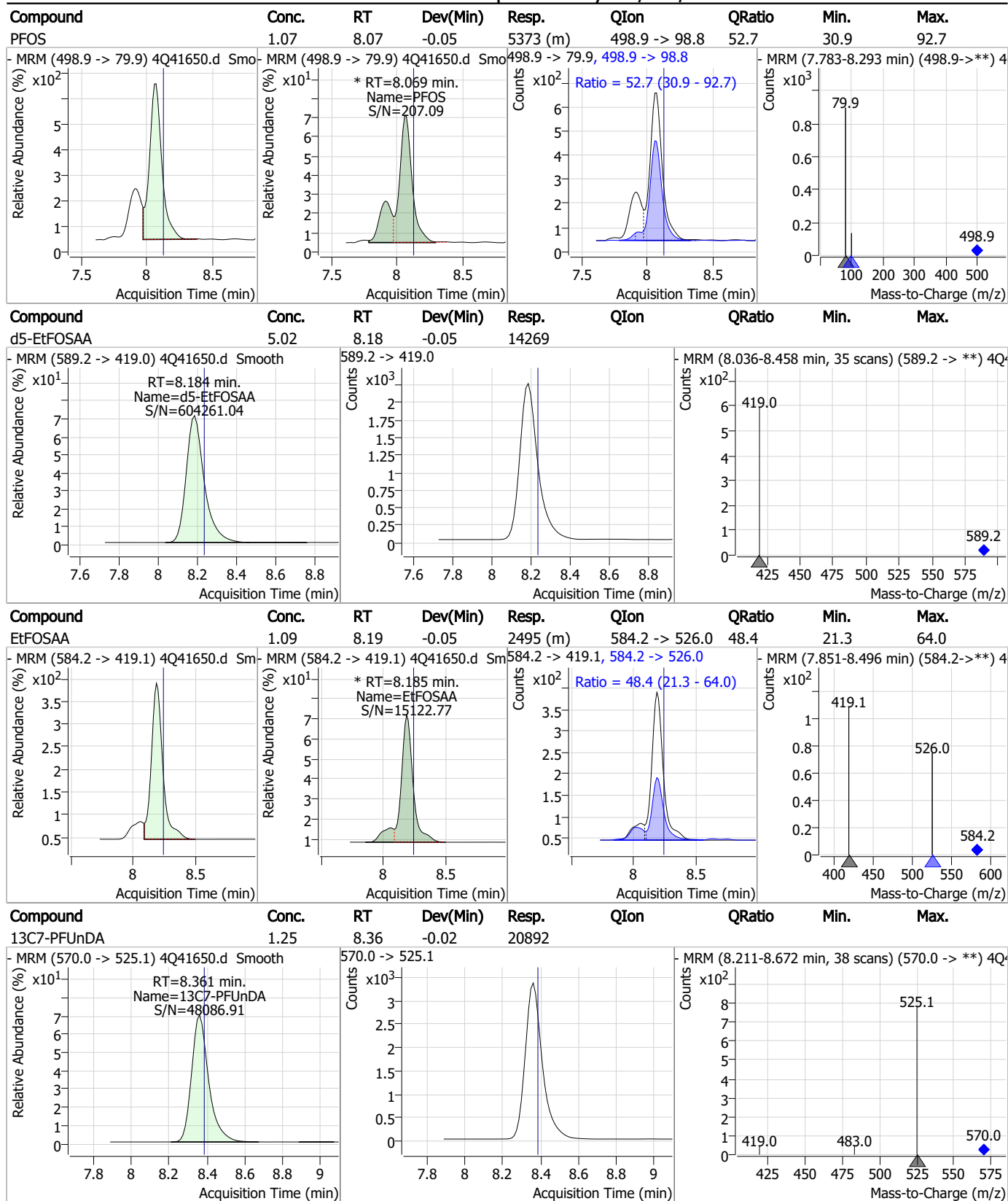
Perfluorinated Compounds by LC/MS/MS



7.7.4

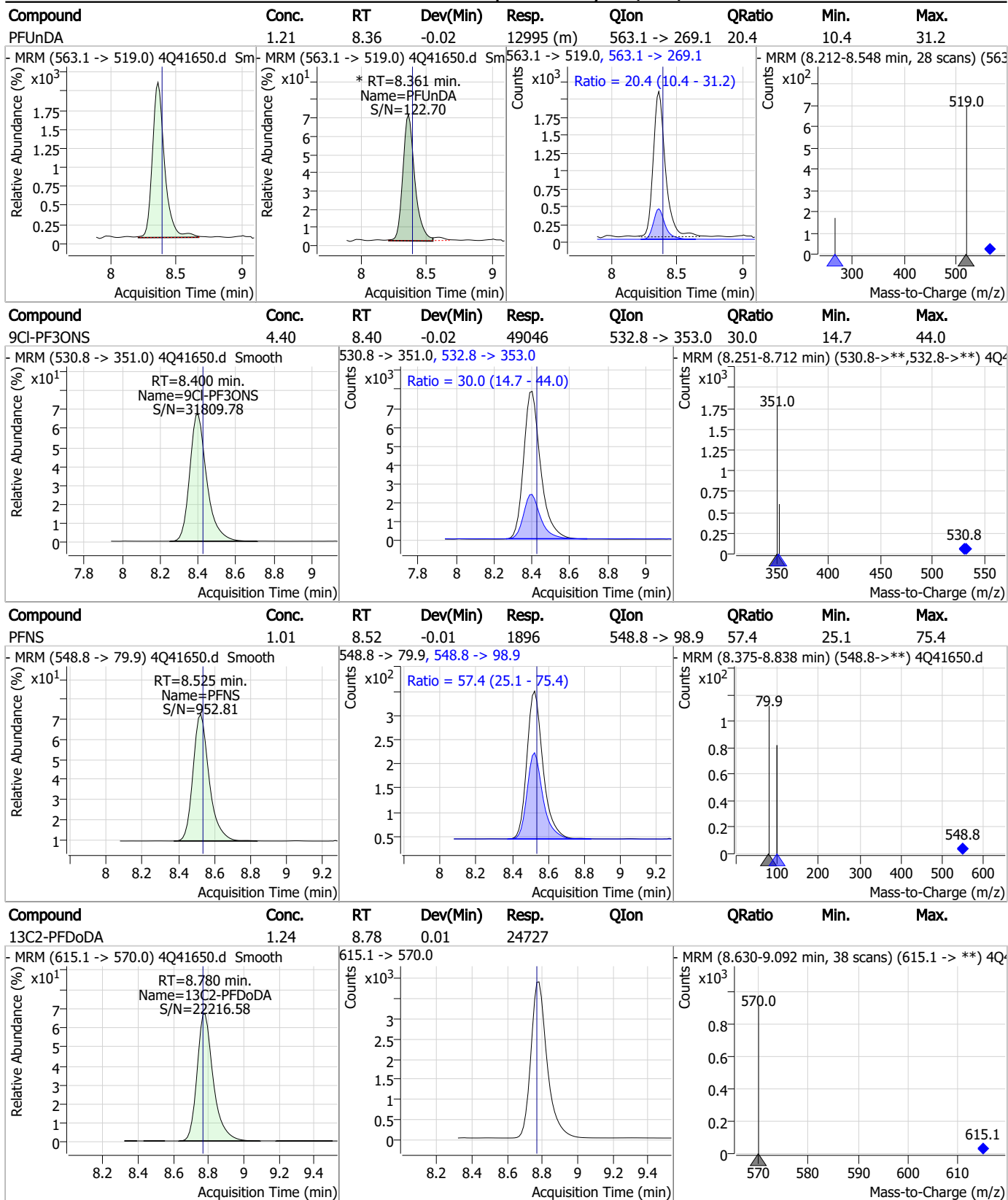
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Perfluorinated Compounds by LC/MS/MS



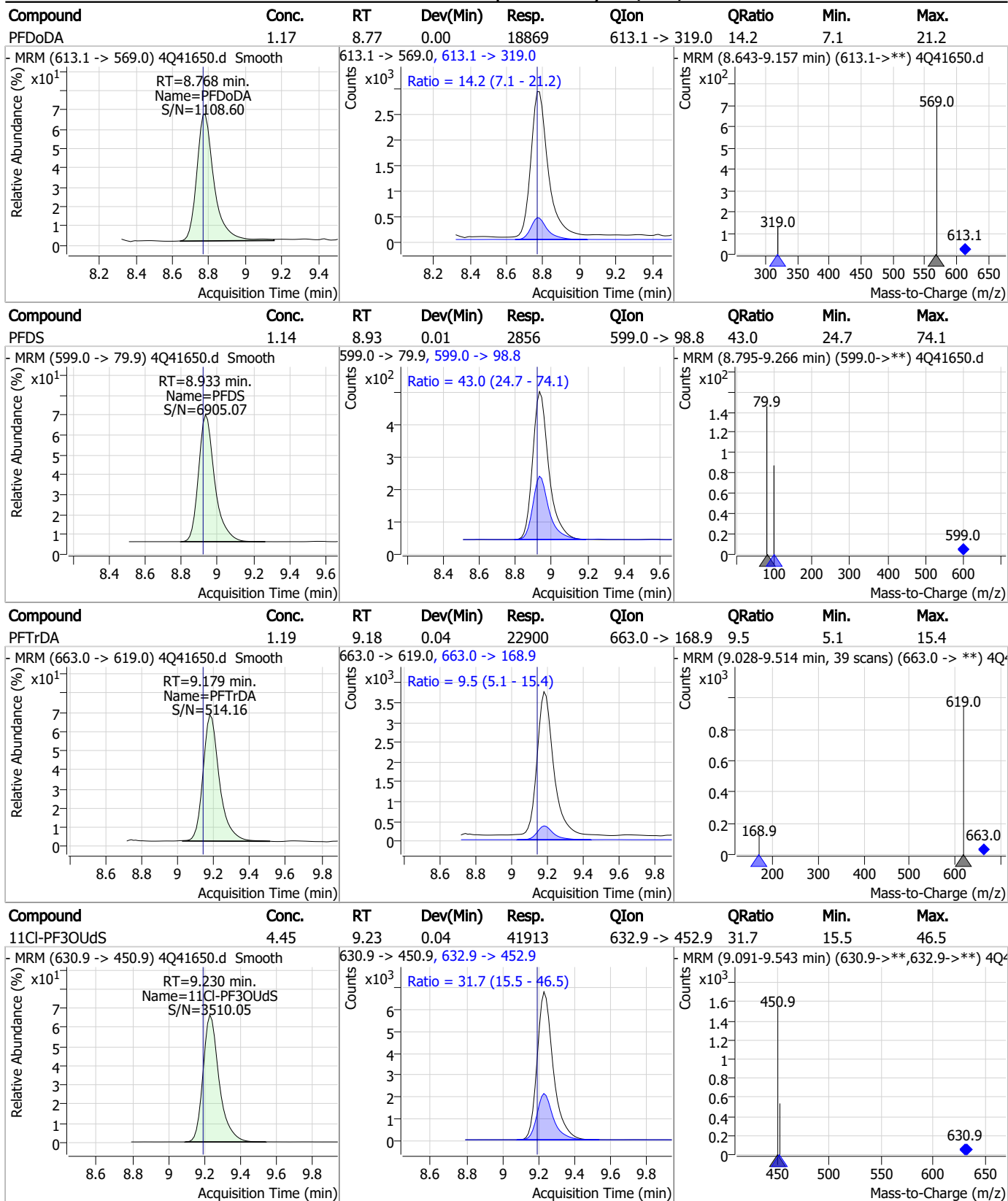
7.7.4
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Perfluorinated Compounds by LC/MS/MS



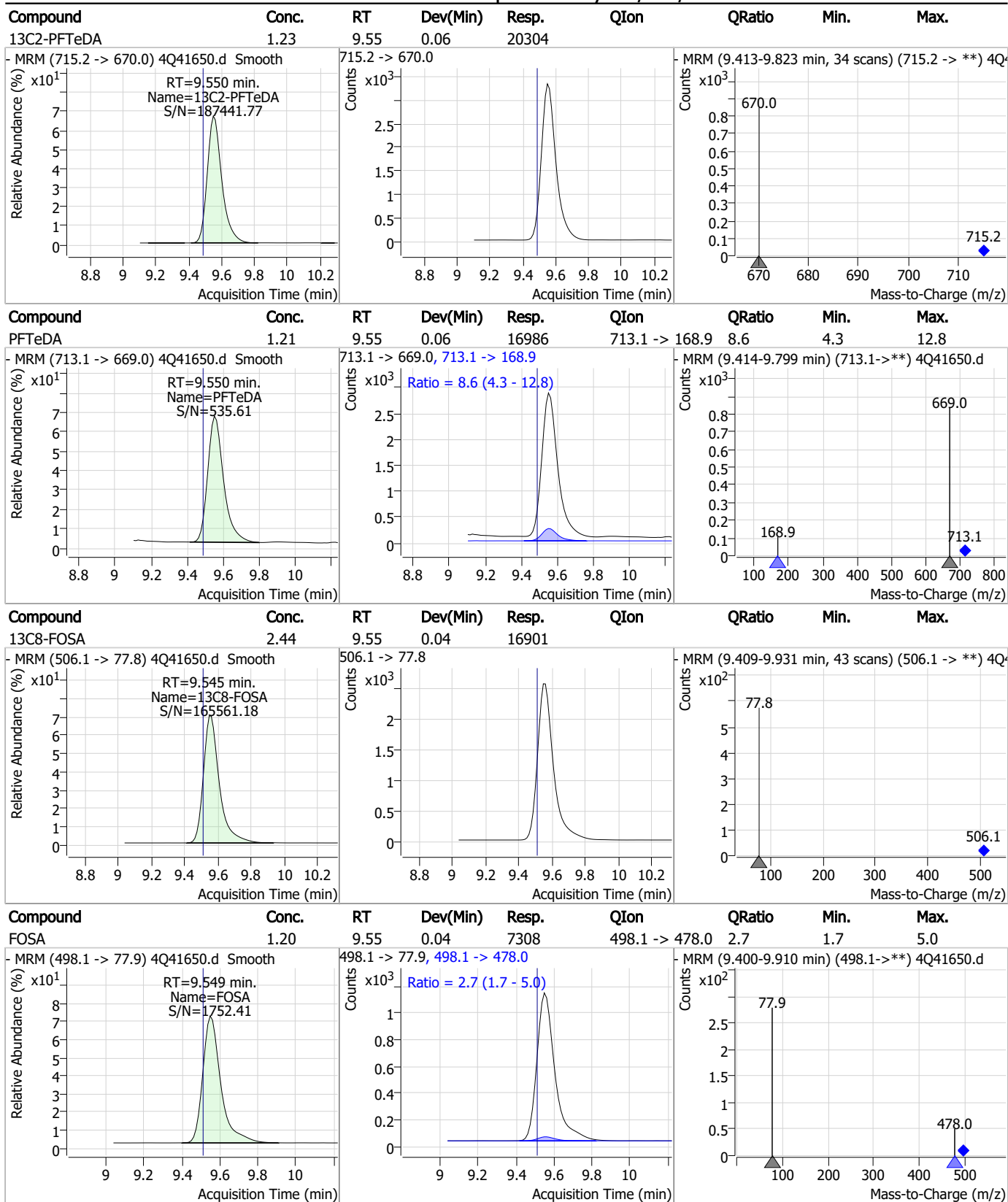
7.7.4
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Perfluorinated Compounds by LC/MS/MS



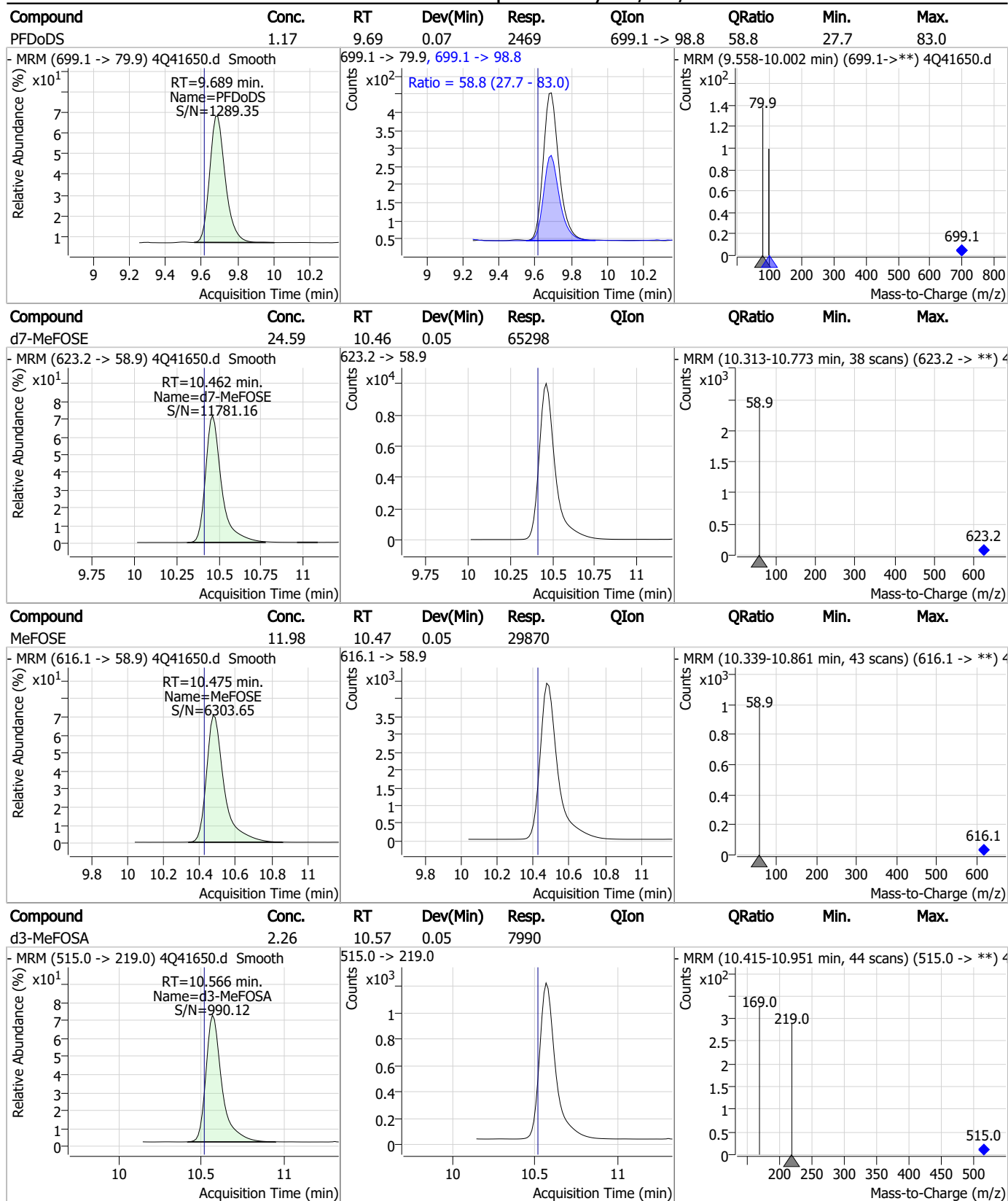
7.7.4
7

Perfluorinated Compounds by LC/MS/MS



7.7.4
7

Perfluorinated Compounds by LC/MS/MS

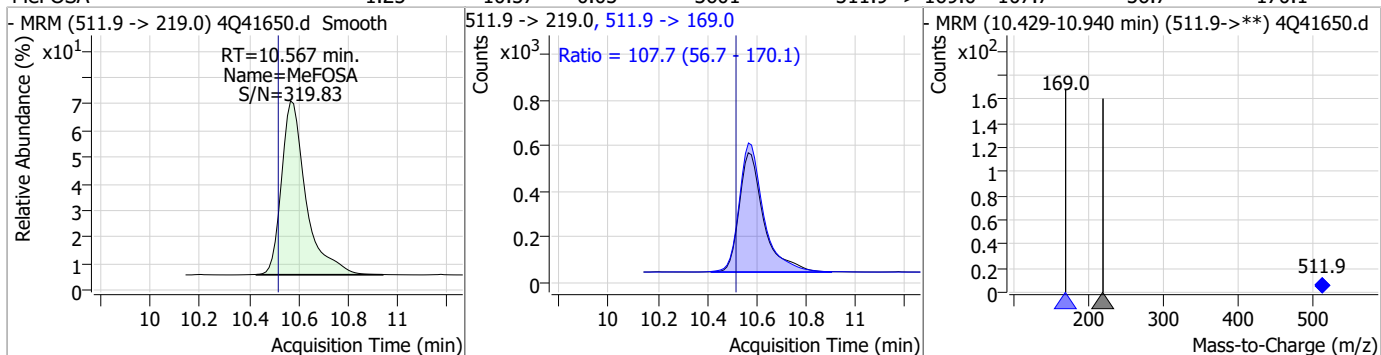


7.7.4

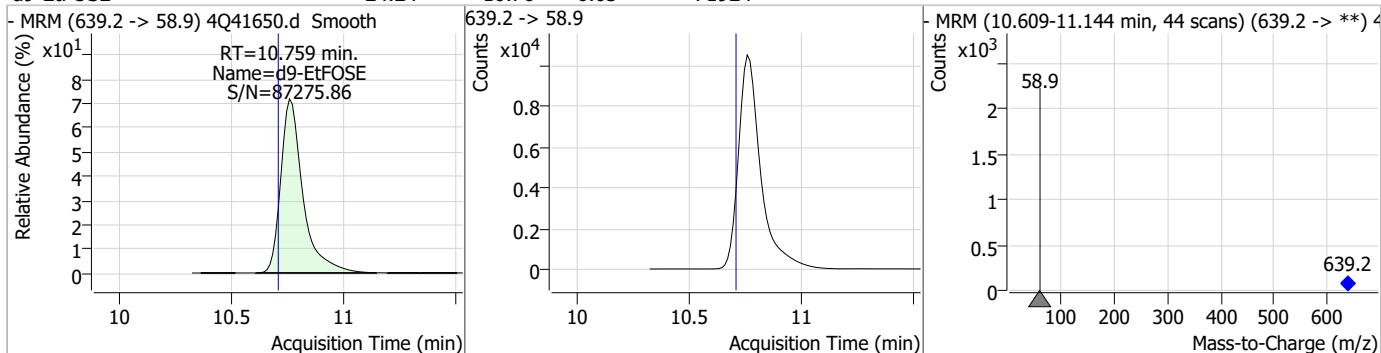
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Perfluorinated Compounds by LC/MS/MS

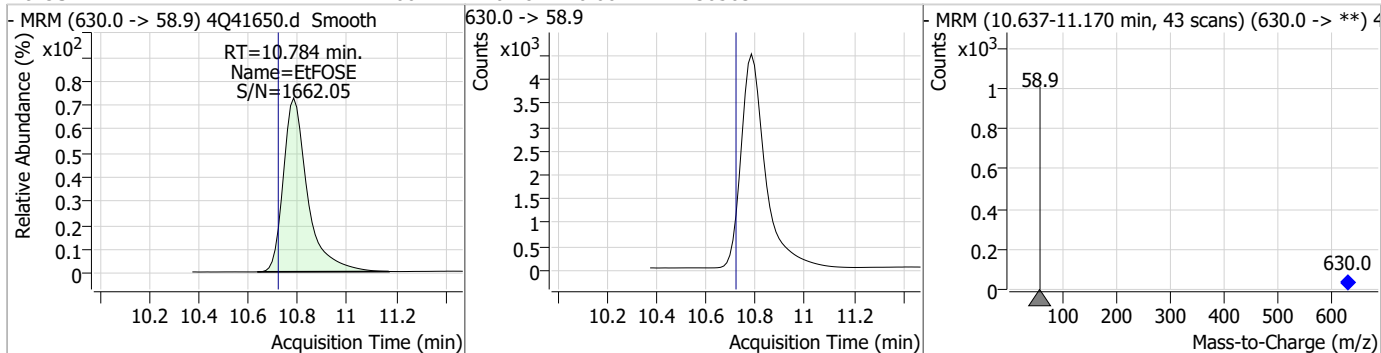
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	1.25	10.57	0.05	3601	511.9 -> 169.0	107.7	56.7	170.1



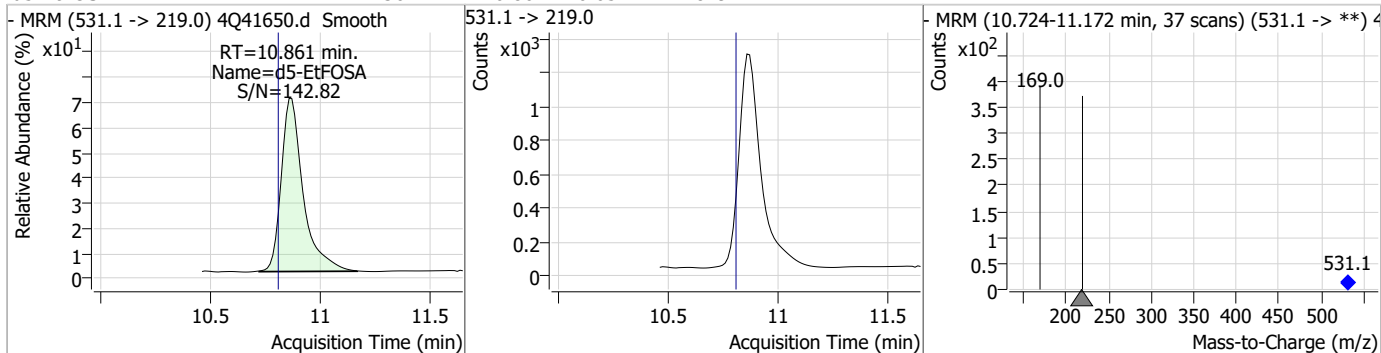
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	24.24	10.76	0.05	71924				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	12.00	10.78	0.06	30563				



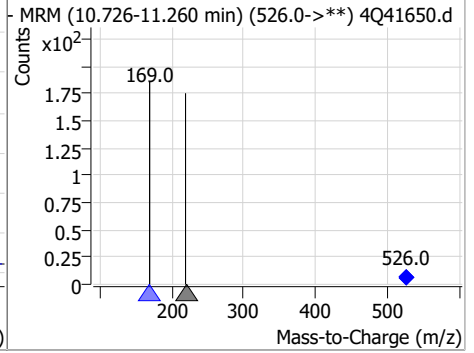
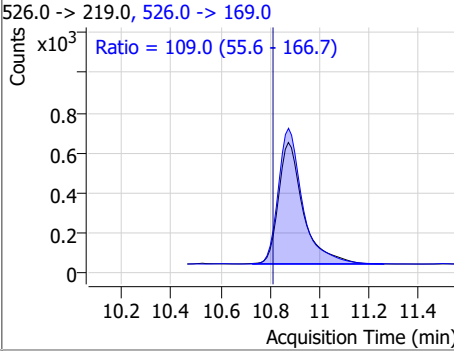
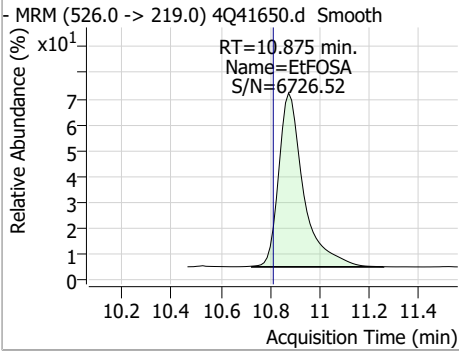
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.36	10.86	0.05	8797				



7.7.4
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	1.19	10.88	0.06	4260	526.0 -> 169.0	109.0	55.6	166.7



7.7.4

7

Manual Integration Approval Summary

Sample Number: S4Q596-IC596
Lab FileID: 4Q41650.D
Injection Time: 03/03/23 18:14

Method: EPA DRAFT 1633
Analyst approved: 03/06/23 15:43 Martha Valls
Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
Perfluorononanoic acid	375-95-1		7.48	Poorly defined baseline
MeFOSAA	2355-31-9		7.98	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.07	Split peak
EtFOSAA	2991-50-6		8.19	Split peak
Perfluoroundecanoic acid	2058-94-8		8.36	Poorly defined baseline

7.7.4.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41651.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 6:28:40 PM
 Sample Name : icc596-4
 Vial : P1-A5
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.239	216.8 -> 171.9	152505	10.00 µg/L	0.000
M5-PFPeA	4.574	268.3 -> 223.0	91178	5.00 µg/L	0.000
M5-PFHxA	5.522	318.0 -> 273.0	70618	2.50 µg/L	0.000
M4-PFHpA	6.342	367.1 -> 322.0	38904	2.50 µg/L	0.000
M8-PFOA	6.949	421.1 -> 376.0	41548	2.50 µg/L	0.000
M9-PFNA	7.496	472.1 -> 427.0	22511	1.25 µg/L	0.000
M6-PFDA	7.967	519.1 -> 474.1	20186	1.25 µg/L	0.000
M7-PFUnDA	8.386	570.0 -> 525.1	22336	1.25 µg/L	0.000
M2-PFDoDA	8.768	615.1 -> 570.0	25330	1.25 µg/L	0.000
M2-PFTeDA	9.488	715.2 -> 670.0	20969	1.25 µg/L	0.000
M8-FOSA	9.509	506.1 -> 77.8	17623	2.50 µg/L	0.000
M3-PFBS	5.489	302.1 -> 79.9	15001	2.50 µg/L	0.000
M3-PFHxS	7.065	402.1 -> 79.9	8493	2.50 µg/L	0.000
M8-PFOS	8.117	507.1 -> 79.9	12324	2.50 µg/L	0.000
M2-4:2FTS	5.260	329.1 -> 80.9	2013	5.00 µg/L	0.000
M2-6:2FTS	6.724	429.1 -> 80.9	2556	5.00 µg/L	0.000
M2-8:2FTS	7.766	529.1 -> 80.9	4069	5.00 µg/L	0.000
M3-MeFOSAA	8.037	573.2 -> 419.0	17403	5.00 µg/L	0.000
M3-HFPO-DA	5.827	286.9 -> 168.9	31924	10.00 µg/L	0.000
M5-EtFOSAA	8.234	589.2 -> 419.0	14512	5.00 µg/L	0.000
M7-MeFOSE	10.413	623.2 -> 58.9	66532	25.00 µg/L	0.000
M9-EtFOSE	10.709	639.2 -> 58.9	72793	25.00 µg/L	0.000
M5-EtFOSA	10.812	531.1 -> 219.0	8571	2.50 µg/L	0.000
M3-MeFOSA	10.516	515.0 -> 219.0	8353	2.50 µg/L	0.000
13C4-PFOS	8.118	502.8 -> 79.9	11979	2.50 µg/L	0.000
13C3-PFBA	3.242	216.0 -> 172.0	88445	5.00 µg/L	0.000
18O2-PFHxS	7.064	403.0 -> 83.9	6336	2.50 µg/L	0.000
13C4-PFOA	6.950	417.1 -> 372.0	50181	2.50 µg/L	0.000
13C2-PFDA	7.967	515.1 -> 470.1	18943	1.25 µg/L	0.000
13C5-PFNA	7.496	468.0 -> 423.0	25122	1.25 µg/L	0.000
13C2-PFHxA	5.523	315.1 -> 270.0	66046	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.260	329.1 -> 80.9	2013	5.86 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 117.1%		
13C2-6:2FTS	6.724	429.1 -> 80.9	2556	5.25 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 105.0%		
13C2-8:2FTS	7.766	529.1 -> 80.9	4069	5.37 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 107.4%		
13C2-PFDoDA	8.768	615.1 -> 570.0	25330	1.26 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 101.2%		
13C2-PFTeDA	9.488	715.2 -> 670.0	20969	1.27 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 101.5%		
13C3-PFBS	5.489	302.1 -> 79.9	15001	2.54 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 101.8%		
13C3-PFHxS	7.065	402.1 -> 79.9	8493	2.46 µg/L	0.000

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.6%	
13C4-PFBA	3.239	216.8 -> 171.9	152505	10.03 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C4-PFHpA	6.342	367.1 -> 322.0	38904	2.48 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.3%	
13C5-PFHxA	5.522	318.0 -> 273.0	70618	2.46 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.6%	
13C5-PFPeA	4.574	268.3 -> 223.0	91178	5.06 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.1%	
13C6-PFDA	7.967	519.1 -> 474.1	20186	1.24 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.5%	
13C7-PFUnDA	8.386	570.0 -> 525.1	22336	1.33 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 106.3%	
13C8-FOSA	9.509	506.1 -> 77.8	17623	2.65 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 105.8%	
13C8-PFOA	6.949	421.1 -> 376.0	41548	2.50 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.1%	
13C8-PFOS	8.117	507.1 -> 79.9	12324	2.61 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.5%	
13C9-PFNA	7.496	472.1 -> 427.0	22511	1.28 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.5%	
d3-MeFOSAA	8.037	573.2 -> 419.0	17403	5.20 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 104.0%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	31924	9.55 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 95.5%	
d3-MeFOSA	10.516	515.0 -> 219.0	8353	2.46 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.5%	
d5-EtFOSAA	8.234	589.2 -> 419.0	14512	5.31 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 106.3%	
d7-MeFOSE	10.413	623.2 -> 58.9	66532	26.08 µg/L	0.000
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 104.3%	
d9-EtFOSE	10.709	639.2 -> 58.9	72793	25.54 µg/L	0.000
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 102.2%	
d5-EtFOSA	10.812	531.1 -> 219.0	8571	2.39 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 95.8%	
Target Compounds					QValue
4:2FTS	5.260	327.1 -> 307.0	24099	8.79 µg/L	100
		327.1 -> 80.9	10838		
6:2FTS	6.725	427.1 -> 407.0	18190	9.83 µg/L	100
		427.1 -> 80.9	7950		
8:2FTS	7.767	527.1 -> 507.0	18229	9.95 µg/L	100
		527.1 -> 80.8	7960		
EtFOSAA	8.235	584.2 -> 419.1	5293	2.27 µg/L	m 92
		584.2 -> 526.0	2538		
FOSA	9.512	498.1 -> 77.9	15431	2.43 µg/L	100
		498.1 -> 478.0	510		
MeFOSAA	8.038	570.1 -> 419.0	5768	2.41 µg/L	m 96
		570.1 -> 483.0	1161		
PFBA	3.246	212.8 -> 168.9	32496	9.90 µg/L	100
PFBS	5.490	298.7 -> 79.9	12265	2.29 µg/L	100
		298.7 -> 98.8	4627		
PFDA	7.968	512.9 -> 469.0	29378	2.54 µg/L	100
		512.9 -> 219.0	5998		
PFDODA	8.768	613.1 -> 569.0	40419	2.45 µg/L	100
		613.1 -> 319.0	5721		
PFDS	8.920	599.0 -> 79.9	6137	2.36 µg/L	100

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.343	599.0 -> 98.8	3031	2.43	µg/L	100
		363.1 -> 319.0	47677			
PFHpS	7.636	363.1 -> 169.0	8547	2.28	µg/L	100
		449.0 -> 79.9	7691			
PFHxA	5.525	449.0 -> 98.9	4103	2.50	µg/L	100
		313.0 -> 269.0	53960			
PFHxS	7.066	313.0 -> 118.9	1621	2.15	µg/L	96
		398.7 -> 79.9	6661			
PFNA	7.497	398.7 -> 98.9	3214	2.51	µg/L	100
		463.0 -> 419.0	29844			
PFNS	8.537	463.0 -> 219.0	7288	2.37	µg/L	100
		548.8 -> 79.9	4637			
PFOA	6.951	548.8 -> 98.9	2332	2.38	µg/L	100
		413.0 -> 369.0	44899			
PFOS	8.119	413.0 -> 169.0	9276	2.16	µg/L	86
		498.9 -> 79.9	11245			
PFPeA	4.576	498.9 -> 98.8	5737	4.93	µg/L	100
		263.0 -> 219.0	86259			
PFPeS	6.407	349.1 -> 79.9	6738	2.36	µg/L	100
		349.1 -> 98.9	2879			
PFTeDA	9.488	713.1 -> 669.0	36426	2.50	µg/L	100
		713.1 -> 168.9	3105			
PFTrDA	9.141	663.0 -> 619.0	50875	2.58	µg/L	100
		663.0 -> 168.9	5236			
PFUnDA	8.386	563.1 -> 519.0	27867	2.43	µg/L	100
		563.1 -> 269.1	5805			
11CI-PF3OUdS	9.193	630.9 -> 450.9	93977	10.33	µg/L	100
		632.9 -> 452.9	29123			
9CI-PF3ONS	8.425	530.8 -> 351.0	110054	10.23	µg/L	100
		532.8 -> 353.0	32297			
ADONA	6.581	376.9 -> 250.9	208551	9.94	µg/L	100
		376.9 -> 84.8	55341			
HFPO-DA	5.828	284.9 -> 168.9	26586	10.58	µg/L	100
		284.9 -> 184.9	3008			
3:3FTCA	4.242	241.0 -> 177.0	11054	11.72	µg/L	100
		241.0 -> 117.0	972			
5:3FTCA	6.296	341.0 -> 237.1	230493	64.44	µg/L	100
		341.0 -> 217.0	161090			
7:3FTCA	7.661	441.0 -> 316.9	86773	65.15	µg/L	100
		441.0 -> 336.9	200066			
EtFOSA	10.813	526.0 -> 219.0	9001	2.57	µg/L	100
		526.0 -> 169.0	10001			
EtFOSE	10.722	630.0 -> 58.9	65071	25.24	µg/L	100
		511.9 -> 219.0	7660			
MeFOSA	10.517	511.9 -> 169.0	8685	2.54	µg/L	100
		616.1 -> 58.9	64220			
MeFOSE	10.426	699.1 -> 79.9	5367	25.28	µg/L	100
		699.1 -> 98.8	2968			
PFDoDS	9.615	295.0 -> 201.0	3993	2.44	µg/L	100
		295.0 -> 84.9	963			
NFDHA	5.428	279.0 -> 85.1	48478	5.44	µg/L	100
		229.0 -> 84.9	40722			
PFMBA	4.906	314.8 -> 134.9	72419	4.83	µg/L	100
		314.8 -> 82.9	2763			
PFMPA	3.807			4.44	µg/L	100
PFEESA	5.921			4.44	µg/L	100

= Qualifier out of range, m = manually integrated, + = Area summed

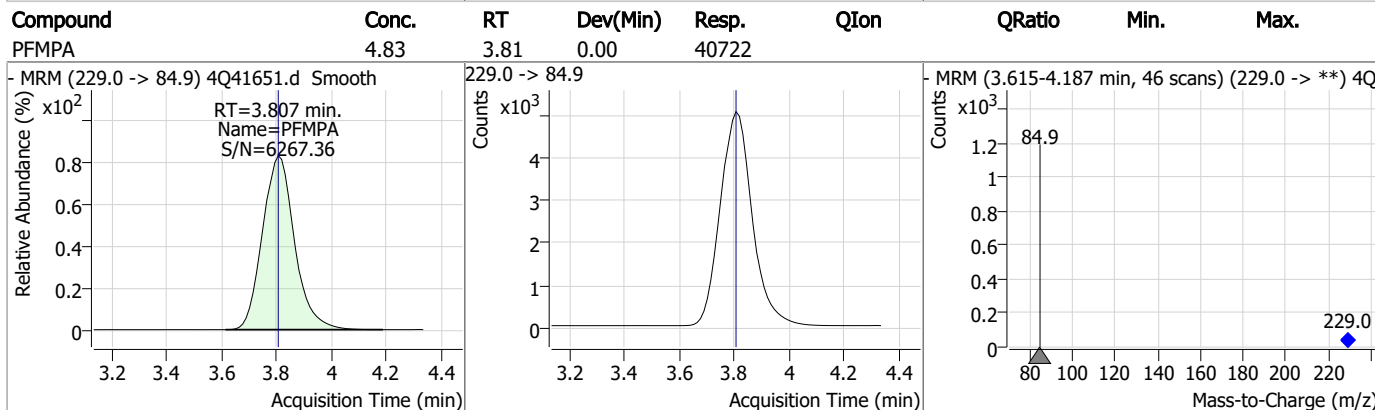
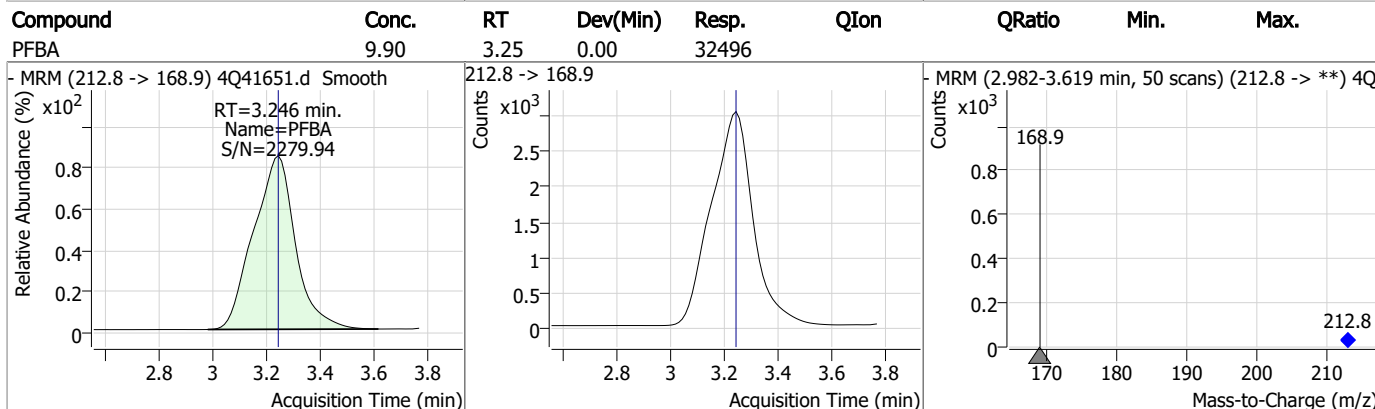
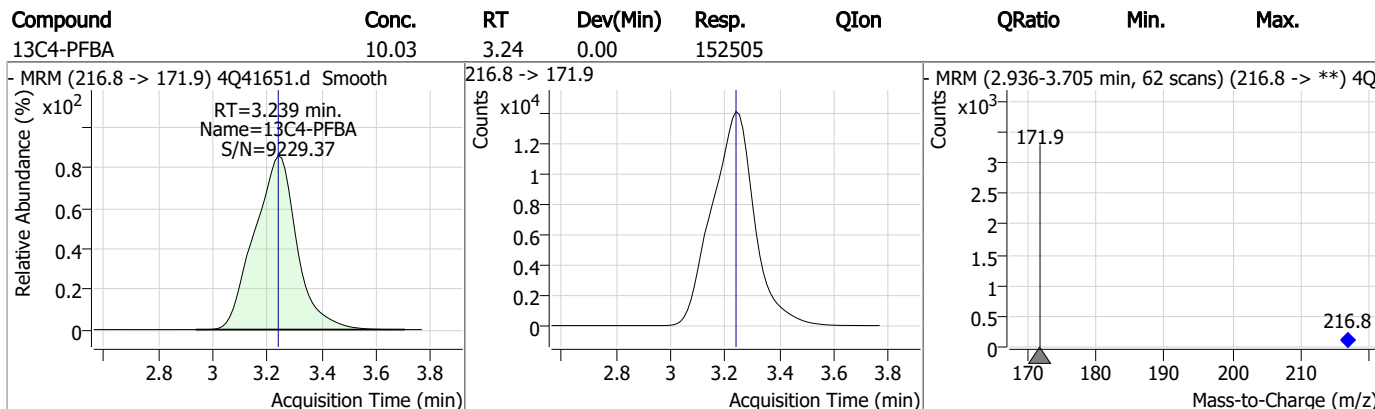
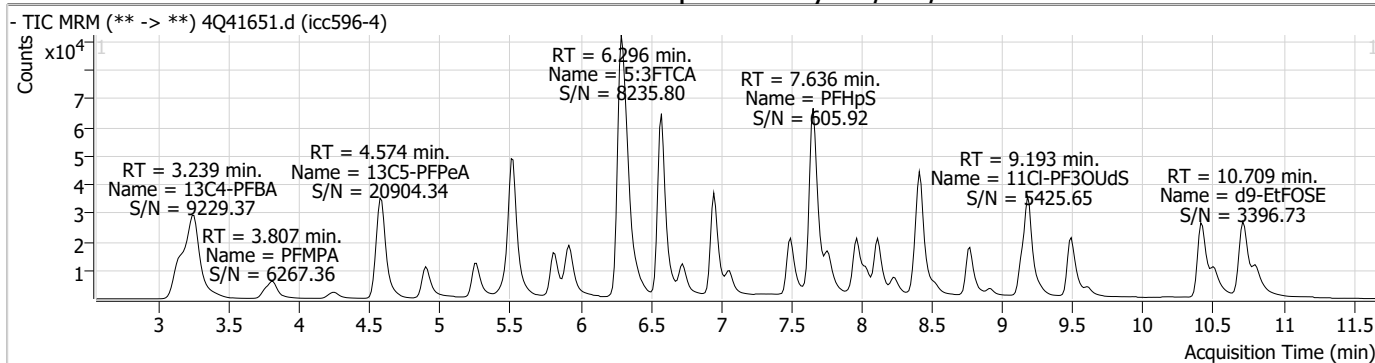
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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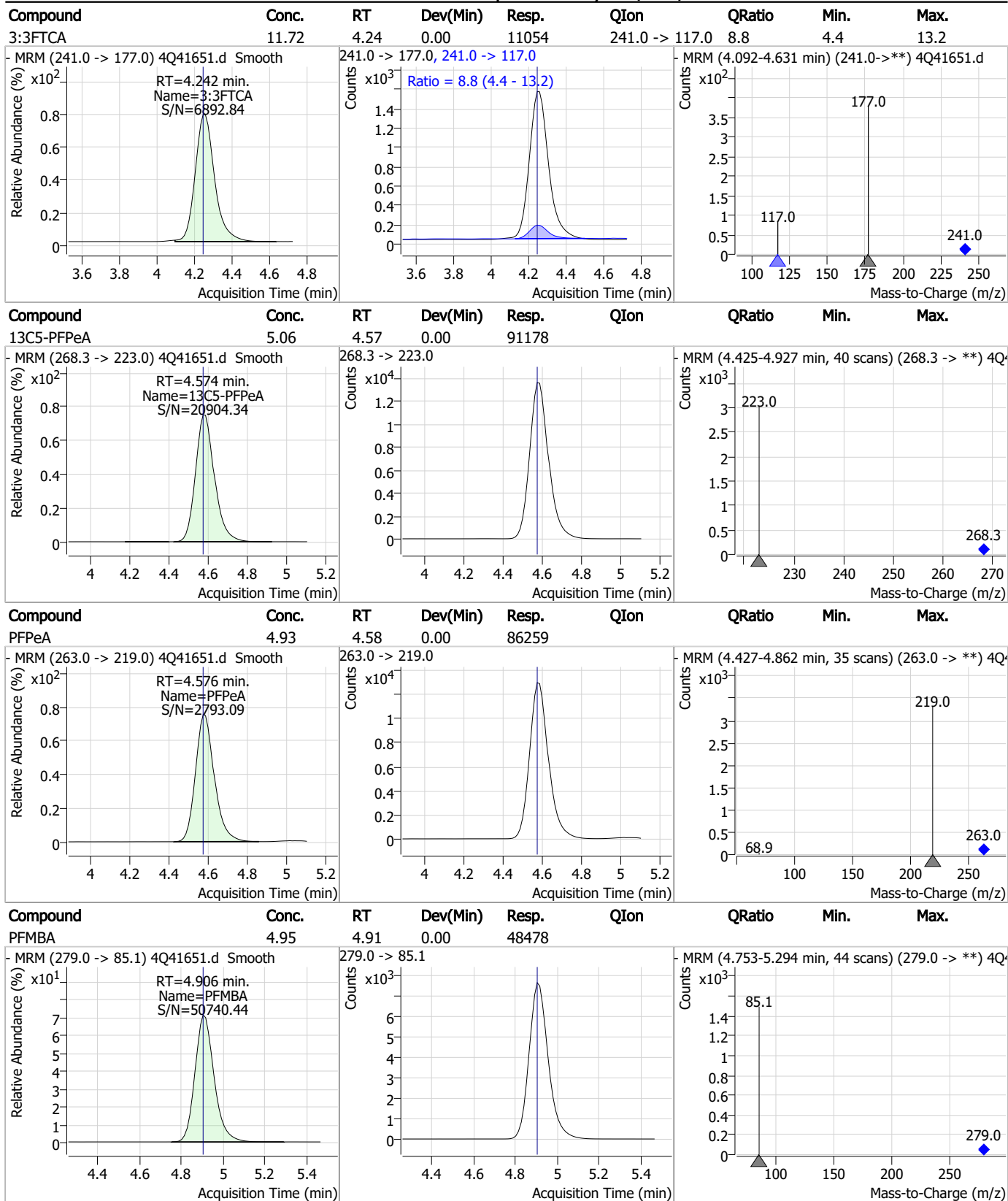
7.7.5
7



Perfluorinated Compounds by LC/MS/MS

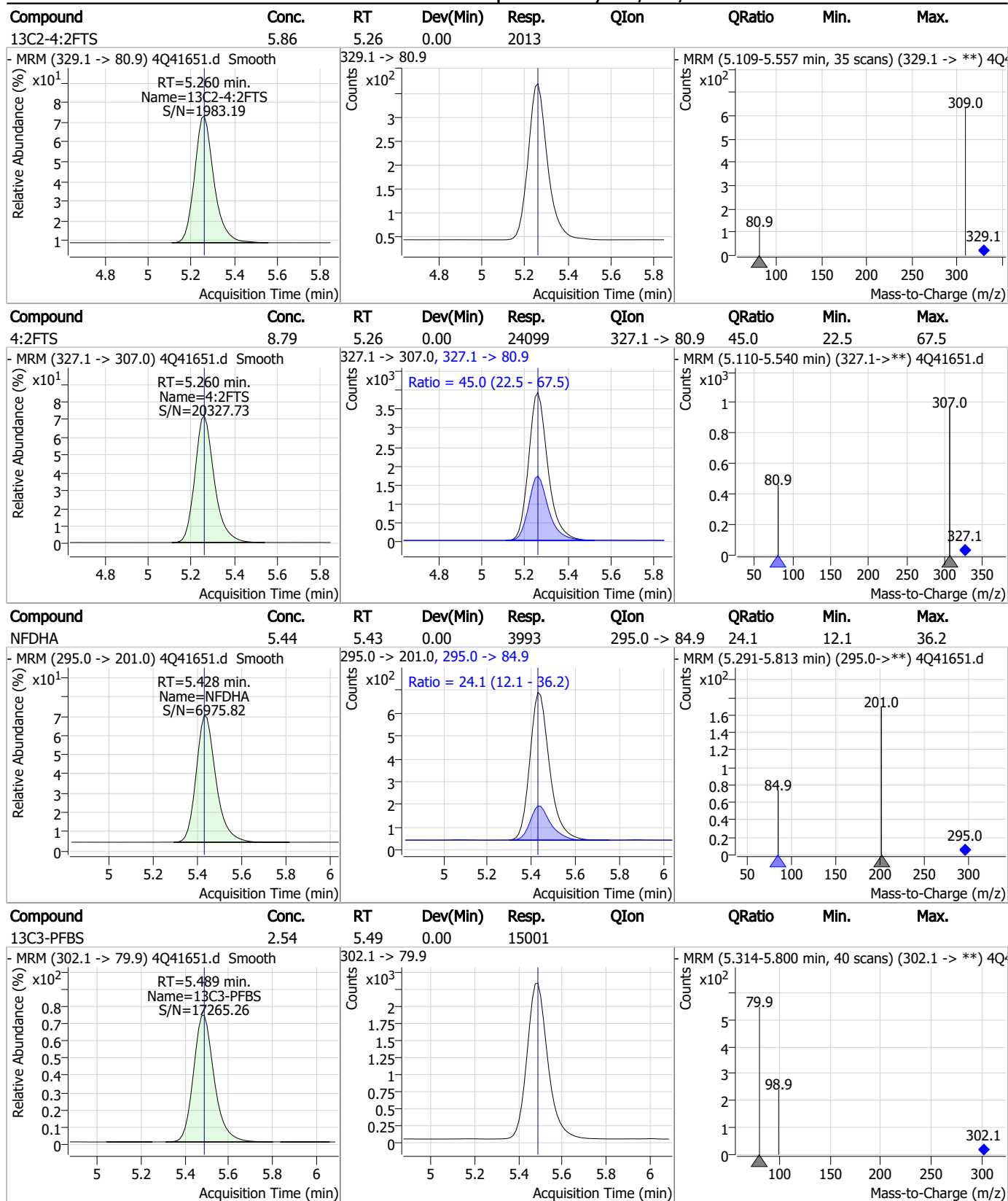


Perfluorinated Compounds by LC/MS/MS



7.7.5
7

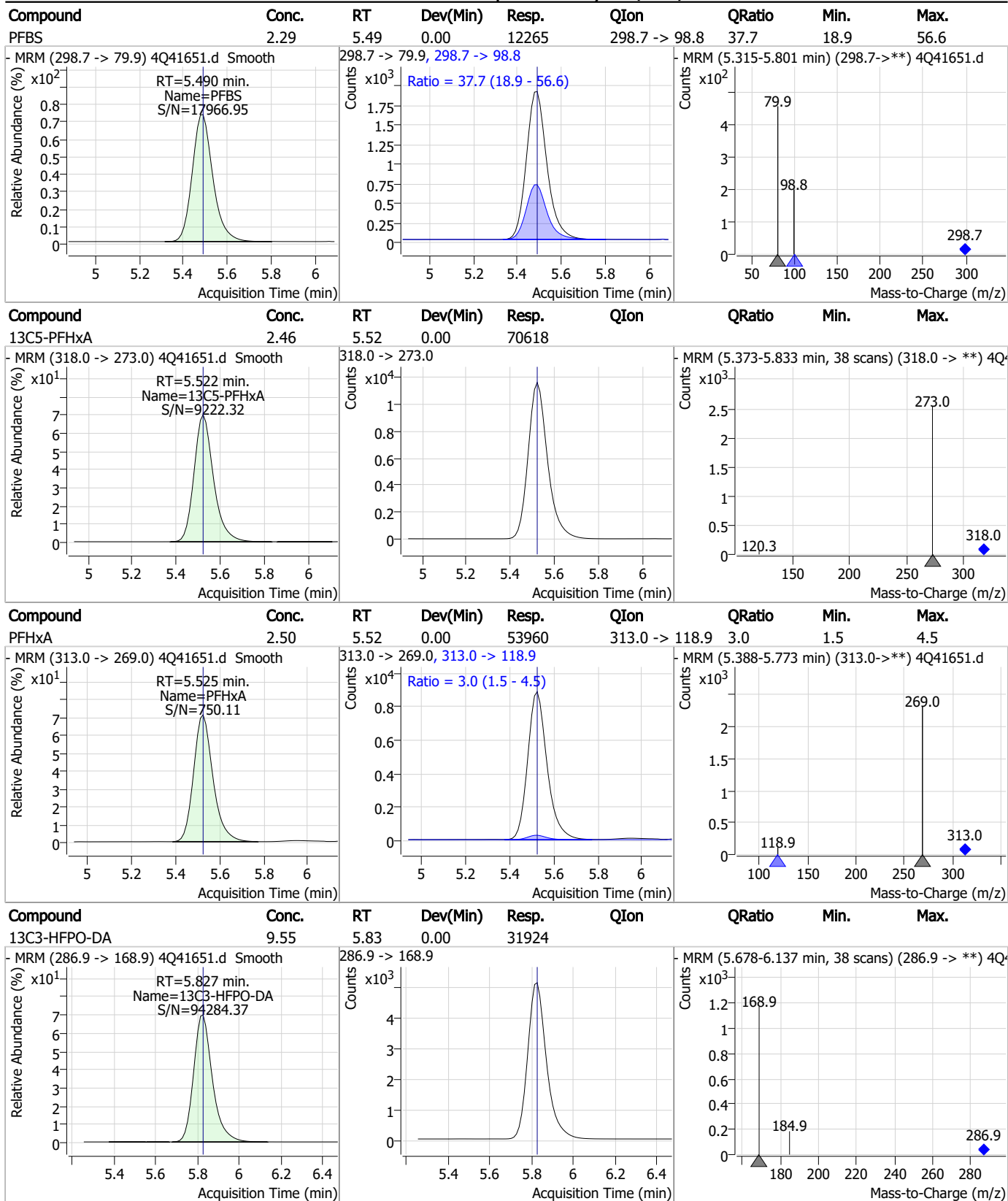
Perfluorinated Compounds by LC/MS/MS



7.7.5

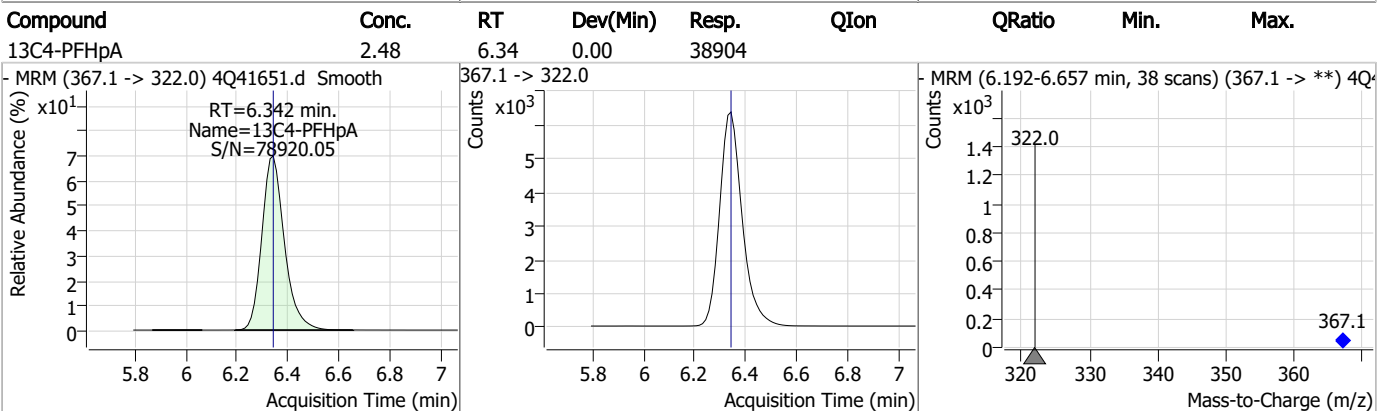
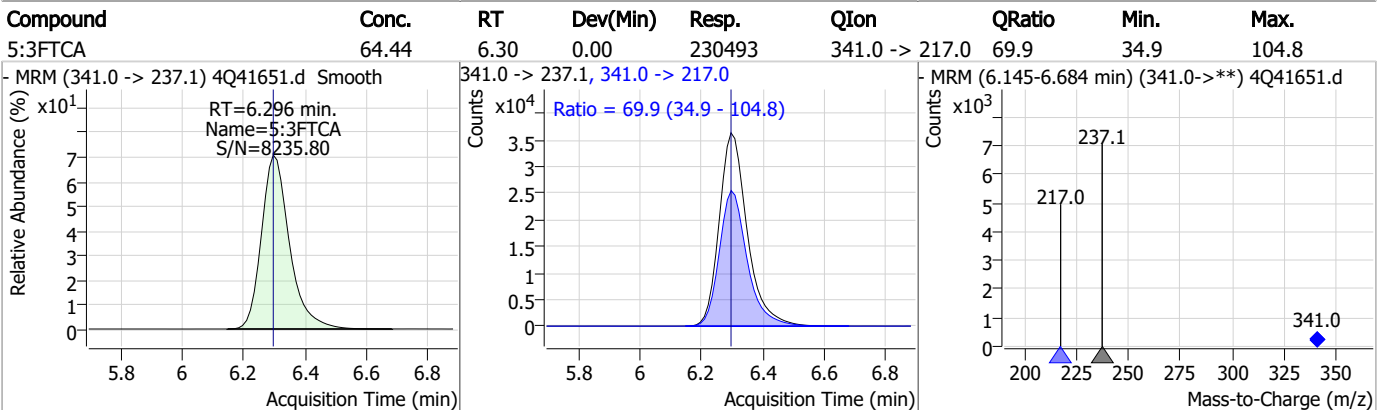
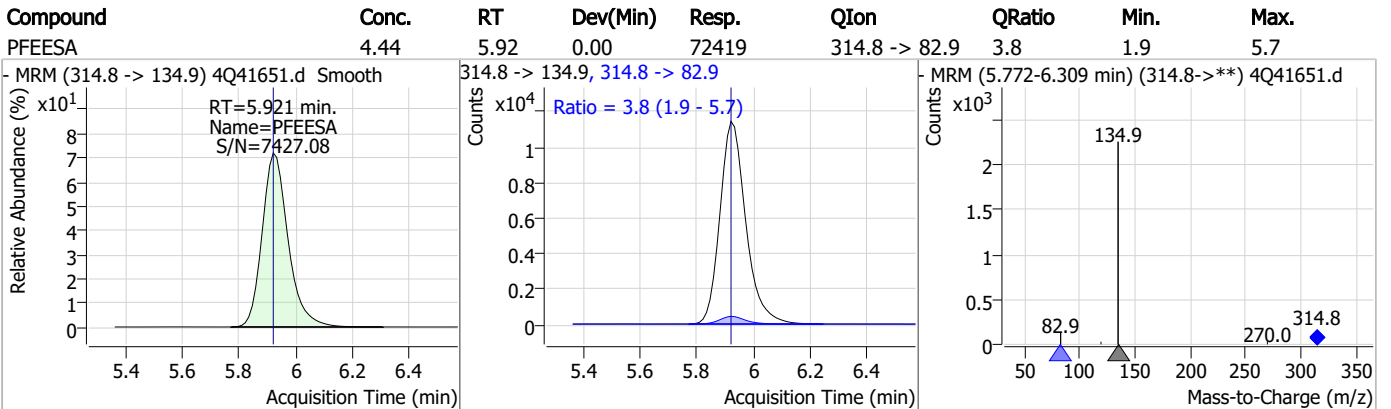
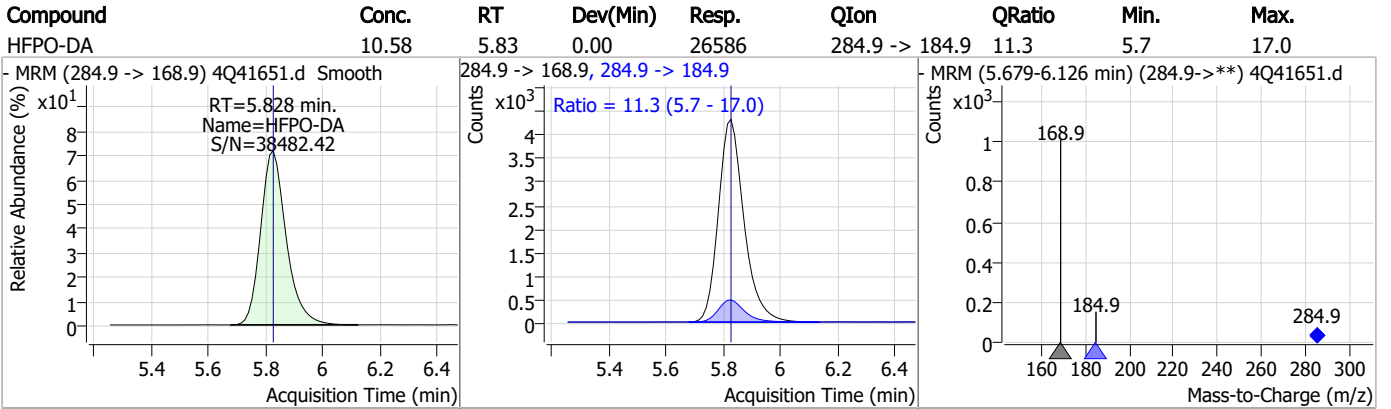
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Perfluorinated Compounds by LC/MS/MS



7.7.5
7

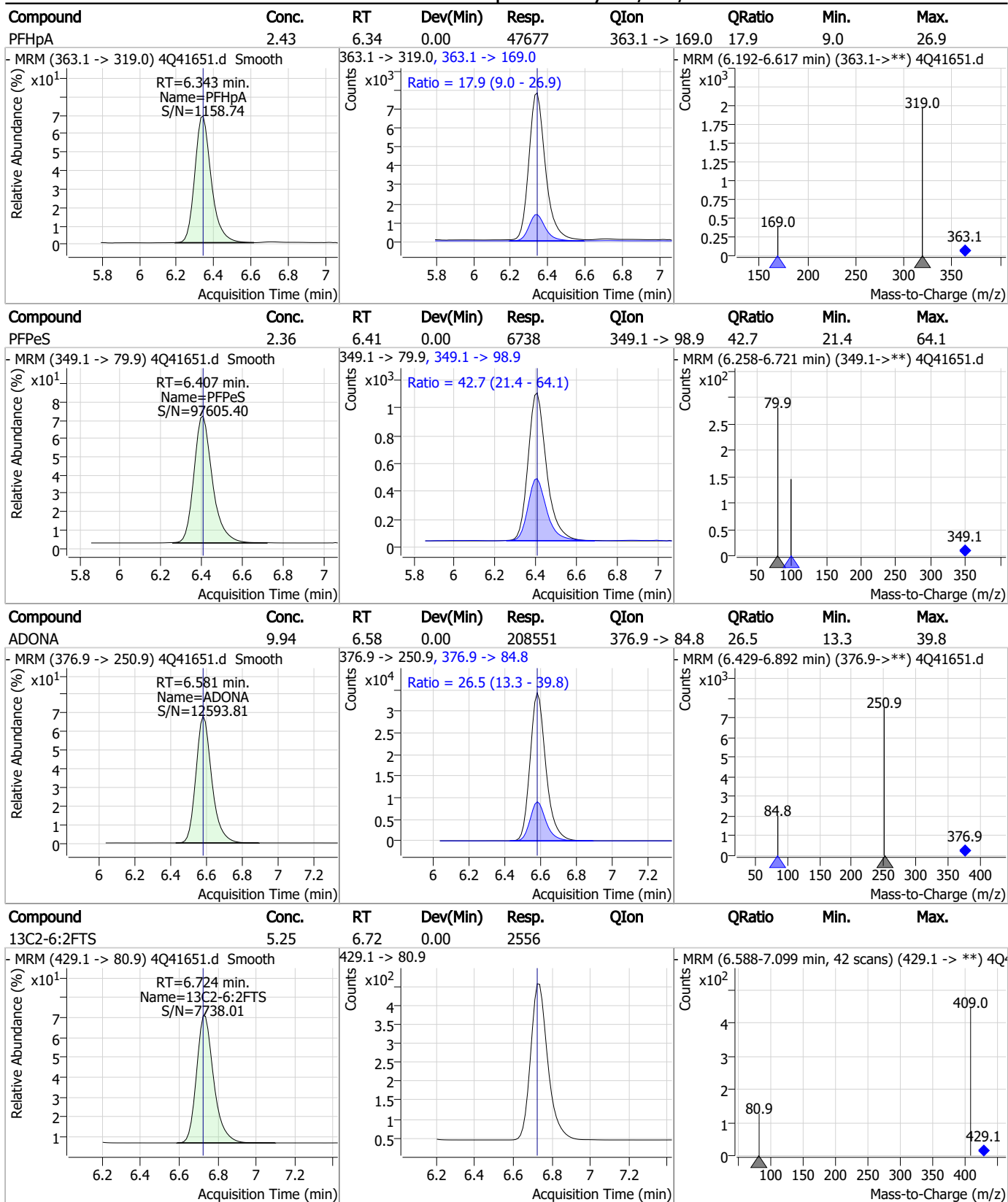
Perfluorinated Compounds by LC/MS/MS



7.7.5

7

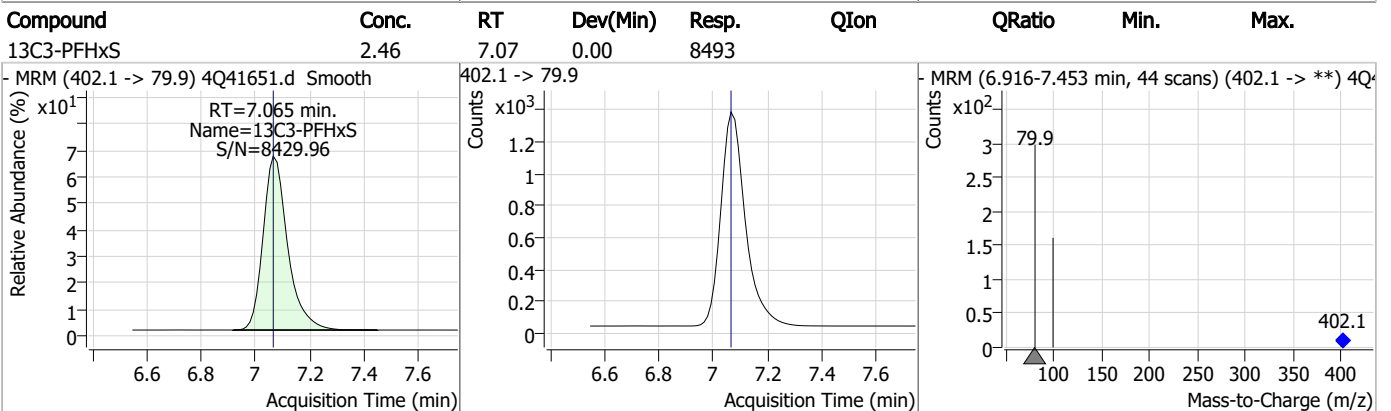
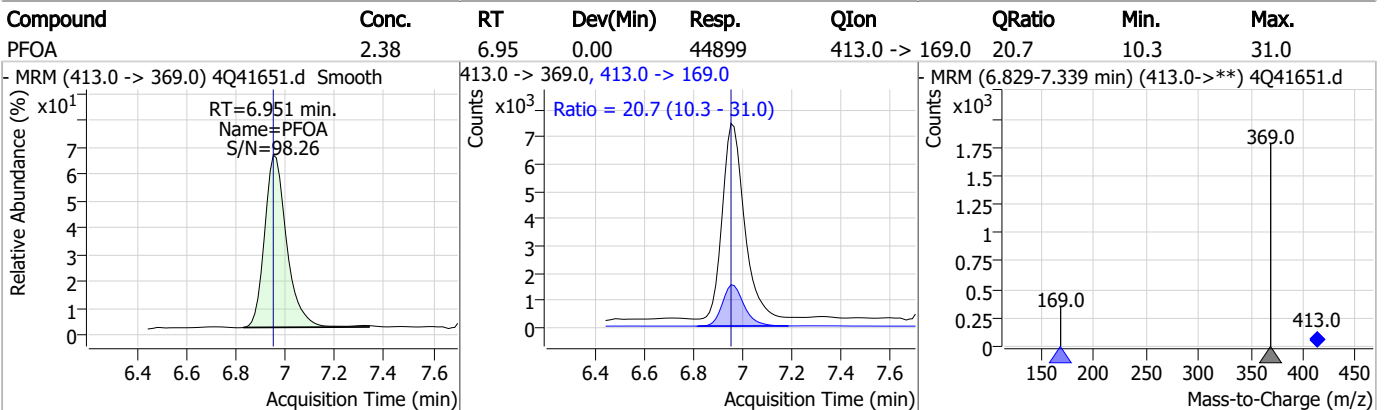
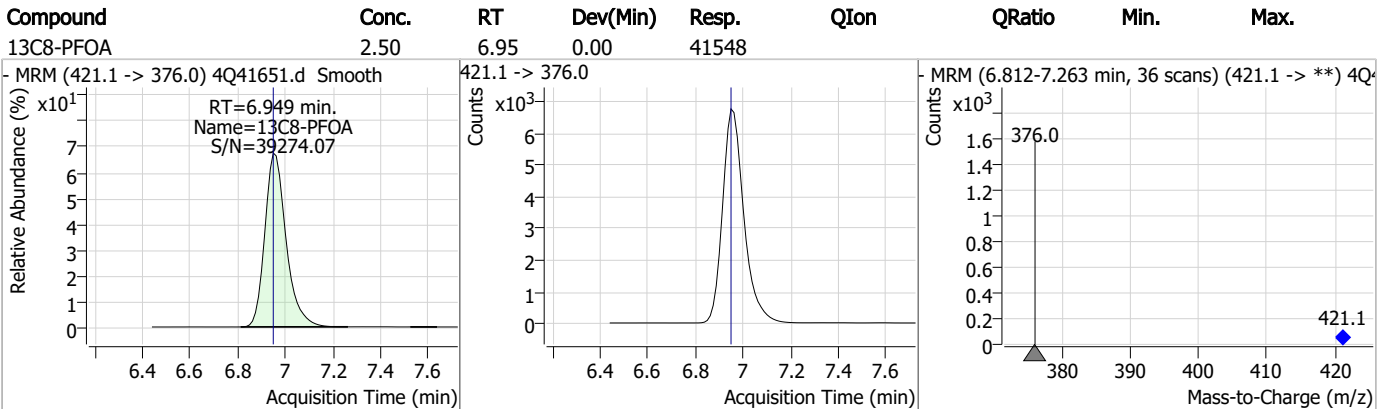
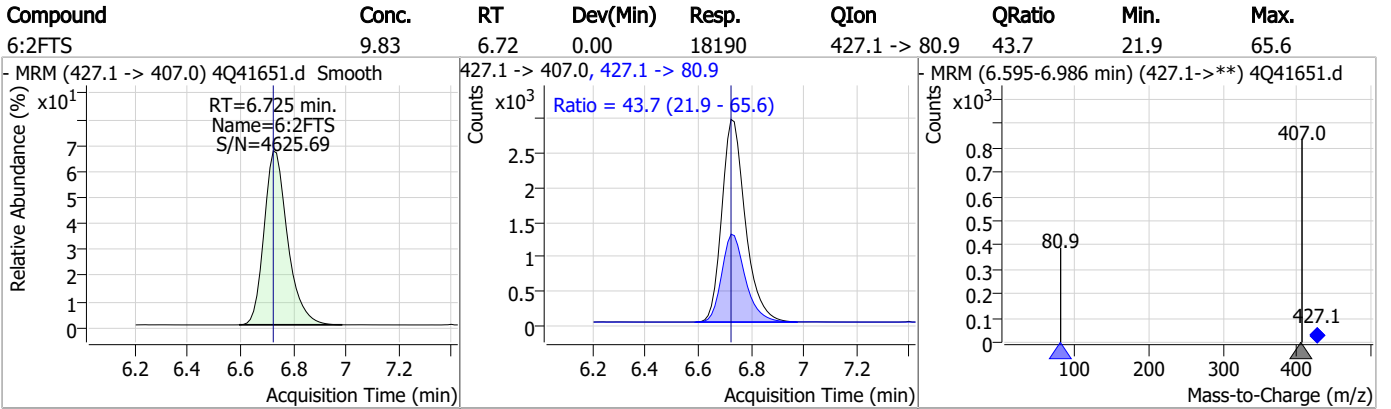
Perfluorinated Compounds by LC/MS/MS



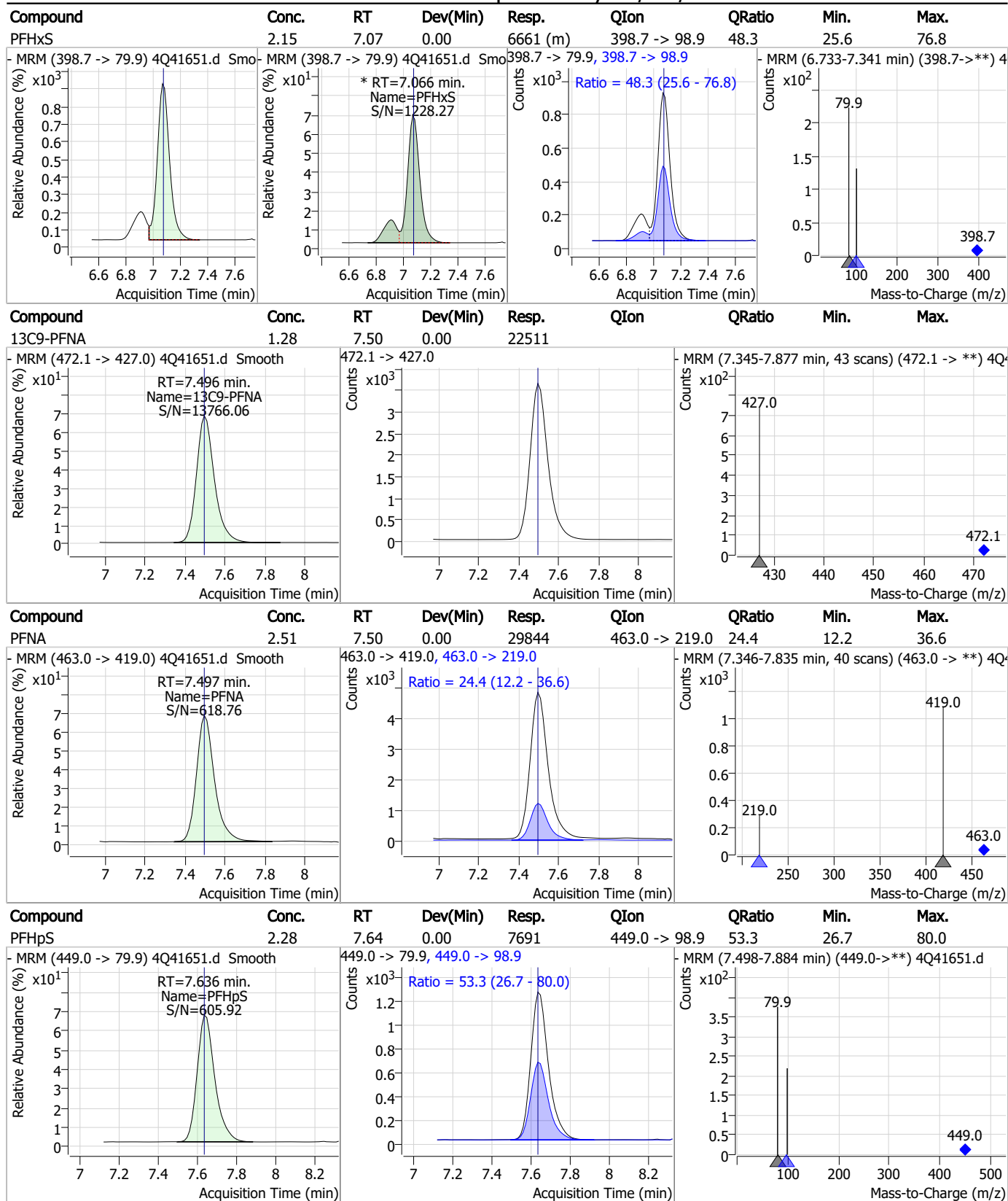
7.7.5
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Perfluorinated Compounds by LC/MS/MS



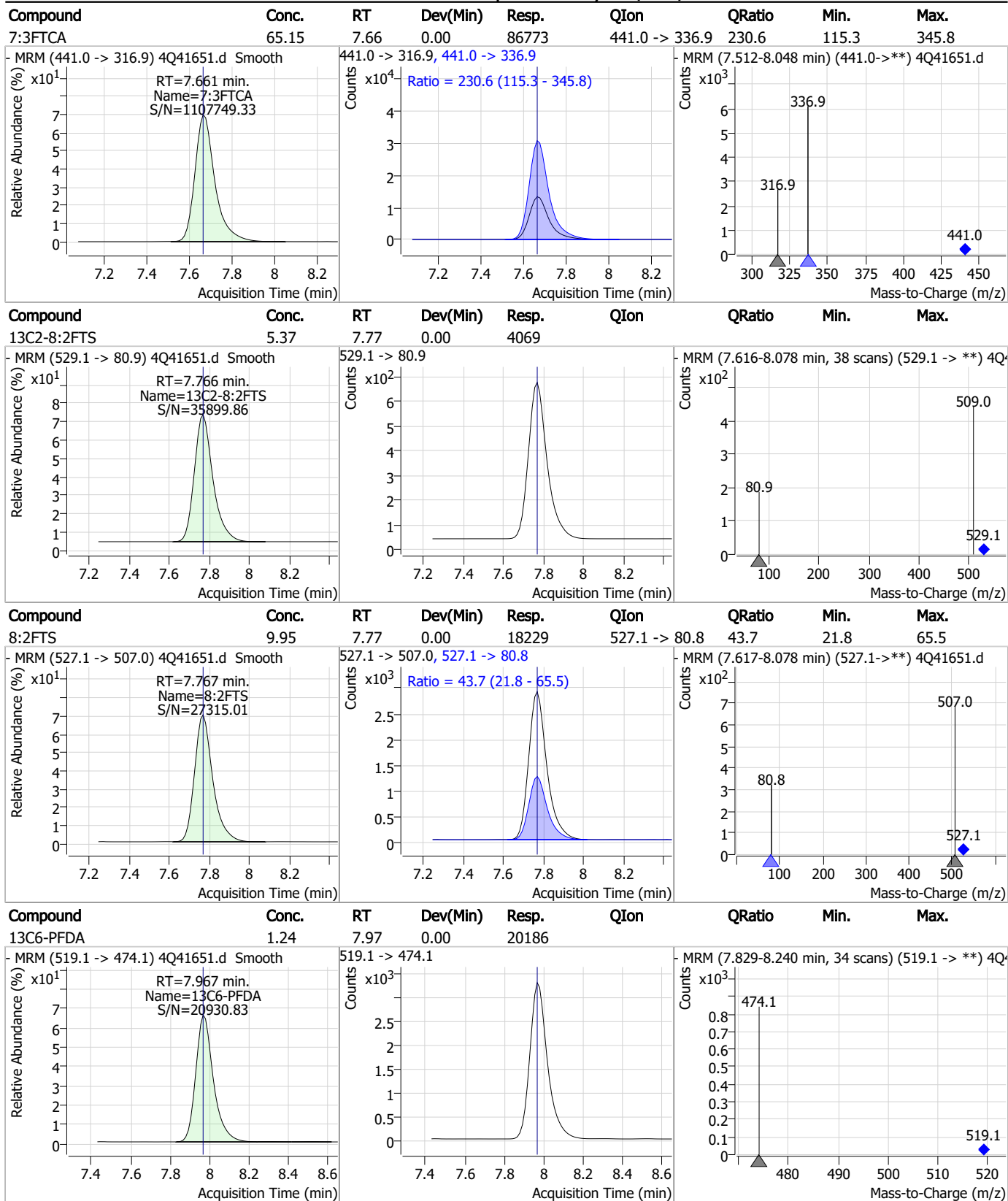
Perfluorinated Compounds by LC/MS/MS



7.7.5
7

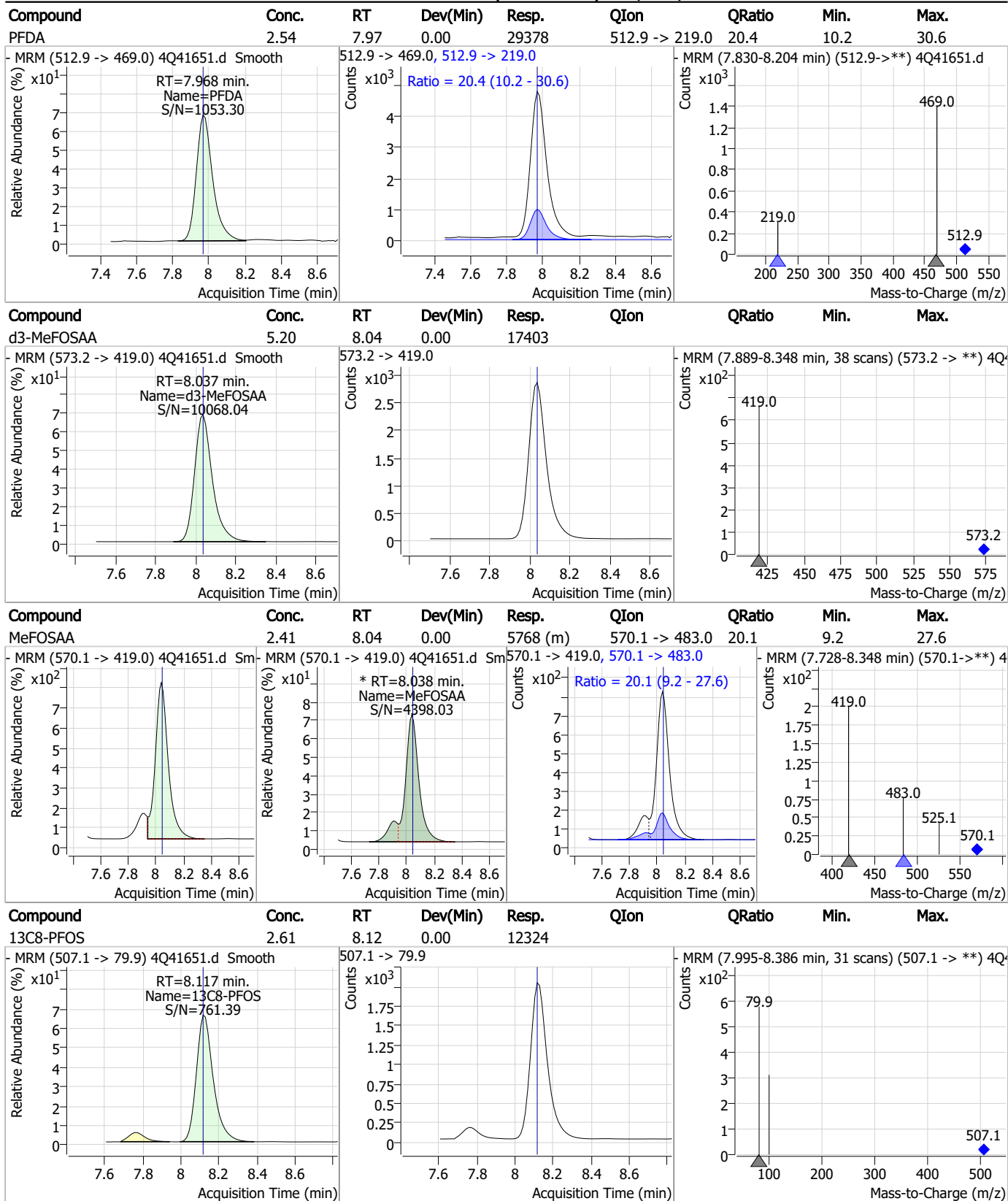


Perfluorinated Compounds by LC/MS/MS



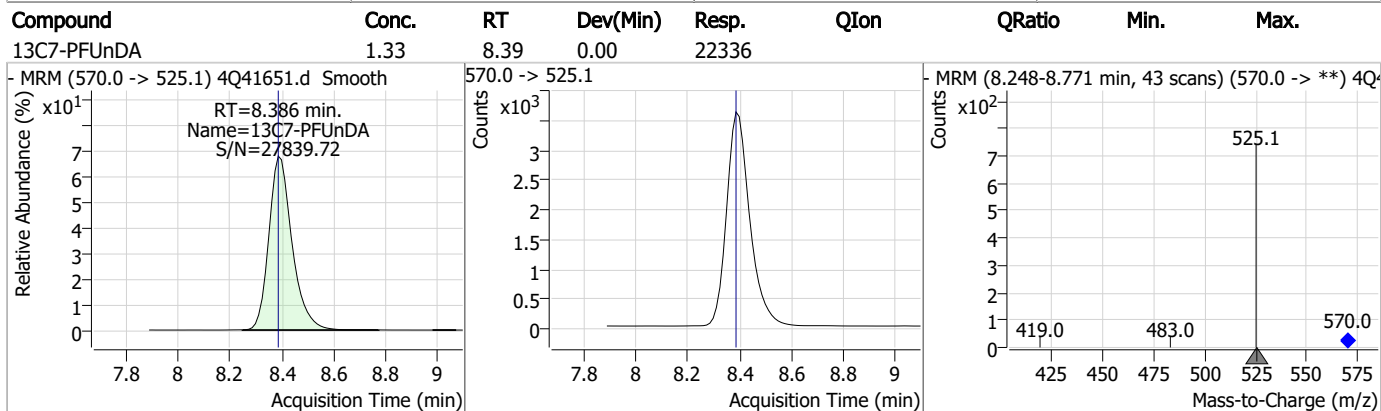
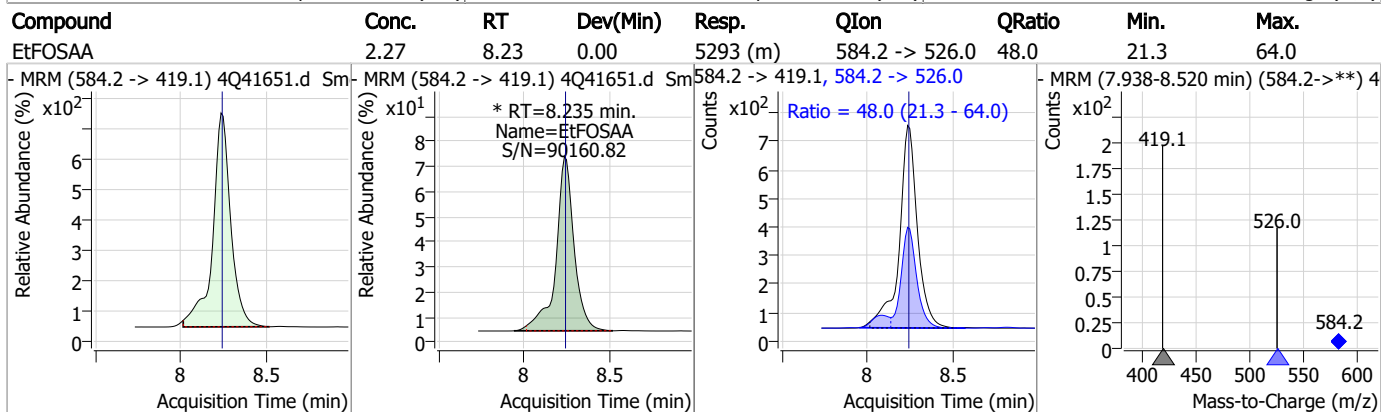
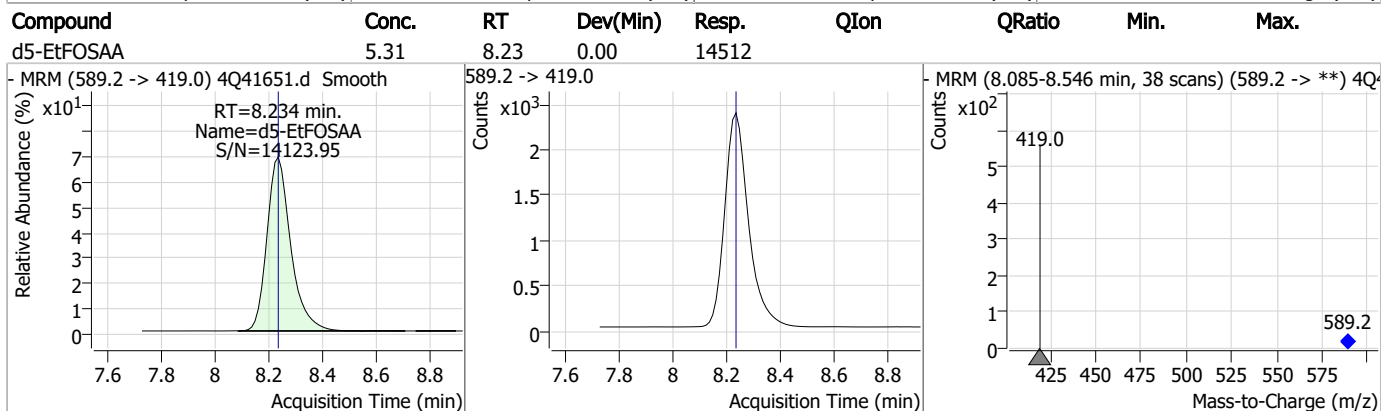
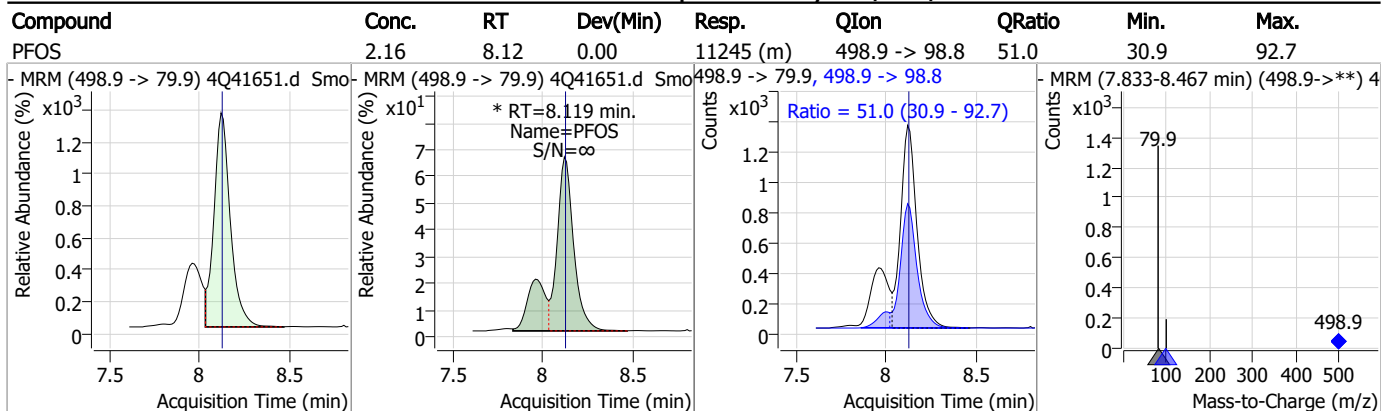
7.7.5
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Perfluorinated Compounds by LC/MS/MS

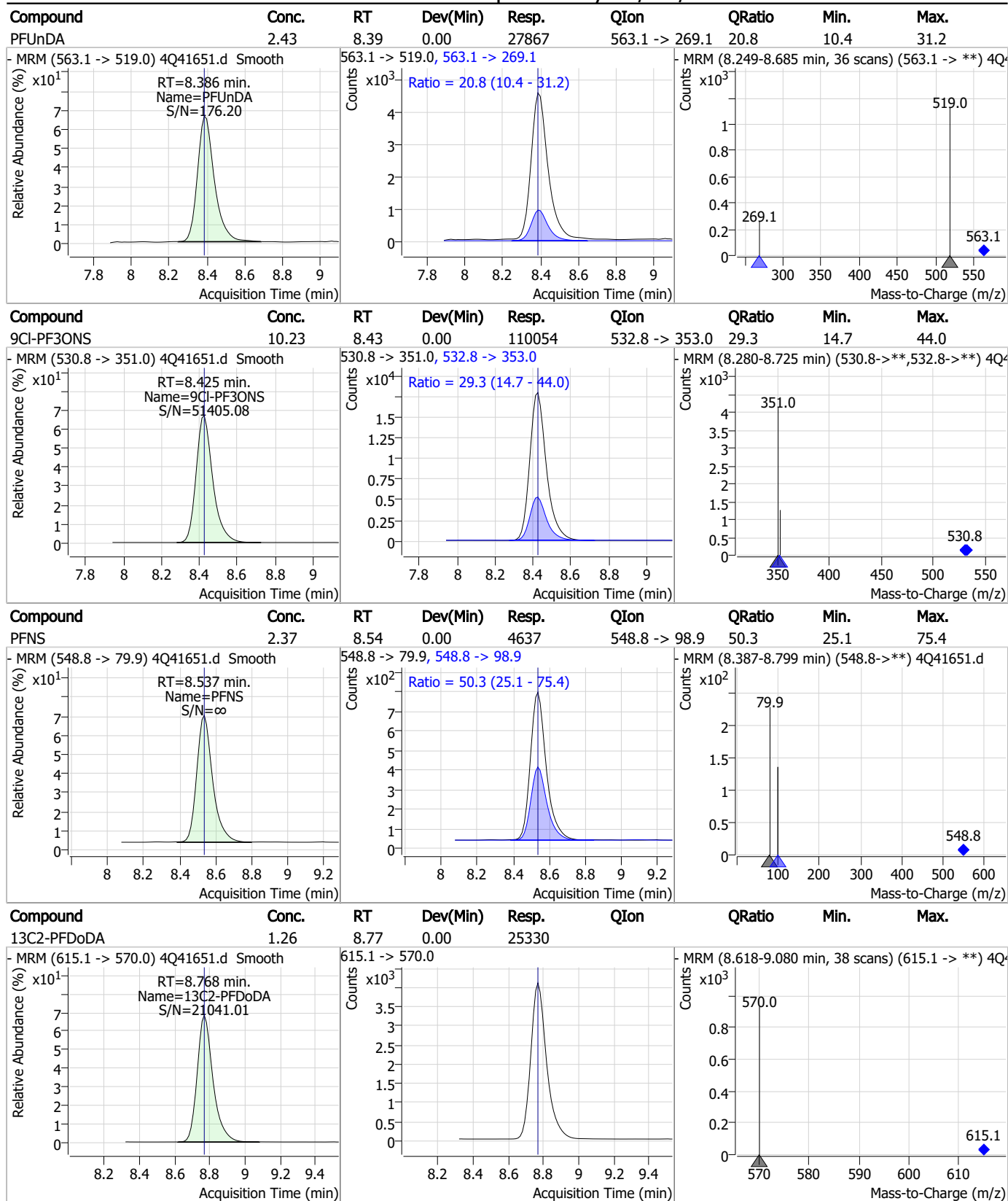


7.7.5
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Perfluorinated Compounds by LC/MS/MS



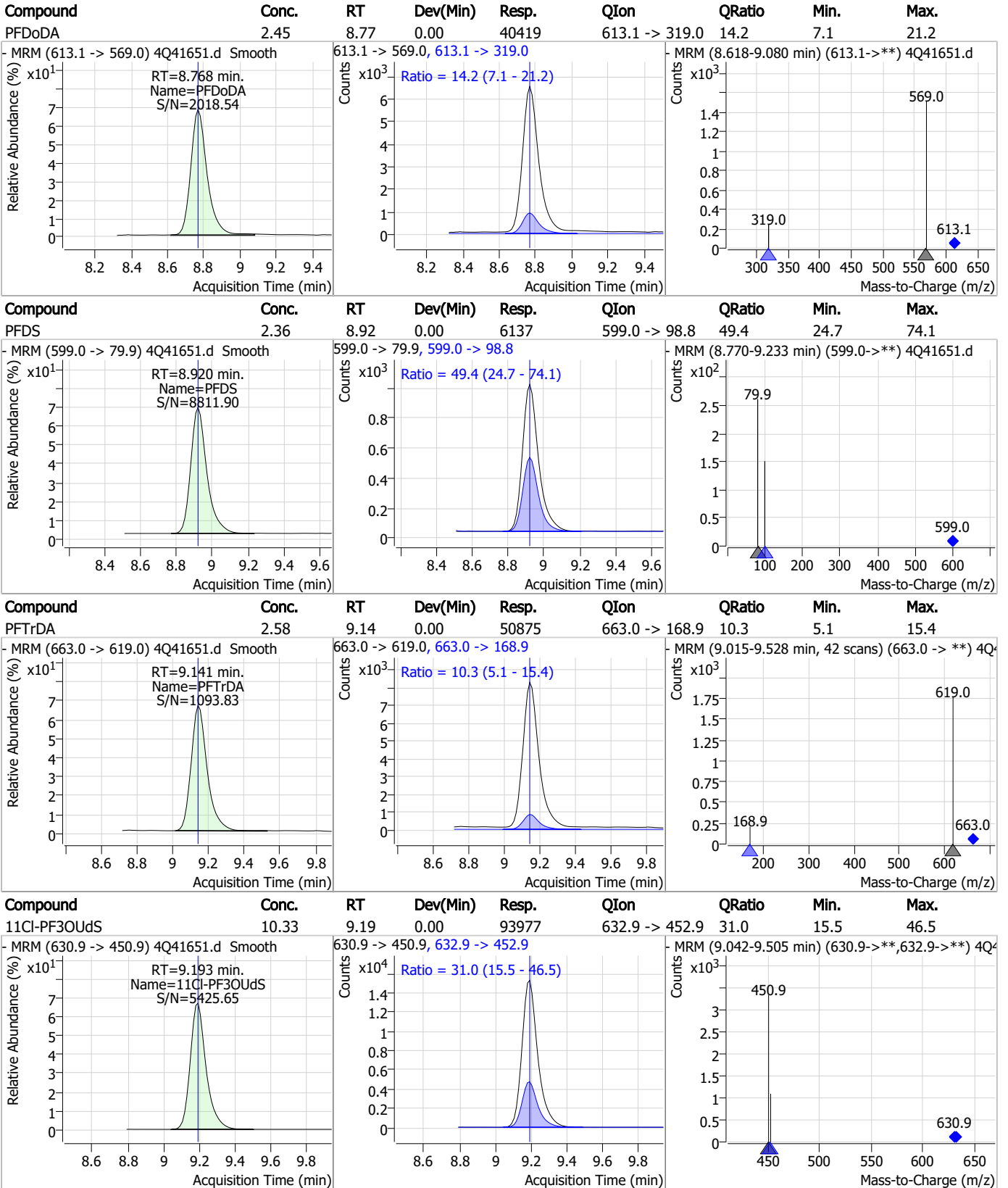
Perfluorinated Compounds by LC/MS/MS



7.7.5

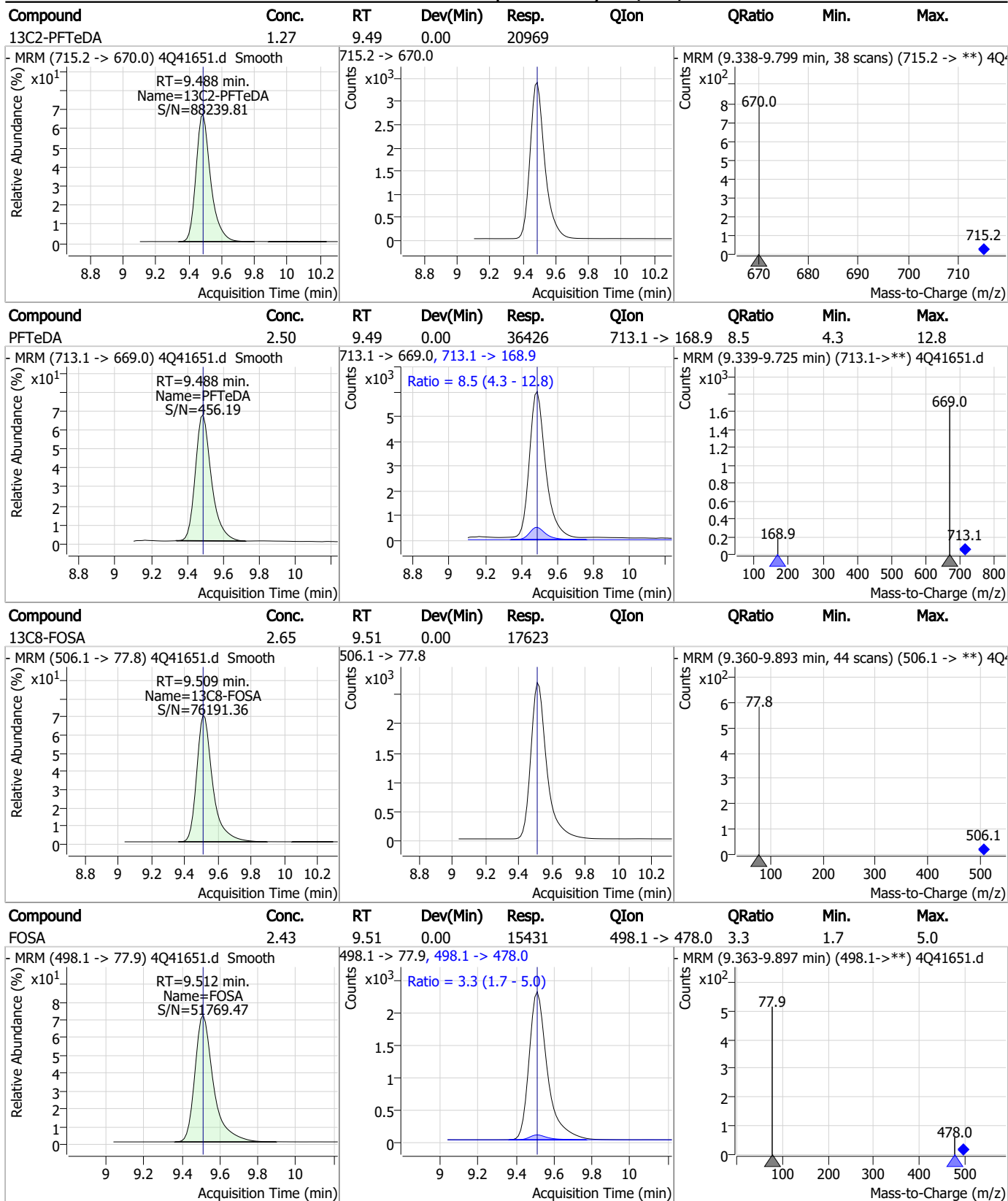
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Perfluorinated Compounds by LC/MS/MS



7.7.5
7

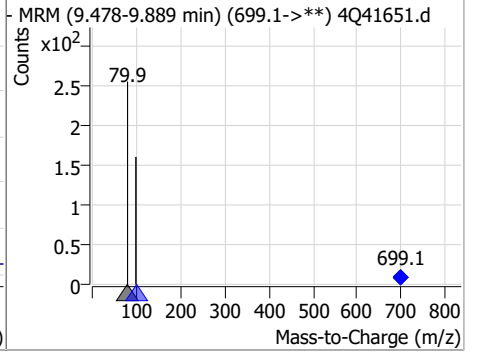
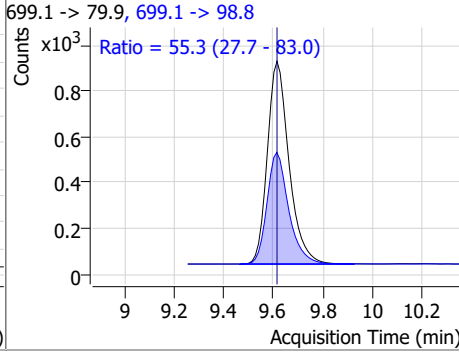
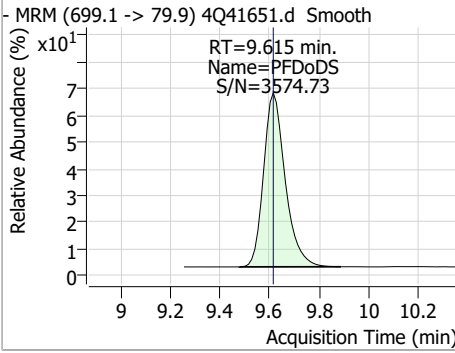
Perfluorinated Compounds by LC/MS/MS



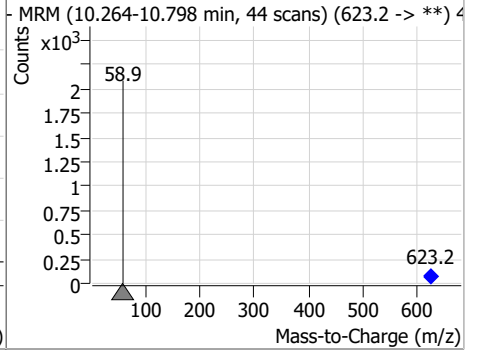
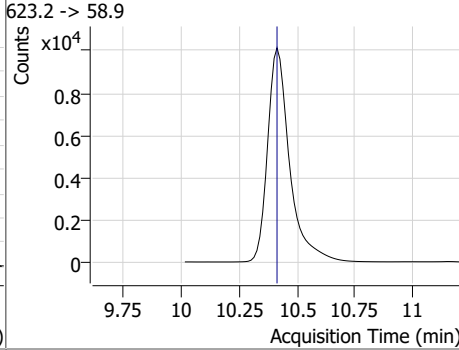
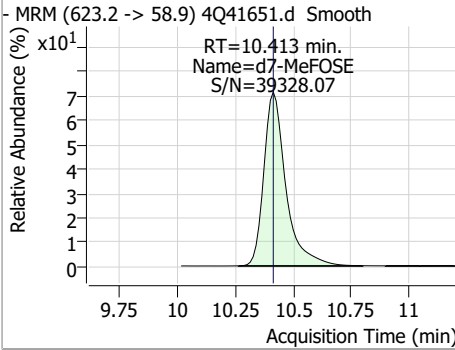
7.7.5
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Perfluorinated Compounds by LC/MS/MS

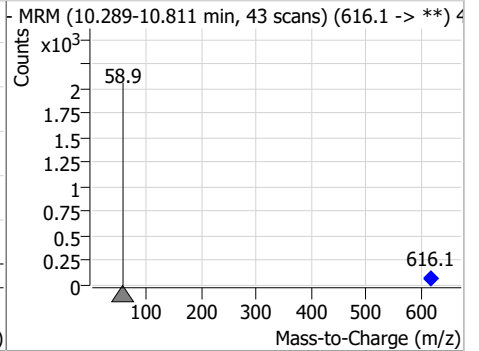
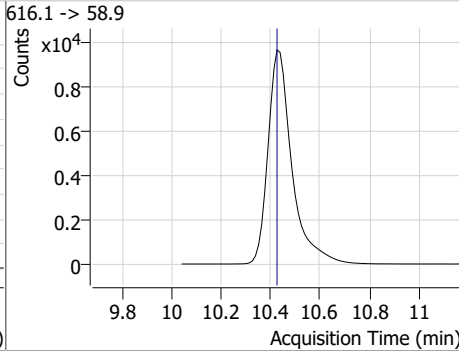
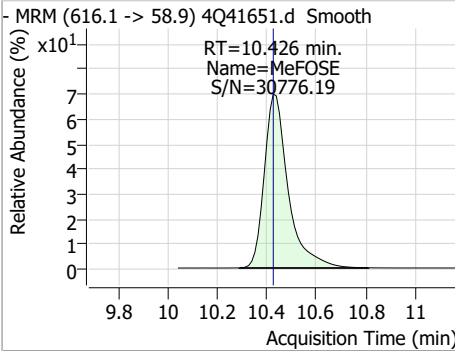
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	2.44	9.61	0.00	5367	699.1 -> 98.8	55.3	27.7	83.0



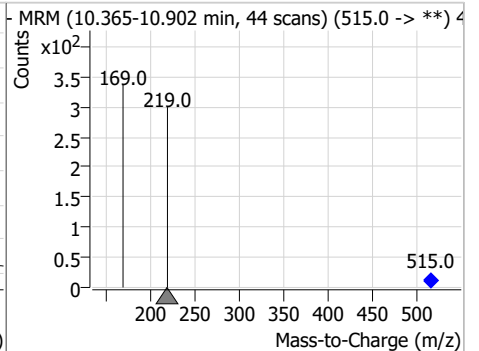
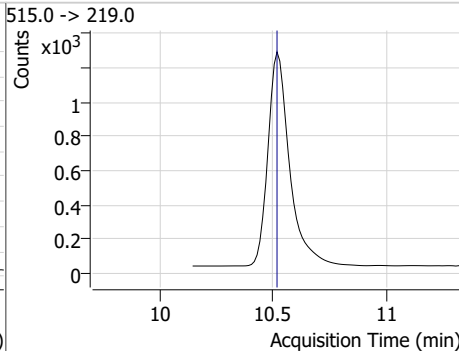
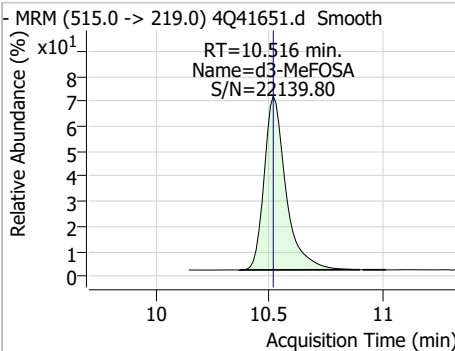
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	26.08	10.41	0.00	66532				



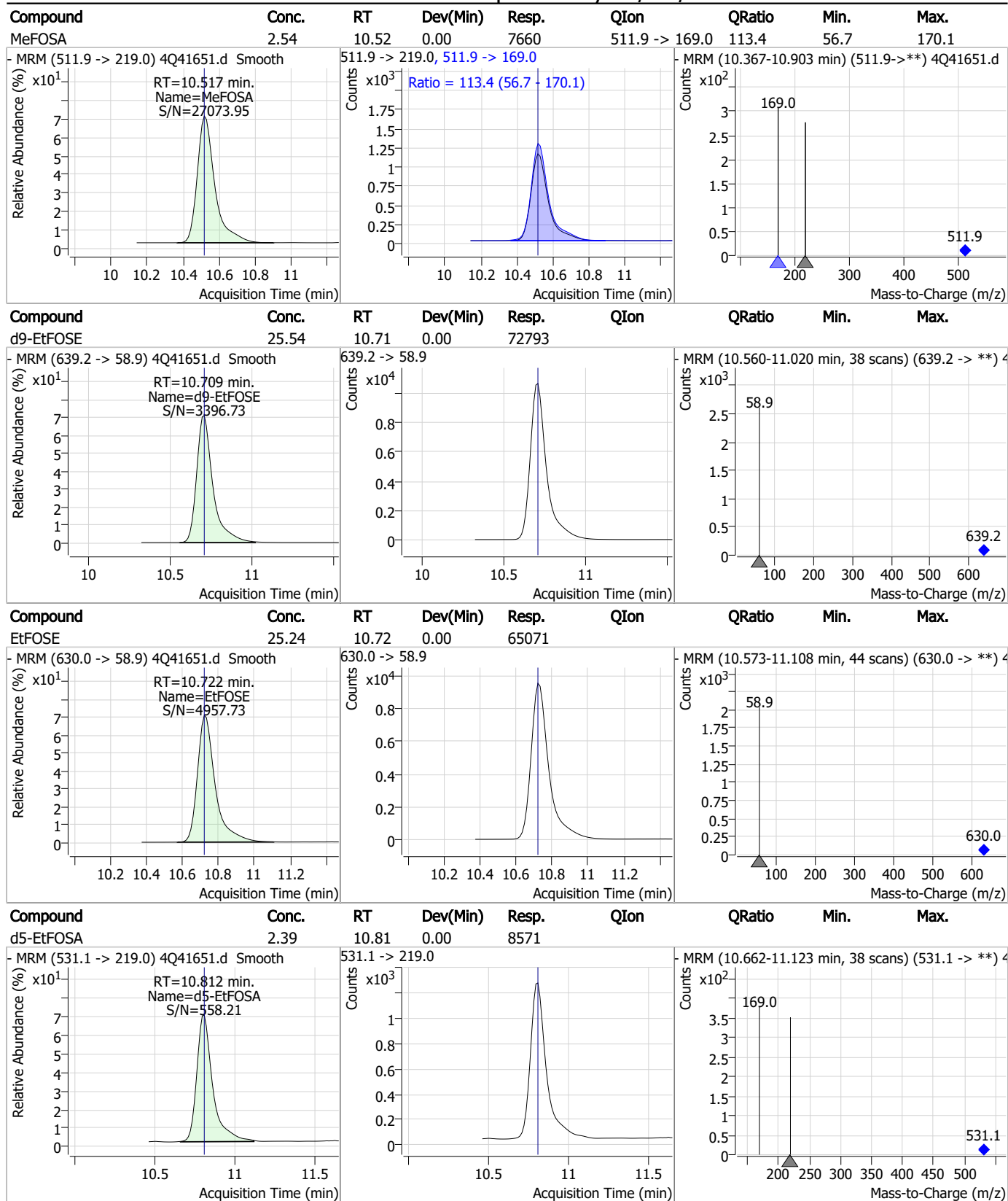
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	25.28	10.43	0.00	64220				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.46	10.52	0.00	8353				



Perfluorinated Compounds by LC/MS/MS



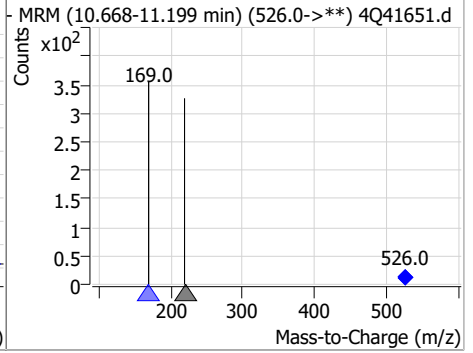
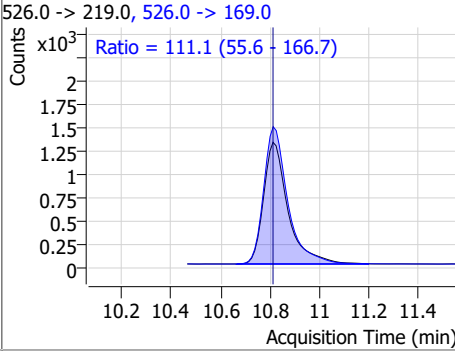
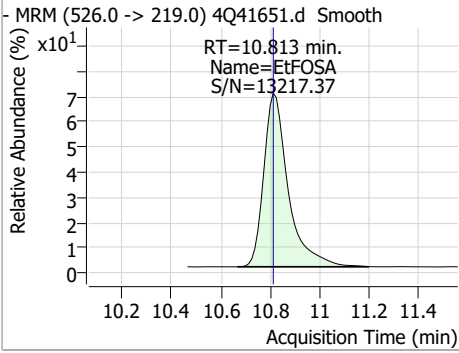
7.7.5

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Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	2.57	10.81	0.00	9001	526.0 -> 169.0	111.1	55.6	166.7



7.7.5

7

Manual Integration Approval Summary

Sample Number: S4Q596-ICC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41651.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 18:28 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.07	Split peak
MeFOSAA	2355-31-9		8.04	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.12	Split peak
EtFOSAA	2991-50-6		8.23	Split peak

7.7.5.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/07/23 15:28

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41652.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 6:42:44 PM
 Sample Name : ic596-5
 Vial : P1-A6
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.202	216.8 -> 171.9	147811	10.00 µg/L	-0.037
M5-PFPeA	4.549	268.3 -> 223.0	88058	5.00 µg/L	-0.025
M5-PFHxA	5.522	318.0 -> 273.0	69090	2.50 µg/L	0.000
M4-PFHpA	6.318	367.1 -> 322.0	38309	2.50 µg/L	-0.025
M8-PFOA	6.937	421.1 -> 376.0	39738	2.50 µg/L	-0.012
M9-PFNA	7.496	472.1 -> 427.0	21621	1.25 µg/L	0.000
M6-PFDA	7.967	519.1 -> 474.1	20186	1.25 µg/L	0.000
M7-PFUnDA	8.386	570.0 -> 525.1	20586	1.25 µg/L	0.000
M2-PFDoDA	8.780	615.1 -> 570.0	24650	1.25 µg/L	0.012
M2-PFTeDA	9.537	715.2 -> 670.0	20457	1.25 µg/L	0.050
M8-FOSA	9.558	506.1 -> 77.8	17122	2.50 µg/L	0.049
M3-PFBS	5.476	302.1 -> 79.9	14689	2.50 µg/L	-0.012
M3-PFHxS	7.065	402.1 -> 79.9	8352	2.50 µg/L	0.000
M8-PFOS	8.117	507.1 -> 79.9	11621	2.50 µg/L	0.000
M2-4:2FTS	5.247	329.1 -> 80.9	1753	5.00 µg/L	-0.012
M2-6:2FTS	6.712	429.1 -> 80.9	2725	5.00 µg/L	-0.012
M2-8:2FTS	7.766	529.1 -> 80.9	3879	5.00 µg/L	0.000
M3-MeFOSAA	8.025	573.2 -> 419.0	17422	5.00 µg/L	-0.012
M3-HFPO-DA	5.815	286.9 -> 168.9	33260	10.00 µg/L	-0.012
M5-EtFOSAA	8.221	589.2 -> 419.0	13739	5.00 µg/L	-0.012
M7-MeFOSE	10.438	623.2 -> 58.9	65629	25.00 µg/L	0.025
M9-EtFOSE	10.721	639.2 -> 58.9	74477	25.00 µg/L	0.012
M5-EtFOSA	10.812	531.1 -> 219.0	9193	2.50 µg/L	0.000
M3-MeFOSA	10.528	515.0 -> 219.0	8551	2.50 µg/L	0.012
13C4-PFOS	8.106	502.8 -> 79.9	12461	2.50 µg/L	-0.012
13C3-PFBA	3.205	216.0 -> 172.0	85876	5.00 µg/L	-0.037
18O2-PFHxS	7.064	403.0 -> 83.9	6335	2.50 µg/L	0.000
13C4-PFOA	6.937	417.1 -> 372.0	49087	2.50 µg/L	-0.012
13C2-PFDA	7.967	515.1 -> 470.1	18681	1.25 µg/L	0.000
13C5-PFNA	7.496	468.0 -> 423.0	25730	1.25 µg/L	0.000
13C2-PFHxA	5.523	315.1 -> 270.0	65086	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.247	329.1 -> 80.9	1753	5.10 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 102.0%		
13C2-6:2FTS	6.712	429.1 -> 80.9	2725	5.60 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 111.9%		
13C2-8:2FTS	7.766	529.1 -> 80.9	3879	5.12 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 102.4%		
13C2-PFDoDA	8.780	615.1 -> 570.0	24650	1.25 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.8%		
13C2-PFTeDA	9.537	715.2 -> 670.0	20457	1.25 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.4%		
13C3-PFBS	5.476	302.1 -> 79.9	14689	2.49 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 99.7%		
13C3-PFHxS	7.065	402.1 -> 79.9	8352	2.42 µg/L	0.000

7.7.6
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 97.0%		
13C4-PFBA	3.202	216.8 -> 171.9	147811	10.01 µg/L	-0.037
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 100.1%		
13C4-PFHpA	6.318	367.1 -> 322.0	38309	2.48 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 99.2%		
13C5-PFHxA	5.522	318.0 -> 273.0	69090	2.45 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 97.8%		
13C5-PFPeA	4.549	268.3 -> 223.0	88058	4.96 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 99.1%		
13C6-PFDA	7.967	519.1 -> 474.1	20186	1.26 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.9%		
13C7-PFUnDA	8.386	570.0 -> 525.1	20586	1.24 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.4%		
13C8-FOSA	9.558	506.1 -> 77.8	17122	2.47 µg/L	0.049
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.8%		
13C8-PFOA	6.937	421.1 -> 376.0	39738	2.45 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 97.9%		
13C8-PFOS	8.117	507.1 -> 79.9	11621	2.37 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 94.7%		
13C9-PFNA	7.496	472.1 -> 427.0	21621	1.20 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.1%		
d3-MeFOSAA	8.025	573.2 -> 419.0	17422	5.01 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 100.1%		
13C3-HFPO-DA	5.815	286.9 -> 168.9	33260	10.09 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%		Recovery = 100.9%		
d3-MeFOSA	10.528	515.0 -> 219.0	8551	2.42 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 96.9%		
d5-EtFOSAA	8.221	589.2 -> 419.0	13739	4.84 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 96.7%		
d7-MeFOSE	10.438	623.2 -> 58.9	65629	24.73 µg/L	0.025
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 98.9%		
d9-EtFOSE	10.721	639.2 -> 58.9	74477	25.12 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%		Recovery = 100.5%		
d5-EtFOSA	10.812	531.1 -> 219.0	9193	2.47 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 98.7%		
Target Compounds					QValue
4:2FTS	5.236	327.1 -> 307.0	46514	19.48 µg/L	98
		327.1 -> 80.9	20201		
6:2FTS	6.712	427.1 -> 407.0	36638	18.57 µg/L	100
		427.1 -> 80.9	15928		
8:2FTS	7.767	527.1 -> 507.0	35212	20.17 µg/L	97
		527.1 -> 80.8	14693		
EtFOSAA	8.222	584.2 -> 419.1	10814	4.90 µg/L	m 93
		584.2 -> 526.0	5130		
FOSA	9.549	498.1 -> 77.9	31068	5.04 µg/L	98
		498.1 -> 478.0	802		
MeFOSAA	8.025	570.1 -> 419.0	11720	4.90 µg/L	100
		570.1 -> 483.0	2135		
PFBA	3.208	212.8 -> 168.9	64414	20.24 µg/L	100
PFBS	5.477	298.7 -> 79.9	24053	4.58 µg/L	97
		298.7 -> 98.8	9453		
PFDA	7.968	512.9 -> 469.0	58928	5.10 µg/L	100
		512.9 -> 219.0	11897		
PFDODA	8.780	613.1 -> 569.0	83625	5.22 µg/L	100
		613.1 -> 319.0	11818		
PFDS	8.945	599.0 -> 79.9	12363	5.04 µg/L	99

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	6154			
PFHpA	6.318	363.1 -> 319.0	98445	5.10	µg/L	97
		363.1 -> 169.0	16407			
PFHpS	7.636	449.0 -> 79.9	15424	4.86	µg/L	98
		449.0 -> 98.9	8443			
PFHxA	5.512	313.0 -> 269.0	107512	5.09	µg/L	100
		313.0 -> 118.9	3232			
PFHxS	7.066	398.7 -> 79.9	12864	4.22	µg/L	m 99
		398.7 -> 98.9	6721			
PFNA	7.497	463.0 -> 419.0	58561	5.13	µg/L	97
		463.0 -> 219.0	15220			
PFNS	8.537	548.8 -> 79.9	8578	4.66	µg/L	93
		548.8 -> 98.9	4747			
PFOA	6.938	413.0 -> 369.0	90624	5.03	µg/L	99
		413.0 -> 169.0	19111			
PFOS	8.106	498.9 -> 79.9	21911	4.46	µg/L	m 84
		498.9 -> 98.8	10917			
PFPeA	4.552	263.0 -> 219.0	172567	10.22	µg/L	100
PFPeS	6.382	349.1 -> 79.9	13981	4.98	µg/L	99
		349.1 -> 98.9	6041			
PFTeDA	9.538	713.1 -> 669.0	74424	5.24	µg/L	99
		713.1 -> 168.9	6185			
PFTrDA	9.166	663.0 -> 619.0	104703	5.46	µg/L	99
		663.0 -> 168.9	10240			
PFUnDA	8.386	563.1 -> 519.0	54985	5.20	µg/L	99
		563.1 -> 269.1	11225			
11CI-PF3OUdS	9.218	630.9 -> 450.9	187972	19.82	µg/L	99
		632.9 -> 452.9	57360			
9CI-PF3ONS	8.425	530.8 -> 351.0	219895	19.61	µg/L	97
		532.8 -> 353.0	67632			
ADONA	6.556	376.9 -> 250.9	415587	19.02	µg/L	99
		376.9 -> 84.8	112251			
HFPO-DA	5.816	284.9 -> 168.9	53442	20.41	µg/L	99
		284.9 -> 184.9	6283			
3:3FTCA	4.204	241.0 -> 177.0	22533	24.73	µg/L	98
		241.0 -> 117.0	2185			
5:3FTCA	6.283	341.0 -> 237.1	464220	132.66	µg/L	99
		341.0 -> 217.0	327989			
7:3FTCA	7.661	441.0 -> 316.9	171092	131.30	µg/L	98
		441.0 -> 336.9	389830			
EtFOSA	10.825	526.0 -> 219.0	18515	4.93	µg/L	99
		526.0 -> 169.0	20774			
EtFOSE	10.735	630.0 -> 58.9	133247	50.51	µg/L	100
MeFOSA	10.542	511.9 -> 219.0	15342	4.97	µg/L	95
		511.9 -> 169.0	18286			
MeFOSE	10.451	616.1 -> 58.9	130598	52.12	µg/L	100
PFDoDS	9.677	699.1 -> 79.9	10470	5.04	µg/L	99
		699.1 -> 98.8	5738			
NFDHA	5.428	295.0 -> 201.0	7728	10.76	µg/L	93
		295.0 -> 84.9	2137			
PFMBA	4.881	279.0 -> 85.1	97084	10.26	µg/L	100
PFMPA	3.794	229.0 -> 84.9	82762	10.17	µg/L	100
PFEESA	5.921	314.8 -> 134.9	144241	9.03	µg/L	99
		314.8 -> 82.9	5055			

= Qualifier out of range, m = manually integrated, + = Area summed

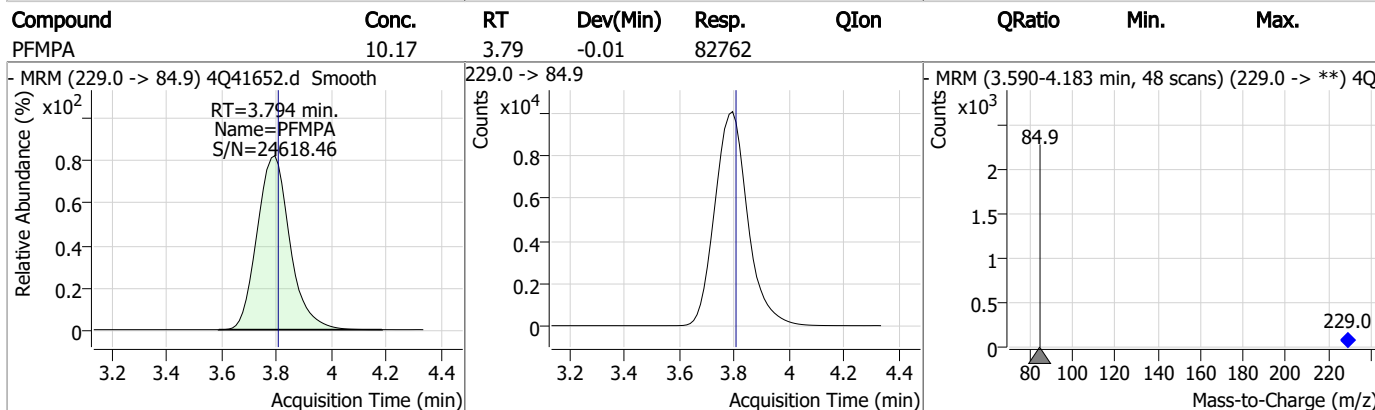
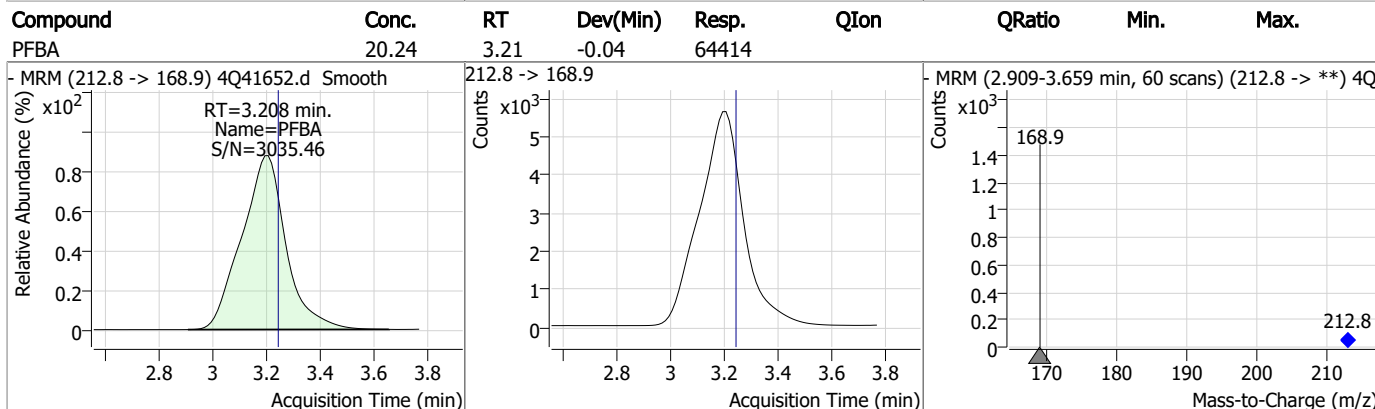
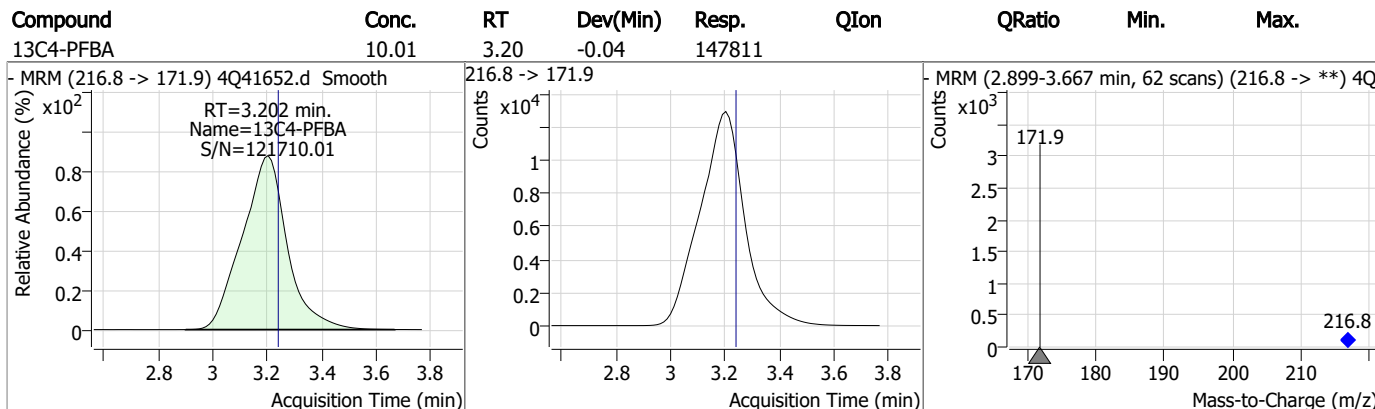
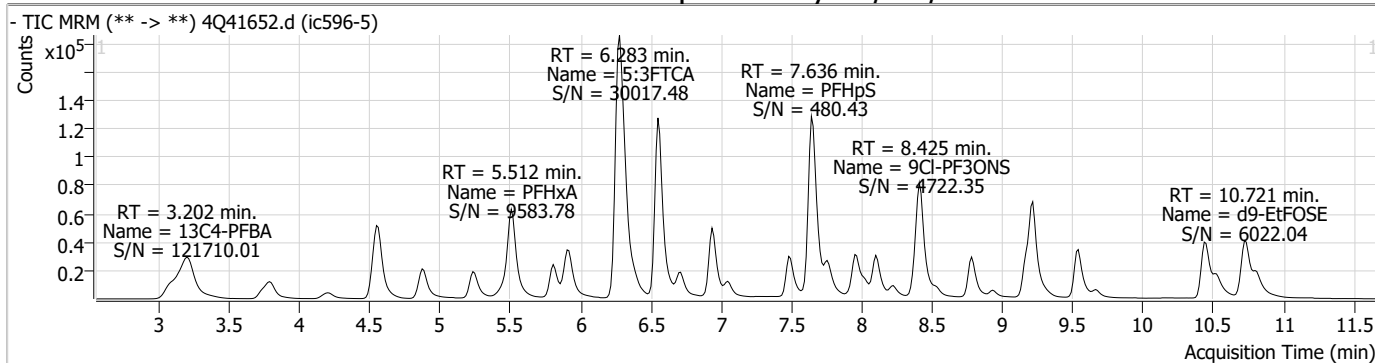
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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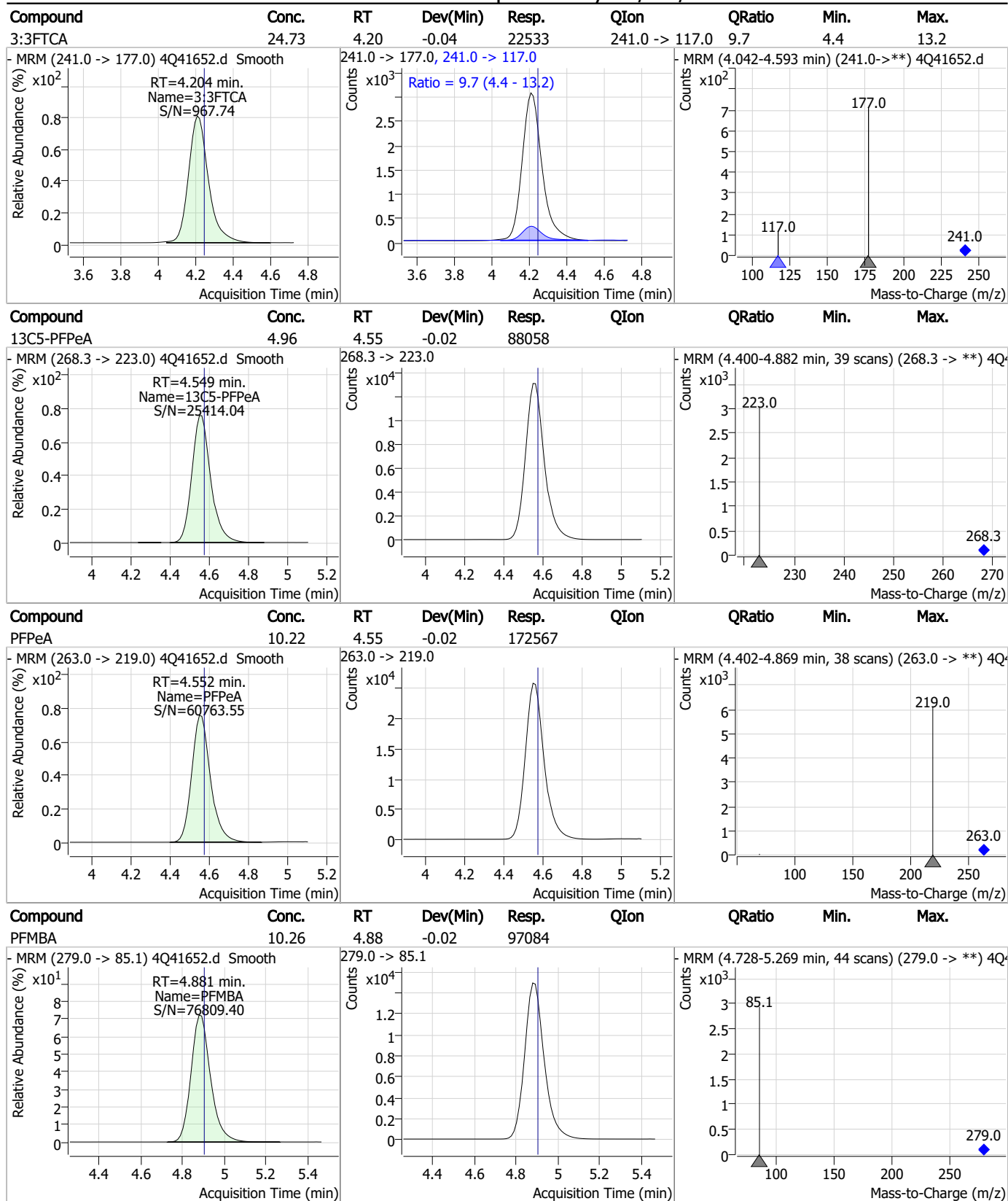
7.7.6

7

Perfluorinated Compounds by LC/MS/MS



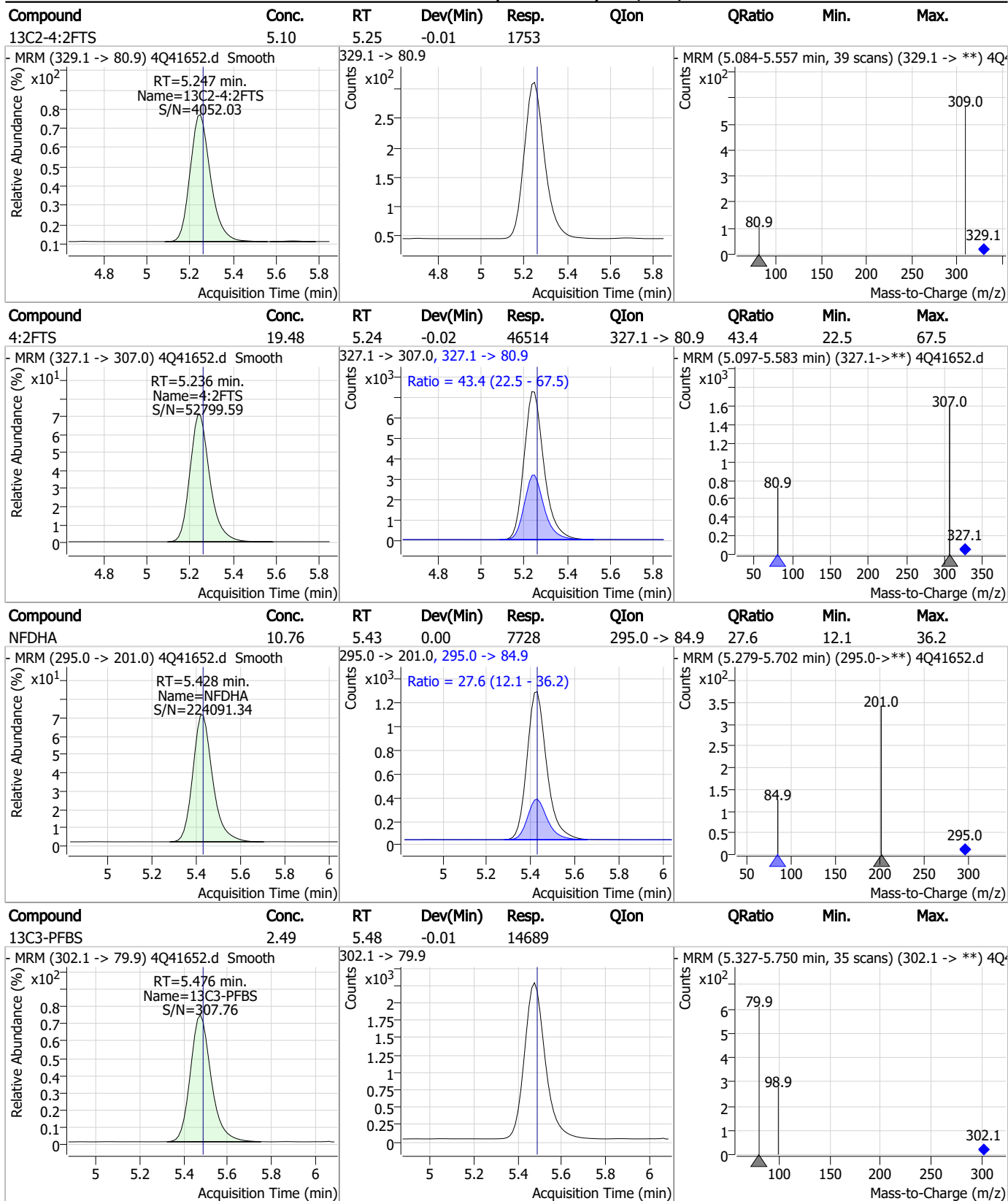
Perfluorinated Compounds by LC/MS/MS



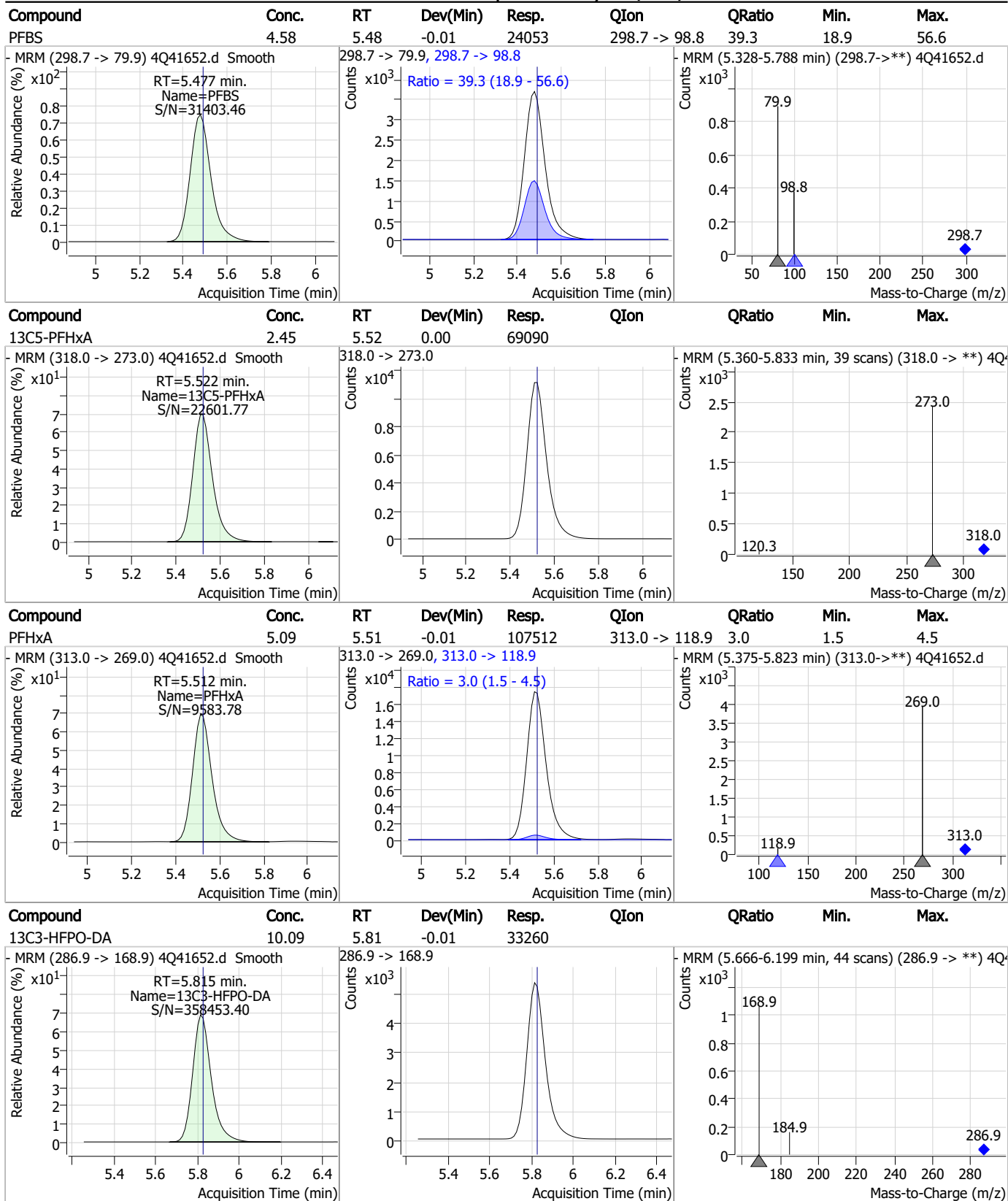
7.7.6

7

Perfluorinated Compounds by LC/MS/MS

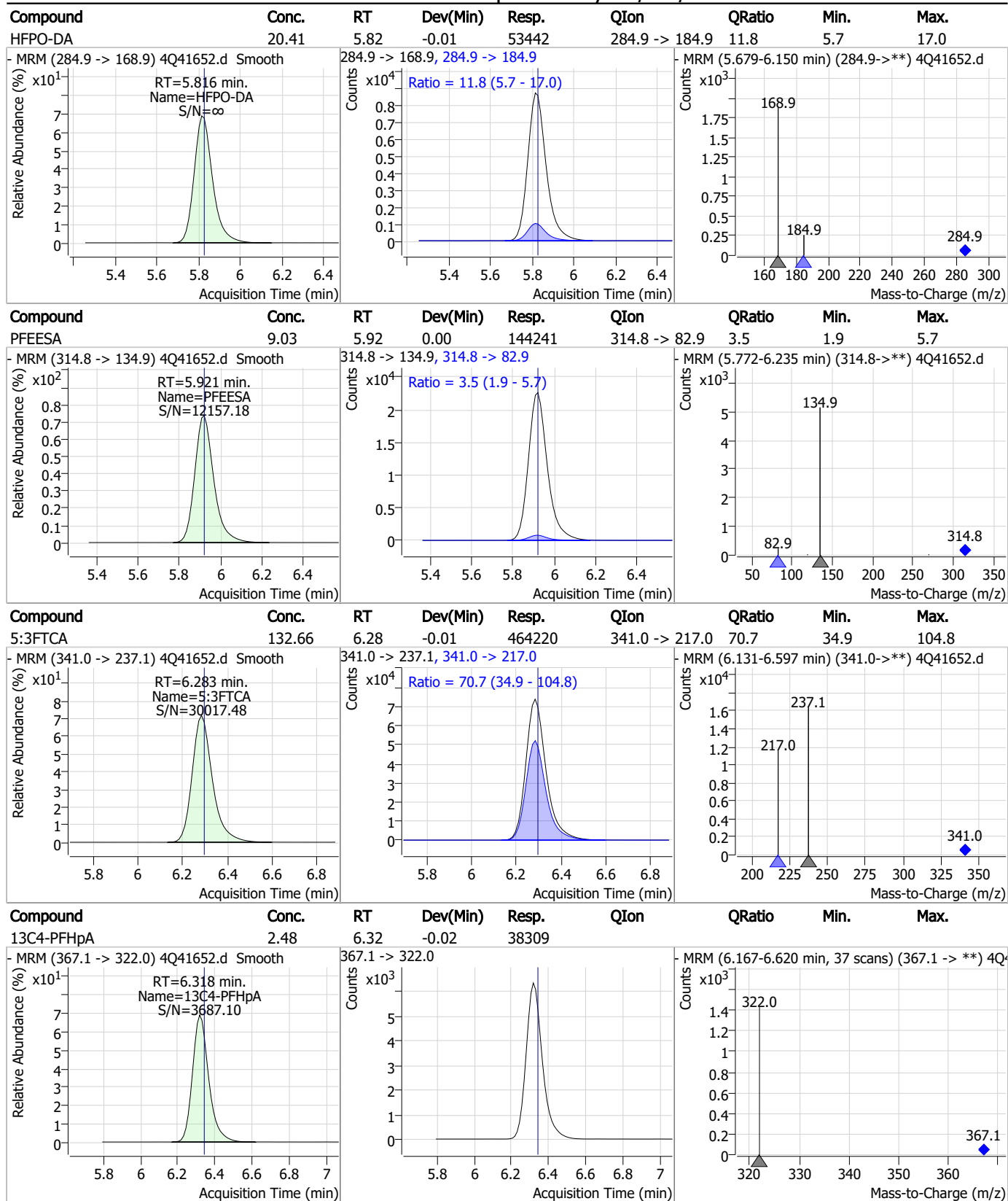


Perfluorinated Compounds by LC/MS/MS



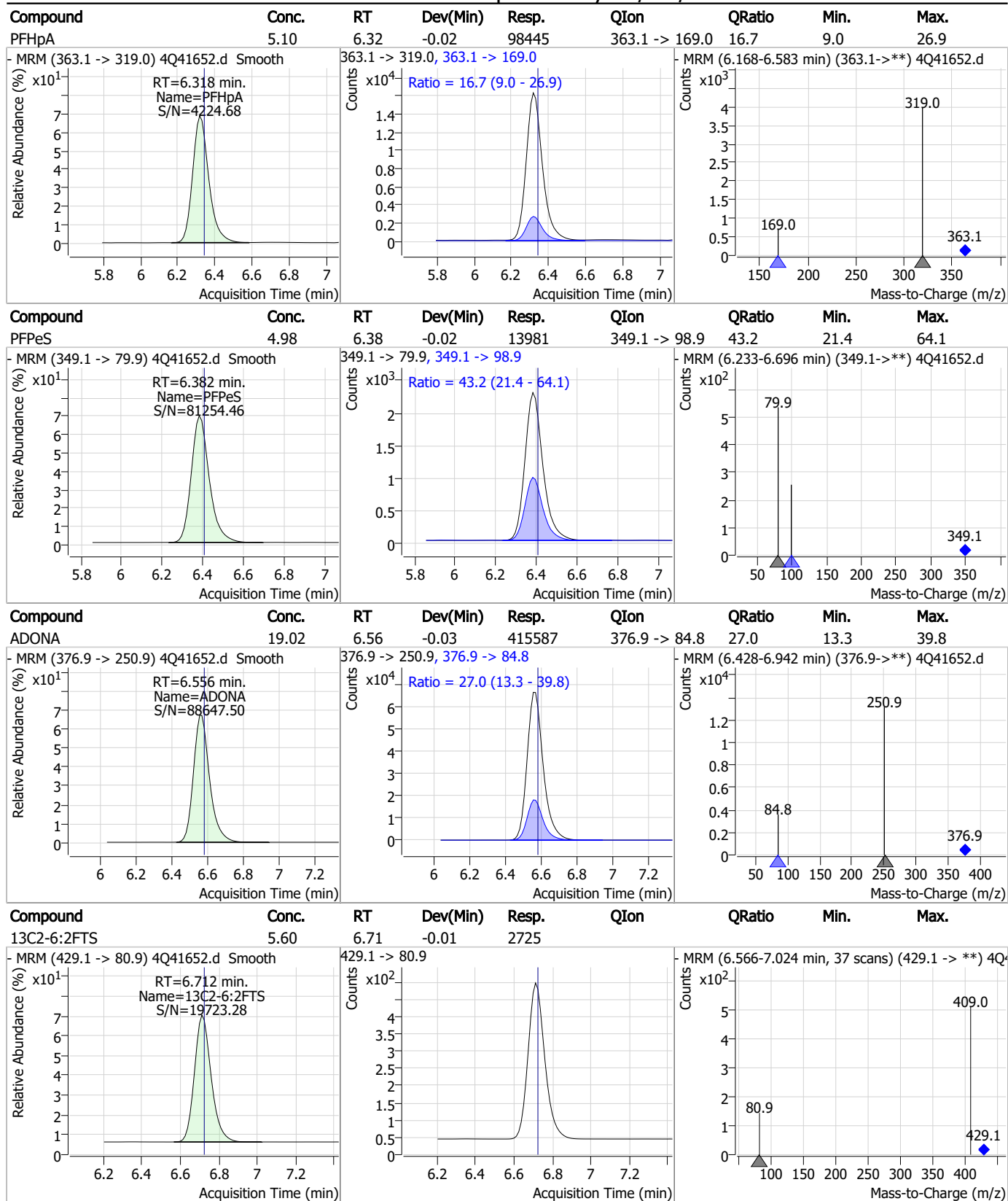
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Perfluorinated Compounds by LC/MS/MS



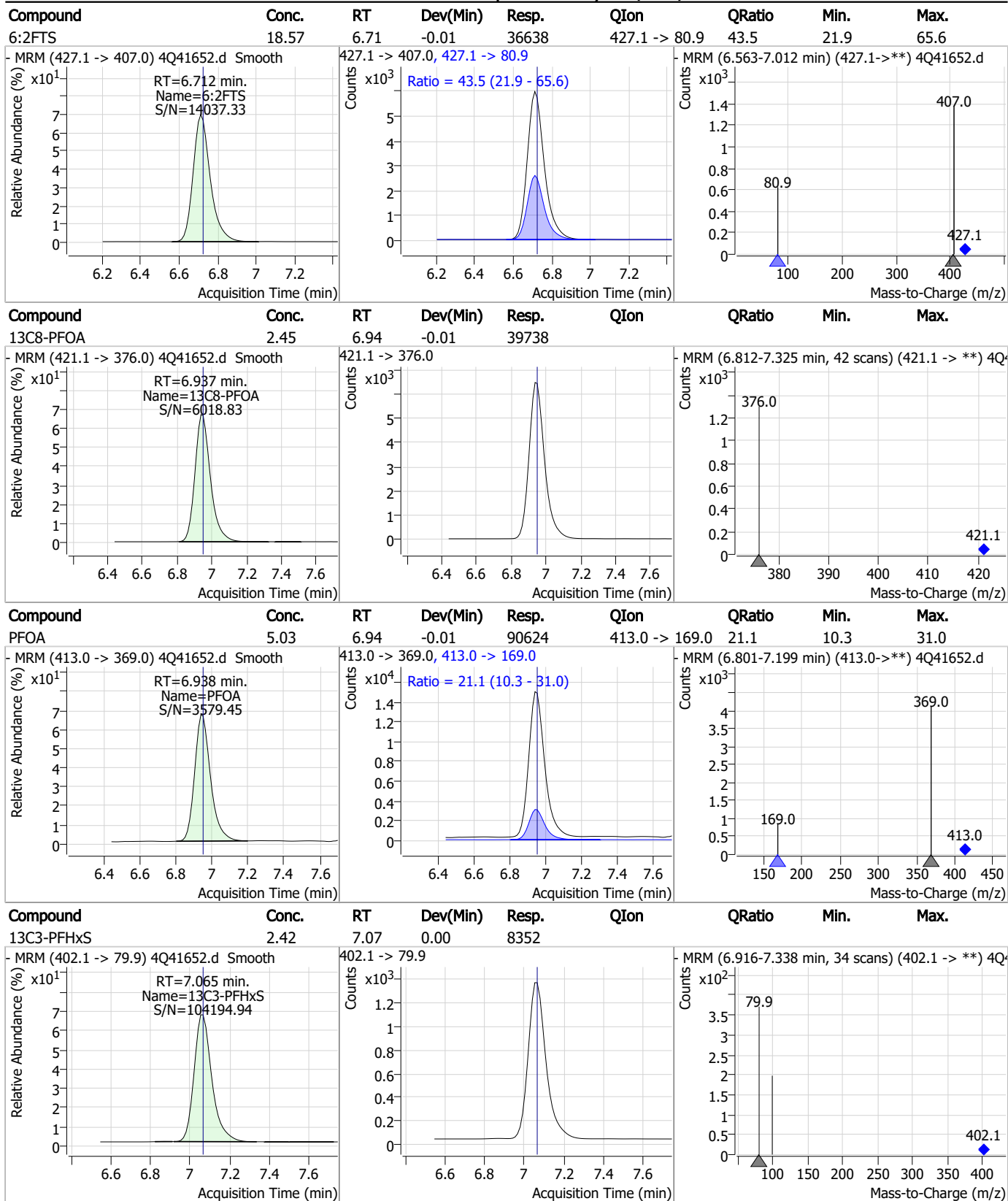
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Perfluorinated Compounds by LC/MS/MS



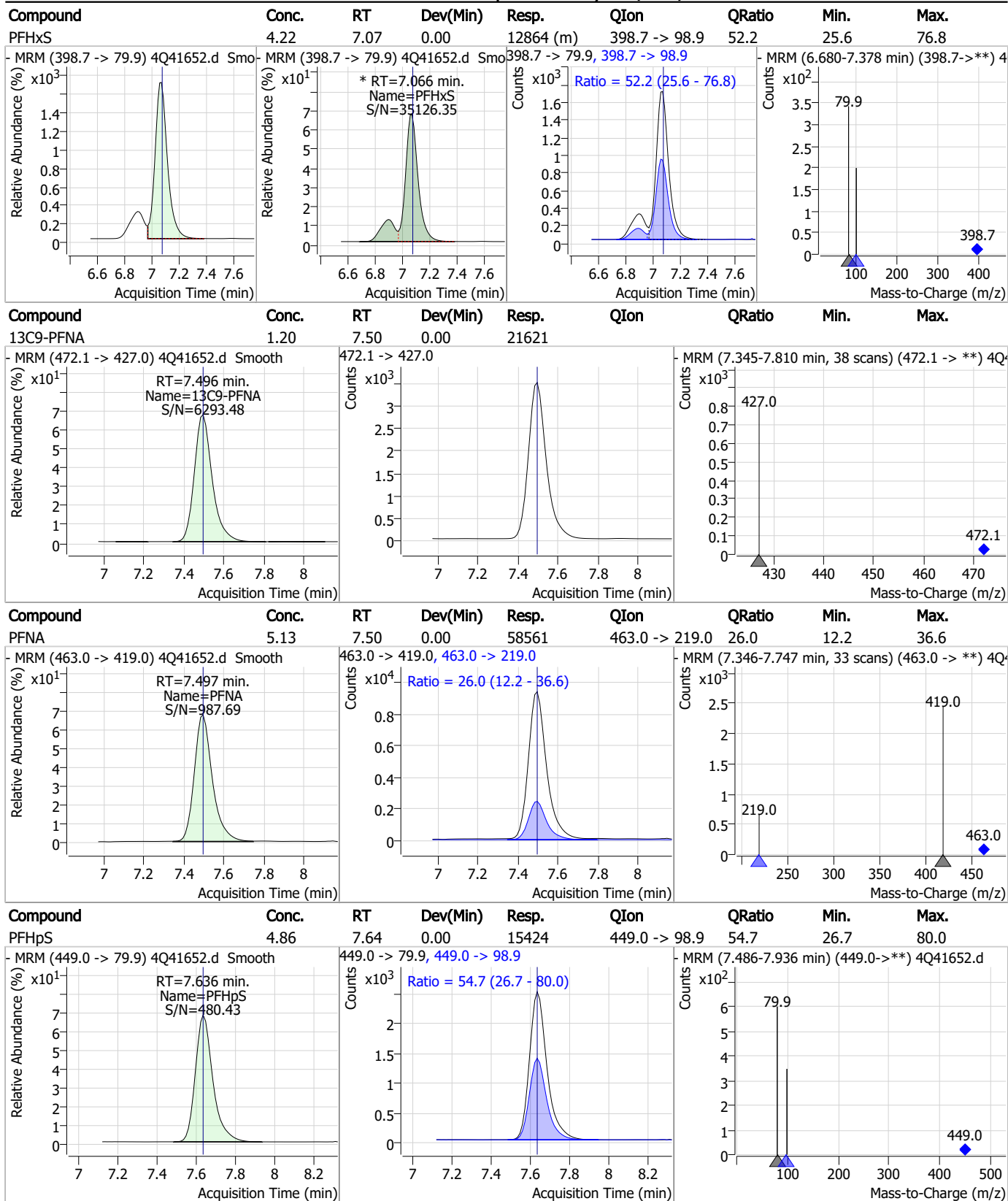
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Perfluorinated Compounds by LC/MS/MS



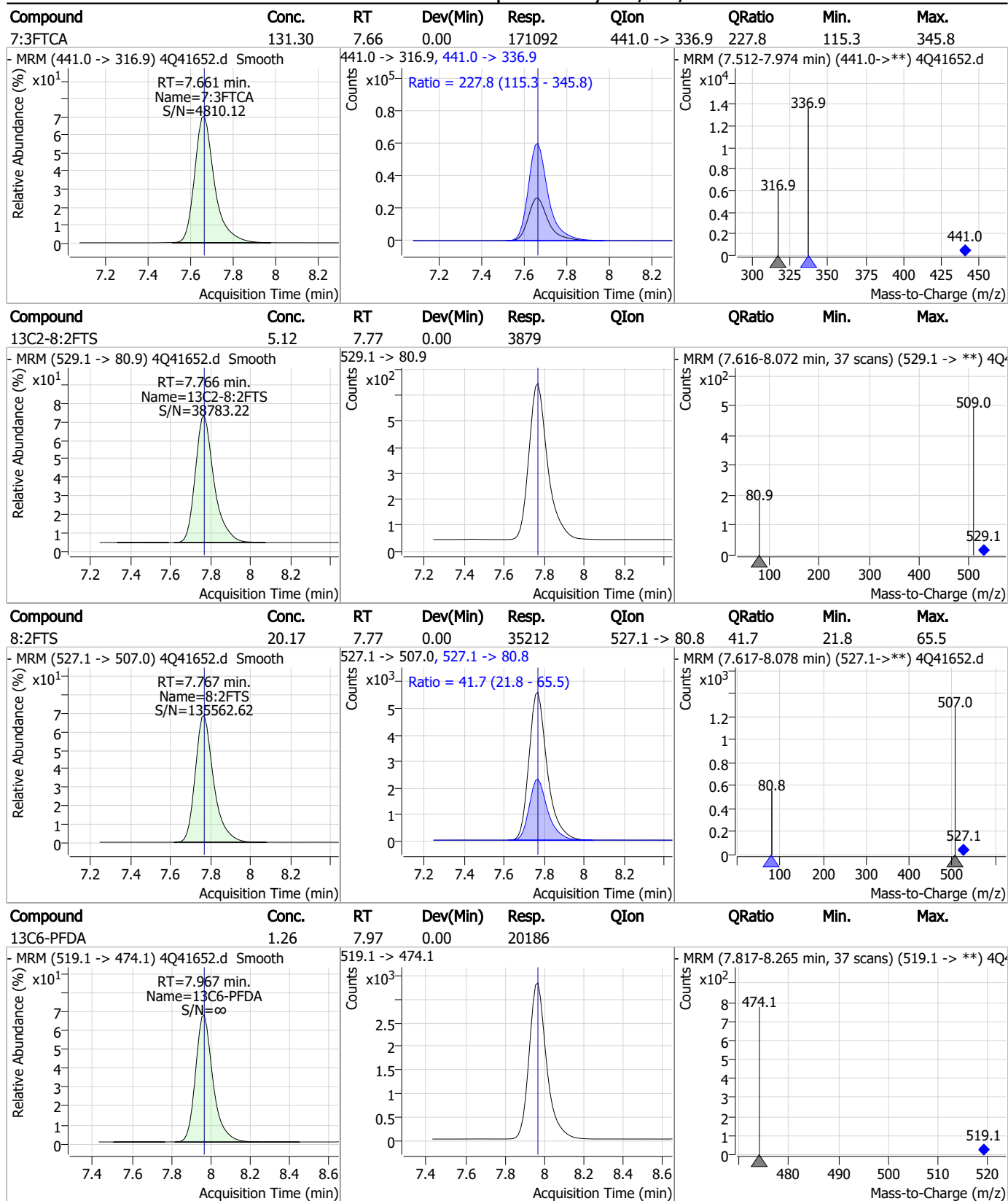
7.7.6
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Perfluorinated Compounds by LC/MS/MS



7.7.6
7

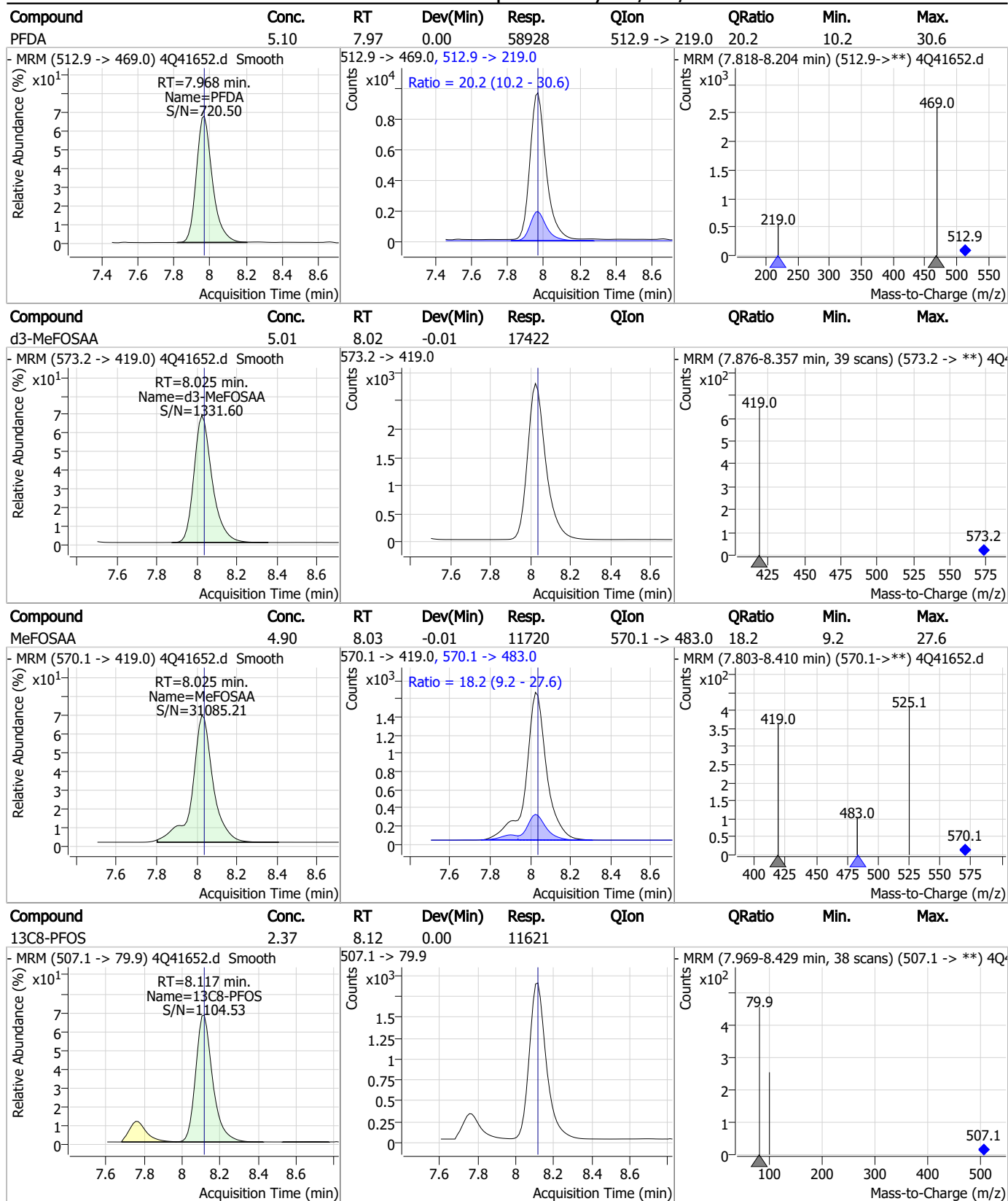
Perfluorinated Compounds by LC/MS/MS



7.7.6

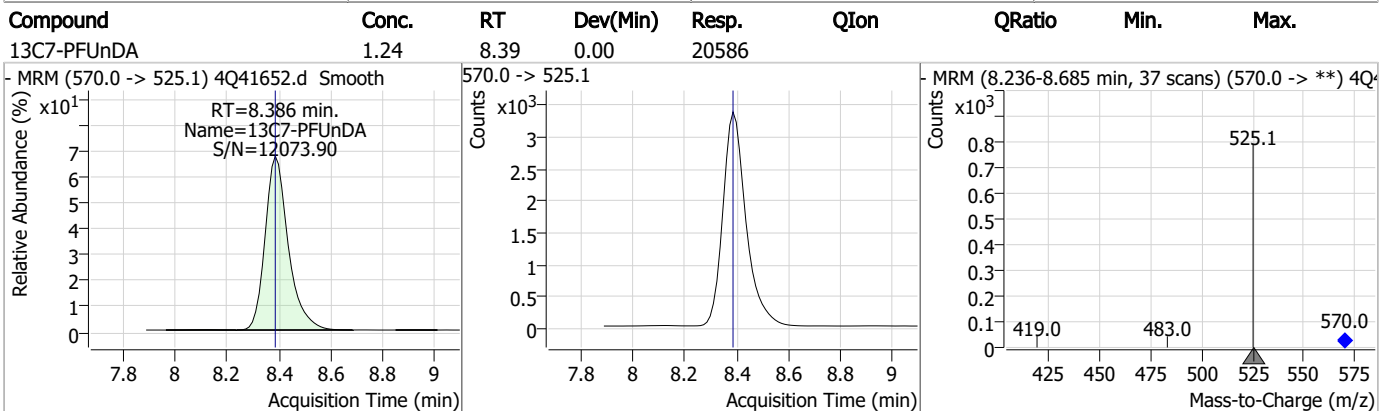
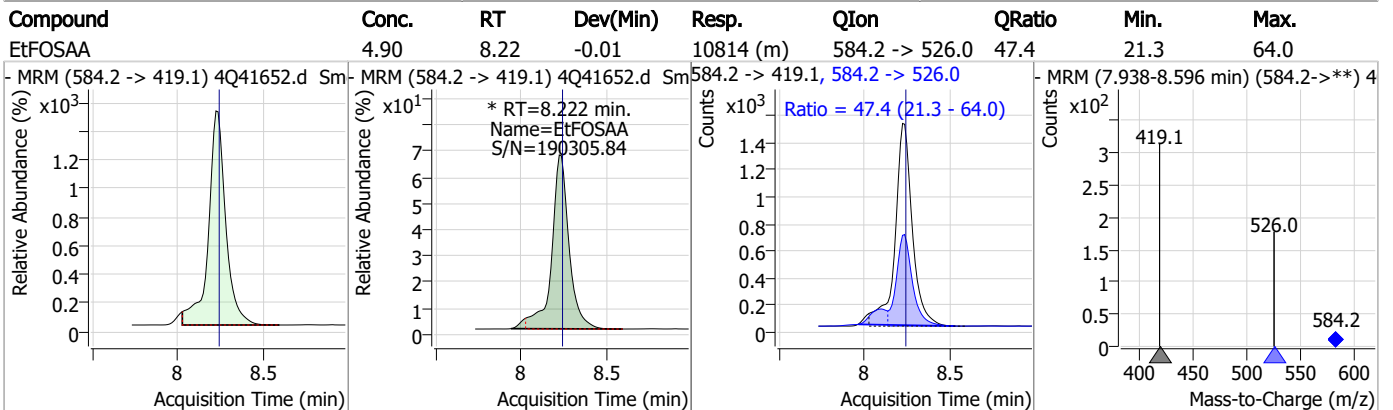
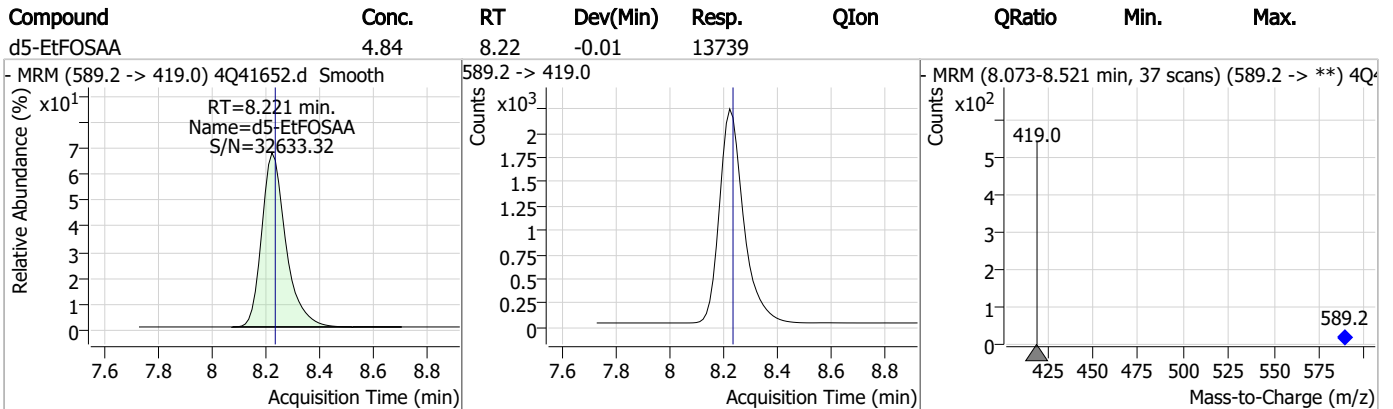
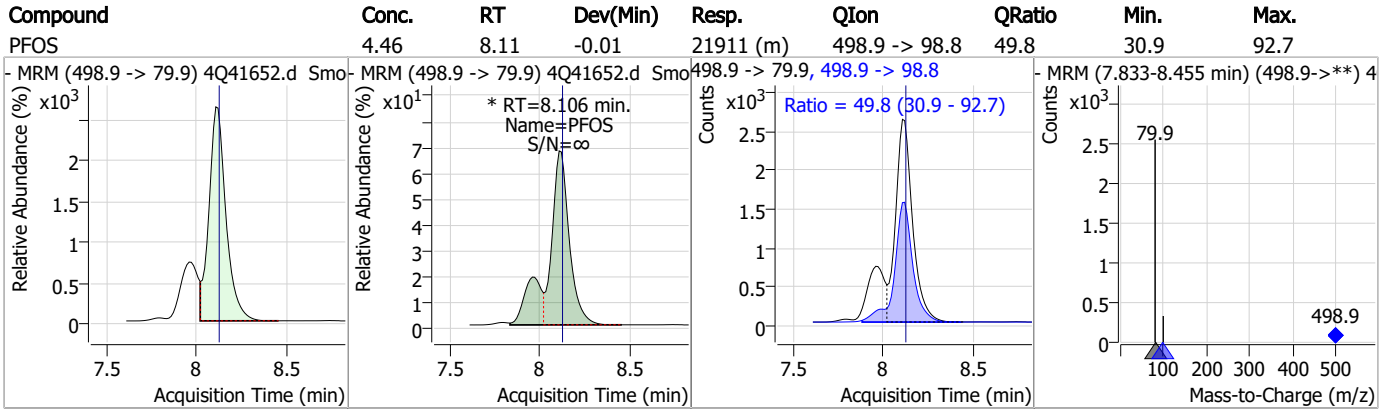
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Perfluorinated Compounds by LC/MS/MS



7.7.6
7

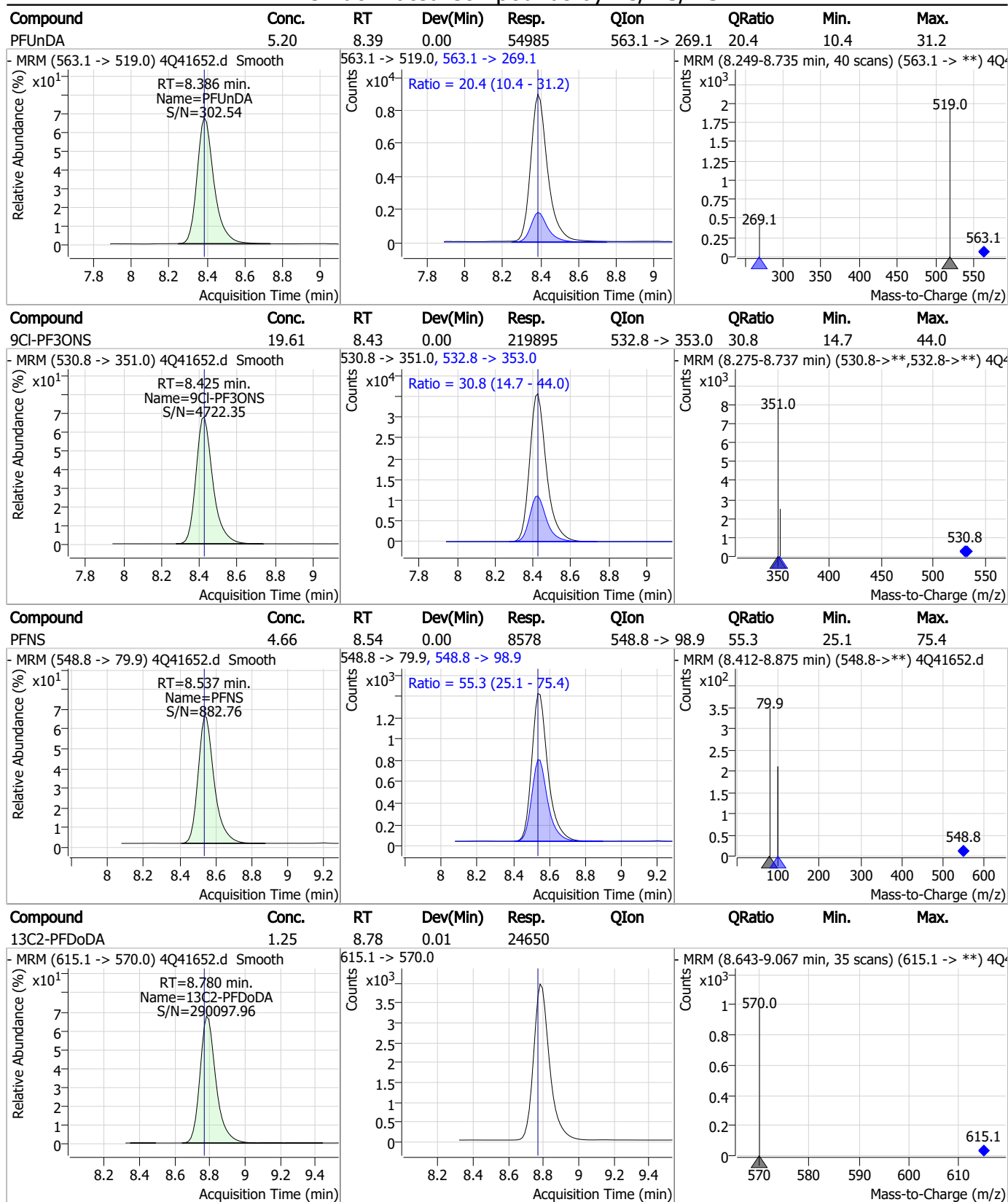
Perfluorinated Compounds by LC/MS/MS



7.7.6

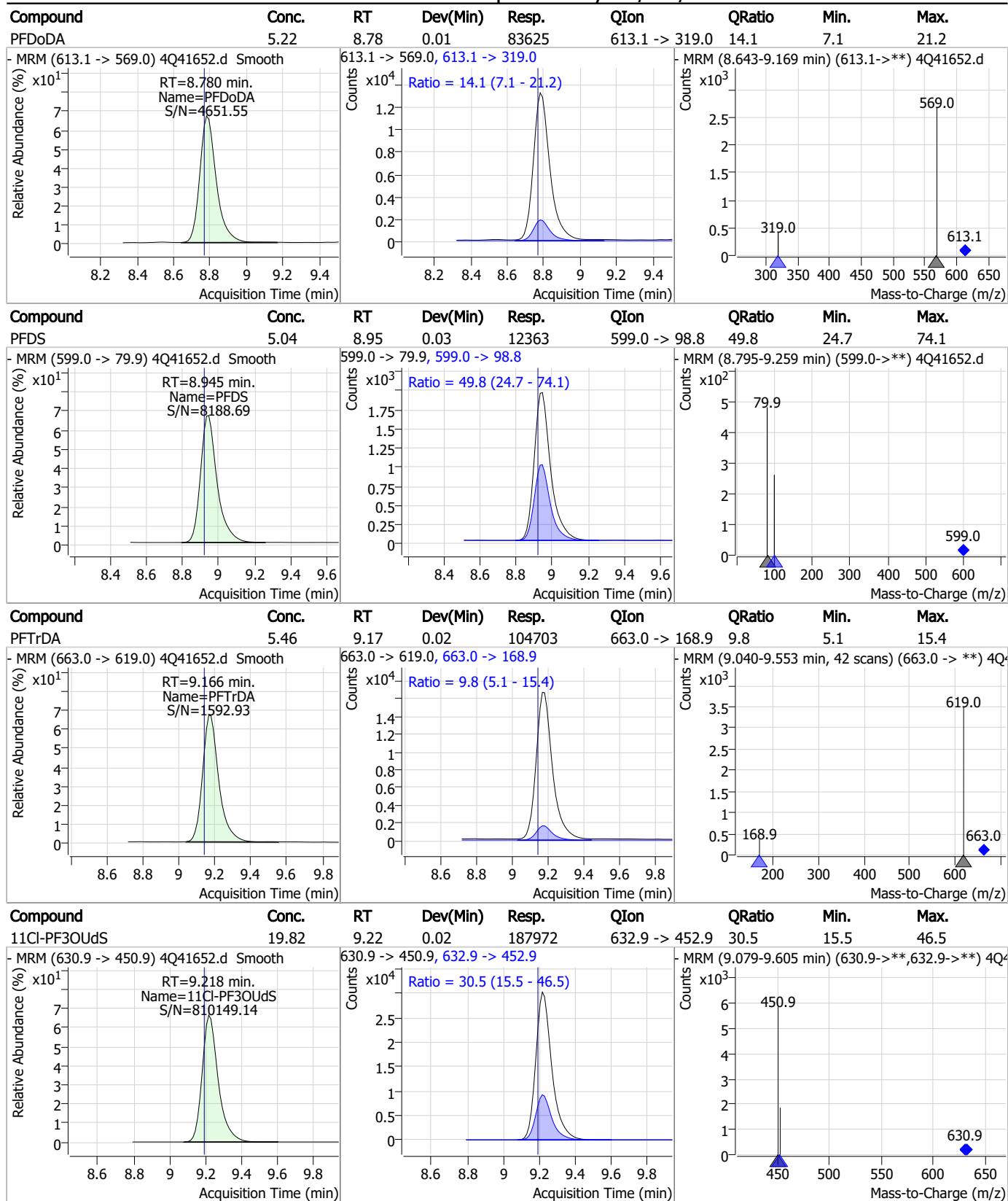
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Perfluorinated Compounds by LC/MS/MS



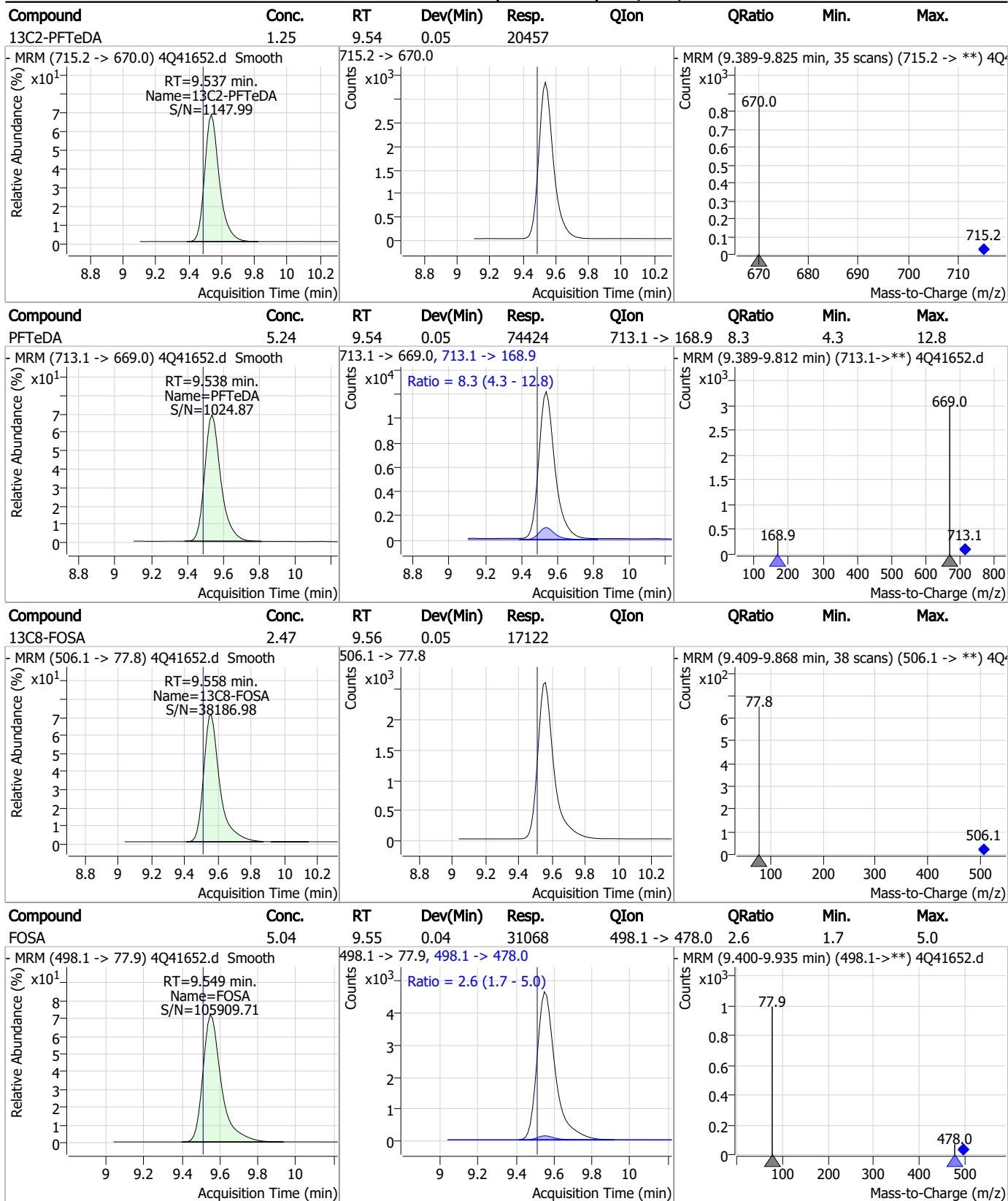
7.7.6
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Perfluorinated Compounds by LC/MS/MS



7.7.6
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Perfluorinated Compounds by LC/MS/MS



7.7.6
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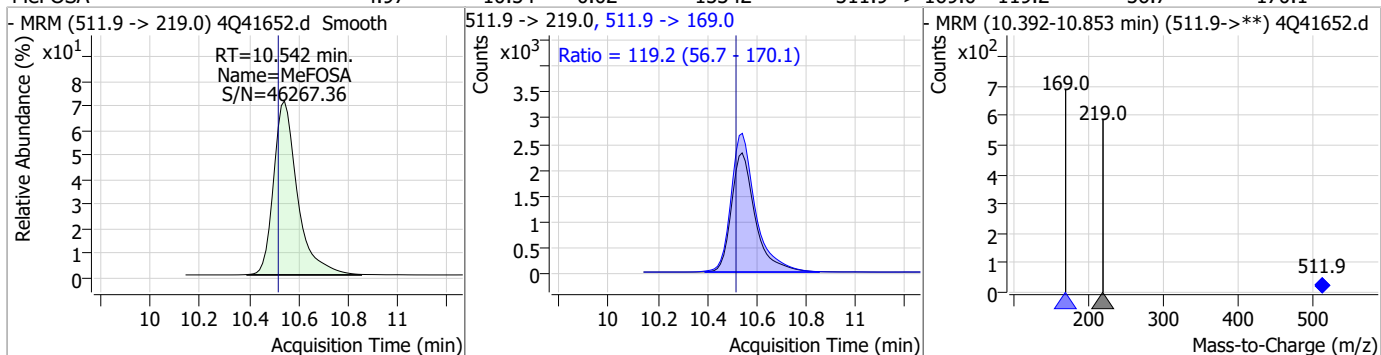
Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFD _o DS	5.04	9.68	0.06	10470	699.1 -> 98.8	54.8	27.7	83.0
d7-MeFOSE	24.73	10.44	0.02	65629	623.2 -> 58.9			
MeFOSE	52.12	10.45	0.02	130598	616.1 -> 58.9			
d3-MeFOSA	2.42	10.53	0.01	8551	515.0 -> 219.0			

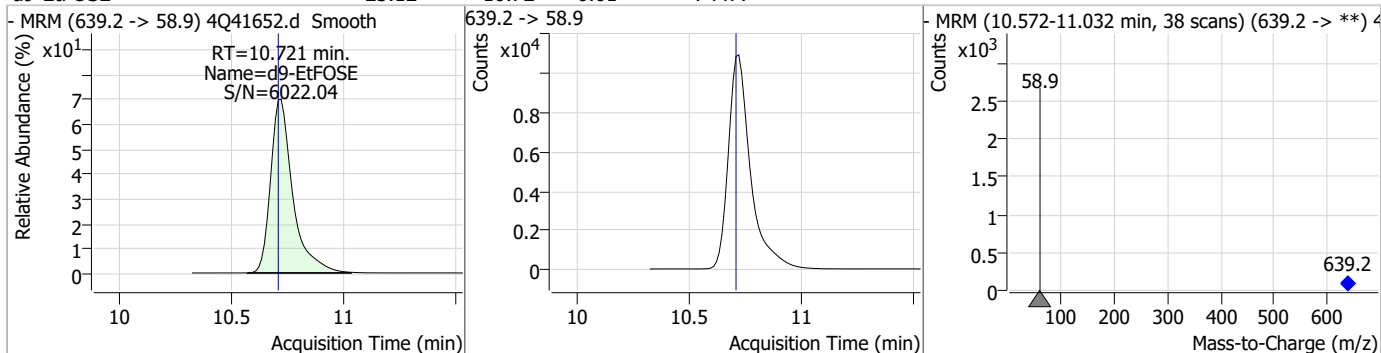
7.7.6
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Perfluorinated Compounds by LC/MS/MS

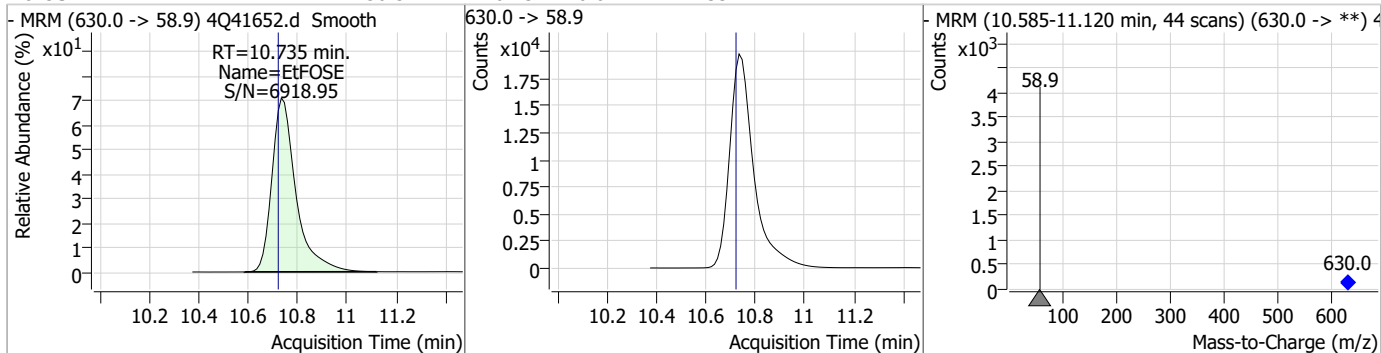
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	4.97	10.54	0.02	15342	511.9 -> 169.0	119.2	56.7	170.1



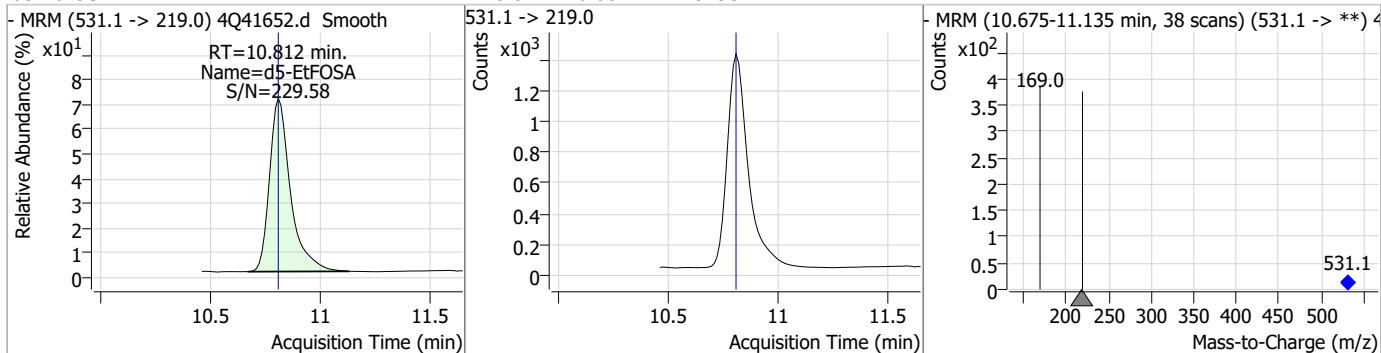
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	25.12	10.72	0.01	74477	639.2 -> 58.9			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	50.51	10.73	0.01	133247	630.0 -> 58.9			

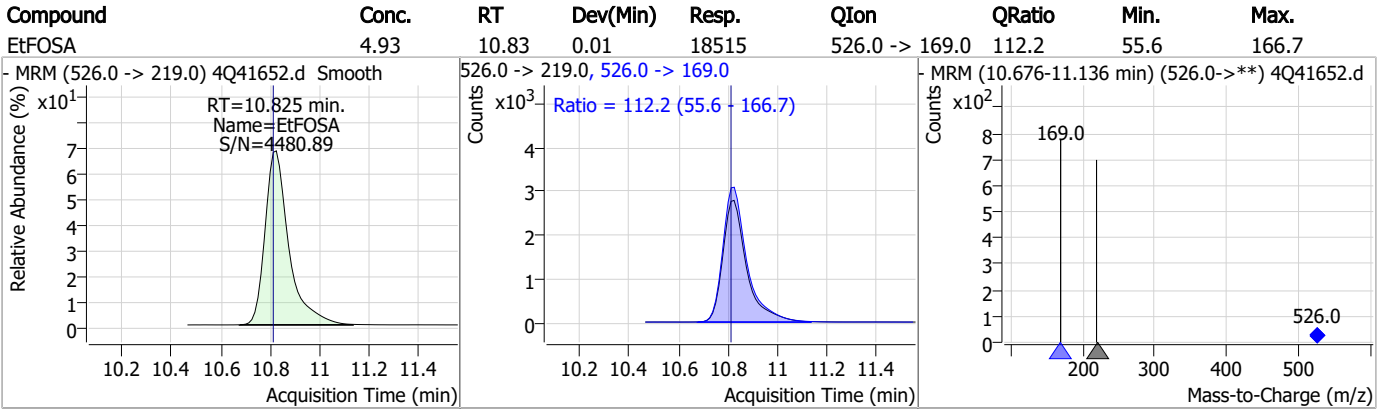


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.47	10.81	0.00	9193	531.1 -> 169.0			



7.7.6
7

Perfluorinated Compounds by LC/MS/MS



7.7.6

7

Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41652.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 18:42 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.07	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.11	Split peak
EtFOSAA	2991-50-6		8.22	Split peak

7.7.6.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41653.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 6:56:46 PM
 Sample Name : ic596-6
 Vial : P1-A7
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	140627	10.00 µg/L	-0.087
M5-PFPeA	4.537	268.3 -> 223.0	85077	5.00 µg/L	-0.037
M5-PFHxA	5.509	318.0 -> 273.0	69250	2.50 µg/L	-0.012
M4-PFHpA	6.342	367.1 -> 322.0	37181	2.50 µg/L	0.000
M8-PFOA	6.988	421.1 -> 376.0	39540	2.50 µg/L	0.039
M9-PFNA	7.496	472.1 -> 427.0	22069	1.25 µg/L	0.000
M6-PFDA	7.929	519.1 -> 474.1	19449	1.25 µg/L	-0.038
M7-PFUnDA	8.336	570.0 -> 525.1	21214	1.25 µg/L	-0.049
M2-PFDoDA	8.730	615.1 -> 570.0	23991	1.25 µg/L	-0.037
M2-PFTeDA	9.450	715.2 -> 670.0	20012	1.25 µg/L	-0.037
M8-FOSA	9.484	506.1 -> 77.8	15962	2.50 µg/L	-0.025
M3-PFBS	5.464	302.1 -> 79.9	14772	2.50 µg/L	-0.025
M3-PFHxS	7.104	402.1 -> 79.9	8722	2.50 µg/L	0.039
M8-PFOS	8.080	507.1 -> 79.9	11188	2.50 µg/L	-0.037
M2-4:2FTS	5.223	329.1 -> 80.9	1573	5.00 µg/L	-0.037
M2-6:2FTS	6.761	429.1 -> 80.9	2282	5.00 µg/L	0.037
M2-8:2FTS	7.741	529.1 -> 80.9	3587	5.00 µg/L	-0.025
M3-MeFOSAA	7.988	573.2 -> 419.0	16679	5.00 µg/L	-0.049
M3-HFPO-DA	5.815	286.9 -> 168.9	32736	10.00 µg/L	-0.012
M5-EtFOSAA	8.184	589.2 -> 419.0	13599	5.00 µg/L	-0.049
M7-MeFOSE	10.388	623.2 -> 58.9	60040	25.00 µg/L	-0.025
M9-EtFOSE	10.684	639.2 -> 58.9	69815	25.00 µg/L	-0.025
M5-EtFOSA	10.787	531.1 -> 219.0	8907	2.50 µg/L	-0.025
M3-MeFOSA	10.491	515.0 -> 219.0	8112	2.50 µg/L	-0.025
13C4-PFOS	8.081	502.8 -> 79.9	11721	2.50 µg/L	-0.037
13C3-PFBA	3.155	216.0 -> 172.0	81969	5.00 µg/L	-0.087
18O2-PFHxS	7.103	403.0 -> 83.9	6170	2.50 µg/L	0.039
13C4-PFOA	6.988	417.1 -> 372.0	48266	2.50 µg/L	0.038
13C2-PFDA	7.930	515.1 -> 470.1	18331	1.25 µg/L	-0.038
13C5-PFNA	7.496	468.0 -> 423.0	25213	1.25 µg/L	0.000
13C2-PFHxA	5.510	315.1 -> 270.0	62407	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1573	4.70 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 94.0%		
13C2-6:2FTS	6.761	429.1 -> 80.9	2282	4.81 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 96.3%		
13C2-8:2FTS	7.741	529.1 -> 80.9	3587	4.86 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 97.2%		
13C2-PFDoDA	8.730	615.1 -> 570.0	23991	1.24 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.0%		
13C2-PFTeDA	9.450	715.2 -> 670.0	20012	1.25 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.1%		
13C3-PFBS	5.464	302.1 -> 79.9	14772	2.57 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 102.9%		
13C3-PFHxS	7.104	402.1 -> 79.9	8722	2.60 µg/L	0.039

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.0%	
13C4-PFBA	3.152	216.8 -> 171.9	140627	9.98 µg/L	-0.087
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.8%	
13C4-PFHpA	6.342	367.1 -> 322.0	37181	2.51 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C5-PFHxA	5.509	318.0 -> 273.0	69250	2.56 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.3%	
13C5-PFPeA	4.537	268.3 -> 223.0	85077	4.99 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 99.9%	
13C6-PFDA	7.929	519.1 -> 474.1	19449	1.24 µg/L	-0.038
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.1%	
13C7-PFUnDA	8.336	570.0 -> 525.1	21214	1.30 µg/L	-0.049
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 104.4%	
13C8-FOSA	9.484	506.1 -> 77.8	15962	2.45 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.9%	
13C8-PFOA	6.988	421.1 -> 376.0	39540	2.48 µg/L	0.039
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.1%	
13C8-PFOS	8.080	507.1 -> 79.9	11188	2.42 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.9%	
13C9-PFNA	7.496	472.1 -> 427.0	22069	1.25 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 100.1%	
d3-MeFOSAA	7.988	573.2 -> 419.0	16679	5.10 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.9%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	32736	10.36 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 103.6%	
d3-MeFOSA	10.491	515.0 -> 219.0	8112	2.44 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.8%	
d5-EtFOSAA	8.184	589.2 -> 419.0	13599	5.09 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.8%	
d7-MeFOSE	10.388	623.2 -> 58.9	60040	24.05 µg/L	-0.025
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 96.2%	
d9-EtFOSE	10.684	639.2 -> 58.9	69815	25.03 µg/L	-0.025
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 100.1%	
d5-EtFOSA	10.787	531.1 -> 219.0	8907	2.54 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.7%	
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0	109621	51.17 µg/L	95
		327.1 -> 80.9	45601		
6:2FTS	6.749	427.1 -> 407.0	80358	48.64 µg/L	97
		427.1 -> 80.9	33668		
8:2FTS	7.742	527.1 -> 507.0	81950	50.75 µg/L	94
		527.1 -> 80.8	32763		
EtFOSAA	8.185	584.2 -> 419.1	27954	12.78 µg/L	89
		584.2 -> 526.0	13887		
FOSA	9.474	498.1 -> 77.9	74921	13.03 µg/L	98
		498.1 -> 478.0	2095		
MeFOSAA	8.001	570.1 -> 419.0	27925	12.19 µg/L	95
		570.1 -> 483.0	5755		
PFBA	3.158	212.8 -> 168.9	156949	51.83 µg/L	100
PFBS	5.465	298.7 -> 79.9	60678	11.48 µg/L	99
		298.7 -> 98.8	23206		
PFDA	7.930	512.9 -> 469.0	151315	13.59 µg/L	99
		512.9 -> 219.0	30089		
PFDoDA	8.731	613.1 -> 569.0	207391	13.30 µg/L	100
		613.1 -> 319.0	29558		
PFDS	8.883	599.0 -> 79.9	30355	12.86 µg/L	100

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	15027			
PFHpA	6.355	363.1 -> 319.0	249251	13.29	µg/L	98
		363.1 -> 169.0	42154			
PFHpS	7.636	449.0 -> 79.9	39697	12.99	µg/L	97
		449.0 -> 98.9	20322			
PFHxA	5.512	313.0 -> 269.0	270580	12.78	µg/L	100
		313.0 -> 118.9	7958			
PFHxS	7.105	398.7 -> 79.9	34684	10.90	µg/L	m 99
		398.7 -> 98.9	17931			
PFNA	7.497	463.0 -> 419.0	151551	13.00	µg/L	99
		463.0 -> 219.0	37707			
PFNS	8.500	548.8 -> 79.9	23606	13.31	µg/L	98
		548.8 -> 98.9	11475			
PFOA	6.989	413.0 -> 369.0	231417	12.92	µg/L	100
		413.0 -> 169.0	47575			
PFOS	8.082	498.9 -> 79.9	54865	11.60	µg/L	m 84
		498.9 -> 98.8	27162			
PFPeA	4.539	263.0 -> 219.0	429978	26.36	µg/L	100
PFPeS	6.419	349.1 -> 79.9	34284	11.69	µg/L	99
		349.1 -> 98.9	14909			
PFTeDA	9.451	713.1 -> 669.0	187209	13.48	µg/L	99
		713.1 -> 168.9	14915			
PFTrDA	9.104	663.0 -> 619.0	244983	13.12	µg/L	99
		663.0 -> 168.9	24331			
PFUnDA	8.337	563.1 -> 519.0	140751	12.92	µg/L	98
		563.1 -> 269.1	27903			
11Cl-PF3OUdS	9.143	630.9 -> 450.9	461308	49.43	µg/L	100
		632.9 -> 452.9	142792			
9Cl-PF3ONS	8.376	530.8 -> 351.0	544267	49.32	µg/L	98
		532.8 -> 353.0	166147			
ADONA	6.606	376.9 -> 250.9	1034489	48.10	µg/L	99
		376.9 -> 84.8	277783			
HFPO-DA	5.816	284.9 -> 168.9	134436	52.17	µg/L	99
		284.9 -> 184.9	15788			
3:3FTCA	4.192	241.0 -> 177.0	57632	65.47	µg/L	99
		241.0 -> 117.0	5210			
5:3FTCA	6.308	341.0 -> 237.1	1134359	323.42	µg/L	98
		341.0 -> 217.0	813519			
7:3FTCA	7.661	441.0 -> 316.9	424648	325.14	µg/L	97
		441.0 -> 336.9	960424			
EtFOSA	10.801	526.0 -> 219.0	47324	13.00	µg/L	99
		526.0 -> 169.0	53248			
EtFOSE	10.710	630.0 -> 58.9	329824	133.39	µg/L	100
MeFOSA	10.492	511.9 -> 219.0	38734	13.23	µg/L	96
		511.9 -> 169.0	45387			
MeFOSE	10.401	616.1 -> 58.9	304770	132.95	µg/L	100
PFDoDS	9.578	699.1 -> 79.9	27191	13.60	µg/L	99
		699.1 -> 98.8	15165			
NFDHA	5.415	295.0 -> 201.0	19787	27.50	µg/L	98
		295.0 -> 84.9	4943			
PFMBA	4.867	279.0 -> 85.1	243213	26.60	µg/L	100
PFMPA	3.765	229.0 -> 84.9	204636	26.02	µg/L	100
PFEESA	5.921	314.8 -> 134.9	368239	23.00	µg/L	99
		314.8 -> 82.9	12299			

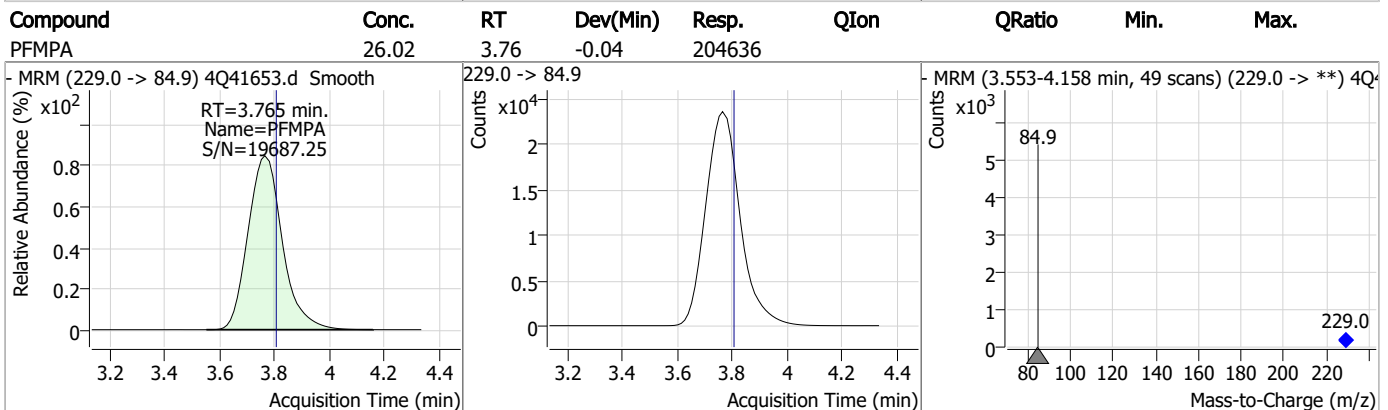
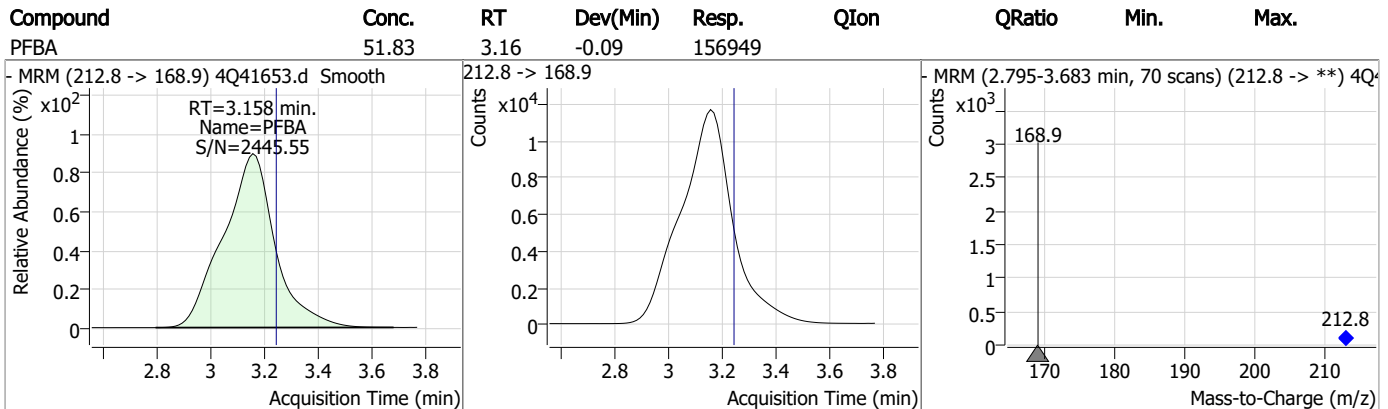
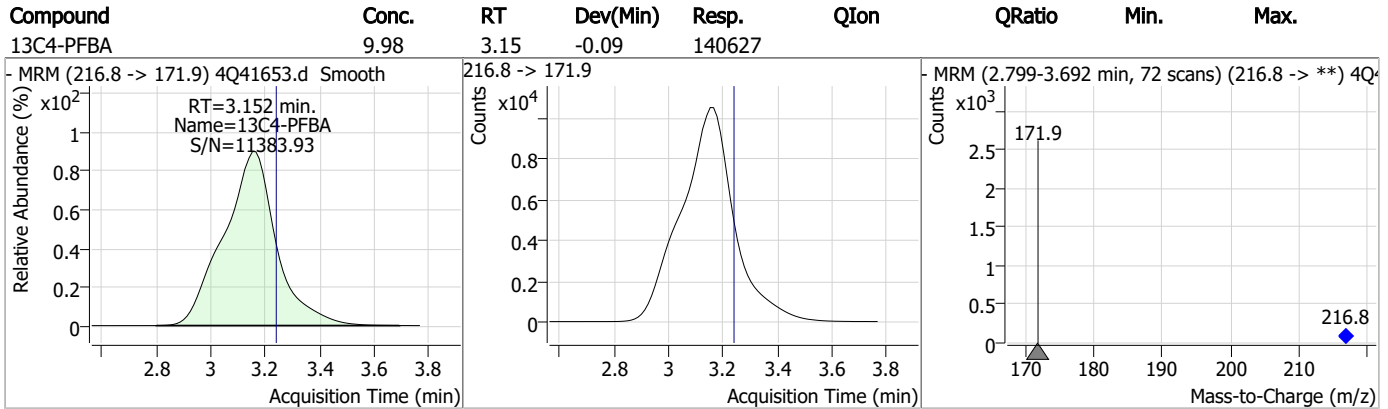
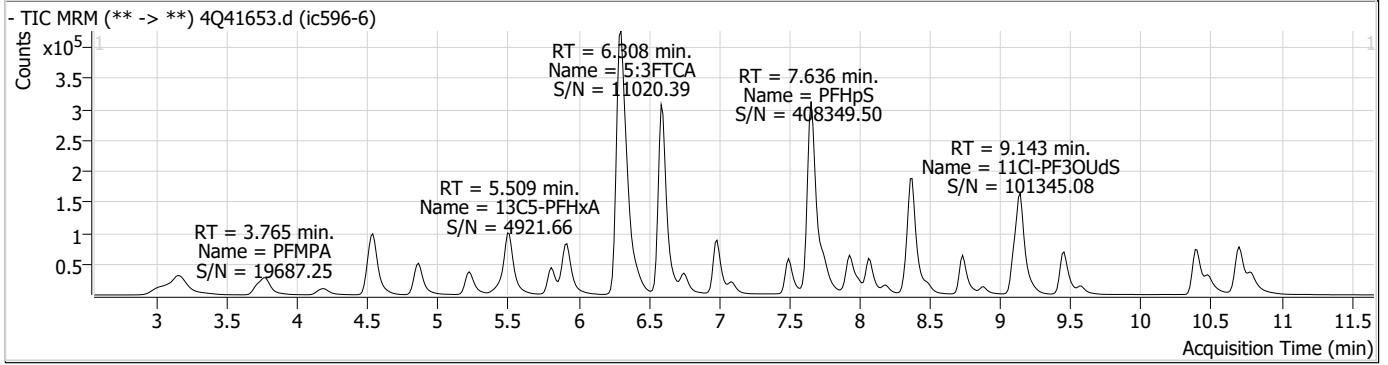
= Qualifier out of range, m = manually integrated, + = Area summed

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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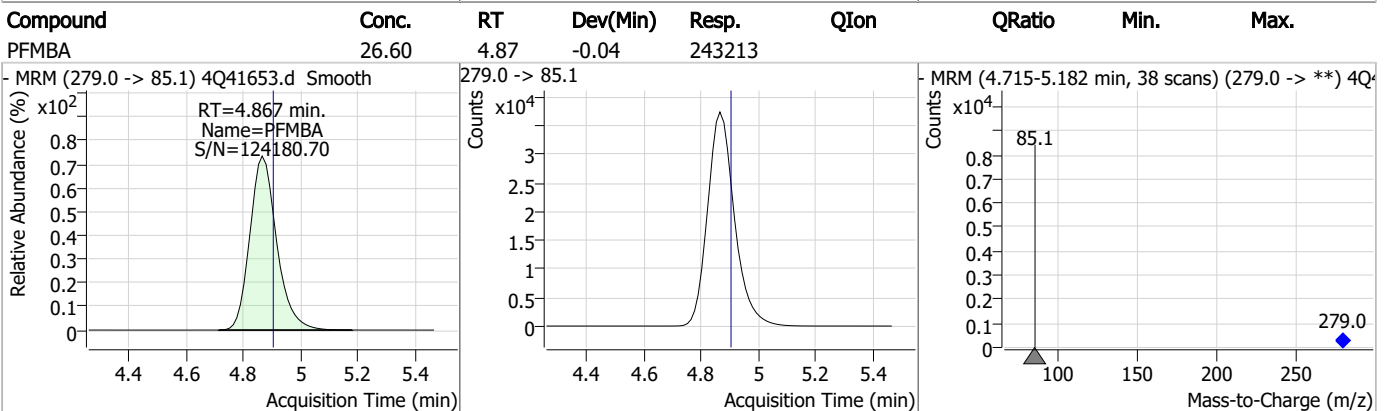
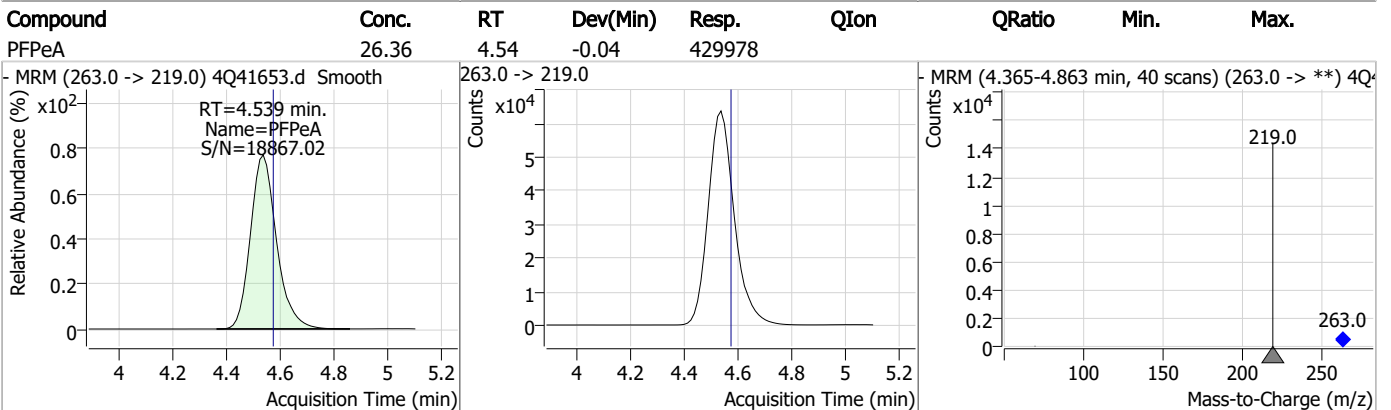
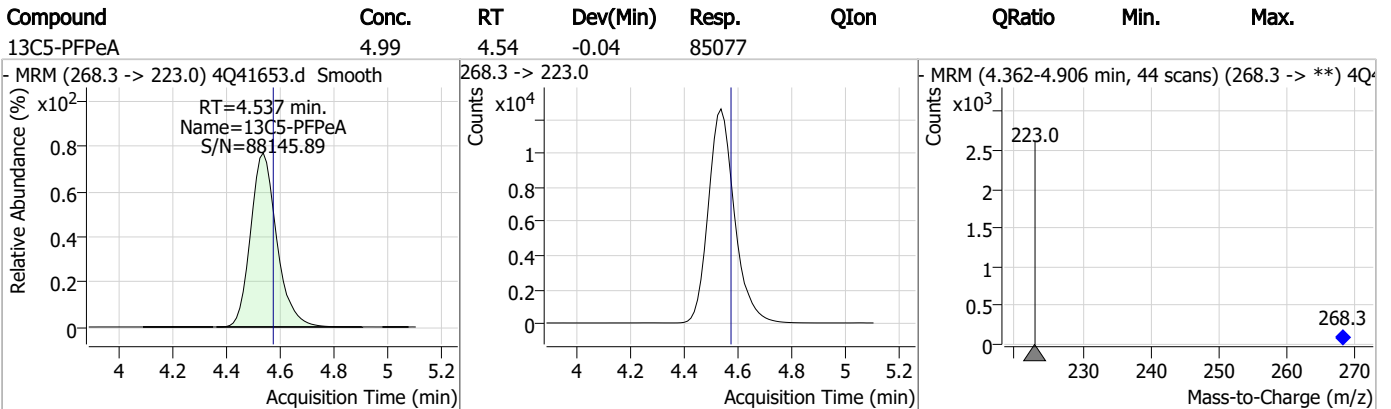
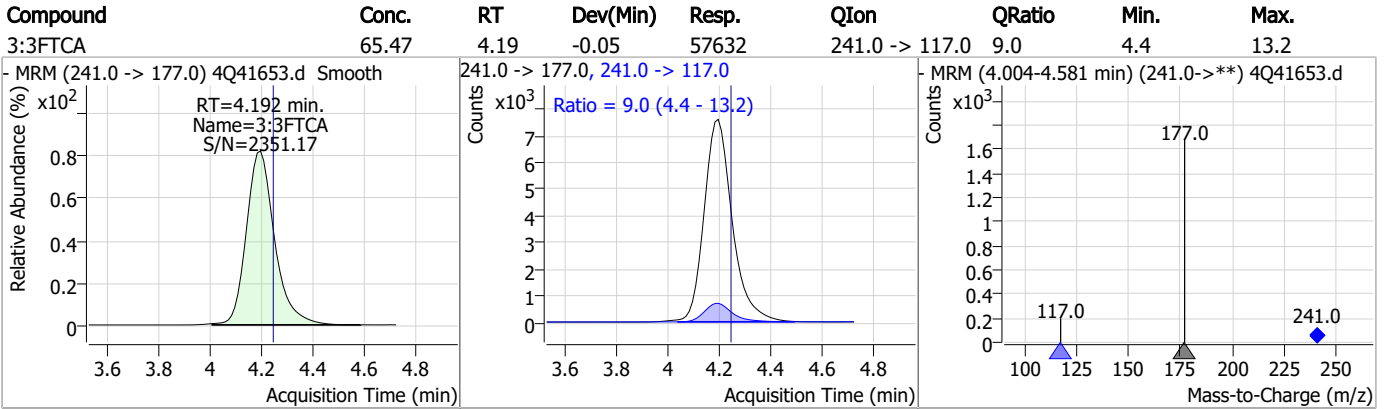
7.7.7
7

Perfluorinated Compounds by LC/MS/MS

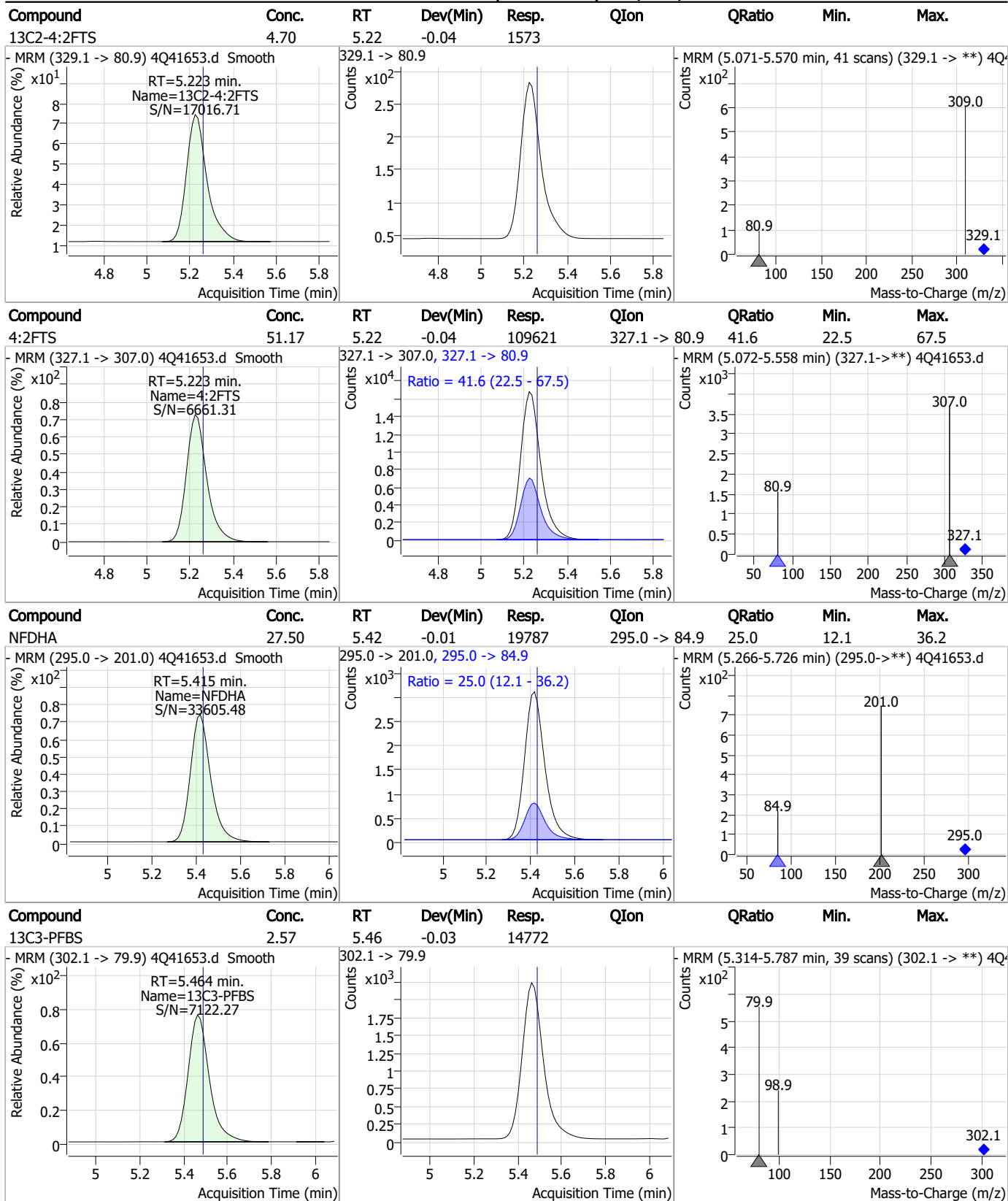


7.7.7
7

Perfluorinated Compounds by LC/MS/MS

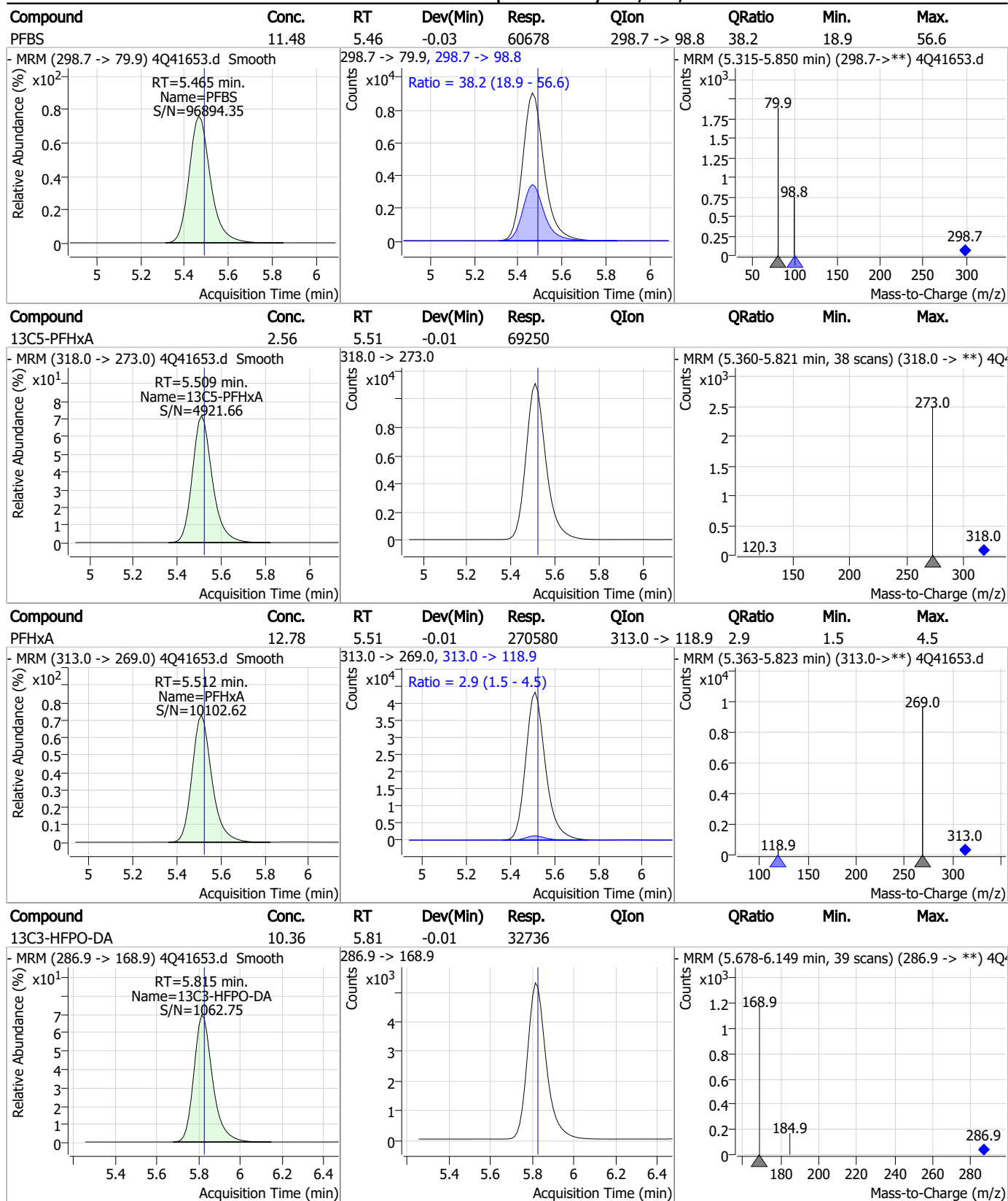


Perfluorinated Compounds by LC/MS/MS



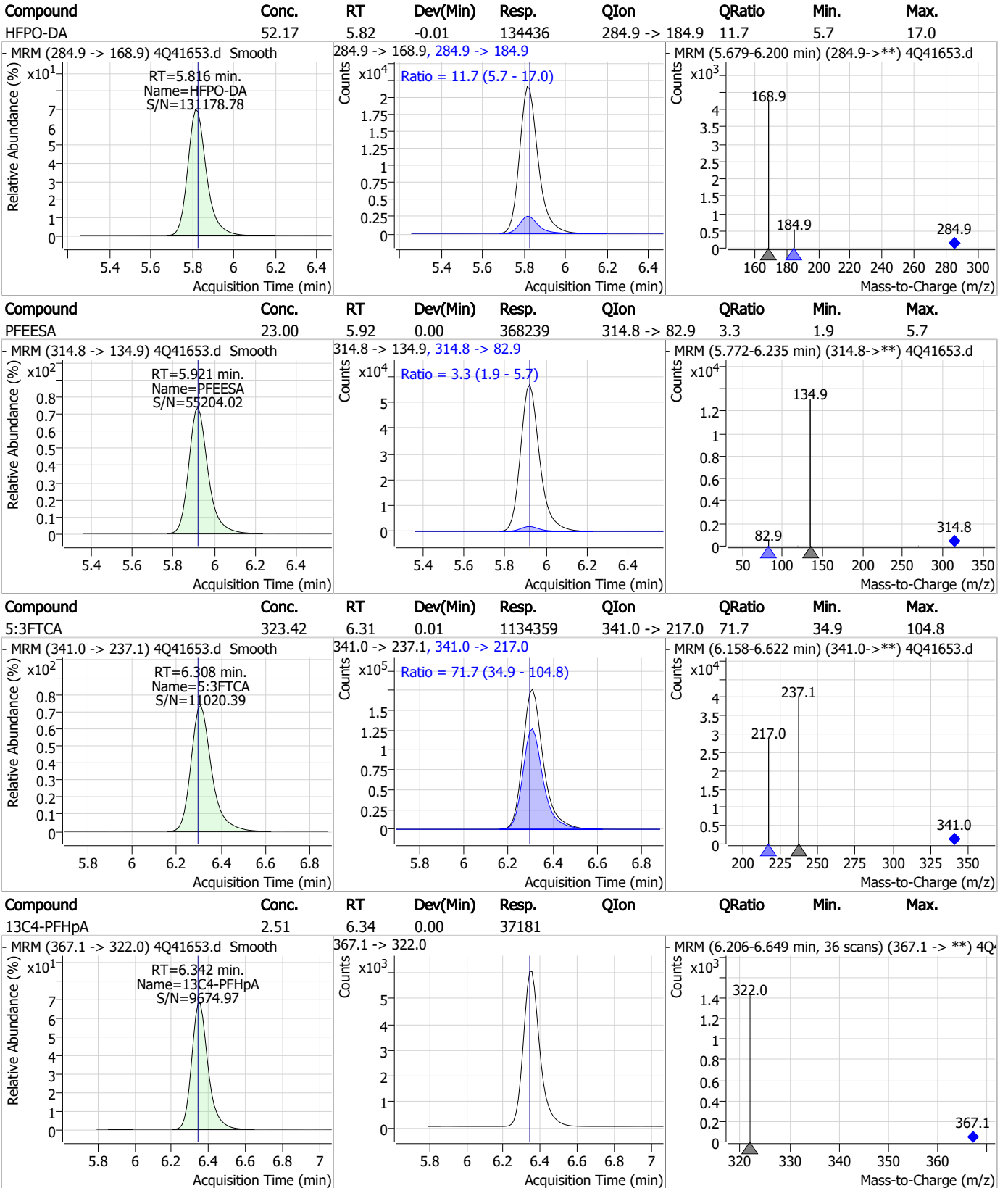
7.7.7
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Perfluorinated Compounds by LC/MS/MS



7.7.7
7

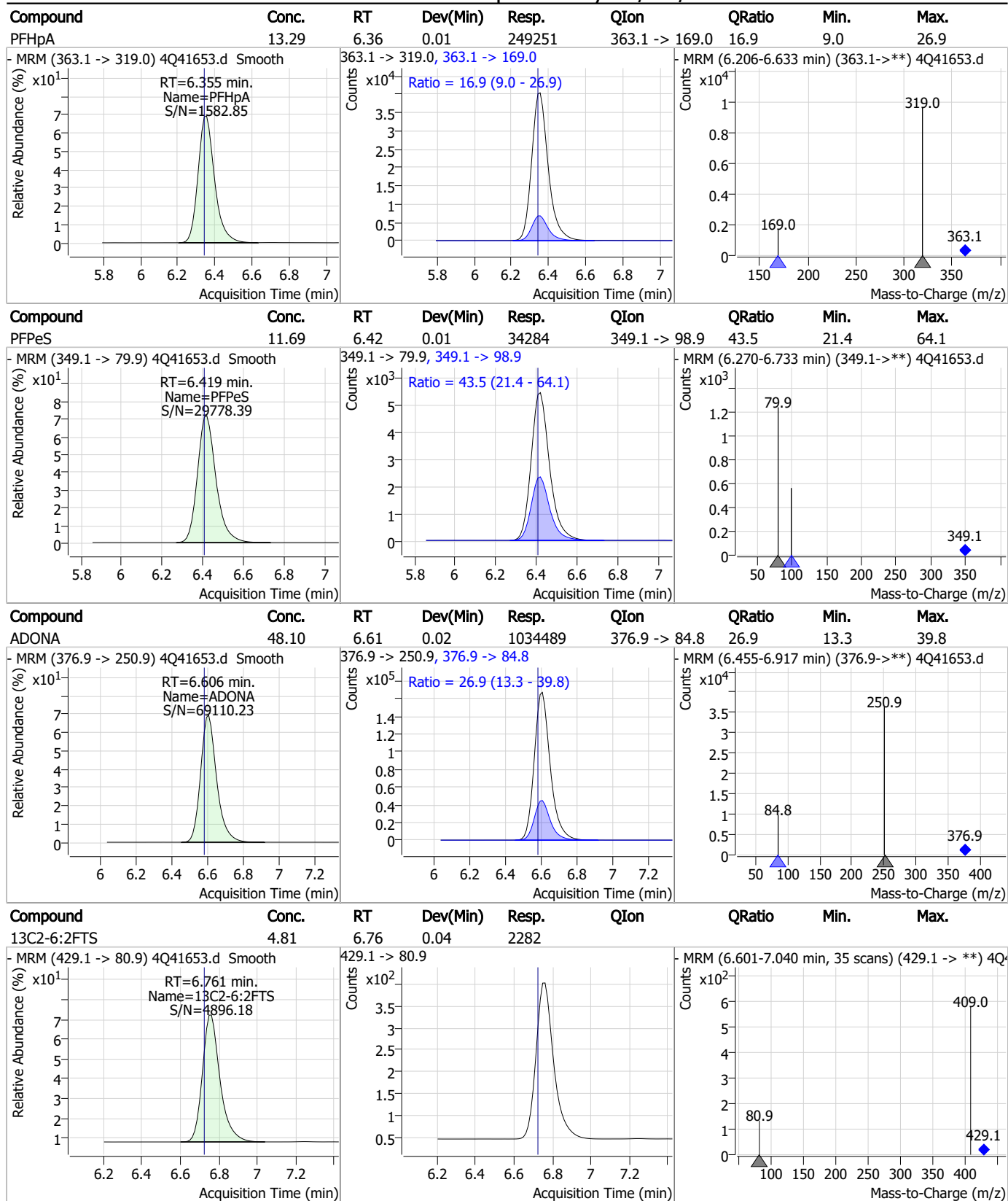
Perfluorinated Compounds by LC/MS/MS



7.7.7

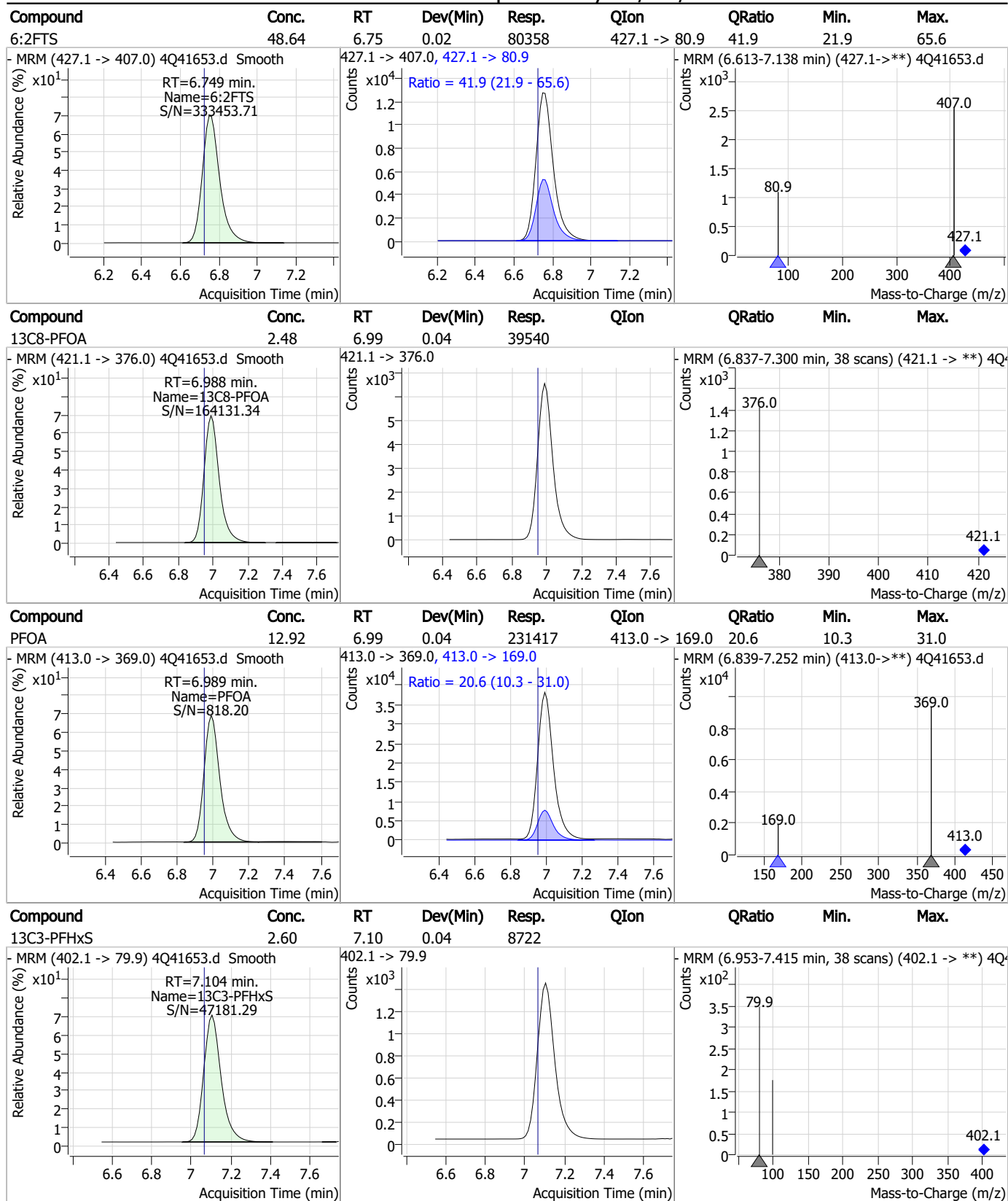
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Perfluorinated Compounds by LC/MS/MS



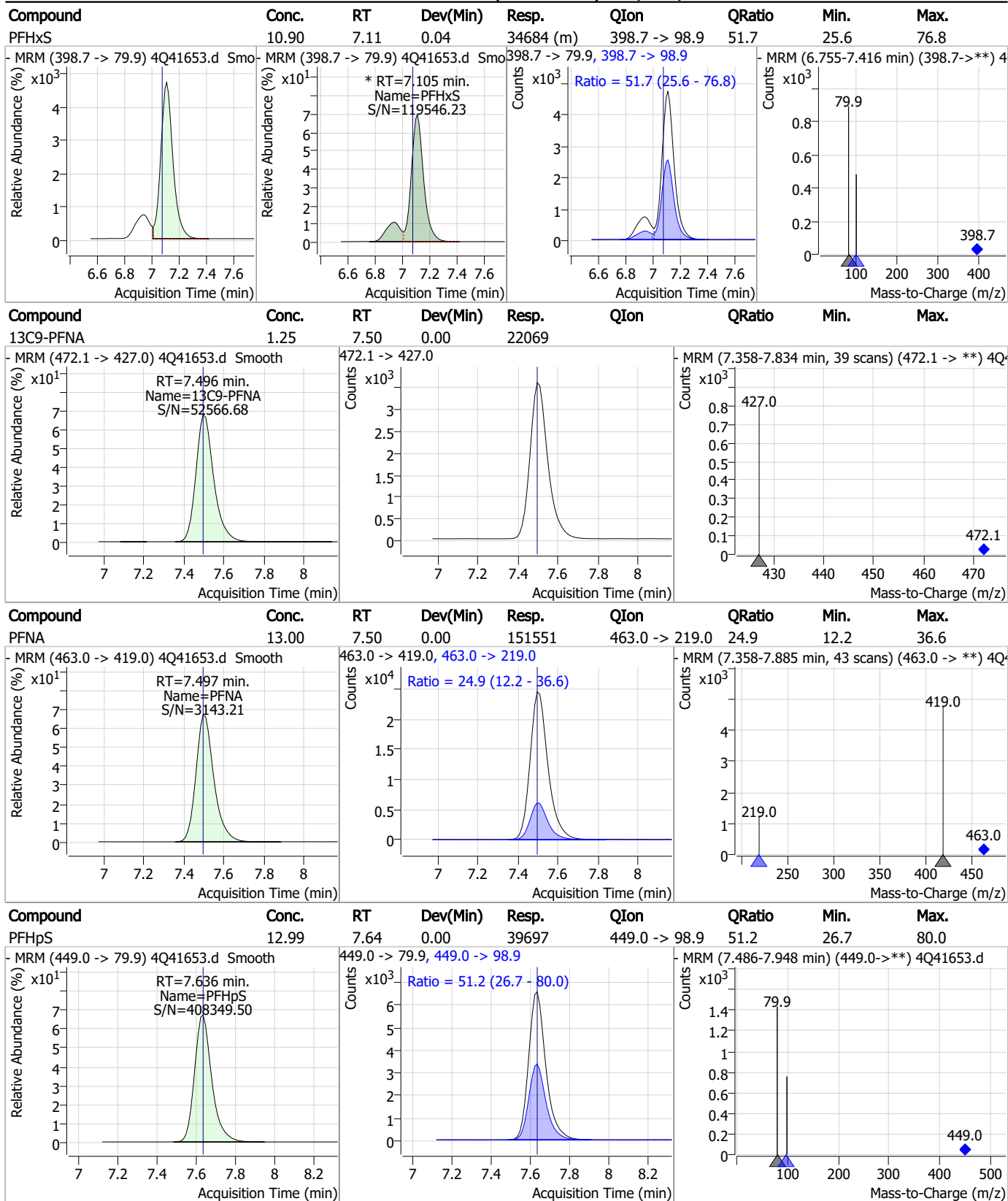
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Perfluorinated Compounds by LC/MS/MS



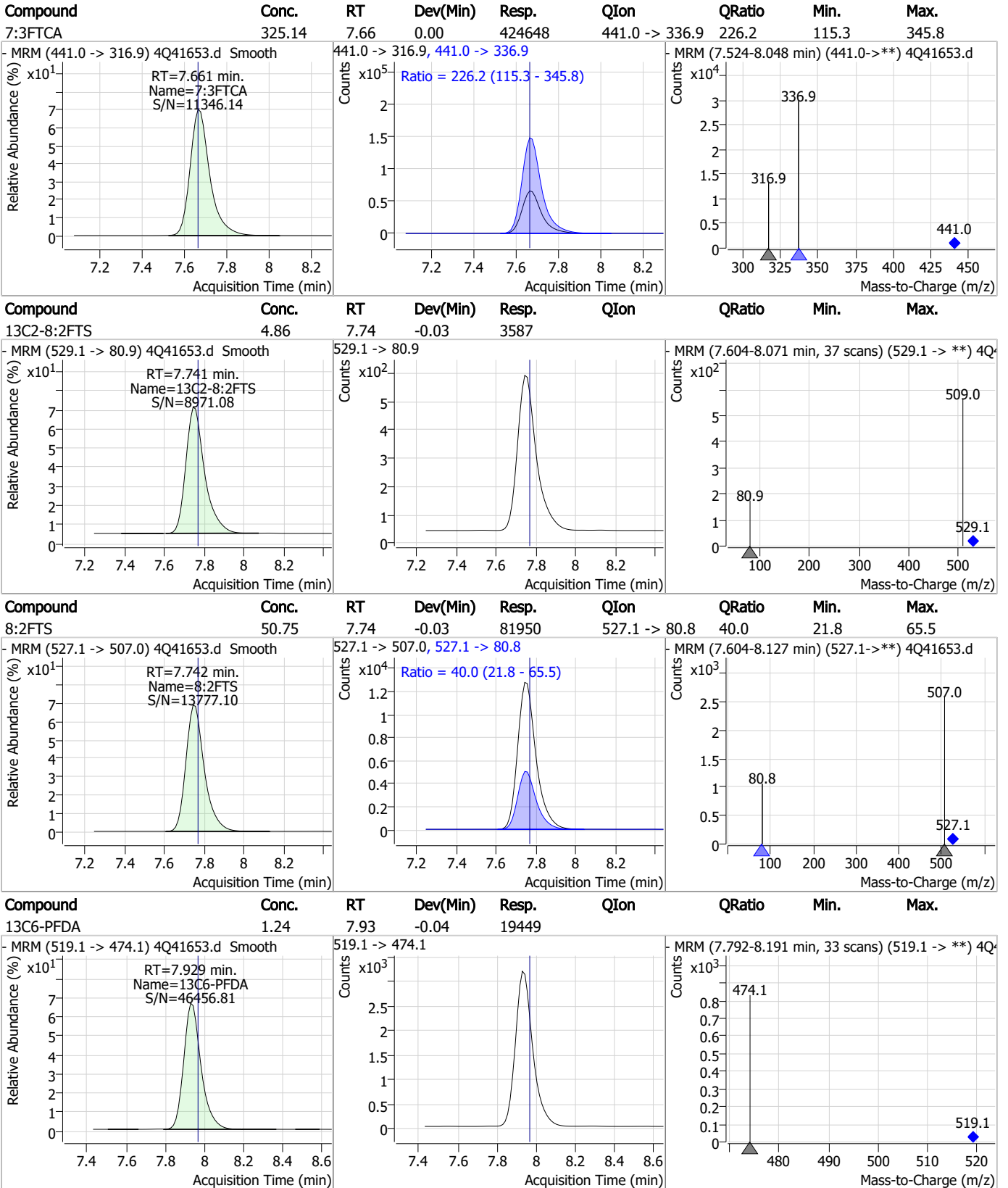
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Perfluorinated Compounds by LC/MS/MS



7.7.7
7

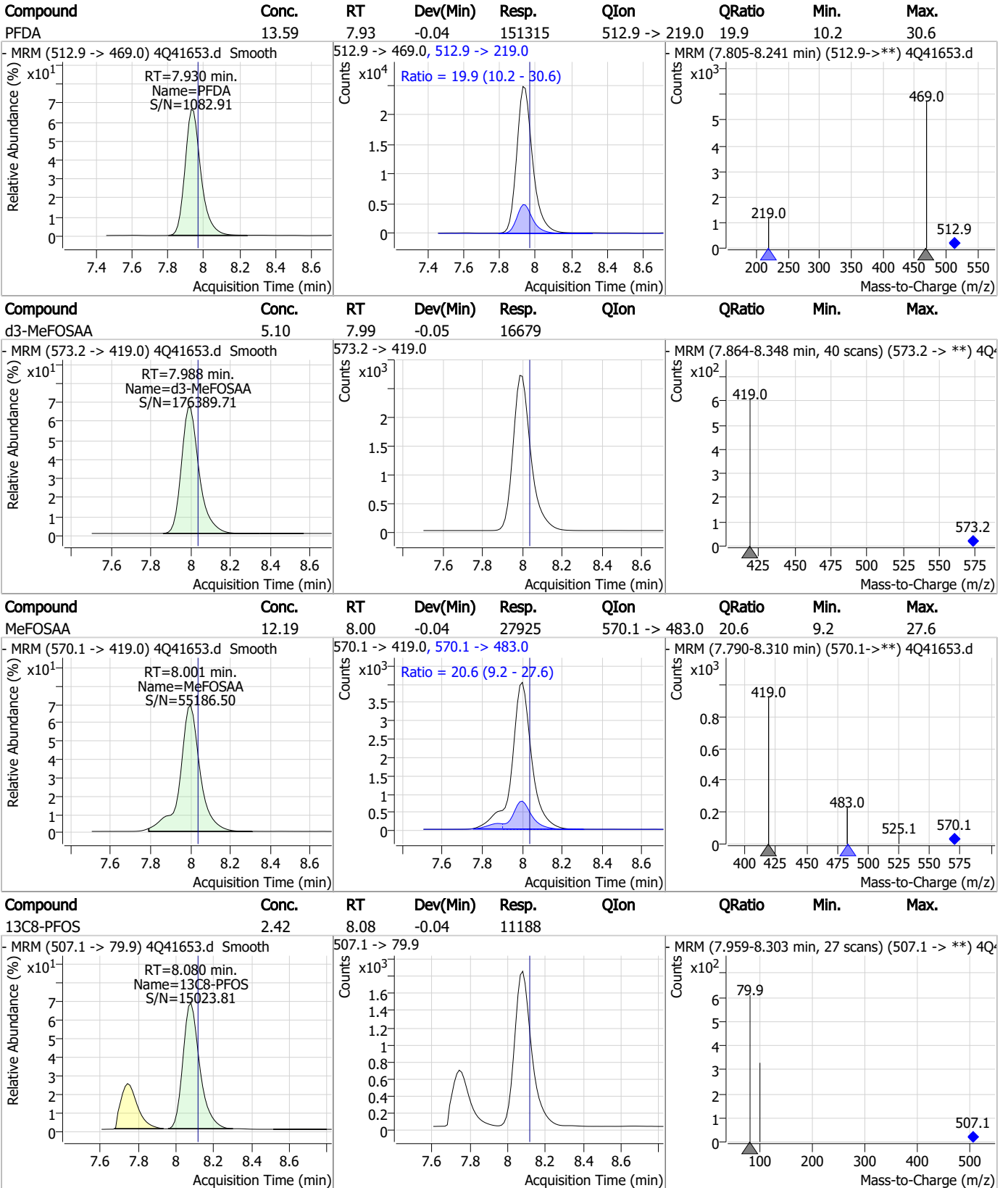
Perfluorinated Compounds by LC/MS/MS



7.7.7

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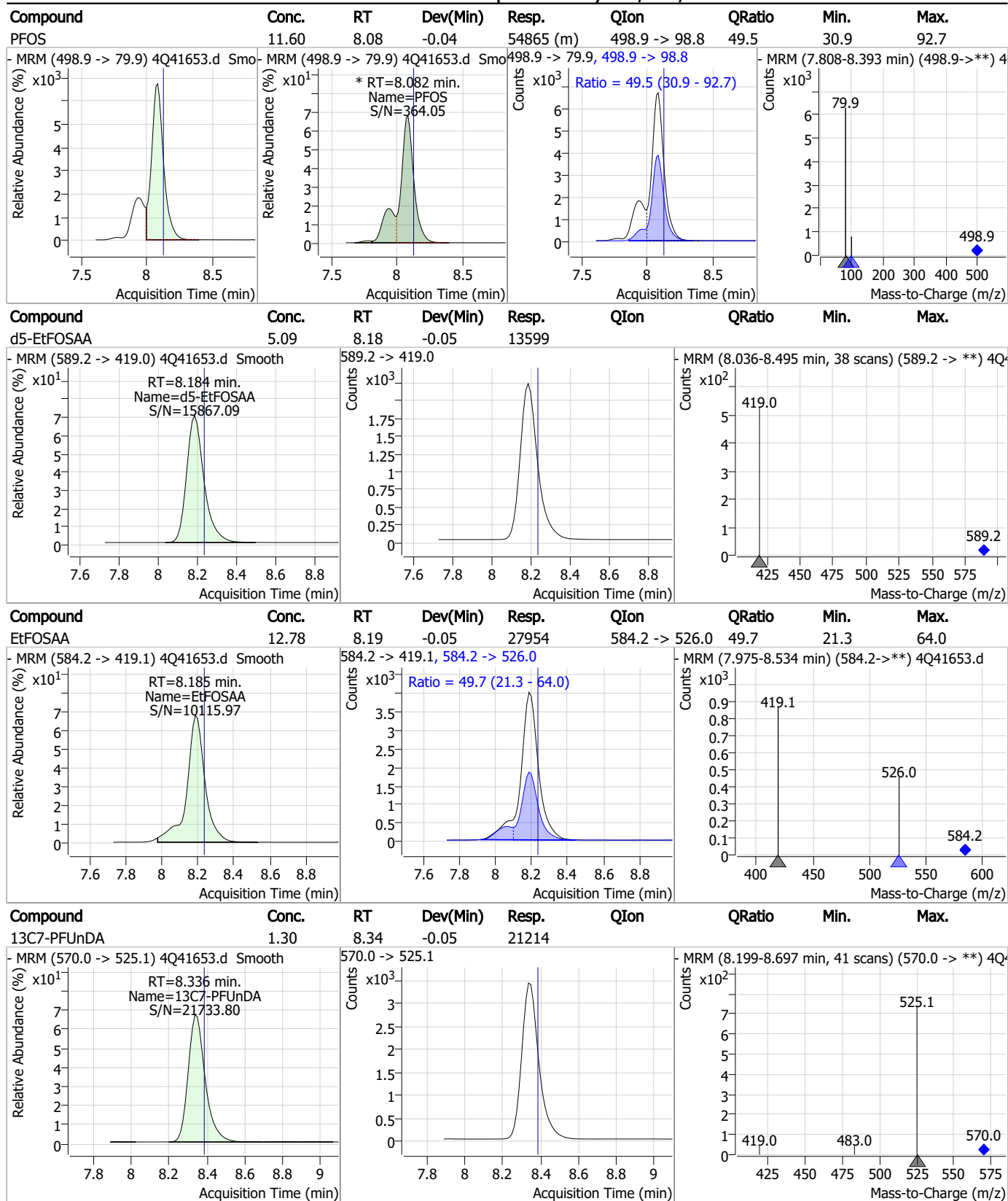
Perfluorinated Compounds by LC/MS/MS



7.7.7

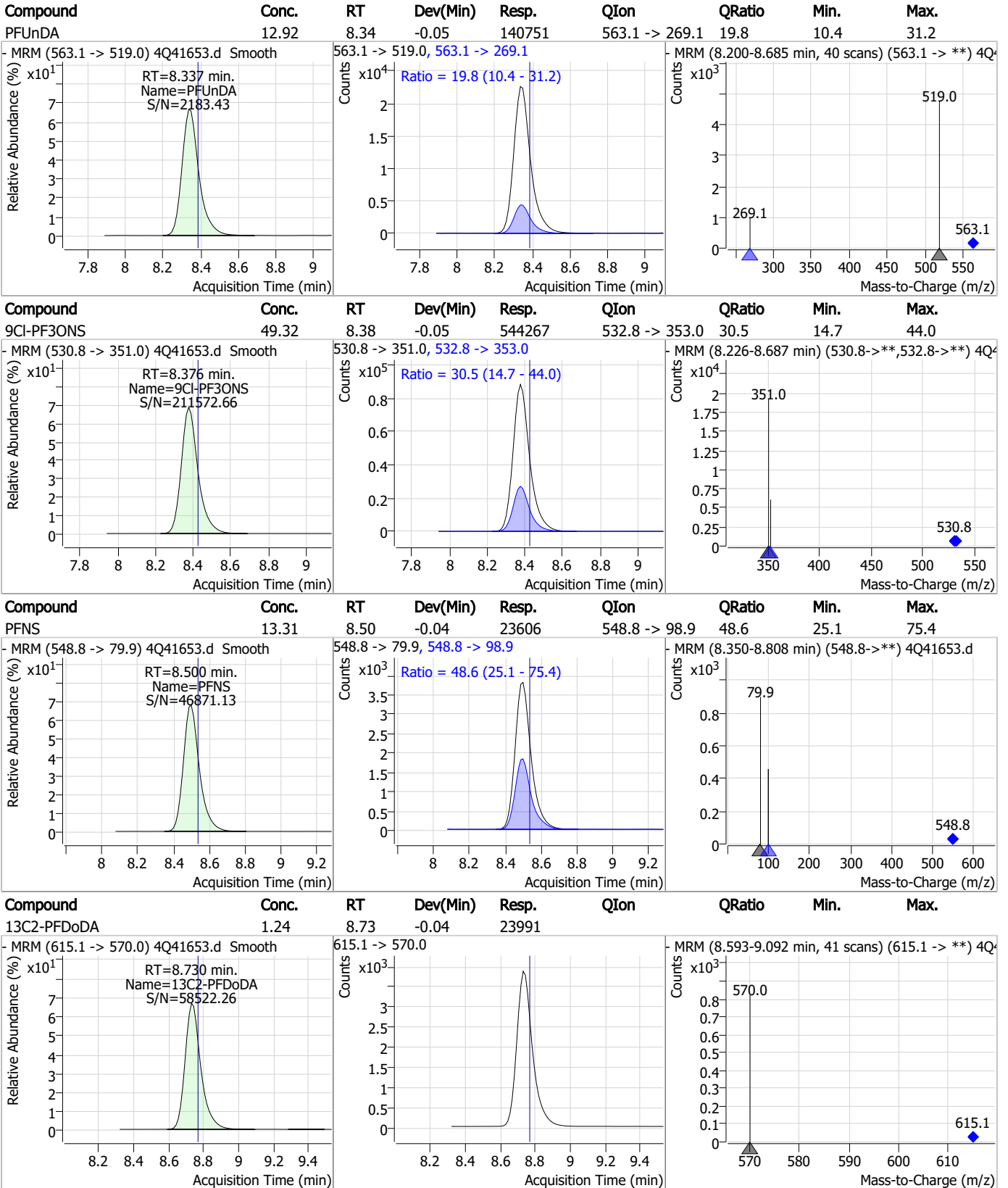
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Perfluorinated Compounds by LC/MS/MS



7.7.7
7

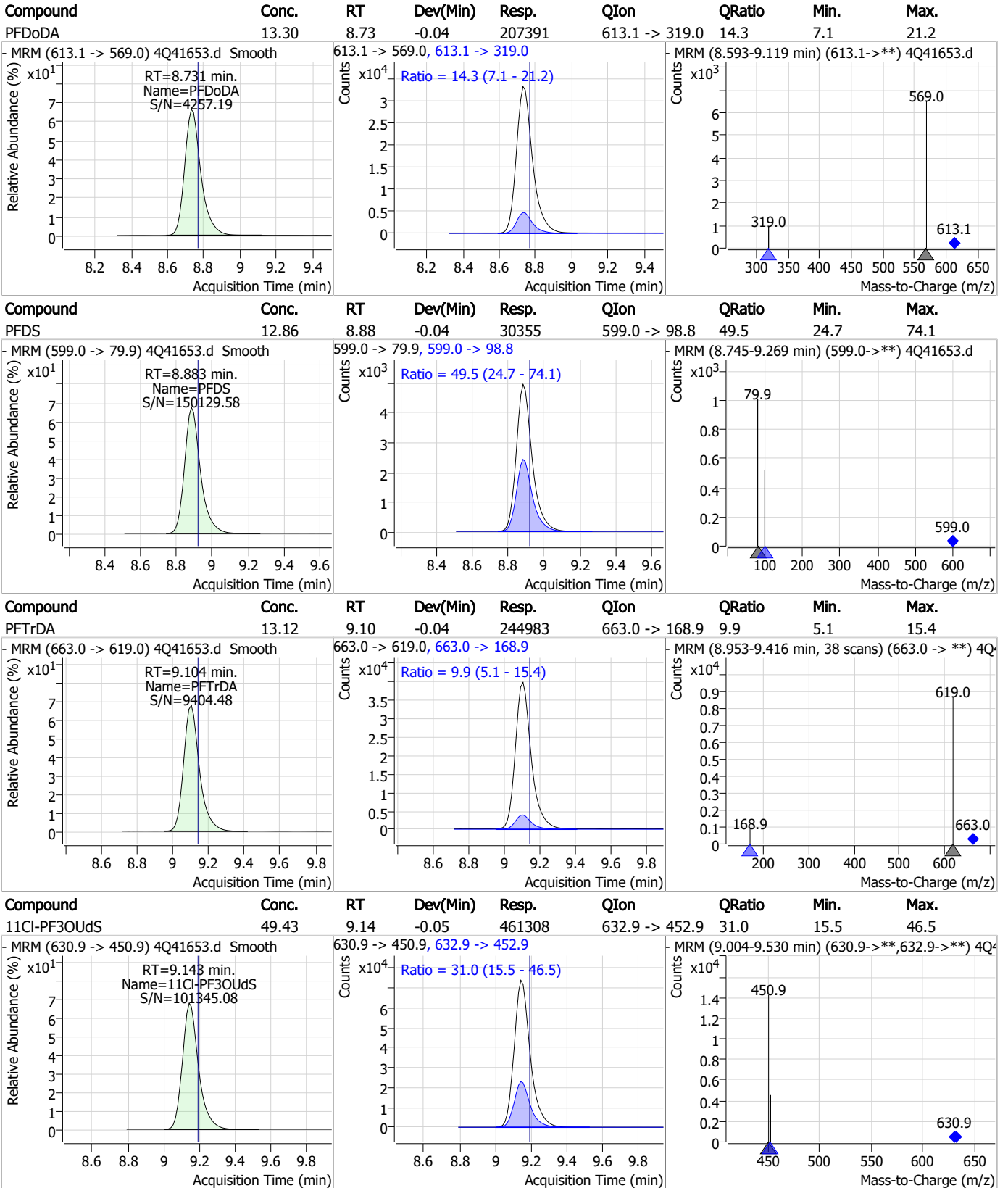
Perfluorinated Compounds by LC/MS/MS



7.7.7

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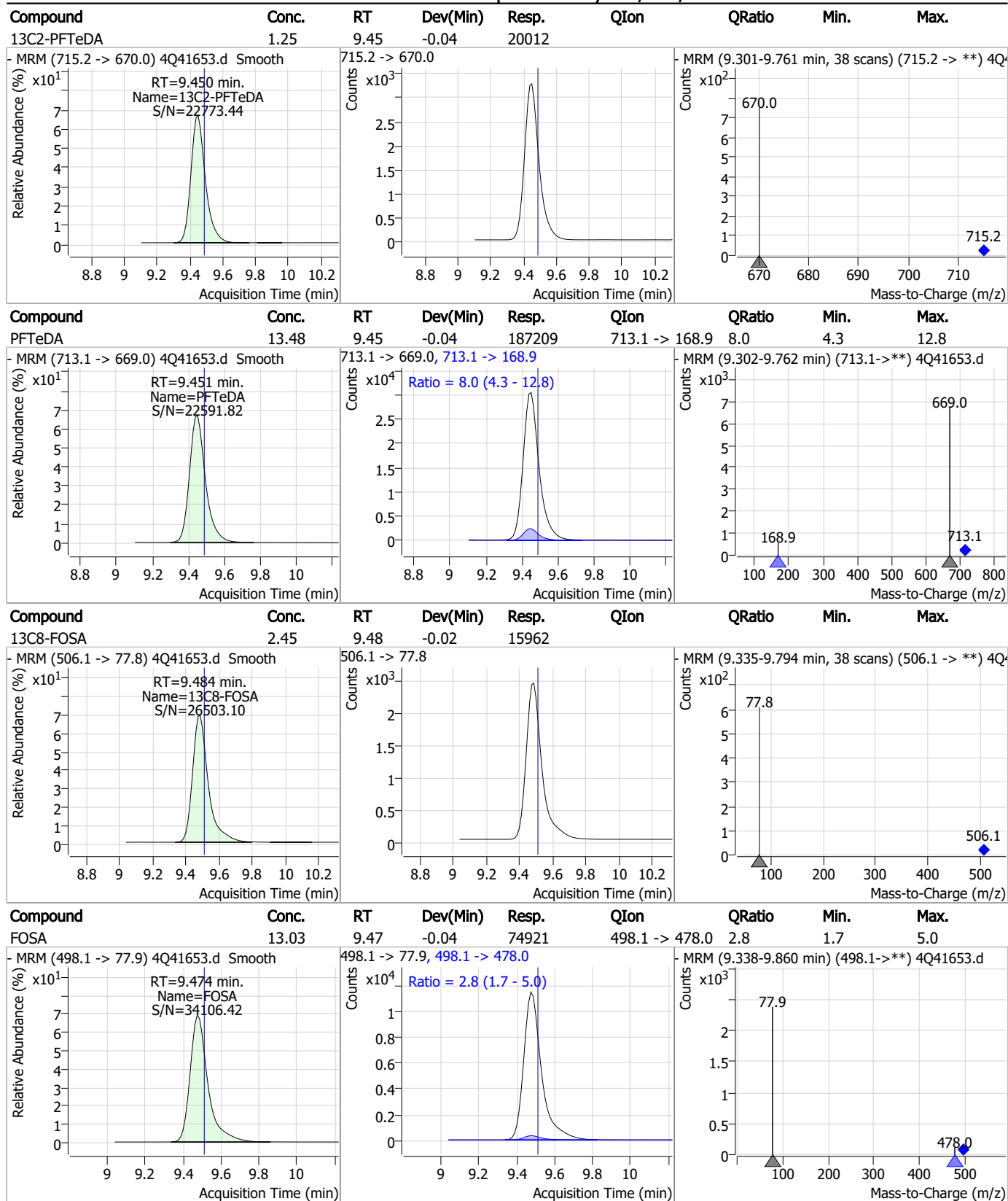
Perfluorinated Compounds by LC/MS/MS



7.7.7

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Perfluorinated Compounds by LC/MS/MS

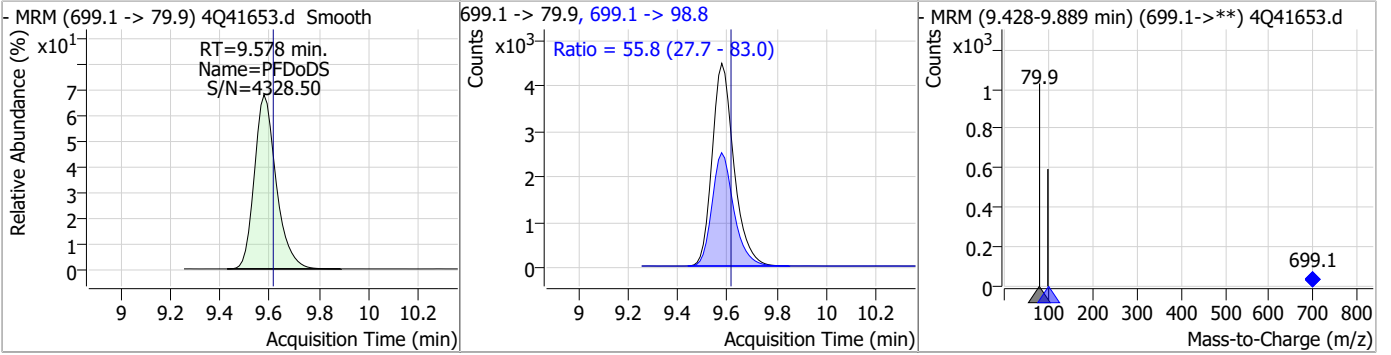


7.7.7
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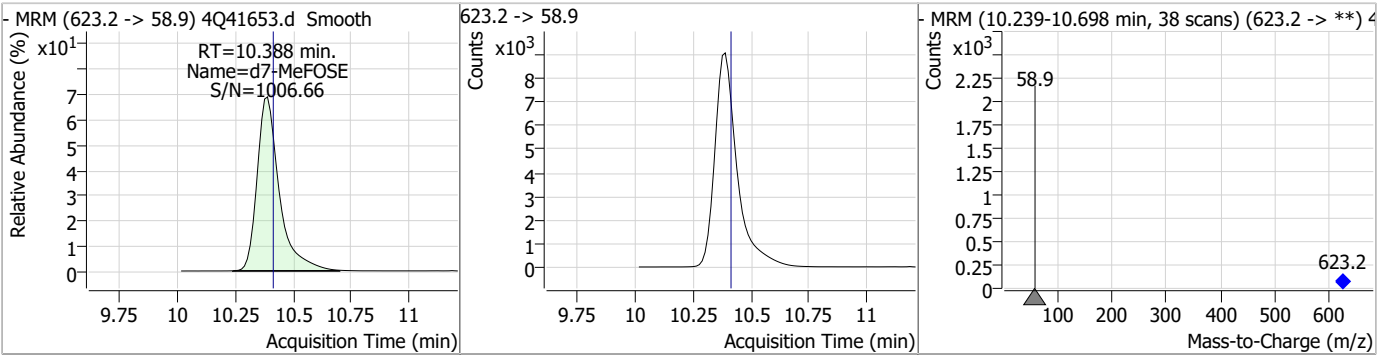


Perfluorinated Compounds by LC/MS/MS

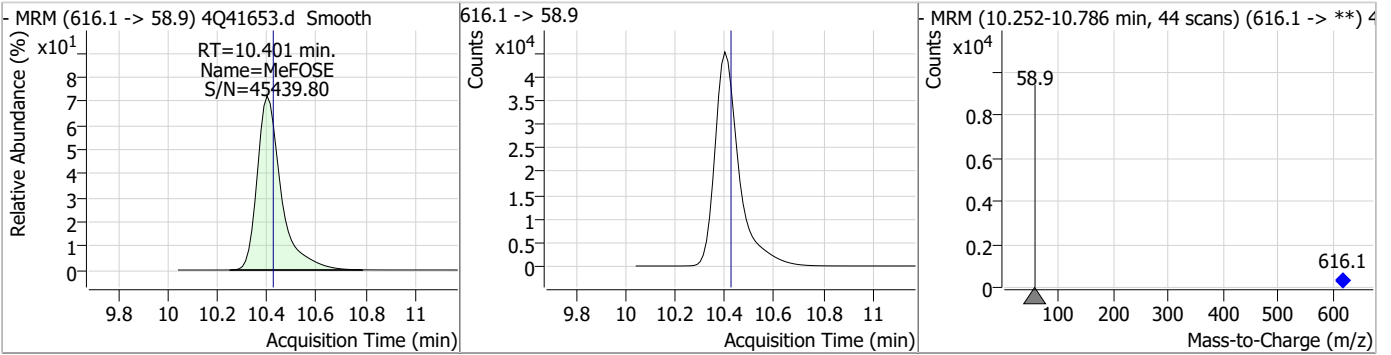
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	13.60	9.58	-0.04	27191	699.1 -> 98.8	55.8	27.7	83.0



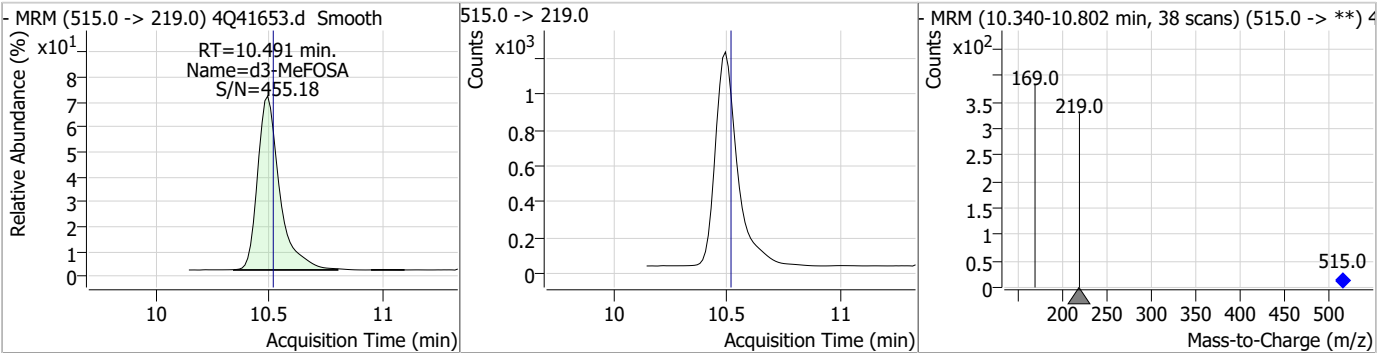
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	24.05	10.39	-0.02	60040				



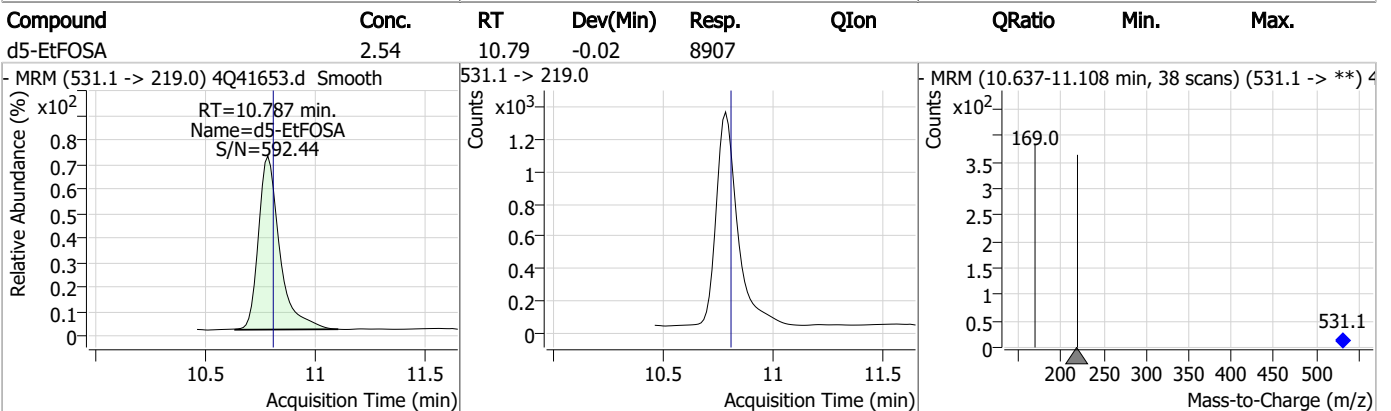
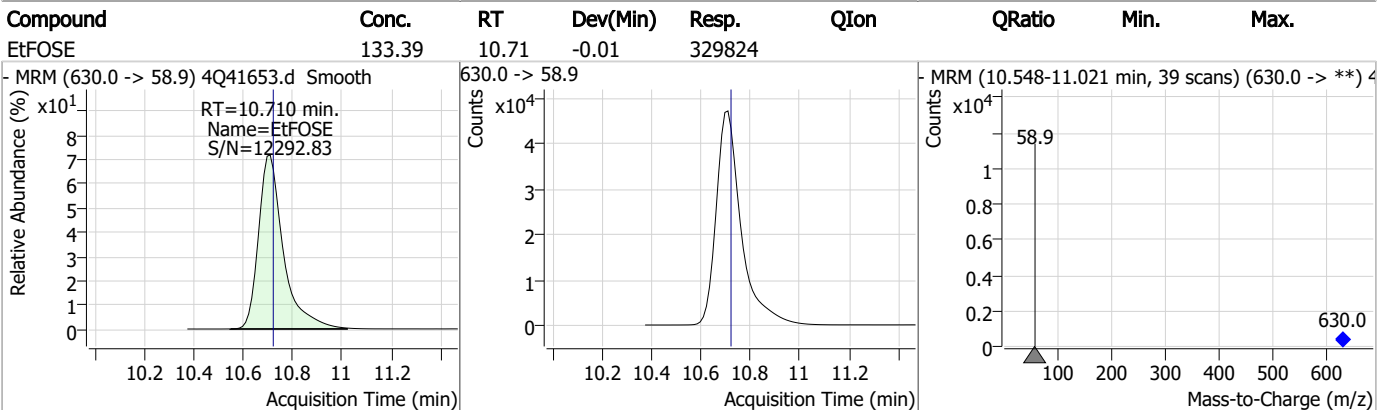
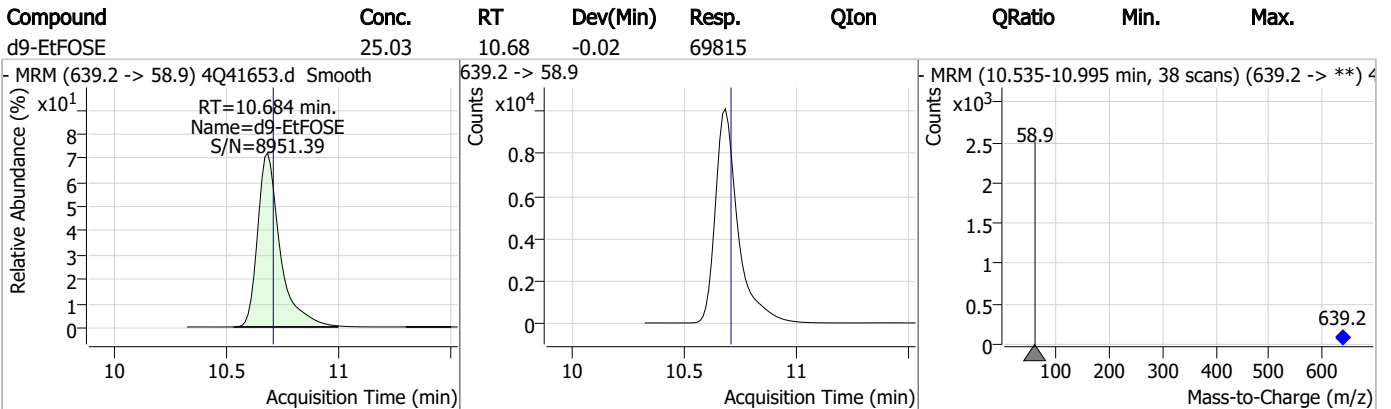
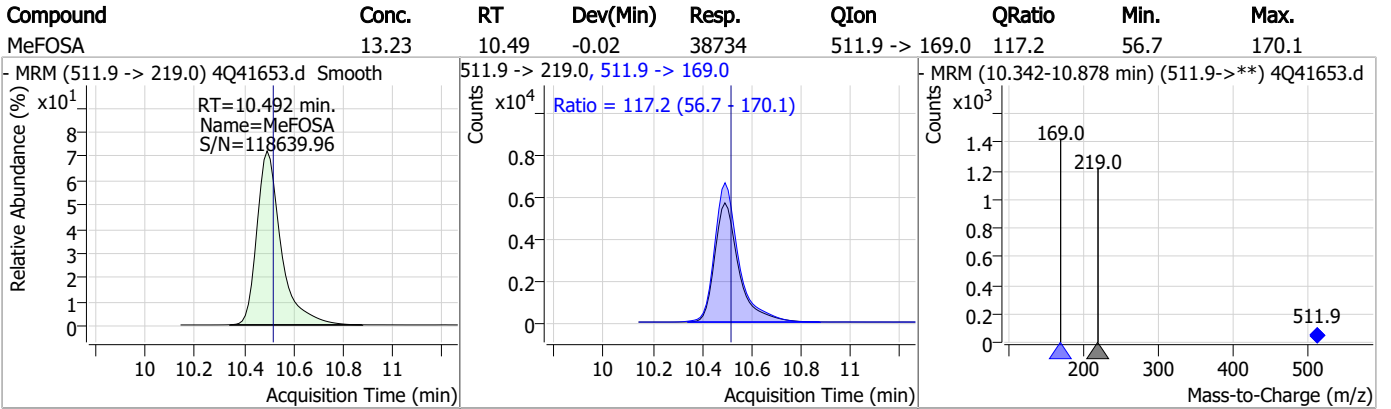
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	132.95	10.40	-0.02	304770				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.44	10.49	-0.02	8112				



Perfluorinated Compounds by LC/MS/MS

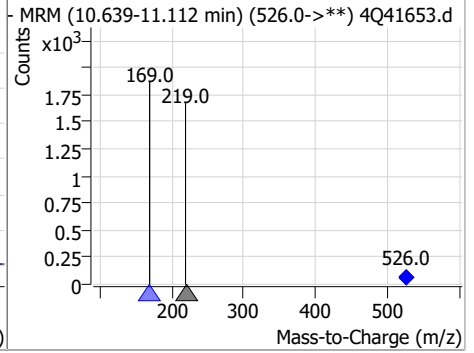
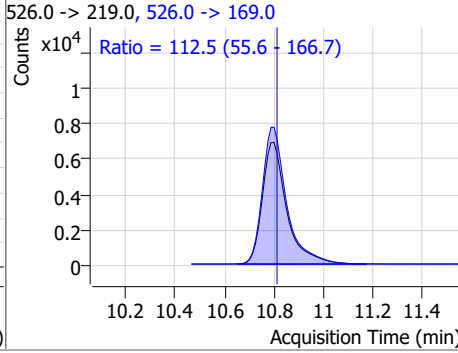
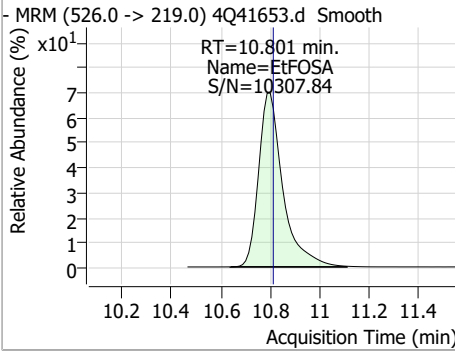


7.7.7

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Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	13.00	10.80	-0.01	47324	526.0 -> 169.0	112.5	55.6	166.7



7.7.7
7

Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41653.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 18:56 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.08	Split peak

7.7.7.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/07/23 15:28

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41654.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 7:10:48 PM
 Sample Name : ic596-7
 Vial : P1-A8
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.202	216.8 -> 171.9	135601	10.00 µg/L	-0.037
M5-PFPeA	4.500	268.3 -> 223.0	78211	5.00 µg/L	-0.075
M5-PFHxA	5.472	318.0 -> 273.0	62300	2.50 µg/L	-0.050
M4-PFHpA	6.305	367.1 -> 322.0	35070	2.50 µg/L	-0.037
M8-PFOA	6.975	421.1 -> 376.0	36981	2.50 µg/L	0.026
M9-PFNA	7.496	472.1 -> 427.0	19541	1.25 µg/L	0.000
M6-PFDA	7.967	519.1 -> 474.1	19260	1.25 µg/L	0.000
M7-PFUnDA	8.423	570.0 -> 525.1	19341	1.25 µg/L	0.037
M2-PFDoDA	8.818	615.1 -> 570.0	23701	1.25 µg/L	0.050
M2-PFTeDA	9.550	715.2 -> 670.0	18592	1.25 µg/L	0.062
M8-FOSA	9.570	506.1 -> 77.8	15026	2.50 µg/L	0.062
M3-PFBS	5.426	302.1 -> 79.9	13751	2.50 µg/L	-0.062
M3-PFHxS	7.080	402.1 -> 79.9	7686	2.50 µg/L	0.014
M8-PFOS	8.117	507.1 -> 79.9	11501	2.50 µg/L	0.000
M2-4:2FTS	5.196	329.1 -> 80.9	1407	5.00 µg/L	-0.064
M2-6:2FTS	6.736	429.1 -> 80.9	1845	5.00 µg/L	0.012
M2-8:2FTS	7.754	529.1 -> 80.9	3248	5.00 µg/L	-0.012
M3-MeFOSAA	8.025	573.2 -> 419.0	15597	5.00 µg/L	-0.012
M3-HFPO-DA	5.777	286.9 -> 168.9	29641	10.00 µg/L	-0.050
M5-EtFOSAA	8.246	589.2 -> 419.0	12781	5.00 µg/L	0.012
M7-MeFOSE	10.462	623.2 -> 58.9	59317	25.00 µg/L	0.049
M9-EtFOSE	10.759	639.2 -> 58.9	66001	25.00 µg/L	0.050
M5-EtFOSA	10.861	531.1 -> 219.0	8632	2.50 µg/L	0.050
M3-MeFOSA	10.578	515.0 -> 219.0	8446	2.50 µg/L	0.062
13C4-PFOS	8.118	502.8 -> 79.9	11127	2.50 µg/L	0.000
13C3-PFBA	3.205	216.0 -> 172.0	79017	5.00 µg/L	-0.037
18O2-PFHxS	7.079	403.0 -> 83.9	5533	2.50 µg/L	0.014
13C4-PFOA	6.976	417.1 -> 372.0	44934	2.50 µg/L	0.026
13C2-PFDA	7.967	515.1 -> 470.1	17747	1.25 µg/L	0.000
13C5-PFNA	7.496	468.0 -> 423.0	22486	1.25 µg/L	0.000
13C2-PFHxA	5.473	315.1 -> 270.0	58608	2.50 µg/L	-0.050
System Monitoring Compounds					
13C2-4:2FTS	5.196	329.1 -> 80.9	1407	4.69 µg/L	-0.064
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 93.8%		
13C2-6:2FTS	6.736	429.1 -> 80.9	1845	4.34 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 86.8%		
13C2-8:2FTS	7.754	529.1 -> 80.9	3248	4.91 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 98.2%		
13C2-PFDoDA	8.818	615.1 -> 570.0	23701	1.26 µg/L	0.050
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 101.1%		
13C2-PFTeDA	9.550	715.2 -> 670.0	18592	1.20 µg/L	0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.0%		
13C3-PFBS	5.426	302.1 -> 79.9	13751	2.67 µg/L	-0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 106.8%		
13C3-PFHxS	7.080	402.1 -> 79.9	7686	2.55 µg/L	0.014

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.2%	
13C4-PFBA	3.202	216.8 -> 171.9	135601	9.98 µg/L	-0.037
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.8%	
13C4-PFHpA	6.305	367.1 -> 322.0	35070	2.52 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
13C5-PFHxA	5.472	318.0 -> 273.0	62300	2.45 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.0%	
13C5-PFPeA	4.500	268.3 -> 223.0	78211	4.89 µg/L	-0.075
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 97.8%	
13C6-PFDA	7.967	519.1 -> 474.1	19260	1.27 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 101.3%	
13C7-PFUnDA	8.423	570.0 -> 525.1	19341	1.23 µg/L	0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 98.3%	
13C8-FOSA	9.570	506.1 -> 77.8	15026	2.43 µg/L	0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.1%	
13C8-PFOA	6.975	421.1 -> 376.0	36981	2.49 µg/L	0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.5%	
13C8-PFOS	8.117	507.1 -> 79.9	11501	2.62 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.9%	
13C9-PFNA	7.496	472.1 -> 427.0	19541	1.24 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.4%	
d3-MeFOSAA	8.025	573.2 -> 419.0	15597	5.02 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C3-HFPO-DA	5.777	286.9 -> 168.9	29641	9.99 µg/L	-0.050
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.9%	
d3-MeFOSA	10.578	515.0 -> 219.0	8446	2.68 µg/L	0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 107.2%	
d5-EtFOSAA	8.246	589.2 -> 419.0	12781	5.04 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.8%	
d7-MeFOSE	10.462	623.2 -> 58.9	59317	25.03 µg/L	0.049
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 100.1%	
d9-EtFOSE	10.759	639.2 -> 58.9	66001	24.93 µg/L	0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 99.7%	
d5-EtFOSA	10.861	531.1 -> 219.0	8632	2.60 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.8%	
Target Compounds					QValue
4:2FTS	5.197	327.1 -> 307.0	190724	99.51 µg/L	95
		327.1 -> 80.9	79503		
6:2FTS	6.737	427.1 -> 407.0	140052	104.83 µg/L	98
		427.1 -> 80.9	59514		
8:2FTS	7.754	527.1 -> 507.0	151361	103.53 µg/L	94
		527.1 -> 80.8	59813		
EtFOSAA	8.247	584.2 -> 419.1	54388	26.47 µg/L	m 93
		584.2 -> 526.0	25720		
FOSA	9.574	498.1 -> 77.9	148609	27.46 µg/L	99
		498.1 -> 478.0	4464		
MeFOSAA	8.038	570.1 -> 419.0	55233	25.78 µg/L	93
		570.1 -> 483.0	11908		
PFBA	3.208	212.8 -> 168.9	316903	108.53 µg/L	100
PFBS	5.427	298.7 -> 79.9	118320	24.05 µg/L	98
		298.7 -> 98.8	45853		
PFDA	7.968	512.9 -> 469.0	295143	26.76 µg/L	99
		512.9 -> 219.0	61140		
PFDoDA	8.819	613.1 -> 569.0	410674	26.65 µg/L	99
		613.1 -> 319.0	56543		
PFDS	8.970	599.0 -> 79.9	61157	25.21 µg/L	98

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	29413			
PFHpA	6.306	363.1 -> 319.0	470394	26.60	µg/L	99
		363.1 -> 169.0	81968			
PFHpS	7.623	449.0 -> 79.9	77558	24.68	µg/L	97
		449.0 -> 98.9	39461			
PFHxA	5.475	313.0 -> 269.0	522090	27.42	µg/L	100
		313.0 -> 118.9	15003			
PFHxS	7.081	398.7 -> 79.9	68447	24.42	µg/L	m 98
		398.7 -> 98.9	34300			
PFNA	7.497	463.0 -> 419.0	298211	28.88	µg/L	98
		463.0 -> 219.0	75319			
PFNS	8.574	548.8 -> 79.9	46500	25.51	µg/L	99
		548.8 -> 98.9	23694			
PFOA	6.977	413.0 -> 369.0	452340	26.99	µg/L	99
		413.0 -> 169.0	90974			
PFOS	8.119	498.9 -> 79.9	105173	21.62	µg/L	m 83
		498.9 -> 98.8	51466			
PFPeA	4.502	263.0 -> 219.0	825695	55.06	µg/L	100
PFPeS	6.370	349.1 -> 79.9	67186	26.00	µg/L	98
		349.1 -> 98.9	29380			
PFTeDA	9.550	713.1 -> 669.0	353433	27.40	µg/L	99
		713.1 -> 168.9	29006			
PFTrDA	9.203	663.0 -> 619.0	487108	26.40	µg/L	99
		663.0 -> 168.9	48698			
PFUnDA	8.423	563.1 -> 519.0	265624	26.74	µg/L	98
		563.1 -> 269.1	52362			
11Cl-PF3OUdS	9.243	630.9 -> 450.9	828463	98.04	µg/L	99
		632.9 -> 452.9	254079			
9Cl-PF3ONS	8.451	530.8 -> 351.0	1008028	100.89	µg/L	97
		532.8 -> 353.0	308933			
ADONA	6.568	376.9 -> 250.9	1980069	101.69	µg/L	99
		376.9 -> 84.8	531947			
HFPO-DA	5.778	284.9 -> 168.9	258026	110.59	µg/L	99
		284.9 -> 184.9	30162			
3:3FTCA	4.179	241.0 -> 177.0	116331	143.75	µg/L	100
		241.0 -> 117.0	10363			
5:3FTCA	6.258	341.0 -> 237.1	2140611	678.40	µg/L	99
		341.0 -> 217.0	1512676			
7:3FTCA	7.661	441.0 -> 316.9	806533	686.43	µg/L	94
		441.0 -> 336.9	1778530			
EtFOSA	10.875	526.0 -> 219.0	98014	27.79	µg/L	100
		526.0 -> 169.0	109273			
EtFOSE	10.784	630.0 -> 58.9	634352	271.37	µg/L	100
MeFOSA	10.580	511.9 -> 219.0	77681	25.48	µg/L	96
		511.9 -> 169.0	91410			
MeFOSE	10.487	616.1 -> 58.9	596069	263.19	µg/L	100
PFDoDS	9.677	699.1 -> 79.9	53200	25.89	µg/L	99
		699.1 -> 98.8	29225			
NFDHA	5.378	295.0 -> 201.0	35959	55.55	µg/L	97
		295.0 -> 84.9	9280			
PFMBA	4.829	279.0 -> 85.1	472217	56.18	µg/L	100
PFMPA	3.794	229.0 -> 84.9	419292	57.99	µg/L	100
PFEESA	5.872	314.8 -> 134.9	725373	50.37	µg/L	99
		314.8 -> 82.9	24719			

= Qualifier out of range, m = manually integrated, + = Area summed

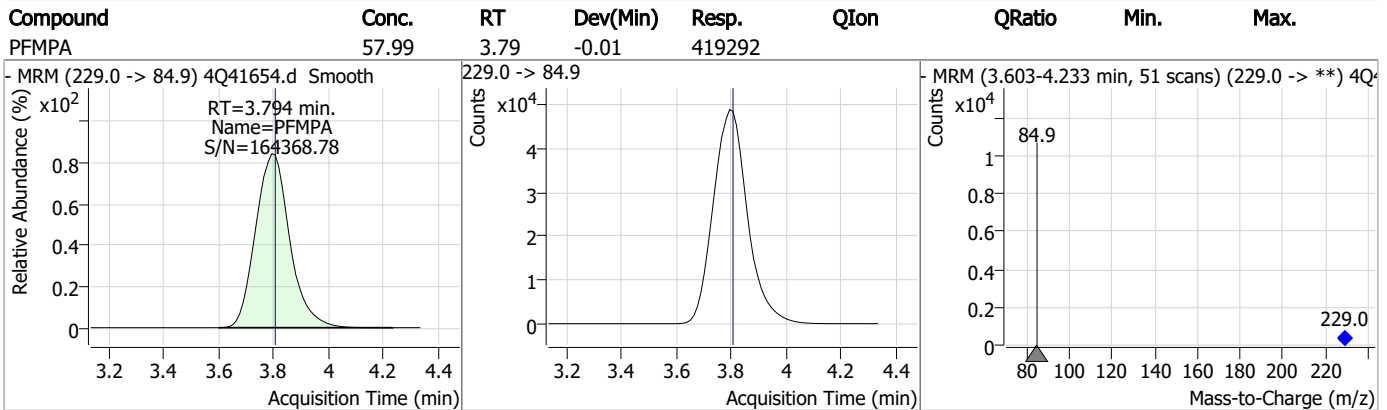
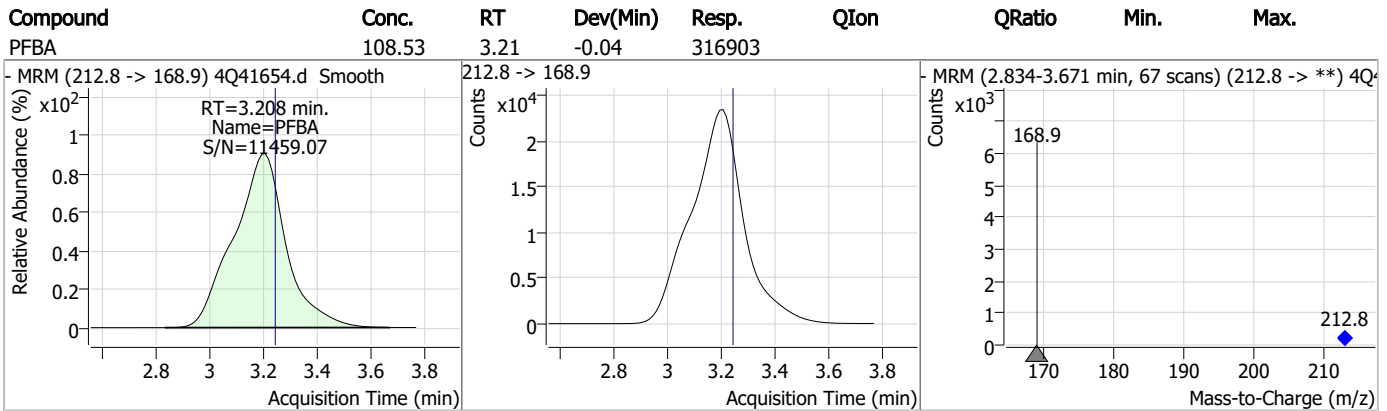
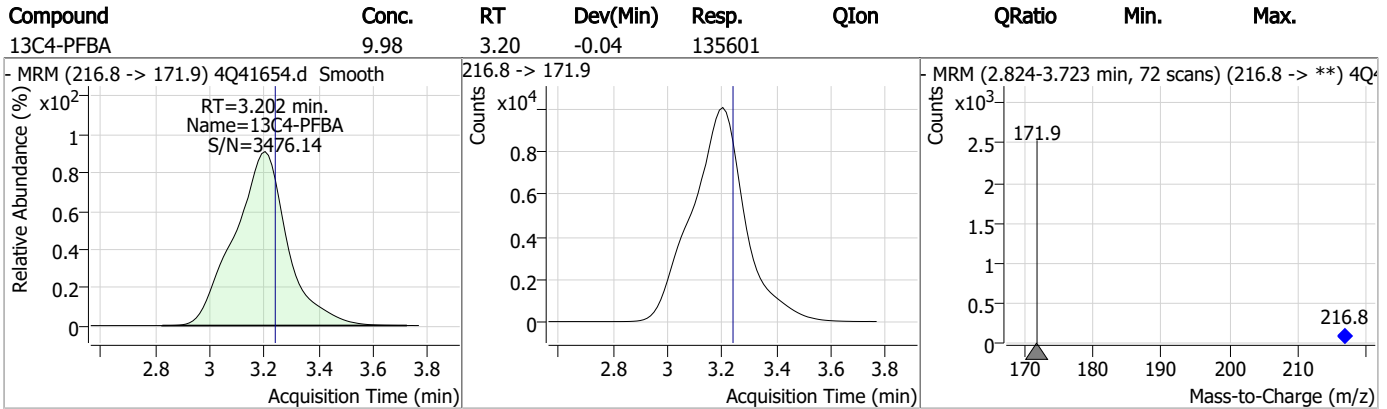
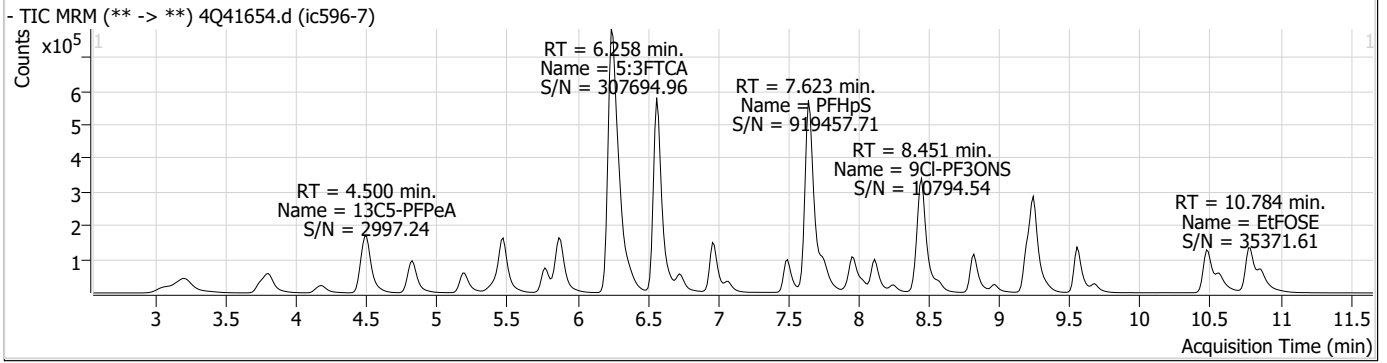
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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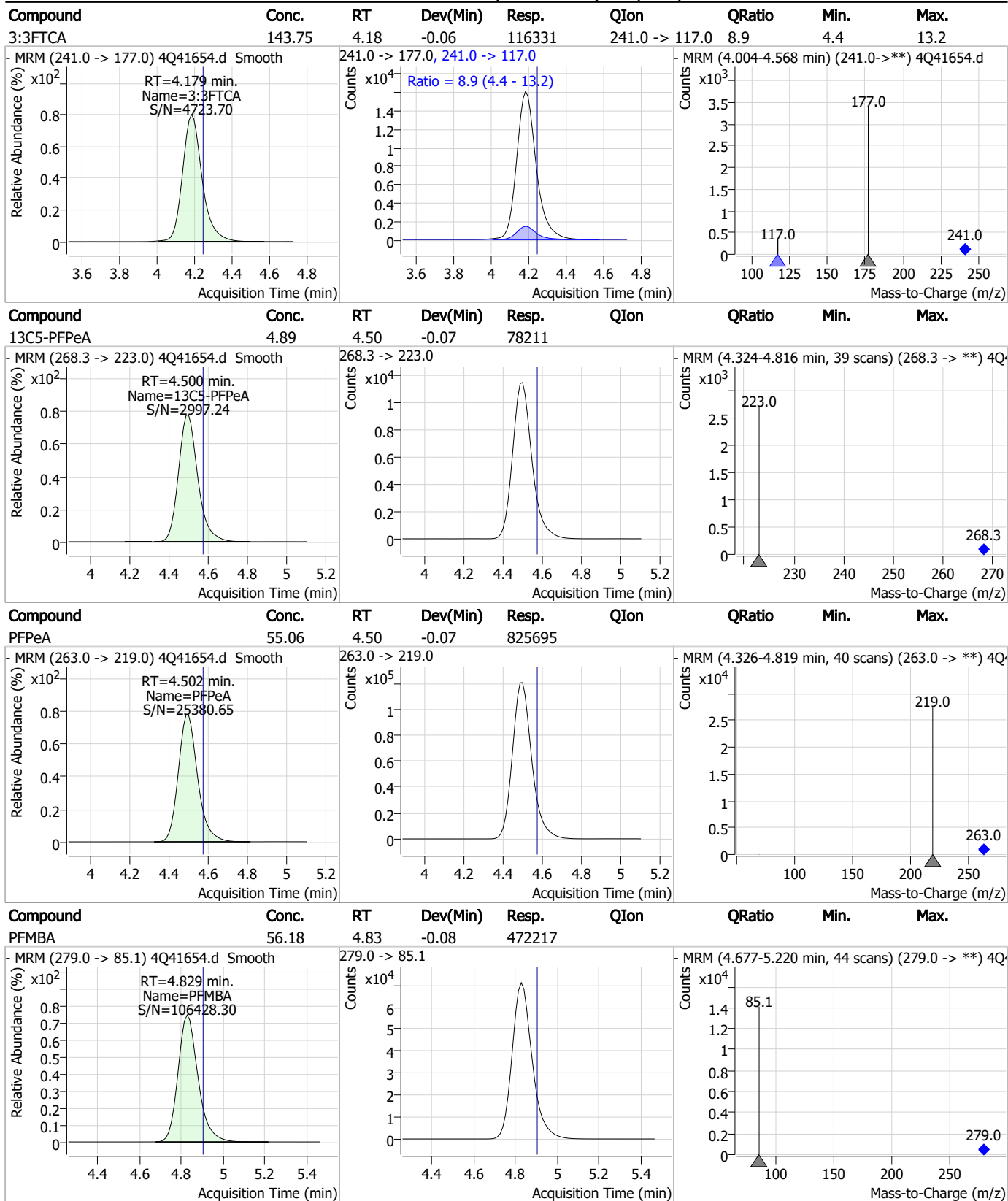
7.7.8
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Perfluorinated Compounds by LC/MS/MS

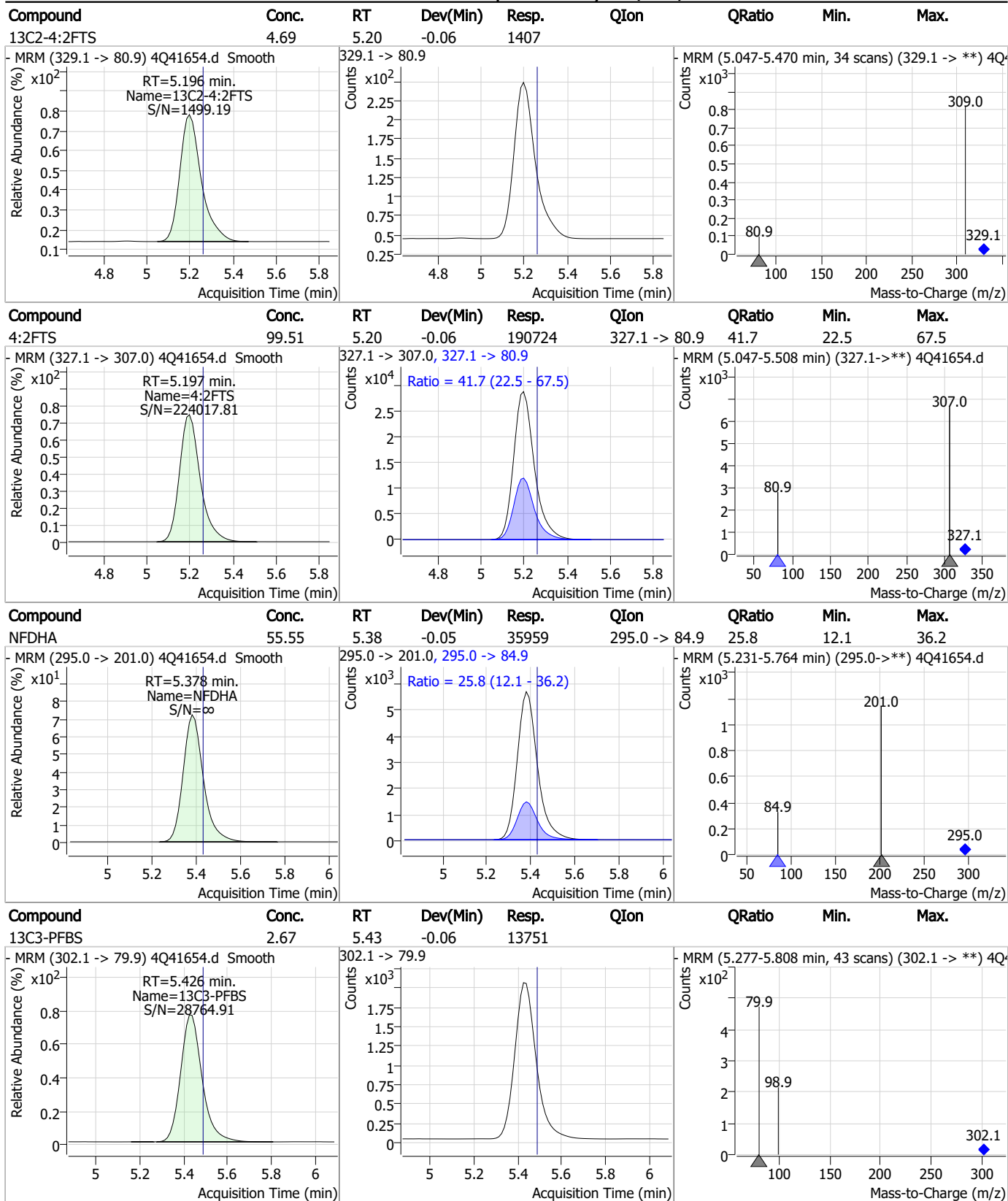


Perfluorinated Compounds by LC/MS/MS



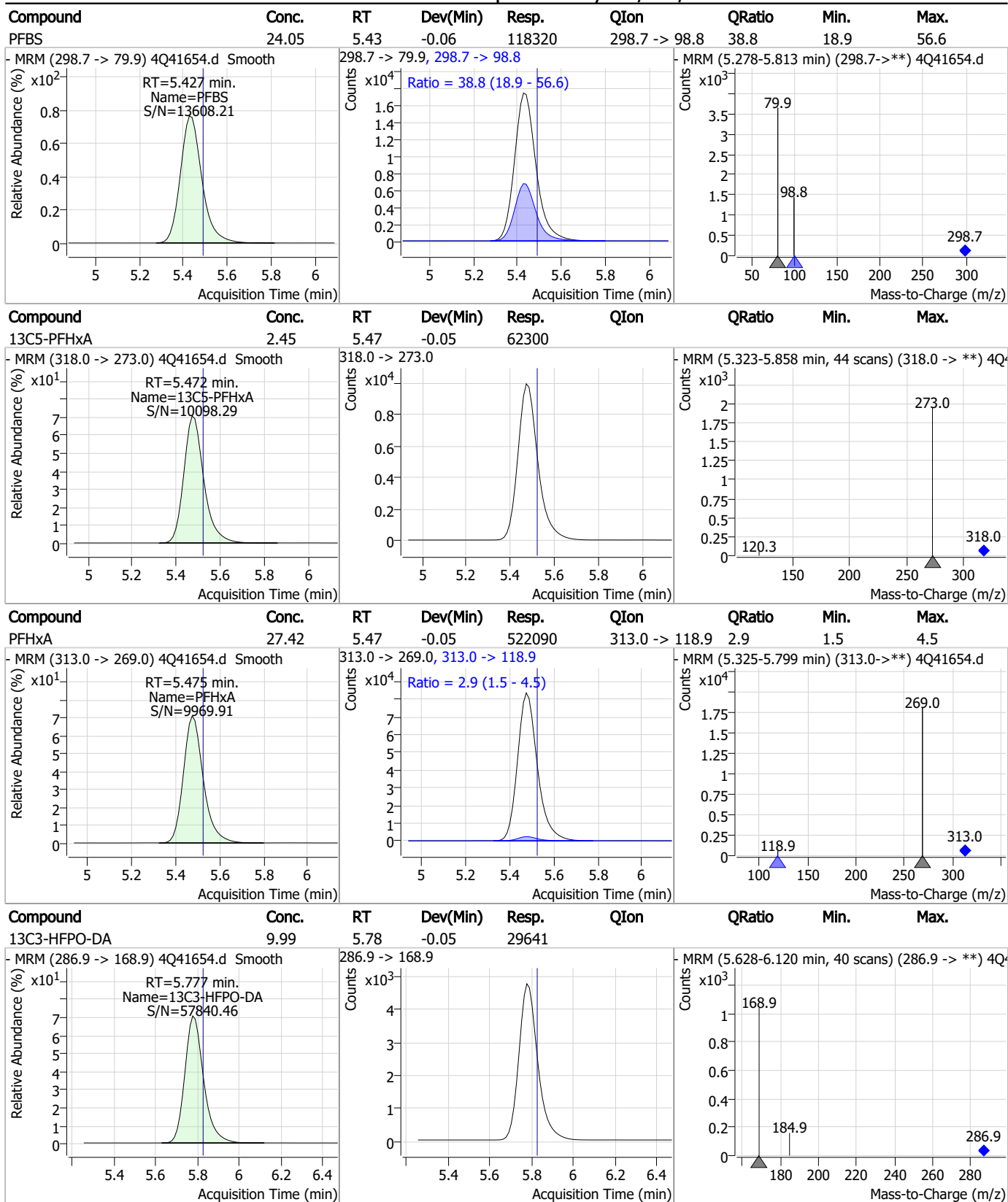
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Perfluorinated Compounds by LC/MS/MS



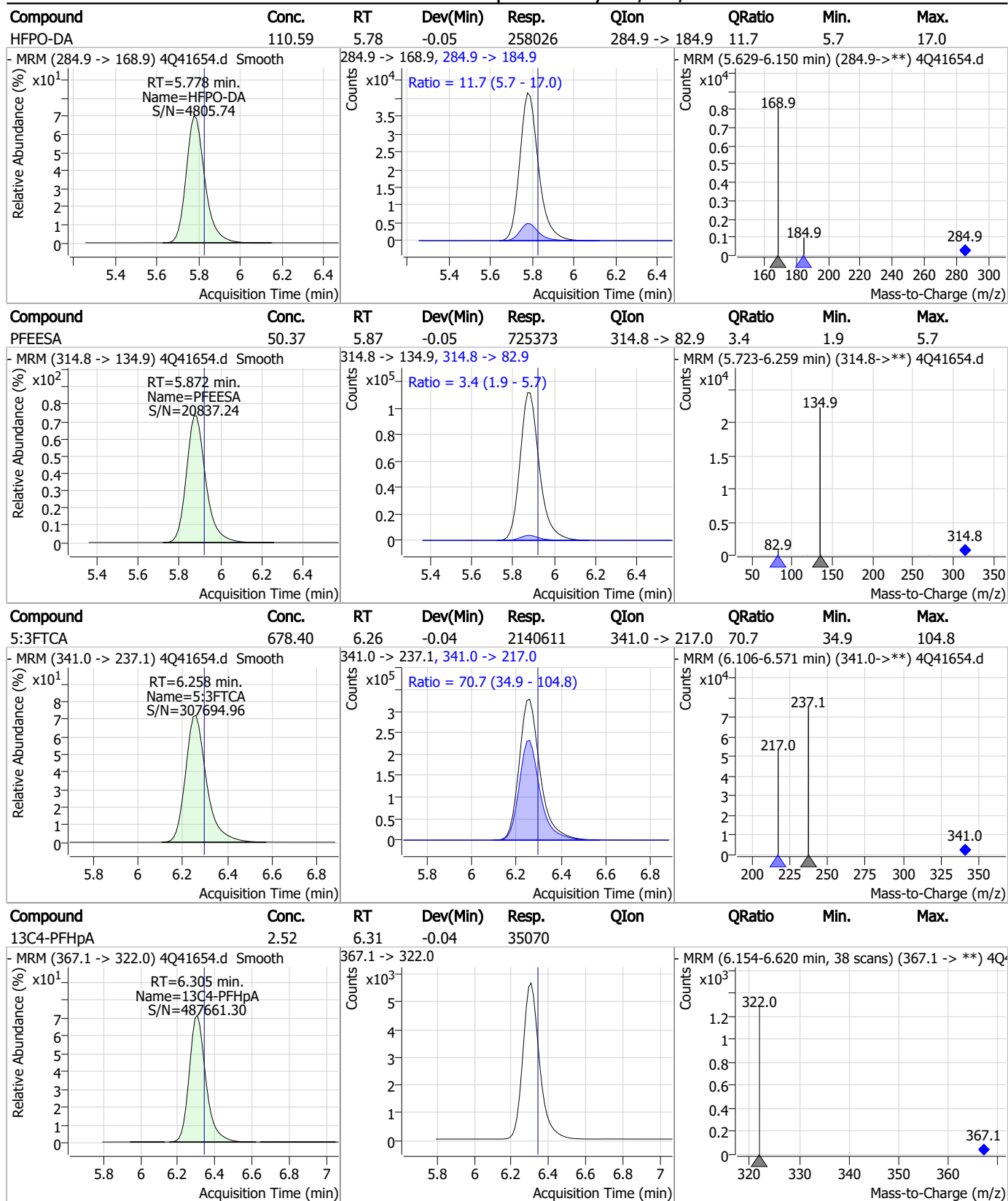
7.7.8
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Perfluorinated Compounds by LC/MS/MS



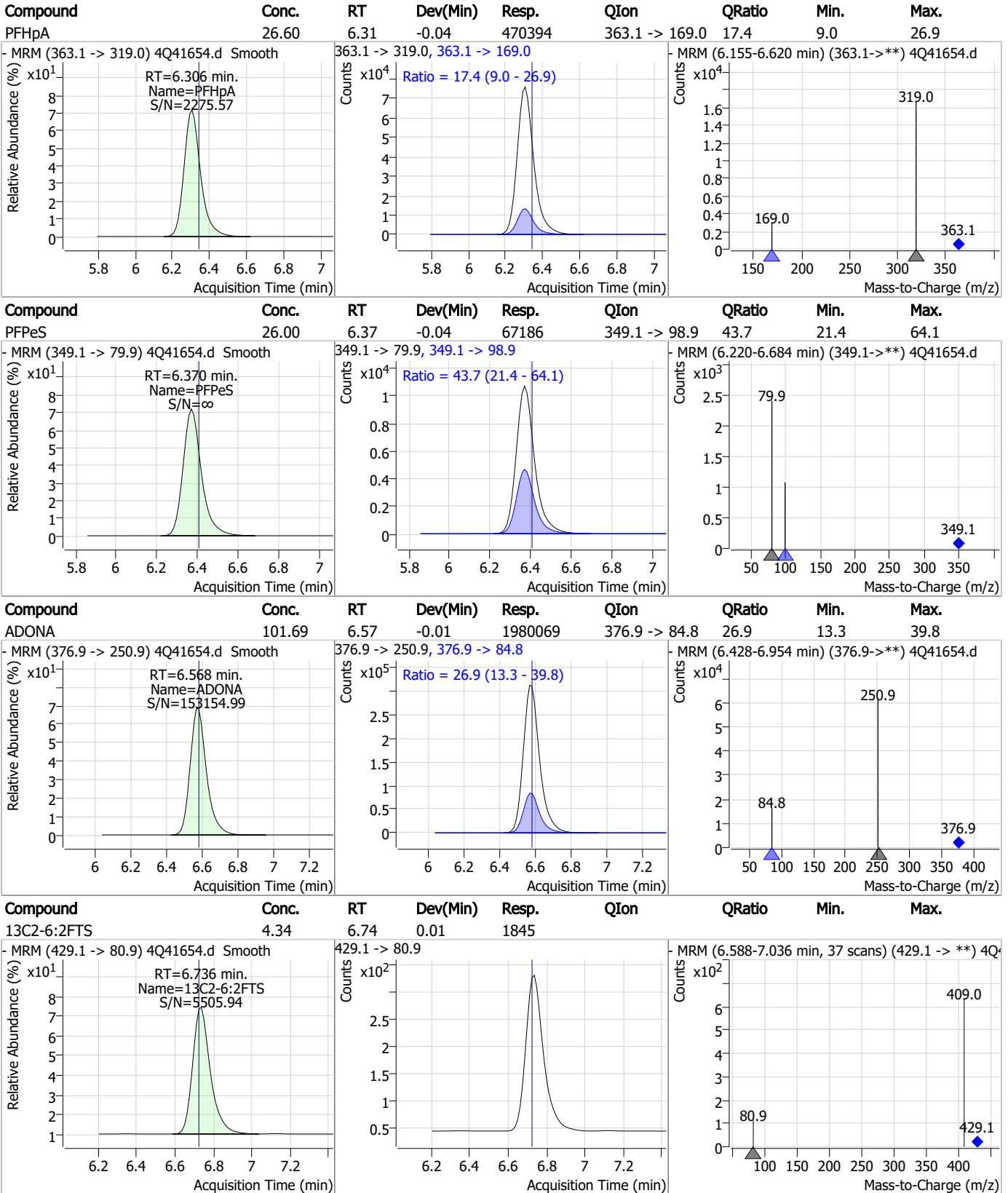
7.7.8
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Perfluorinated Compounds by LC/MS/MS



7.7.8
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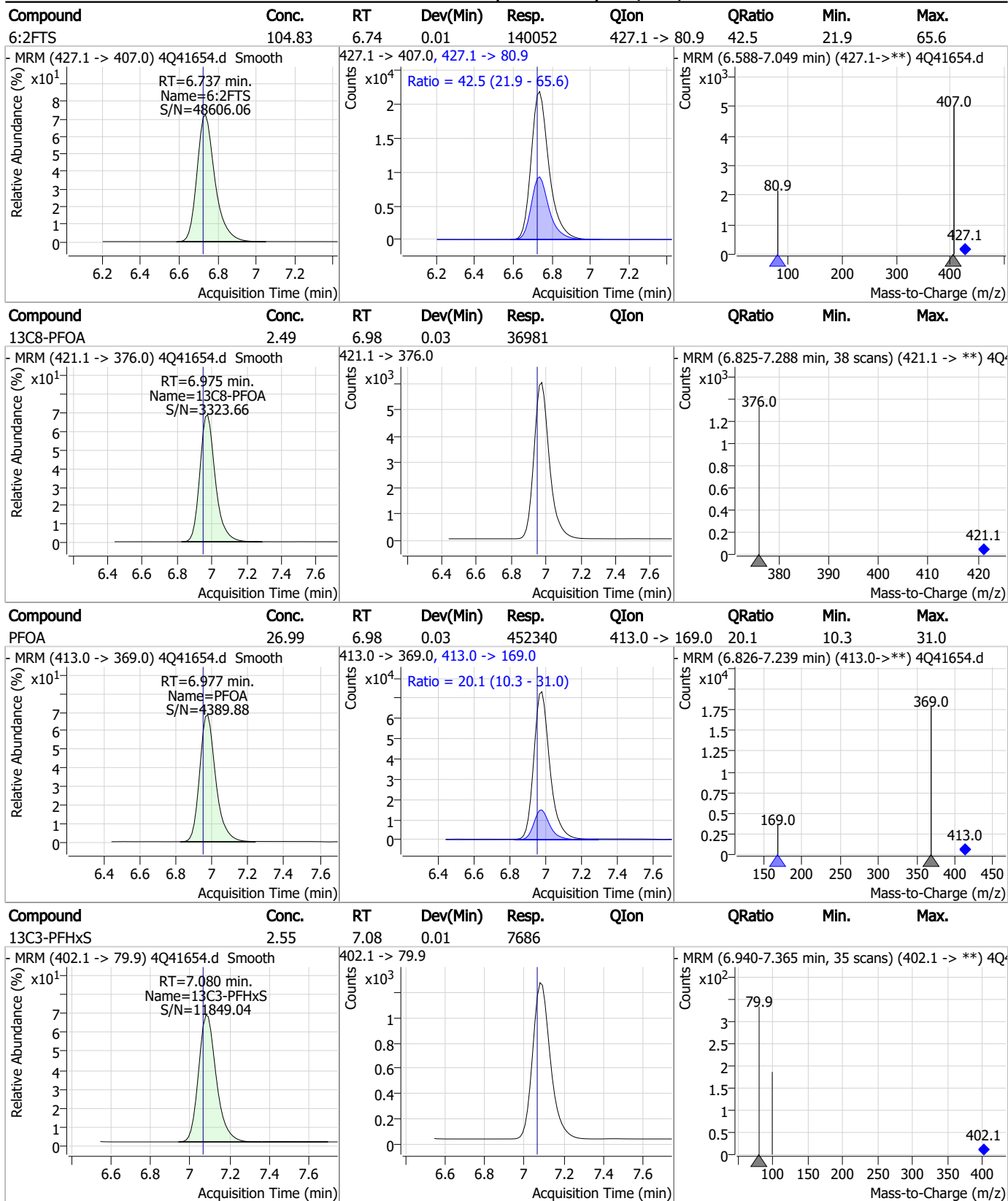
Perfluorinated Compounds by LC/MS/MS



7.7.8

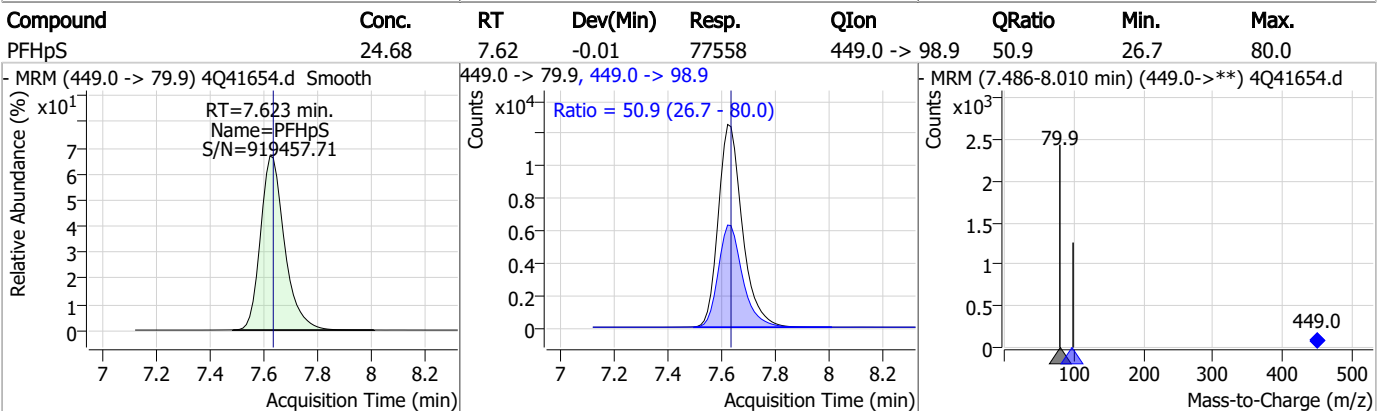
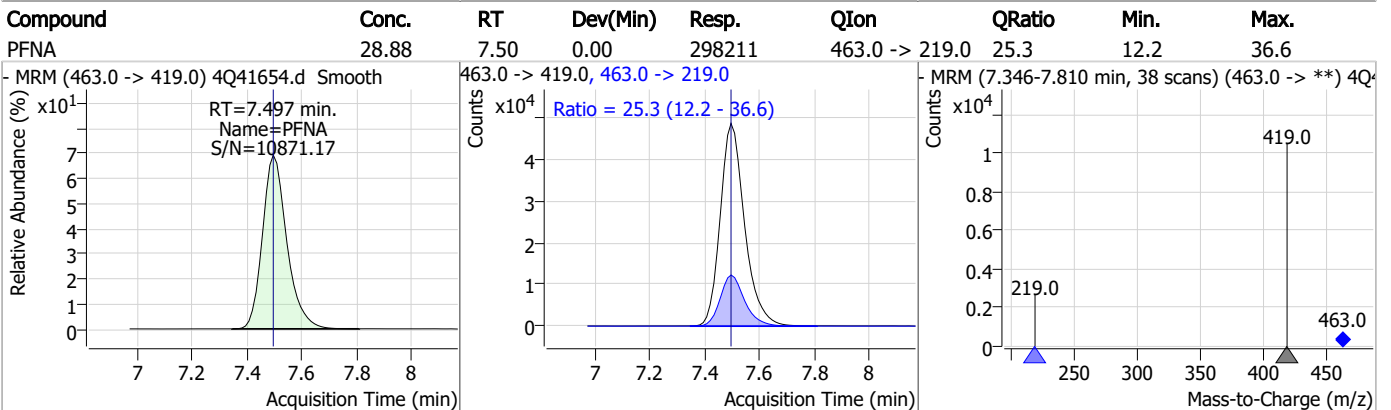
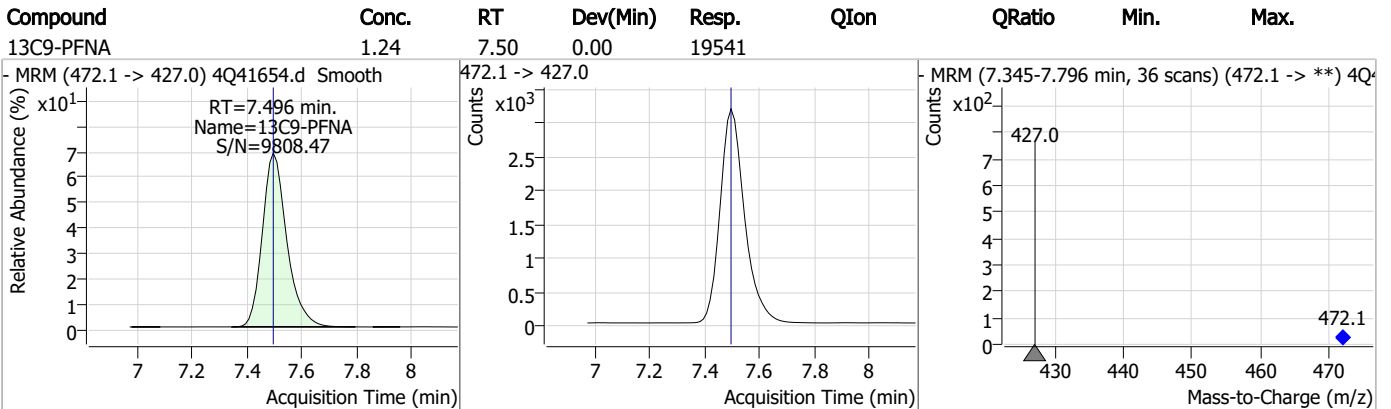
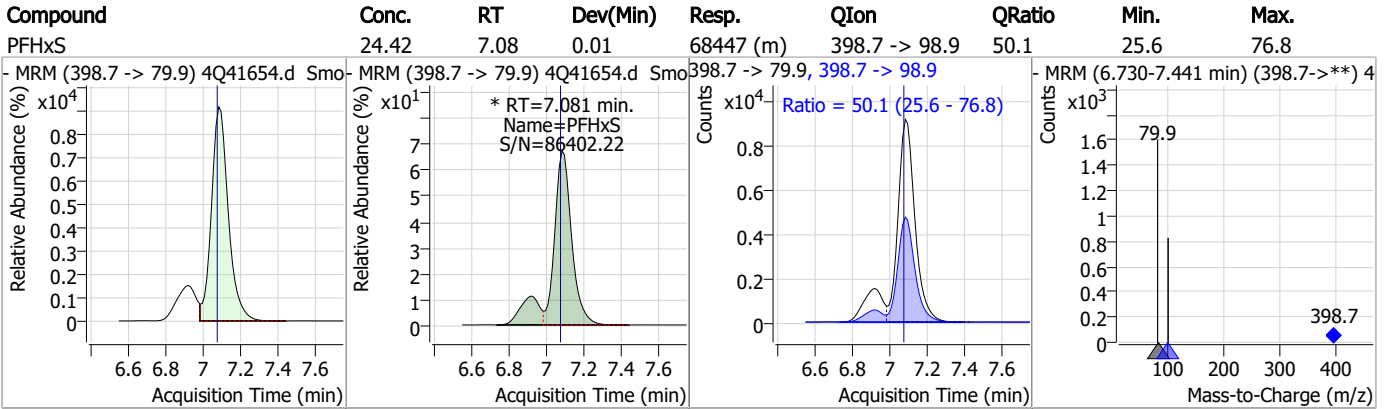
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Perfluorinated Compounds by LC/MS/MS

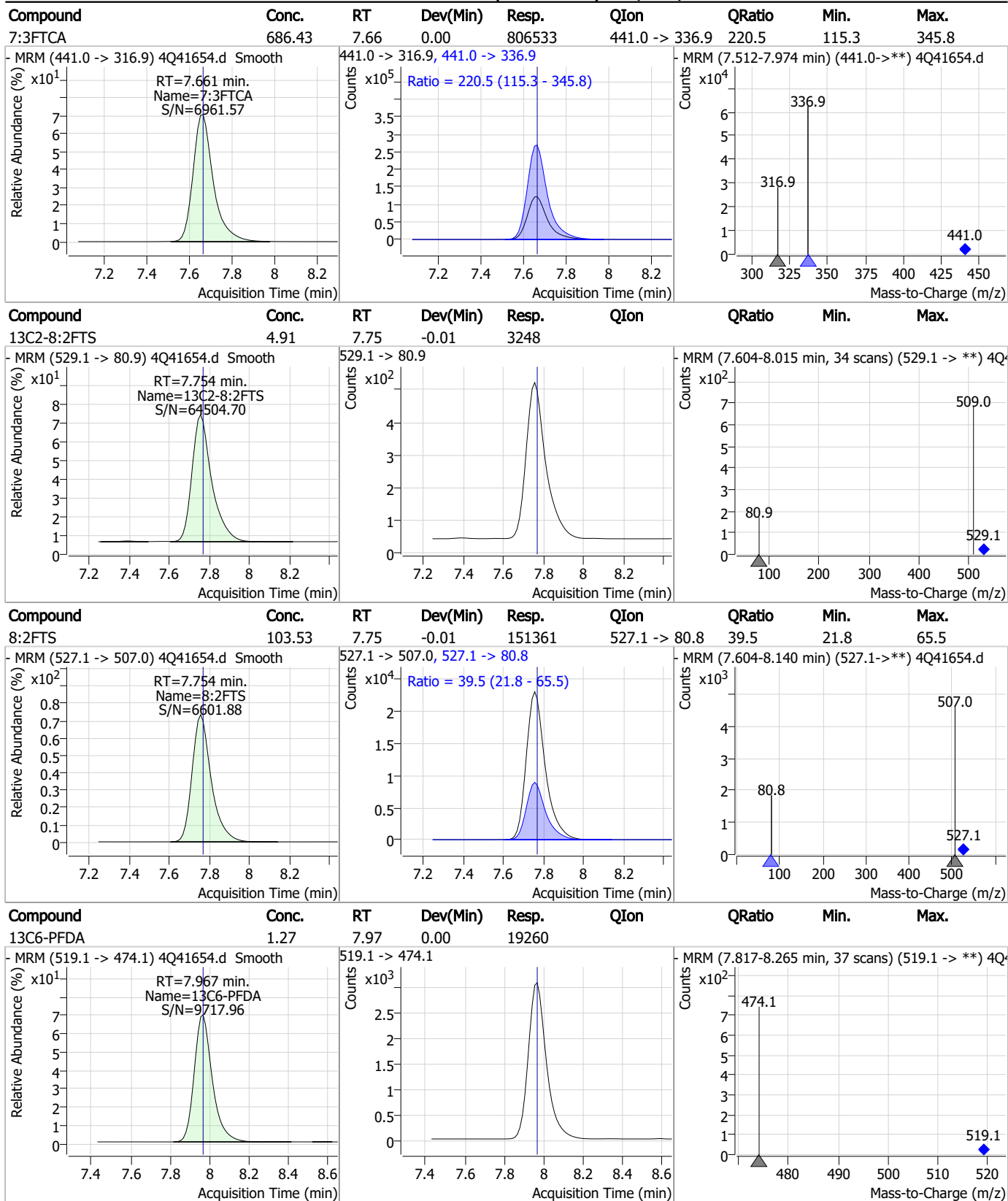


7.7.8
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Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

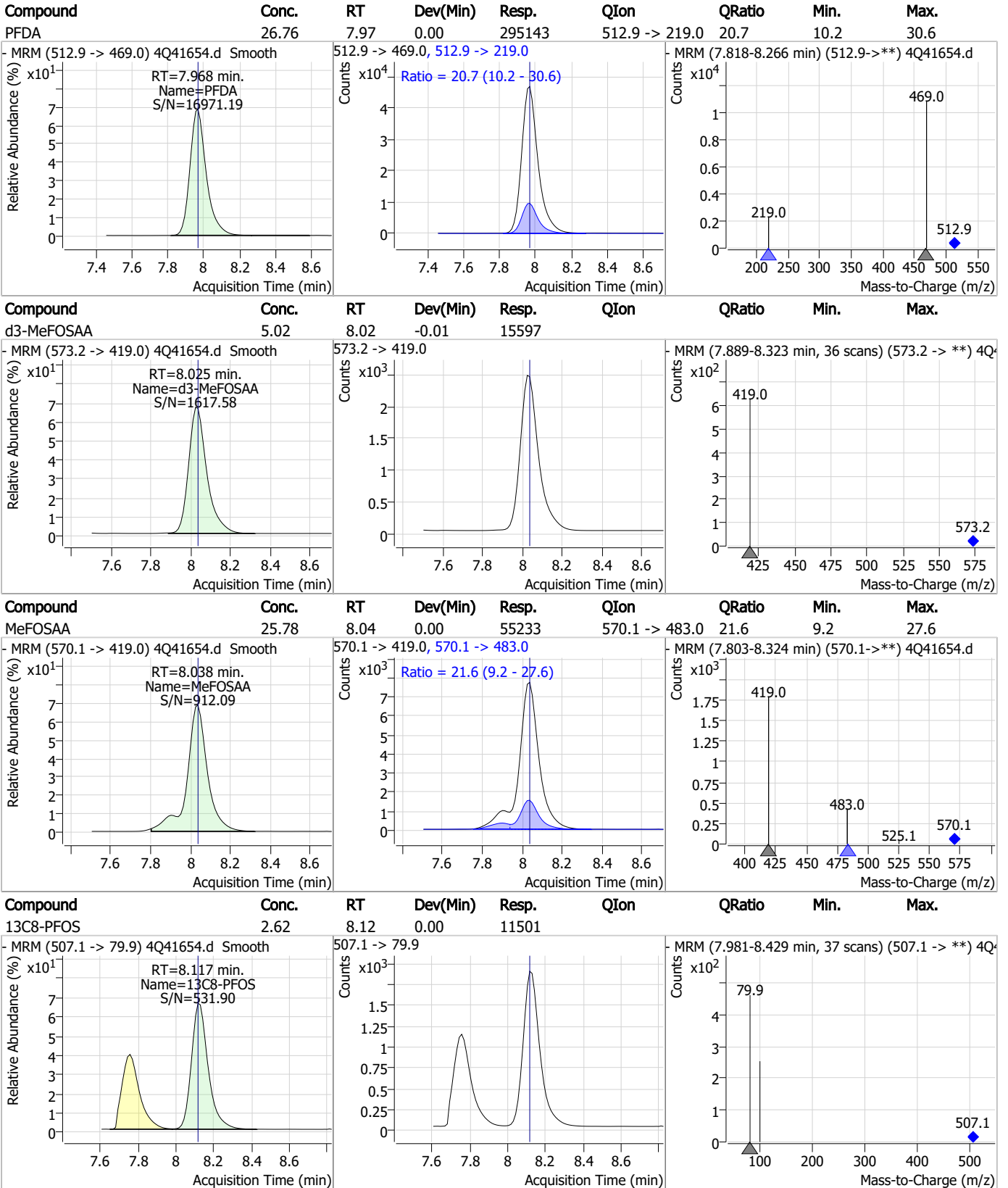


7.7.8

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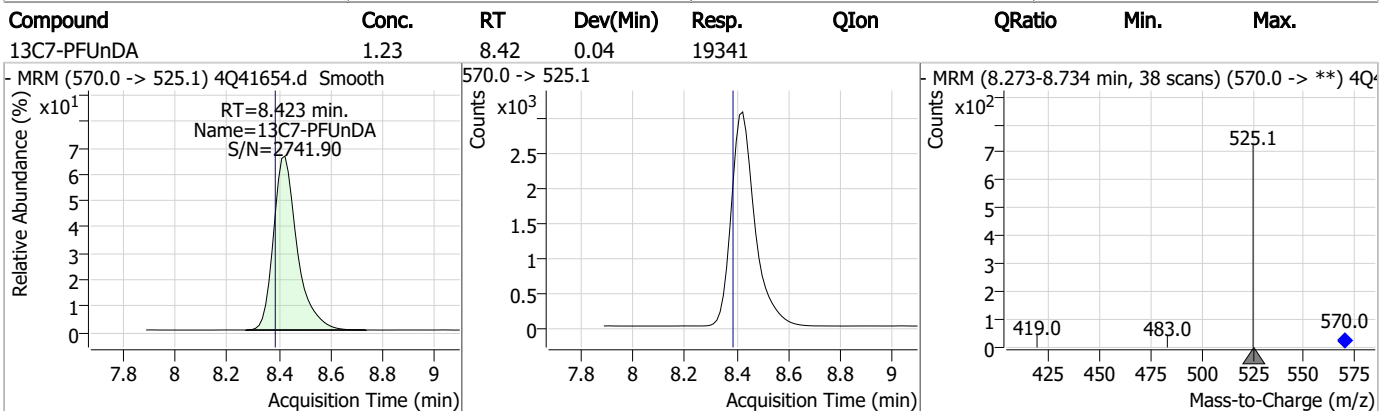
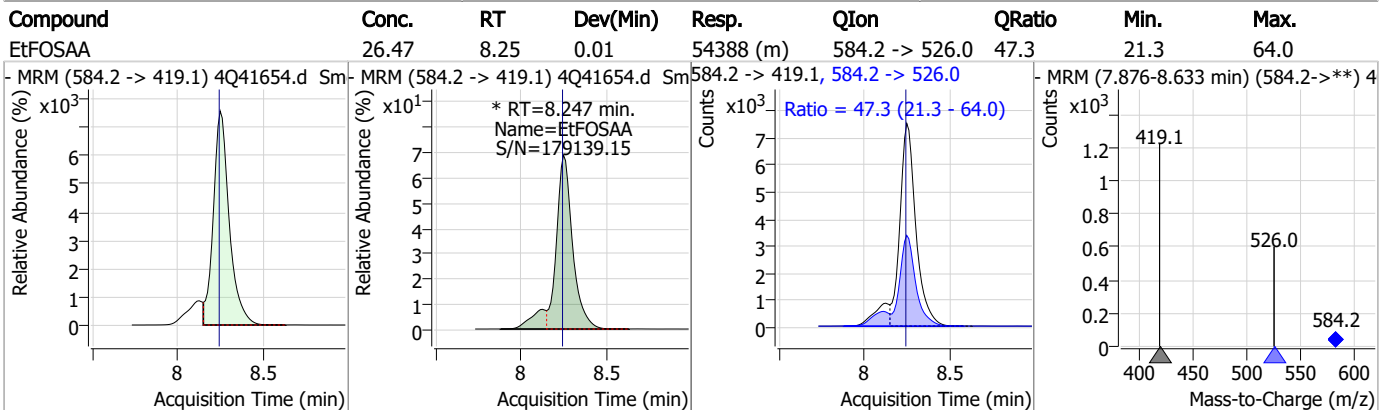
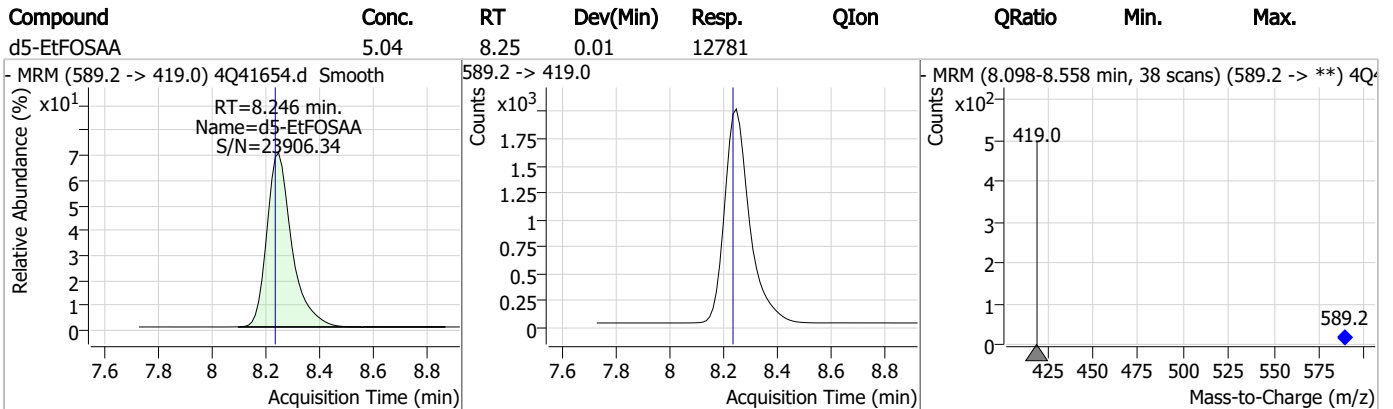
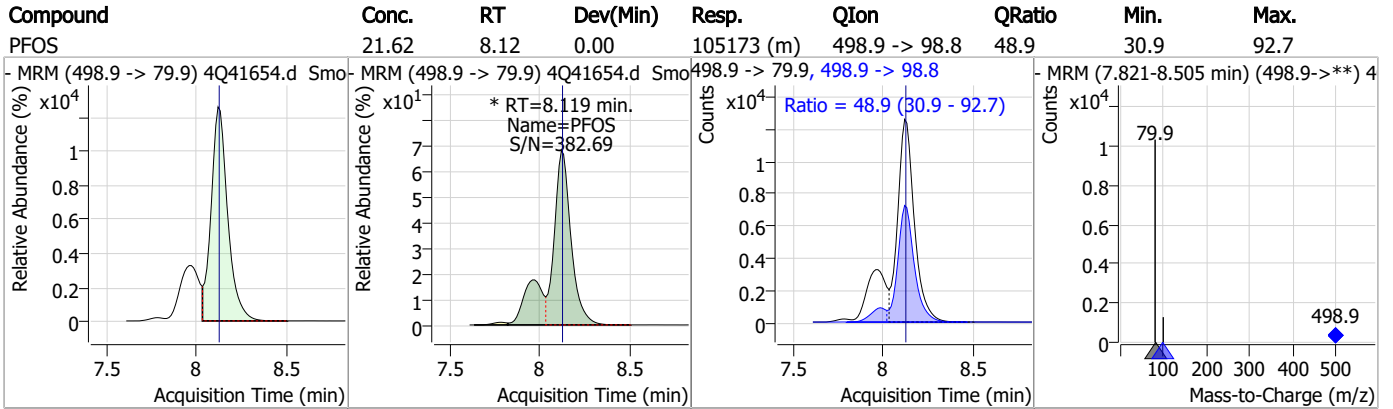
Perfluorinated Compounds by LC/MS/MS



7.7.8

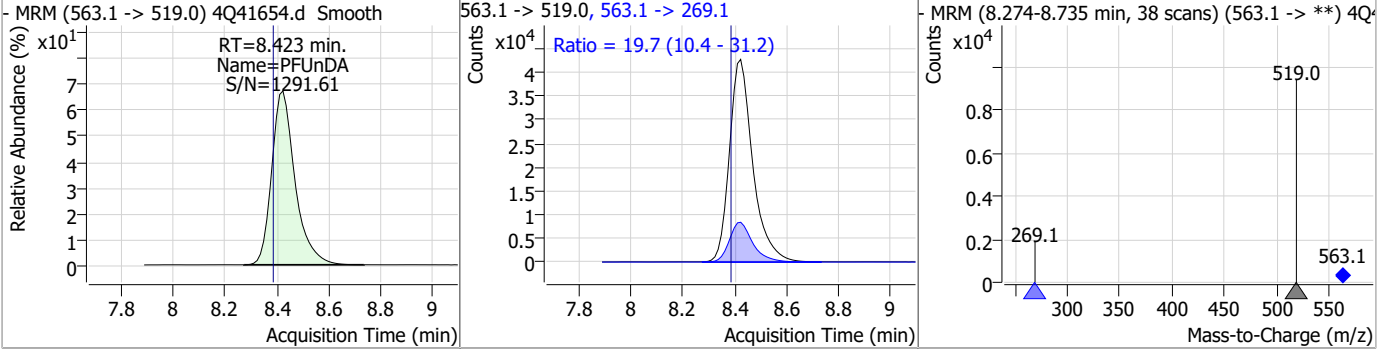
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Perfluorinated Compounds by LC/MS/MS

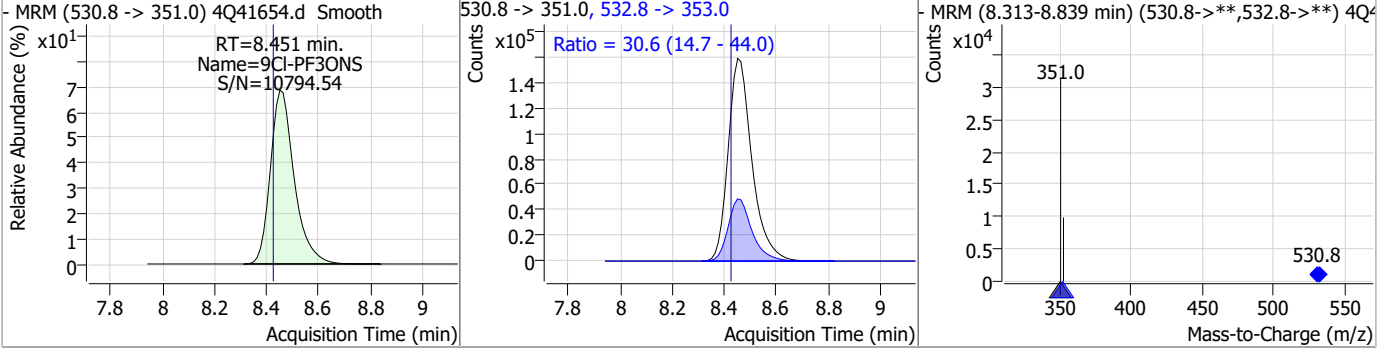


Perfluorinated Compounds by LC/MS/MS

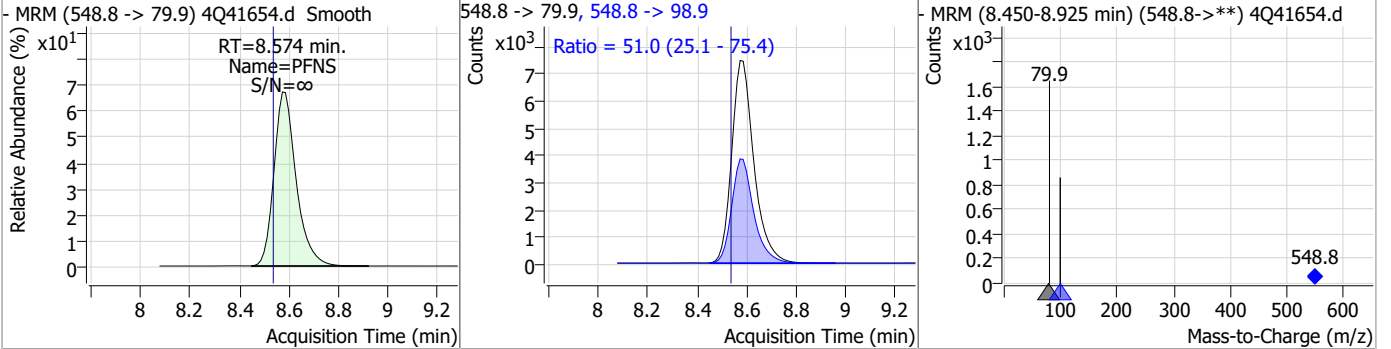
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	26.74	8.42	0.04	265624	563.1 -> 269.1	19.7	10.4	31.2



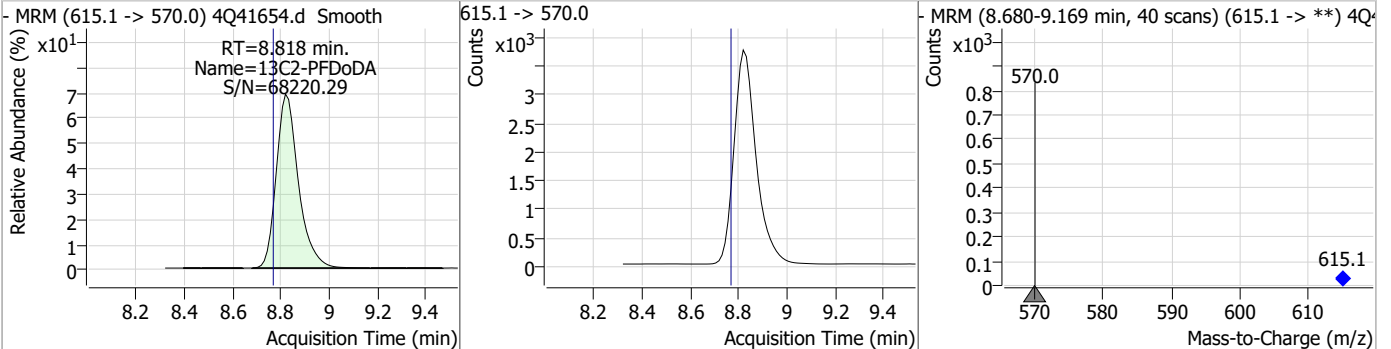
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	100.89	8.45	0.03	1008028	532.8 -> 353.0	30.6	14.7	44.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	25.51	8.57	0.04	46500	548.8 -> 98.9	51.0	25.1	75.4

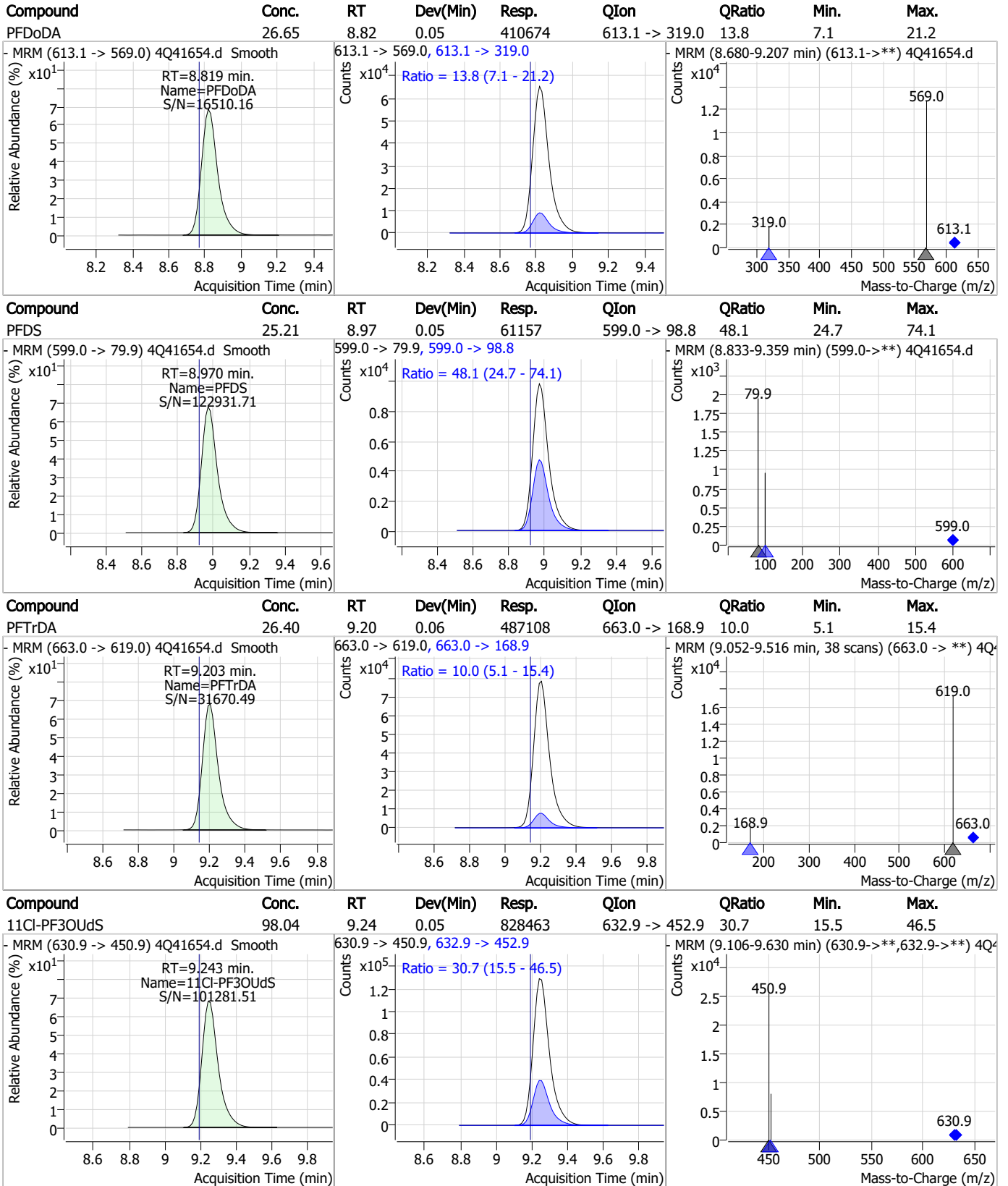


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA	1.26	8.82	0.05	23701	615.1 -> 570.0			



7.7.8
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Perfluorinated Compounds by LC/MS/MS

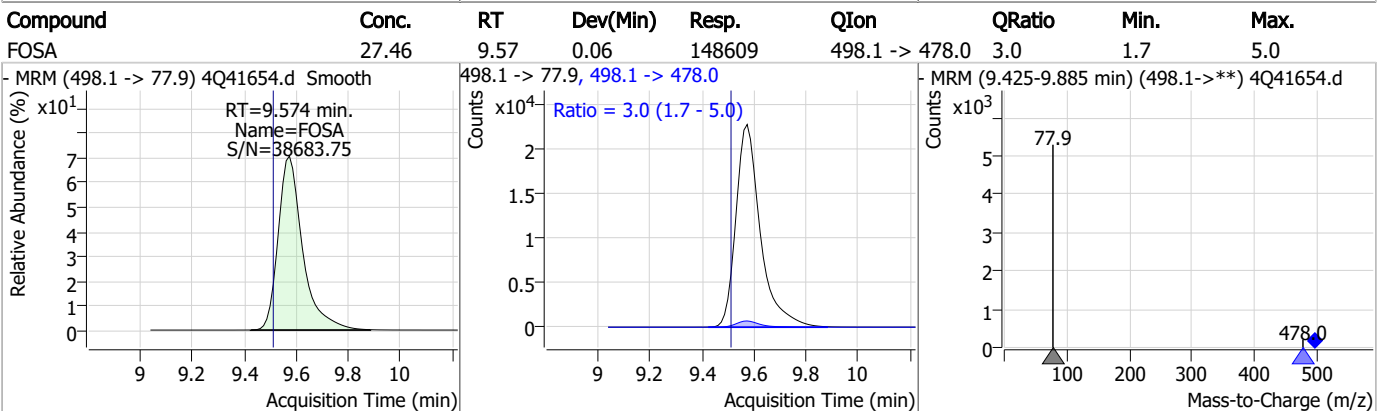
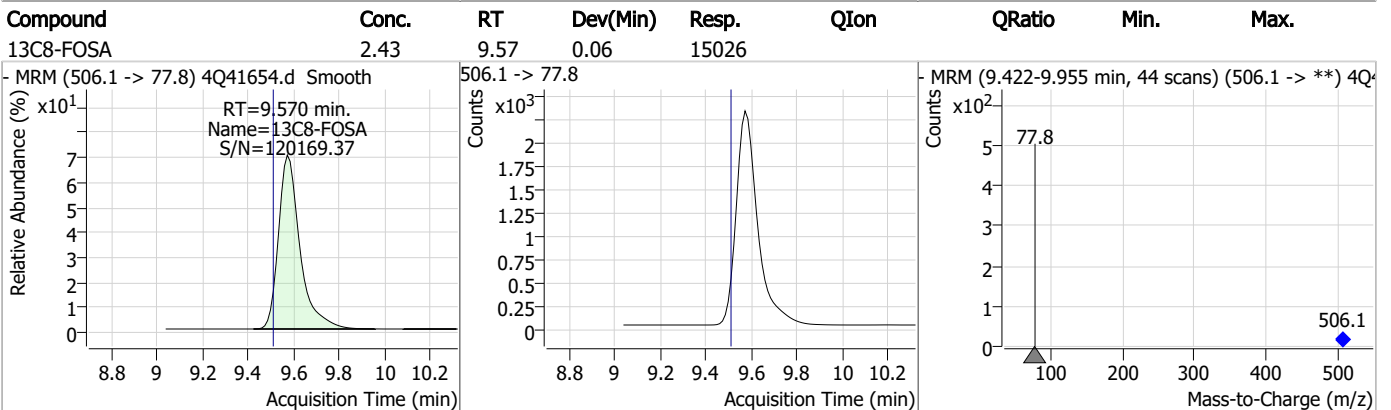
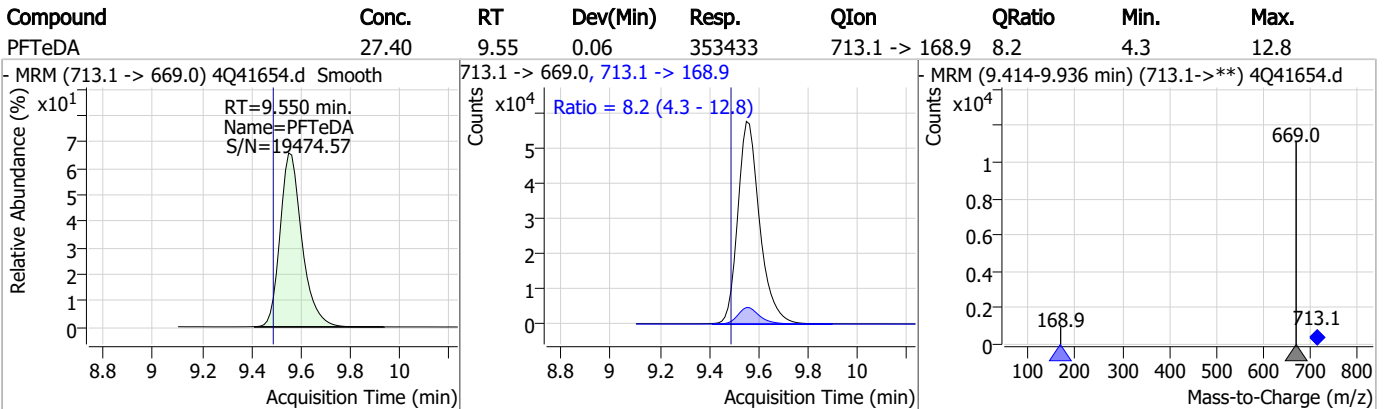
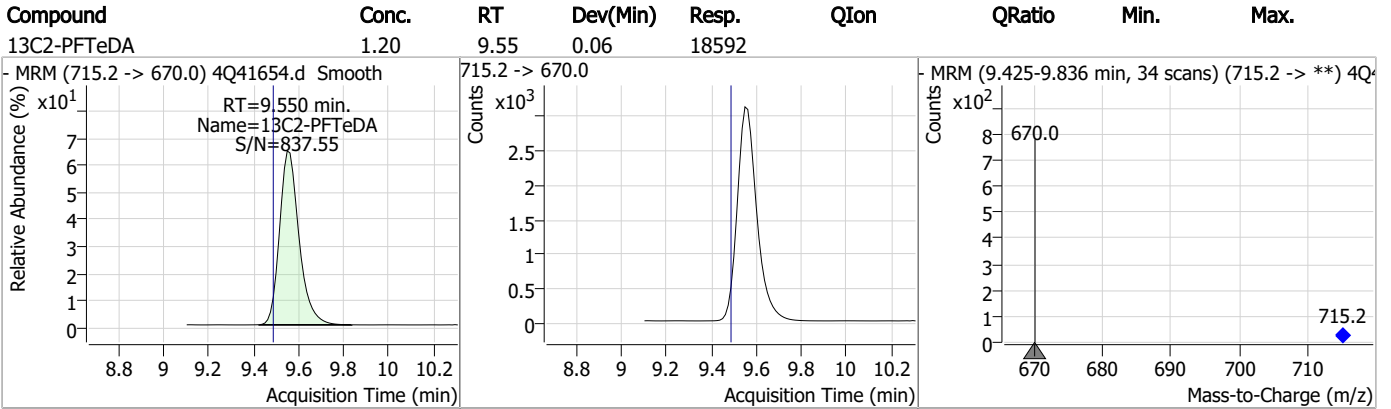


7.7.8

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Perfluorinated Compounds by LC/MS/MS

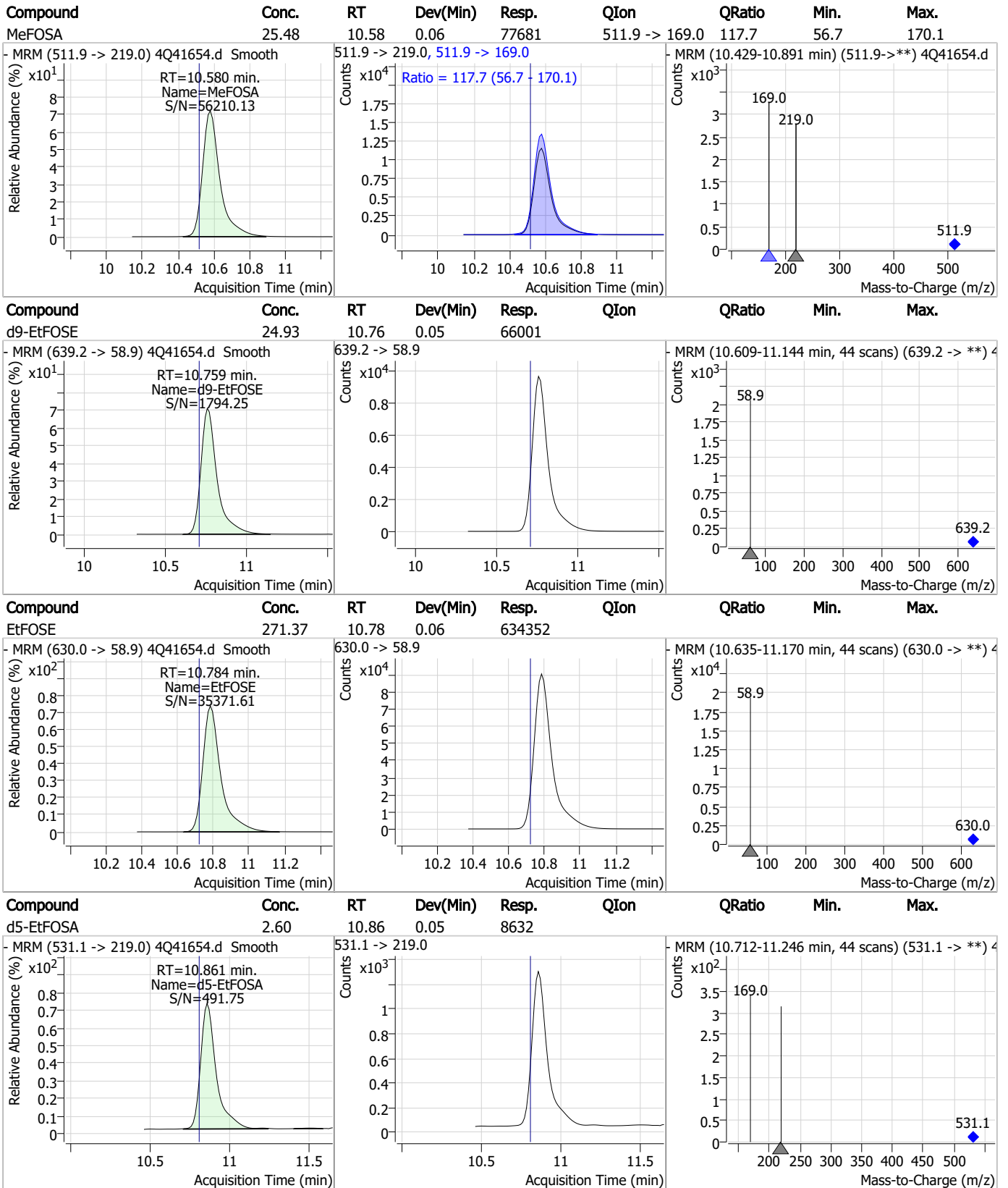


Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	25.89	9.68	0.06	53200	699.1 -> 98.8	54.9	27.7	83.0
- MRM (699.1 -> 79.9) 4Q41654.d Smooth			699.1 -> 79.9, 699.1 -> 98.8		- MRM (9.553-9.985 min) (699.1->**) 4Q41654.d			
d7-MeFOSE	25.03	10.46	0.05	59317				
- MRM (623.2 -> 58.9) 4Q41654.d Smooth			623.2 -> 58.9		- MRM (10.313-10.847 min, 44 scans) (623.2 -> **) 4			
MeFOSE	263.19	10.49	0.06	596069				
- MRM (616.1 -> 58.9) 4Q41654.d Smooth			616.1 -> 58.9		- MRM (10.339-10.873 min, 44 scans) (616.1 -> **) 4			
d3-MeFOSA	2.68	10.58	0.06	8446				
- MRM (515.0 -> 219.0) 4Q41654.d Smooth			515.0 -> 219.0		- MRM (10.427-10.889 min, 38 scans) (515.0 -> **) 4			

7.7.8
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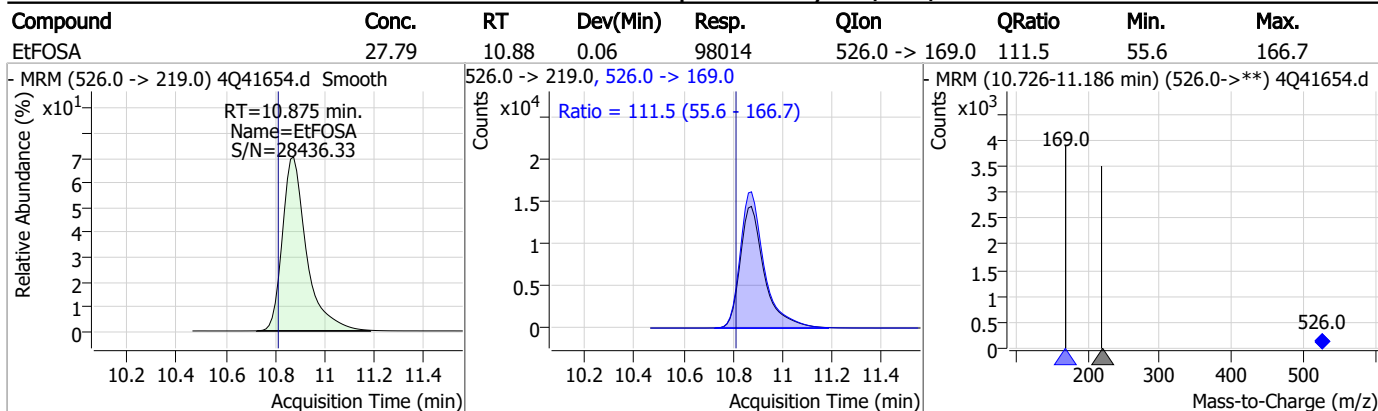
Perfluorinated Compounds by LC/MS/MS



7.7.8

7

Perfluorinated Compounds by LC/MS/MS



7.7.8
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Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41654.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 19:10 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.08	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.12	Split peak
EtFOSAA	2991-50-6		8.25	Split peak

7.7.8.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41655.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 7:24:52 PM
 Sample Name : ic596-8
 Vial : P1-A9
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.189	216.8 -> 171.9	126985	10.00 µg/L	-0.050
M5-PFPeA	4.512	268.3 -> 223.0	75243	5.00 µg/L	-0.062
M5-PFHxA	5.497	318.0 -> 273.0	62067	2.50 µg/L	-0.025
M4-PFHpA	6.342	367.1 -> 322.0	33578	2.50 µg/L	0.000
M8-PFOA	6.975	421.1 -> 376.0	35288	2.50 µg/L	0.026
M9-PFNA	7.483	472.1 -> 427.0	19918	1.25 µg/L	-0.012
M6-PFDA	7.942	519.1 -> 474.1	19059	1.25 µg/L	-0.025
M7-PFUnDA	8.361	570.0 -> 525.1	17346	1.25 µg/L	-0.025
M2-PFDoDA	8.755	615.1 -> 570.0	23070	1.25 µg/L	-0.012
M2-PFTeDA	9.500	715.2 -> 670.0	18761	1.25 µg/L	0.012
M8-FOSA	9.521	506.1 -> 77.8	15511	2.50 µg/L	0.012
M3-PFBS	5.451	302.1 -> 79.9	13585	2.50 µg/L	-0.038
M3-PFHxS	7.092	402.1 -> 79.9	8130	2.50 µg/L	0.027
M8-PFOS	8.093	507.1 -> 79.9	10588	2.50 µg/L	-0.025
M2-4:2FTS	5.223	329.1 -> 80.9	1226	5.00 µg/L	-0.037
M2-6:2FTS	6.761	429.1 -> 80.9	1876	5.00 µg/L	0.037
M2-8:2FTS	7.741	529.1 -> 80.9	2774	5.00 µg/L	-0.025
M3-MeFOSAA	8.000	573.2 -> 419.0	14100	5.00 µg/L	-0.037
M3-HFPO-DA	5.815	286.9 -> 168.9	28387	10.00 µg/L	-0.012
M5-EtFOSAA	8.197	589.2 -> 419.0	10781	5.00 µg/L	-0.037
M7-MeFOSE	10.425	623.2 -> 58.9	53269	25.00 µg/L	0.012
M9-EtFOSE	10.721	639.2 -> 58.9	62078	25.00 µg/L	0.012
M5-EtFOSA	10.824	531.1 -> 219.0	8919	2.50 µg/L	0.012
M3-MeFOSA	10.541	515.0 -> 219.0	8575	2.50 µg/L	0.025
13C4-PFOS	8.093	502.8 -> 79.9	10725	2.50 µg/L	-0.025
13C3-PFBA	3.193	216.0 -> 172.0	74045	5.00 µg/L	-0.050
18O2-PFHxS	7.091	403.0 -> 83.9	6274	2.50 µg/L	0.027
13C4-PFOA	6.976	417.1 -> 372.0	42367	2.50 µg/L	0.026
13C2-PFDA	7.943	515.1 -> 470.1	17059	1.25 µg/L	-0.025
13C5-PFNA	7.484	468.0 -> 423.0	22475	1.25 µg/L	-0.012
13C2-PFHxA	5.498	315.1 -> 270.0	57358	2.50 µg/L	-0.025
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1226	3.60 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 72.1%		
13C2-6:2FTS	6.761	429.1 -> 80.9	1876	3.89 µg/L	0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 77.8%		
13C2-8:2FTS	7.741	529.1 -> 80.9	2774	3.70 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 73.9%		
13C2-PFDoDA	8.755	615.1 -> 570.0	23070	1.28 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 102.3%		
13C2-PFTeDA	9.500	715.2 -> 670.0	18761	1.26 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.8%		
13C3-PFBS	5.451	302.1 -> 79.9	13585	2.33 µg/L	-0.038
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 93.1%		
13C3-PFHxS	7.092	402.1 -> 79.9	8130	2.38 µg/L	0.027

7.7.9
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 95.3%	
13C4-PFBA	3.189	216.8 -> 171.9	126985	9.98 µg/L	-0.050
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 99.8%	
13C4-PFHpA	6.342	367.1 -> 322.0	33578	2.47 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.7%	
13C5-PFHxA	5.497	318.0 -> 273.0	62067	2.49 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.7%	
13C5-PFPeA	4.512	268.3 -> 223.0	75243	4.81 µg/L	-0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 96.1%	
13C6-PFDA	7.942	519.1 -> 474.1	19059	1.30 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 104.3%	
13C7-PFUnDA	8.361	570.0 -> 525.1	17346	1.15 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 91.7%	
13C8-FOSA	9.521	506.1 -> 77.8	15511	2.60 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 104.0%	
13C8-PFOA	6.975	421.1 -> 376.0	35288	2.52 µg/L	0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.7%	
13C8-PFOS	8.093	507.1 -> 79.9	10588	2.51 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.2%	
13C9-PFNA	7.483	472.1 -> 427.0	19918	1.27 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 101.4%	
d3-MeFOSAA	8.000	573.2 -> 419.0	14100	4.71 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 94.1%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	28387	9.77 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 97.7%	
d3-MeFOSA	10.541	515.0 -> 219.0	8575	2.82 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 112.9%	
d5-EtFOSAA	8.197	589.2 -> 419.0	10781	4.41 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 88.2%	
d7-MeFOSE	10.425	623.2 -> 58.9	53269	23.32 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 93.3%	
d9-EtFOSE	10.721	639.2 -> 58.9	62078	24.32 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 97.3%	
d5-EtFOSA	10.824	531.1 -> 219.0	8919	2.78 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 111.3%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	400988	240.09 µg/L	94
		327.1 -> 80.9	165796		
6:2FTS	6.762	427.1 -> 407.0	274488	202.13 µg/L	98
		427.1 -> 80.9	116604		
8:2FTS	7.742	527.1 -> 507.0	299008	239.43 µg/L	94
		527.1 -> 80.8	118387		
EtFOSAA	8.210	584.2 -> 419.1	123248	71.10 µg/L	m 94
		584.2 -> 526.0	56961		
FOSA	9.524	498.1 -> 77.9	365601	65.45 µg/L	98
		498.1 -> 478.0	9599		
MeFOSAA	8.001	570.1 -> 419.0	133402	68.87 µg/L	m 96
		570.1 -> 483.0	26911		
PFBA	3.196	212.8 -> 168.9	723613	264.63 µg/L	100
PFBS	5.452	298.7 -> 79.9	279179	57.44 µg/L	98
		298.7 -> 98.8	108934		
PFDA	7.943	512.9 -> 469.0	692511	63.45 µg/L	99
		512.9 -> 219.0	138551		
PFDoDA	8.756	613.1 -> 569.0	965675	64.39 µg/L	100
		613.1 -> 319.0	139088		
PFDS	8.908	599.0 -> 79.9	142347	63.74 µg/L	98

7.7.9
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	68587			
PFHpA	6.355	363.1 -> 319.0	1115851	65.90	µg/L	99
		363.1 -> 169.0	195230			
PFHpS	7.611	449.0 -> 79.9	172232	59.53	µg/L	98
		449.0 -> 98.9	89738			
PFHxA	5.500	313.0 -> 269.0	1202419	63.38	µg/L	100
		313.0 -> 118.9	35921			
PFHxS	7.093	398.7 -> 79.9	173942	58.67	µg/L	m 98
		398.7 -> 98.9	86093			
PFNA	7.484	463.0 -> 419.0	706479	67.13	µg/L	98
		463.0 -> 219.0	180459			
PFNS	8.525	548.8 -> 79.9	112527	67.06	µg/L	99
		548.8 -> 98.9	56209			
PFOA	6.977	413.0 -> 369.0	1042252	65.18	µg/L	99
		413.0 -> 169.0	212312			
PFOS	8.094	498.9 -> 79.9	241845	54.01	µg/L	m 83
		498.9 -> 98.8	117561			
PFPeA	4.514	263.0 -> 219.0	1877225	130.12	µg/L	100
PFPeS	6.407	349.1 -> 79.9	166314	60.84	µg/L	99
		349.1 -> 98.9	72275			
PFTeDA	9.501	713.1 -> 669.0	846154	65.01	µg/L	100
		713.1 -> 168.9	70586			
PFTrDA	9.141	663.0 -> 619.0	1092631	60.83	µg/L	99
		663.0 -> 168.9	107923			
PFUnDA	8.361	563.1 -> 519.0	583161	65.46	µg/L	98
		563.1 -> 269.1	116172			
11Cl-PF3OUdS	9.193	630.9 -> 450.9	1690634	208.92	µg/L	100
		632.9 -> 452.9	526044			
9Cl-PF3ONS	8.400	530.8 -> 351.0	2161061	225.85	µg/L	97
		532.8 -> 353.0	667039			
ADONA	6.606	376.9 -> 250.9	4486970	240.61	µg/L	100
		376.9 -> 84.8	1199601			
HFPO-DA	5.816	284.9 -> 168.9	581137	260.08	µg/L	99
		284.9 -> 184.9	67808			
3:3FTCA	4.192	241.0 -> 177.0	285033	366.12	µg/L	100
		241.0 -> 117.0	25200			
5:3FTCA	6.308	341.0 -> 237.1	4749443	1510.83	µg/L	100
		341.0 -> 217.0	3329386			
7:3FTCA	7.649	441.0 -> 316.9	1746606	1492.08	µg/L	95
		441.0 -> 336.9	3891874			
EtFOSA	10.838	526.0 -> 219.0	238287	65.39	µg/L	100
		526.0 -> 169.0	263734			
EtFOSE	10.747	630.0 -> 58.9	1358835	618.03	µg/L	100
MeFOSA	10.542	511.9 -> 219.0	189968	61.39	µg/L	97
		511.9 -> 169.0	220864			
MeFOSE	10.451	616.1 -> 58.9	1301914	640.12	µg/L	100
PFDoS	9.627	699.1 -> 79.9	120114	63.48	µg/L	99
		699.1 -> 98.8	66990			
NFDHA	5.403	295.0 -> 201.0	69765	108.17	µg/L	97
		295.0 -> 84.9	17771			
PFMBA	4.842	279.0 -> 85.1	1091355	134.95	µg/L	100
PFMPA	3.794	229.0 -> 84.9	964353	138.63	µg/L	100
PFEESA	5.921	314.8 -> 134.9	1705744	118.89	µg/L	99
		314.8 -> 82.9	59295			

= Qualifier out of range, m = manually integrated, + = Area summed

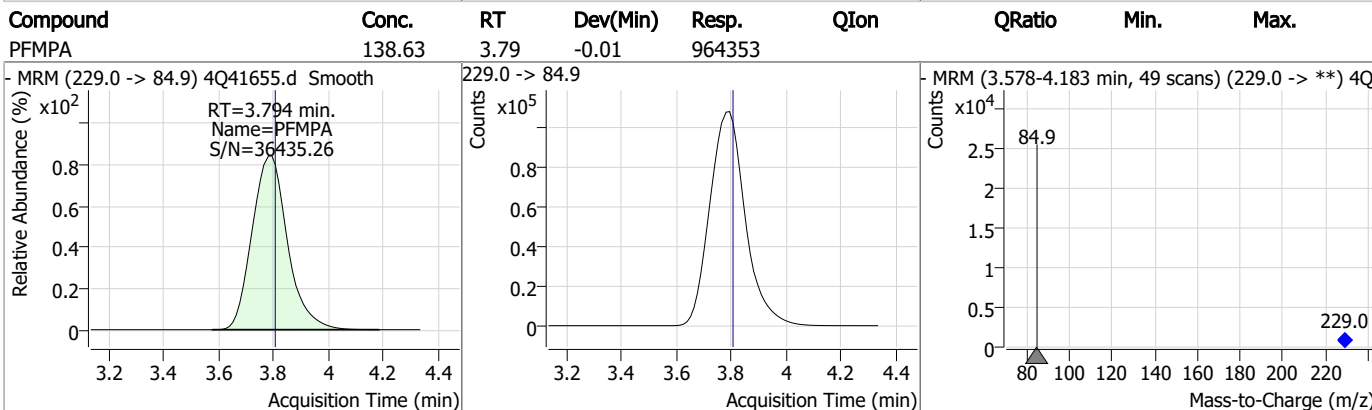
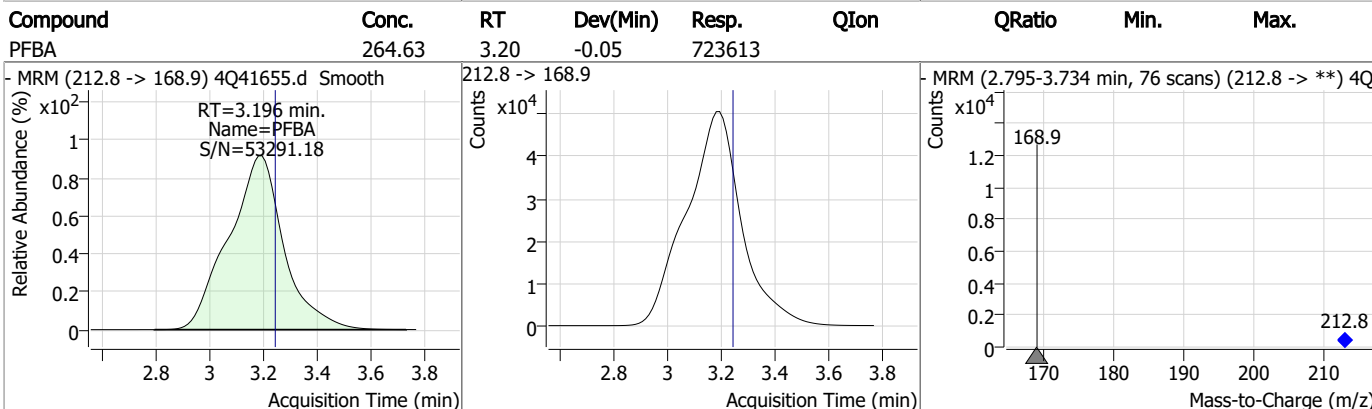
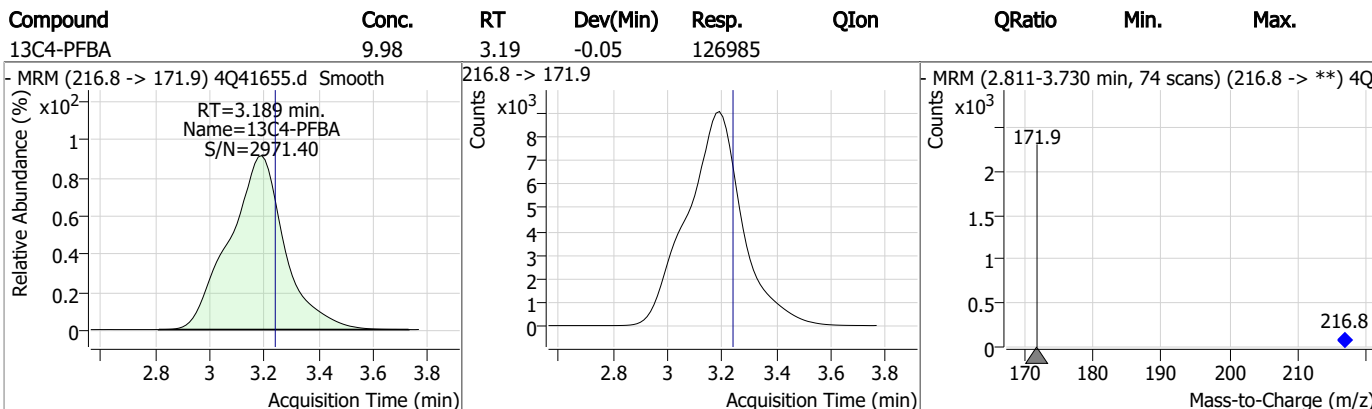
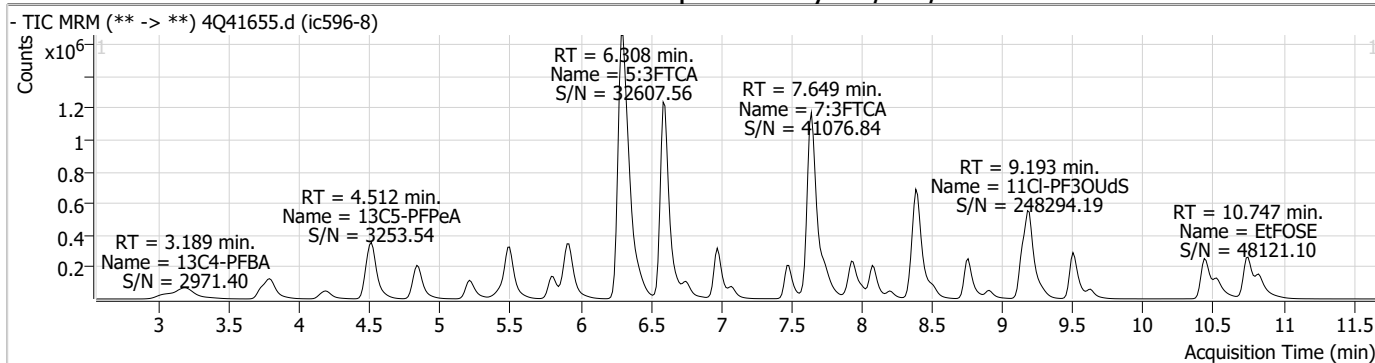
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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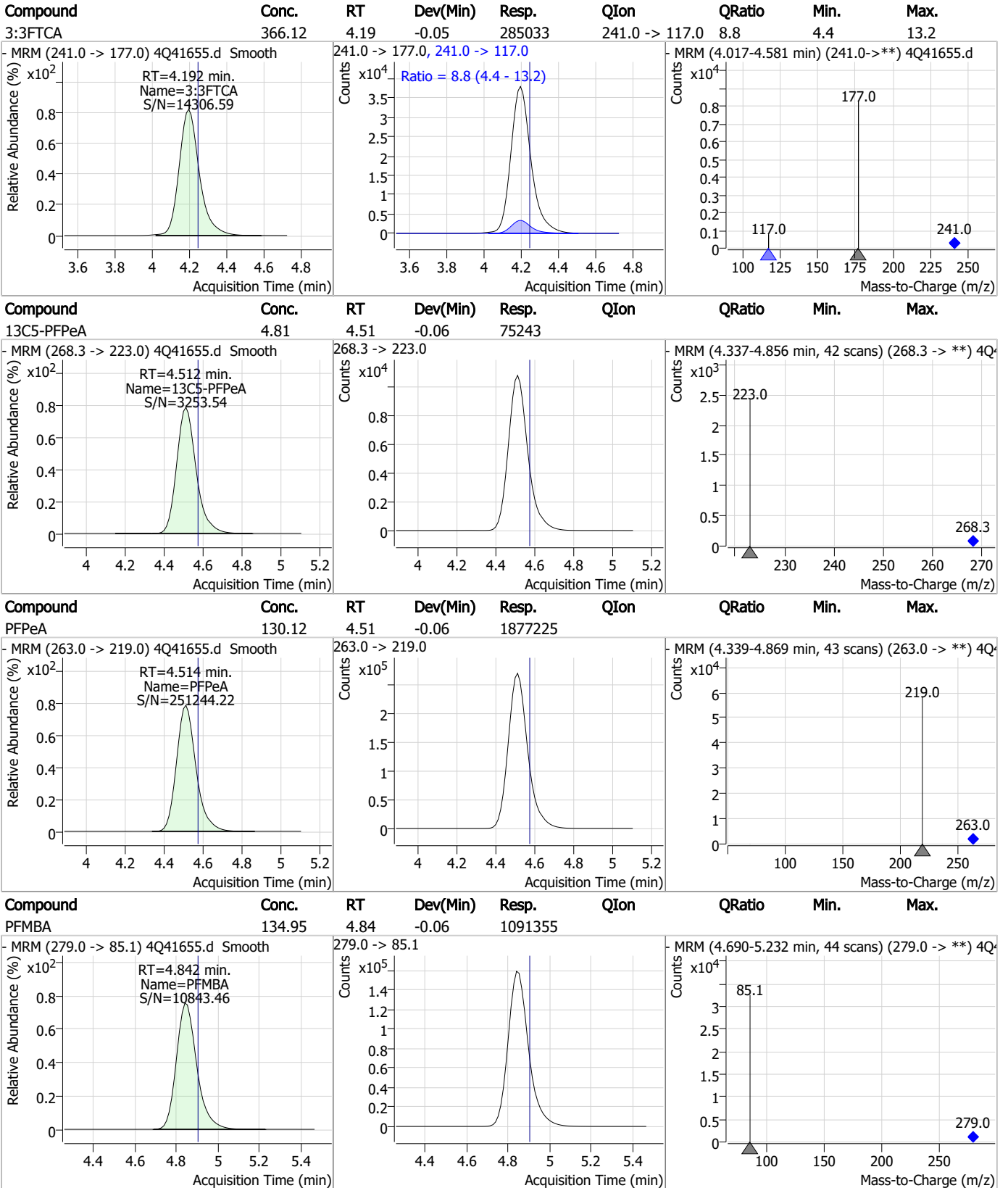
7.7.9

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Perfluorinated Compounds by LC/MS/MS



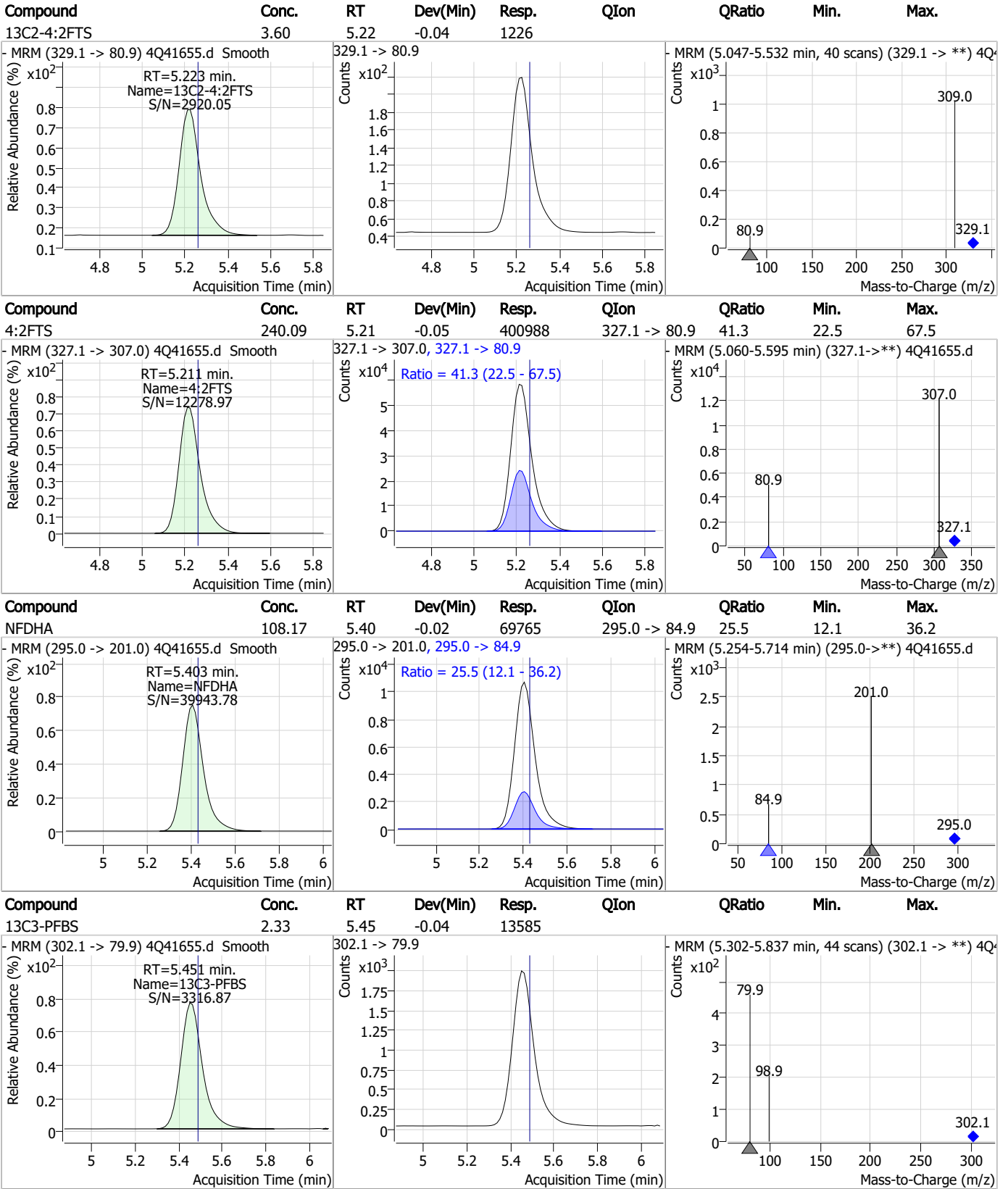
Perfluorinated Compounds by LC/MS/MS



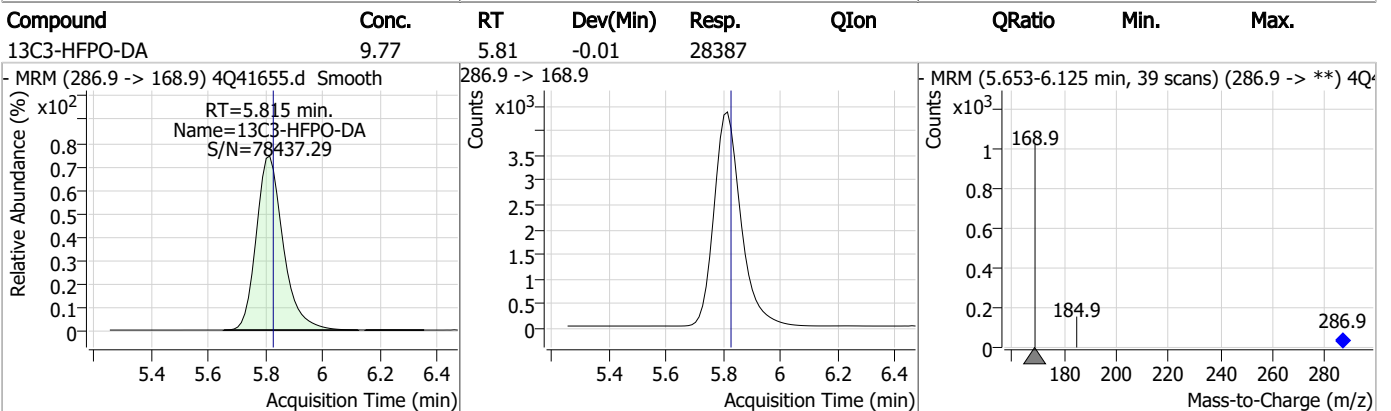
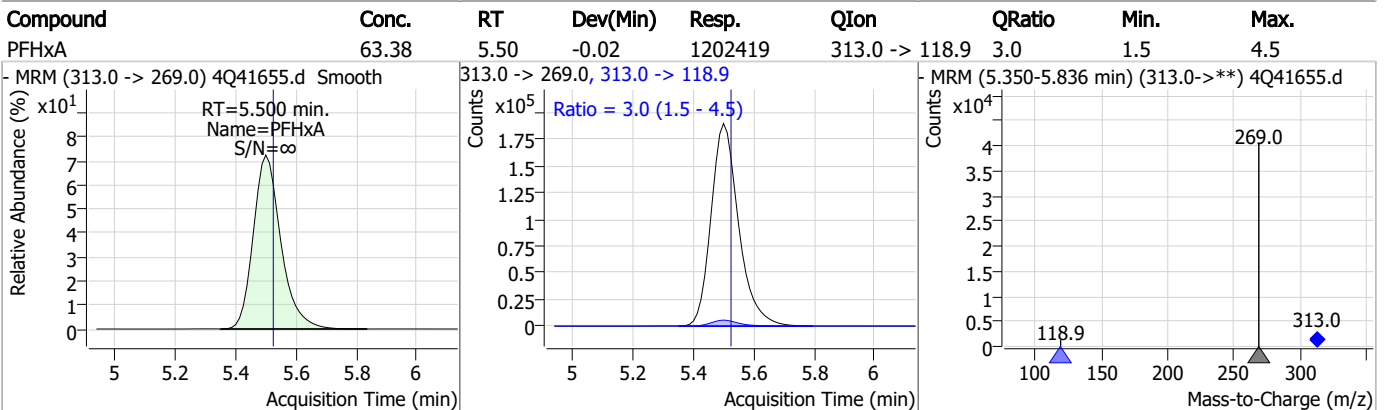
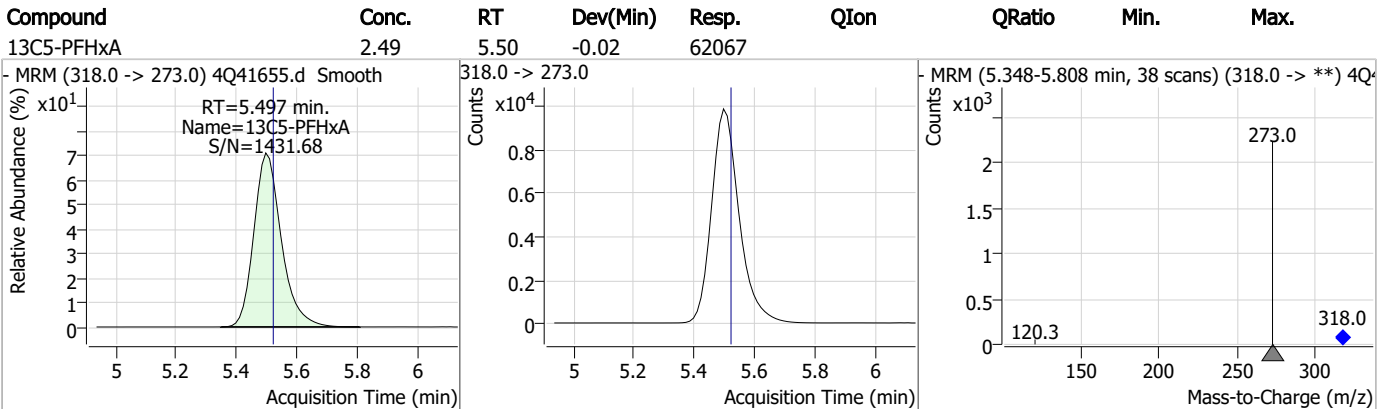
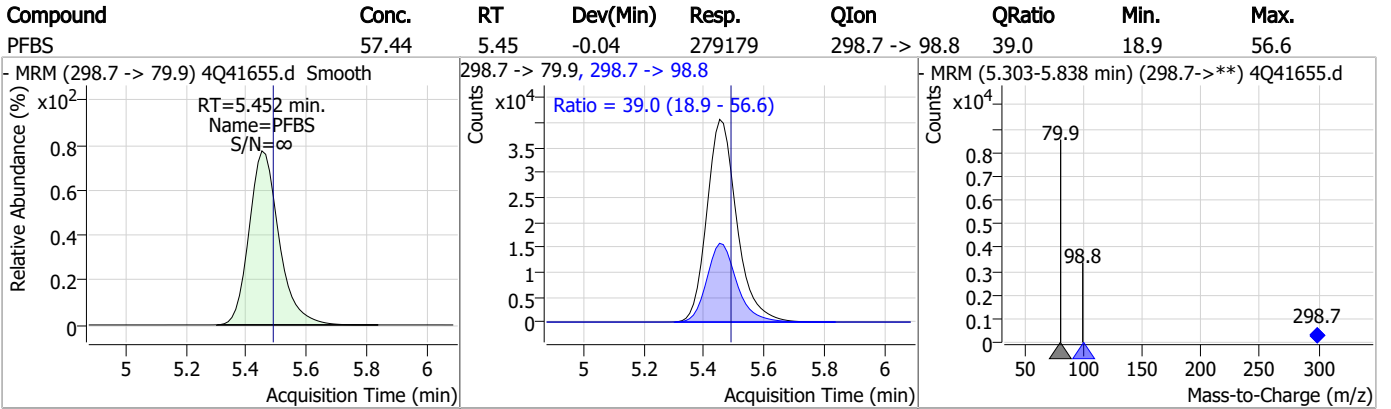
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Perfluorinated Compounds by LC/MS/MS



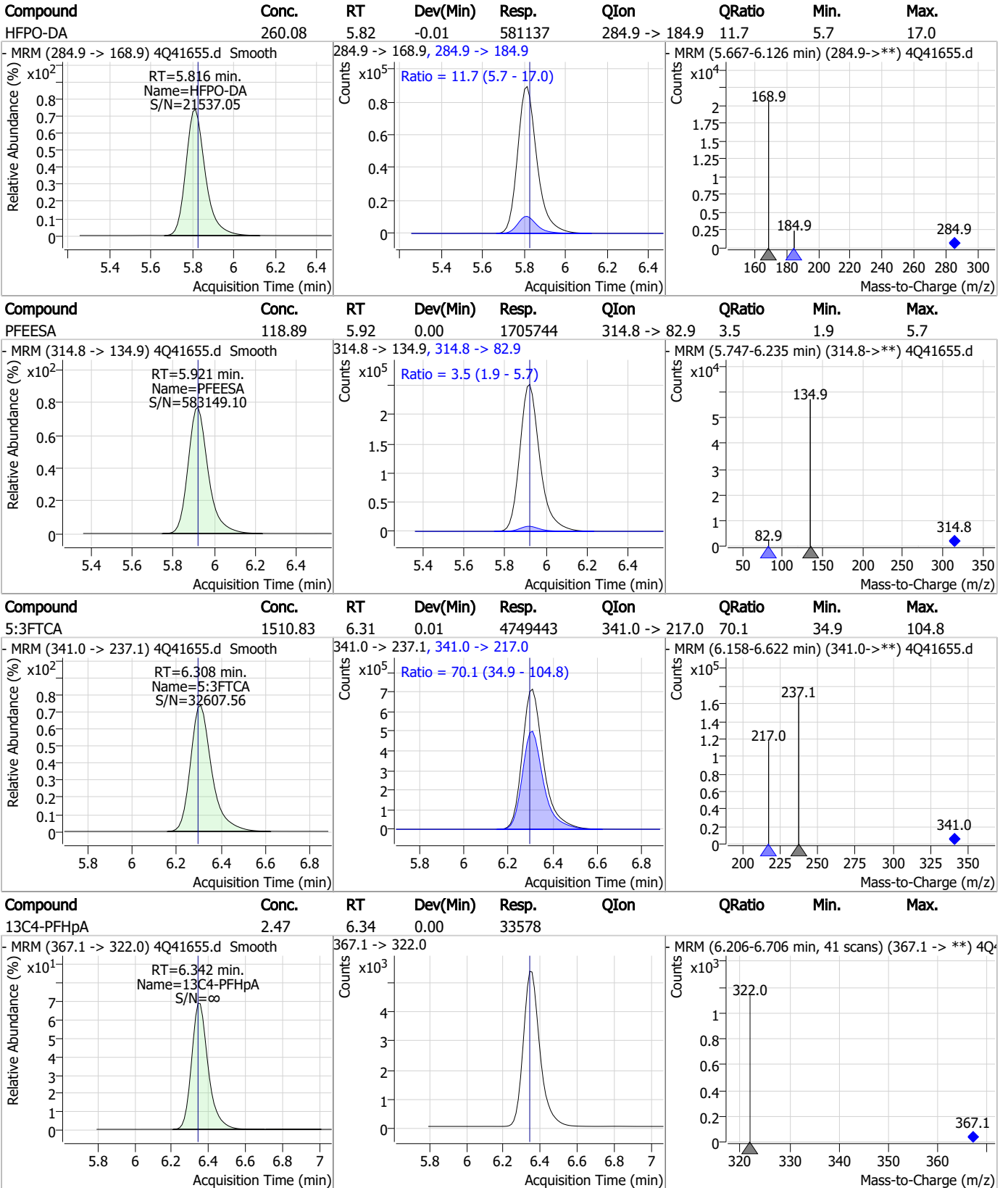
Perfluorinated Compounds by LC/MS/MS



7.7.9

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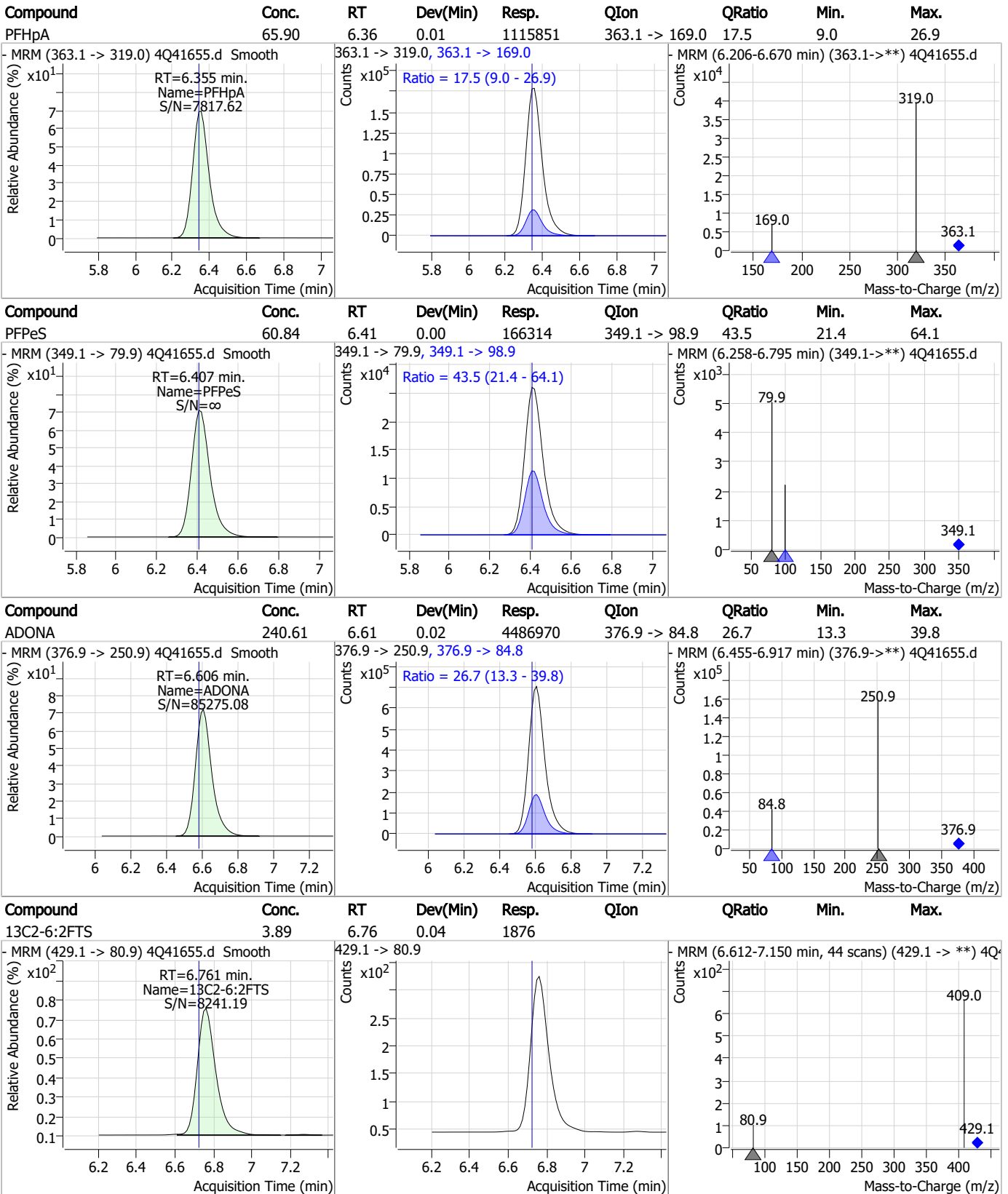
Perfluorinated Compounds by LC/MS/MS



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Perfluorinated Compounds by LC/MS/MS

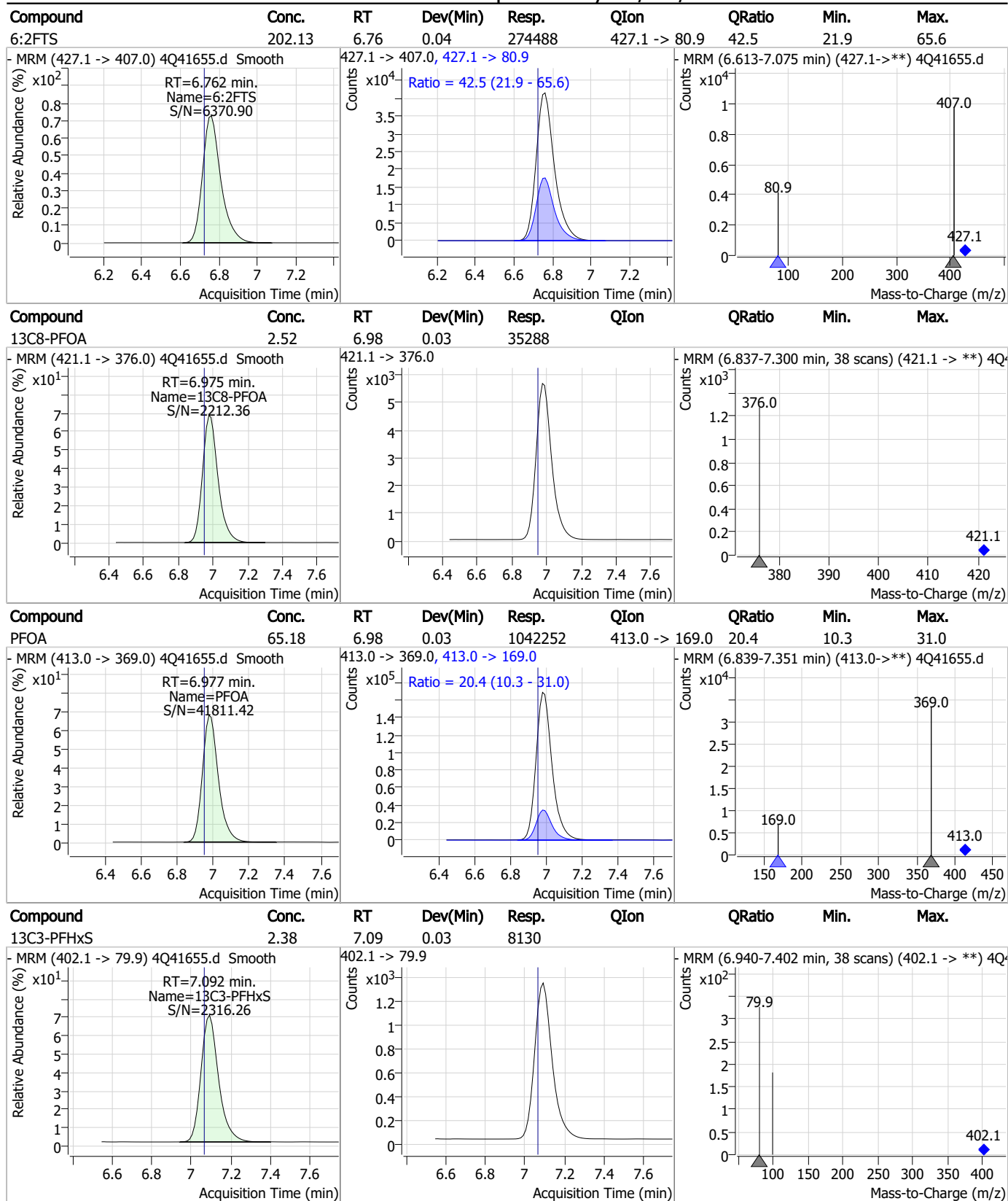


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Perfluorinated Compounds by LC/MS/MS

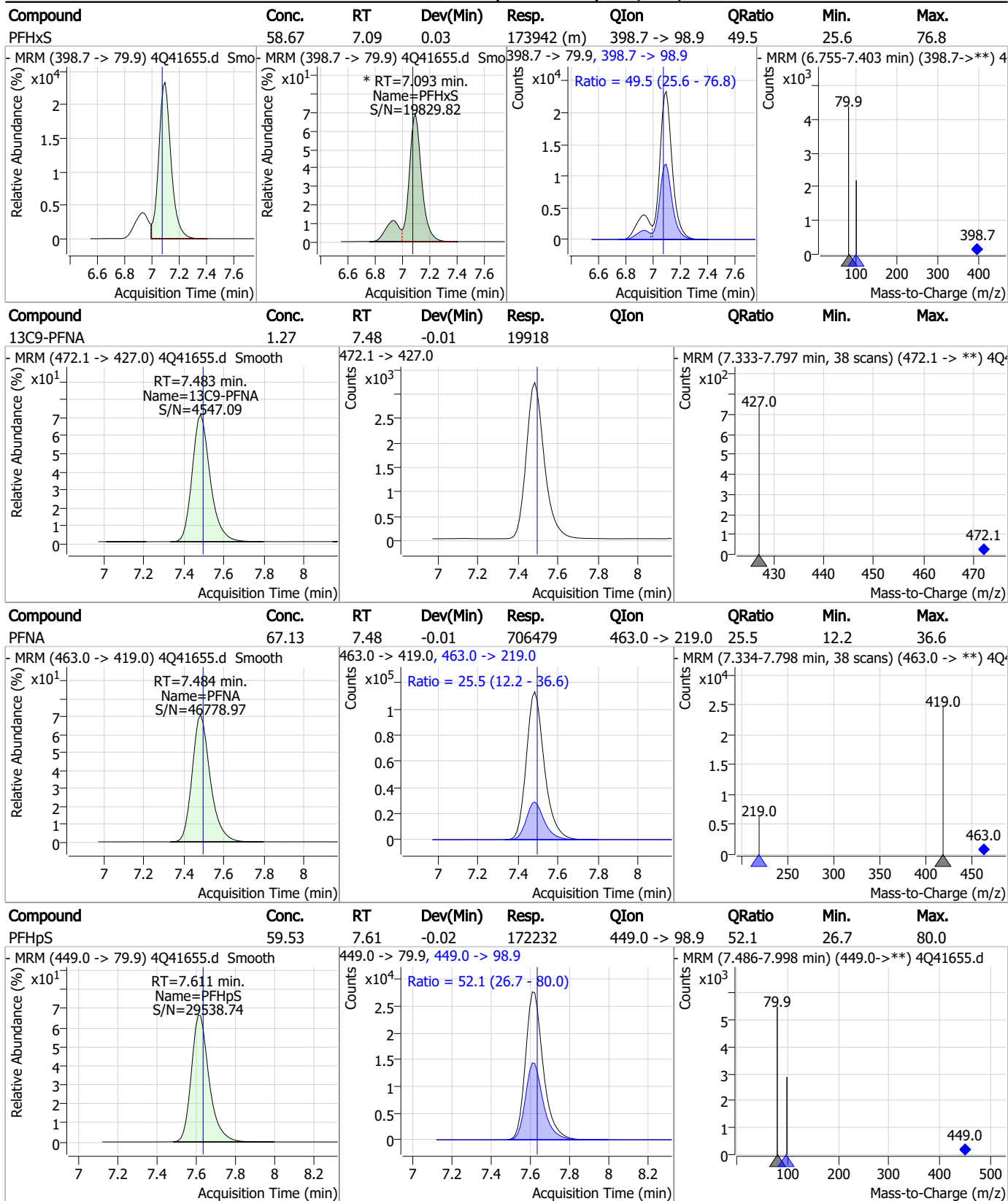


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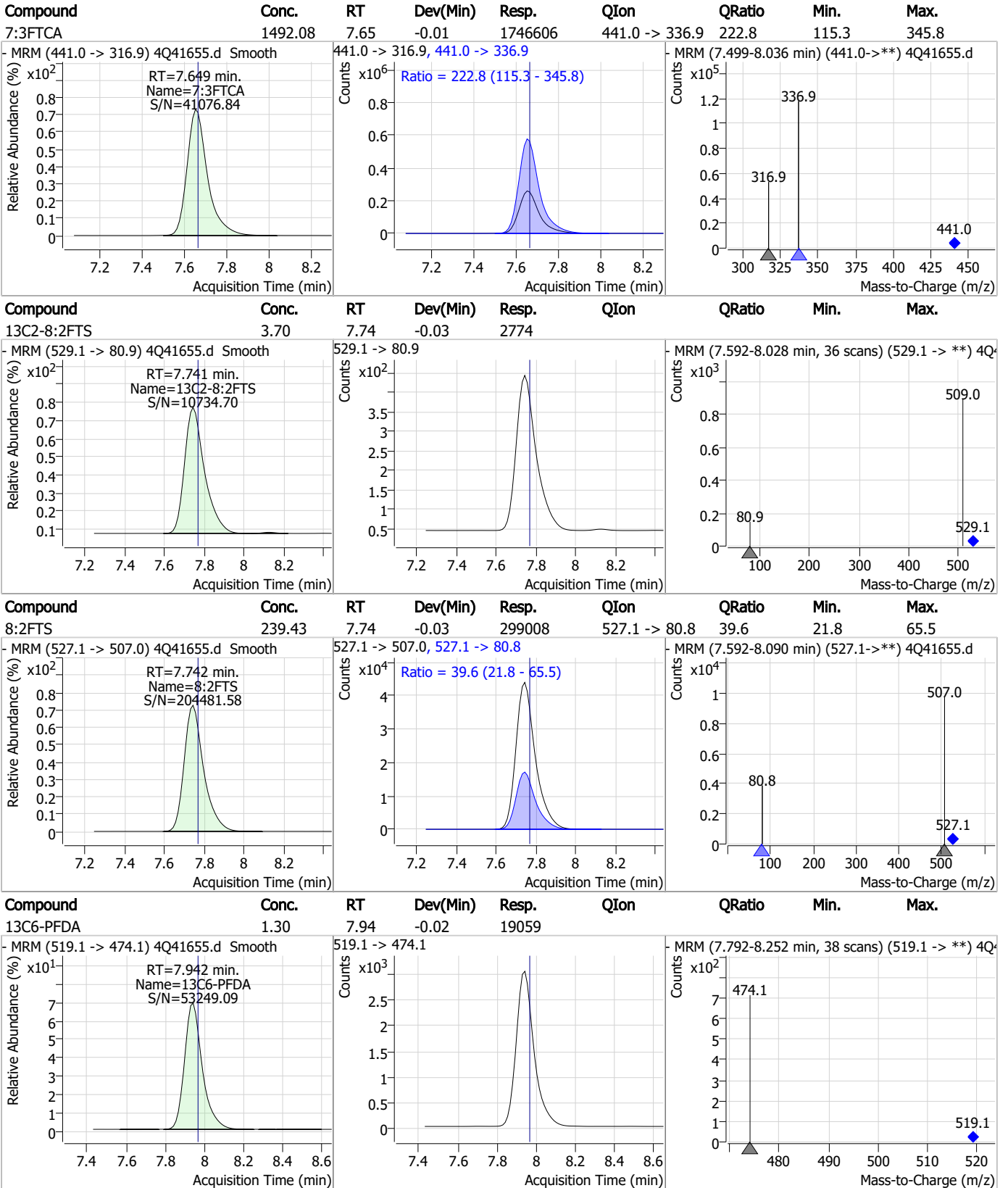


Perfluorinated Compounds by LC/MS/MS



7.7.9
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Perfluorinated Compounds by LC/MS/MS

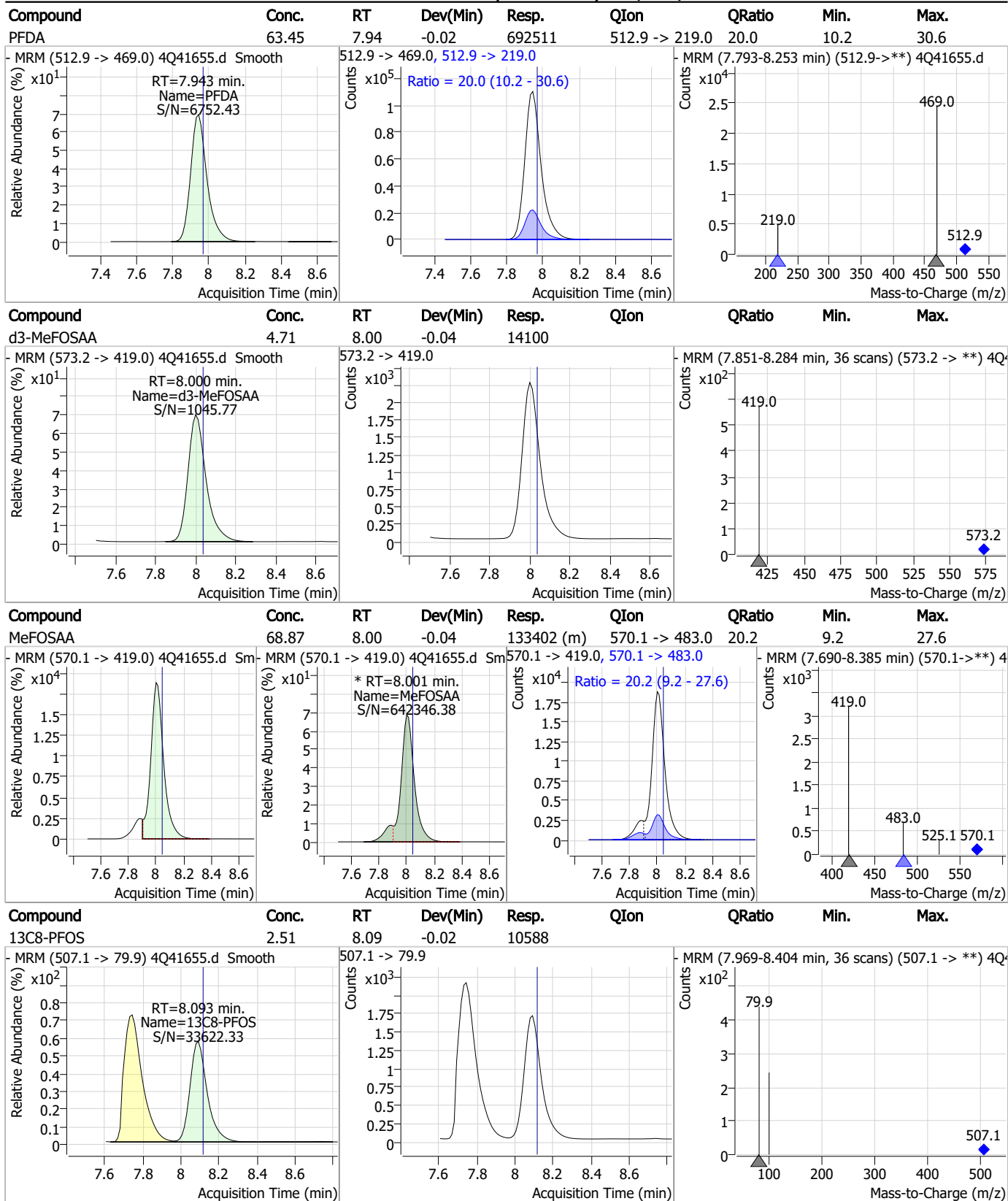


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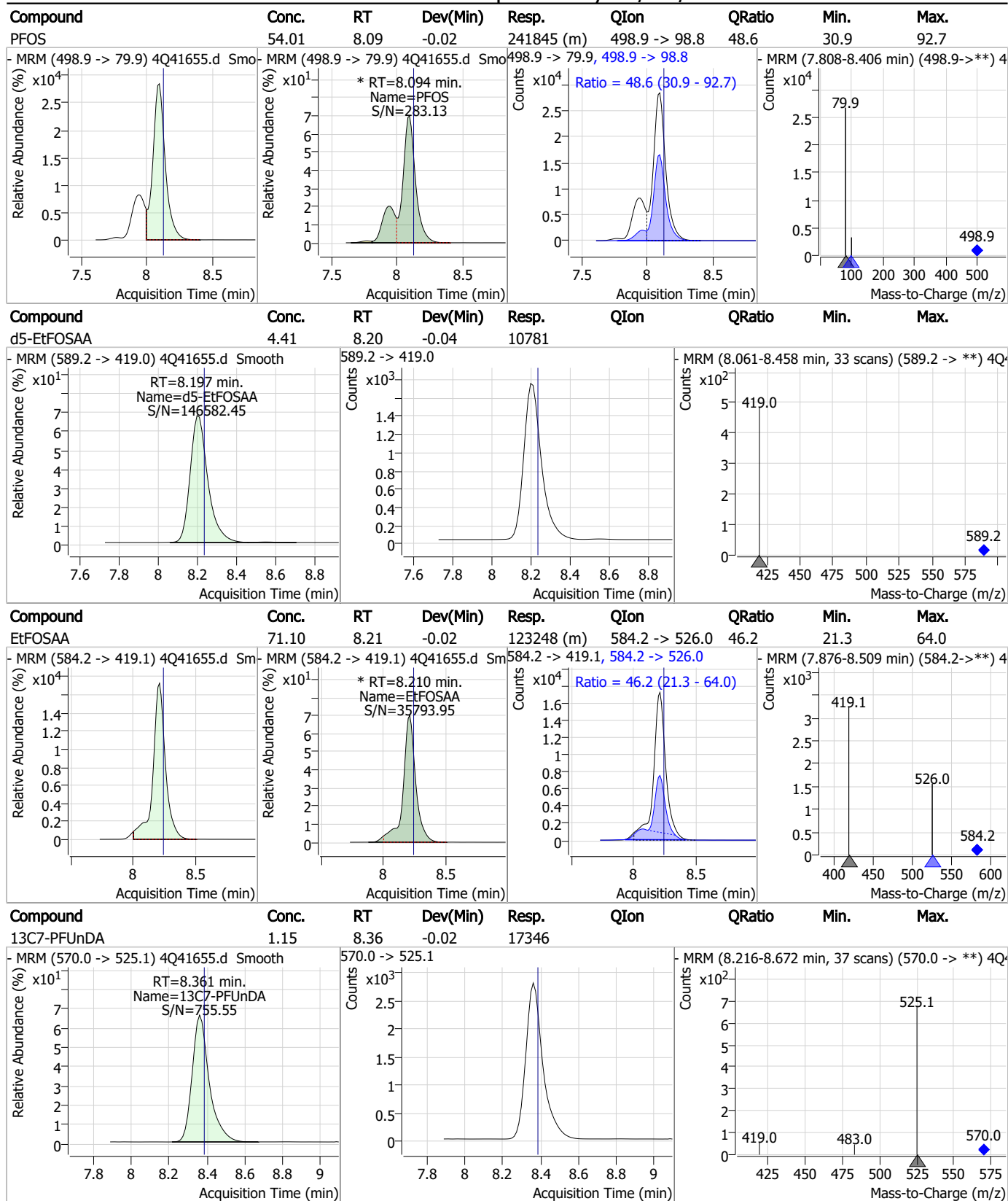


Perfluorinated Compounds by LC/MS/MS



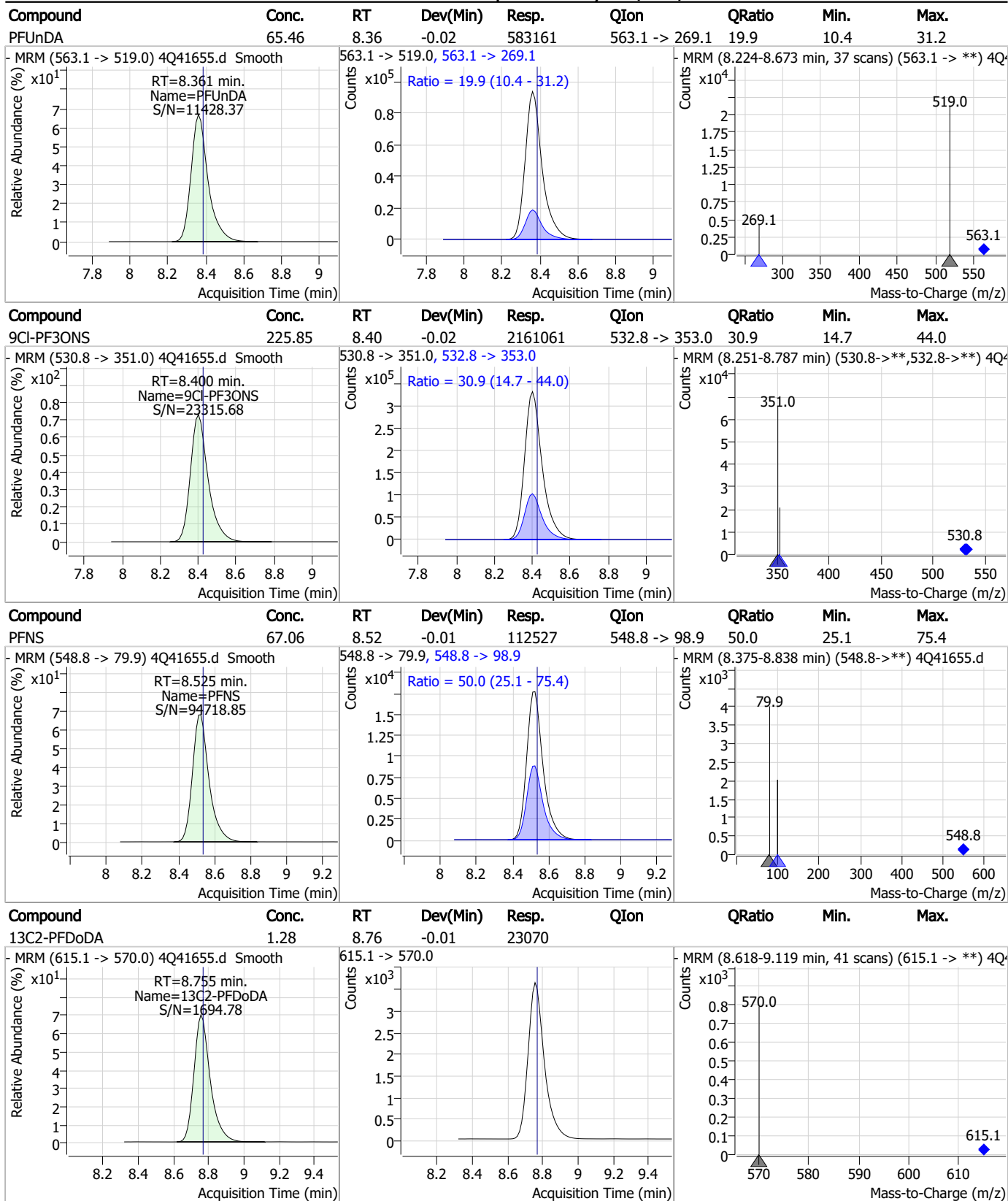
7.7.9
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Perfluorinated Compounds by LC/MS/MS



7.7.9
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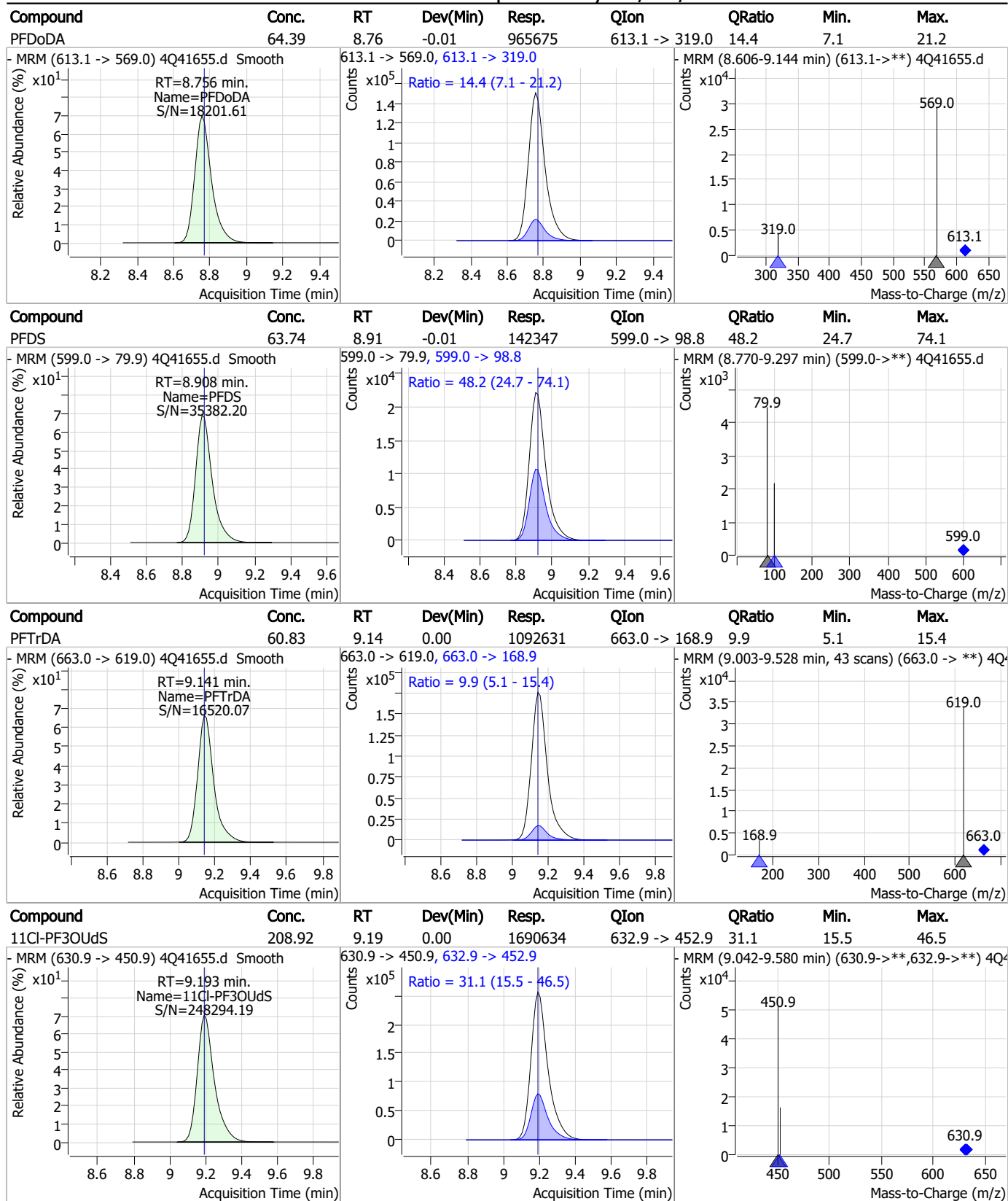
Perfluorinated Compounds by LC/MS/MS



7.7.9
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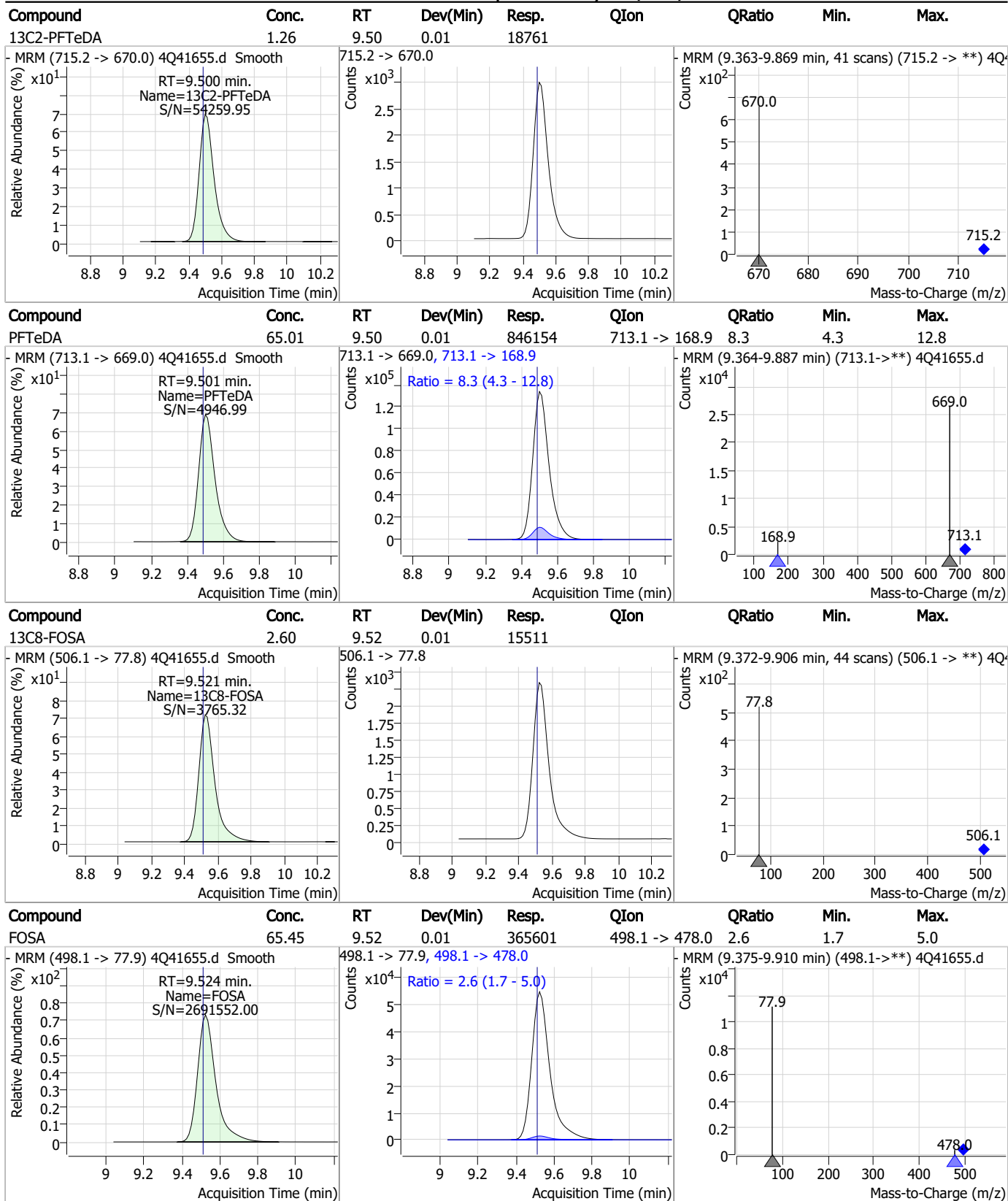


Perfluorinated Compounds by LC/MS/MS



7.7.9
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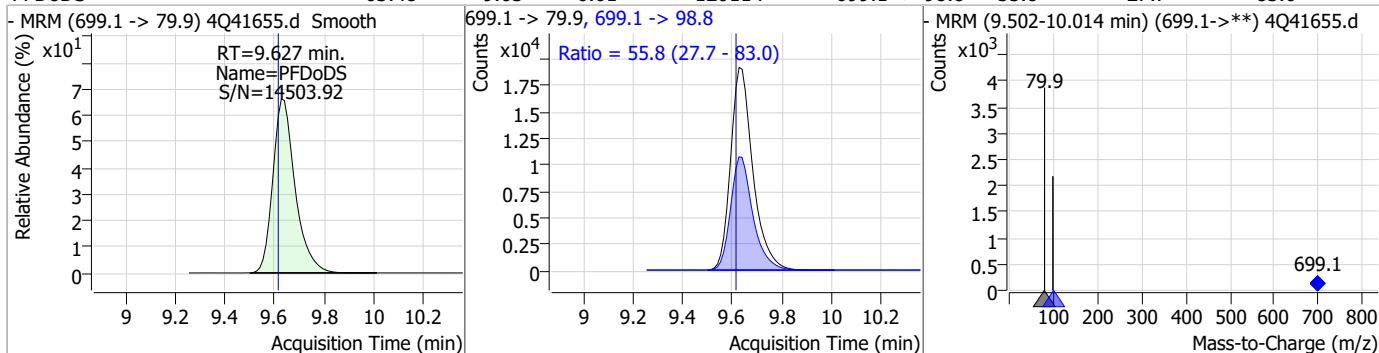
Perfluorinated Compounds by LC/MS/MS



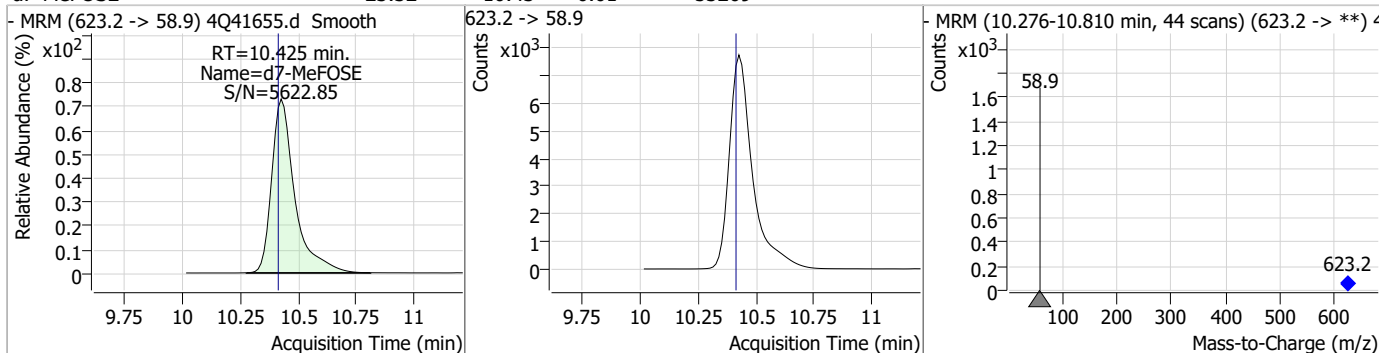
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Perfluorinated Compounds by LC/MS/MS

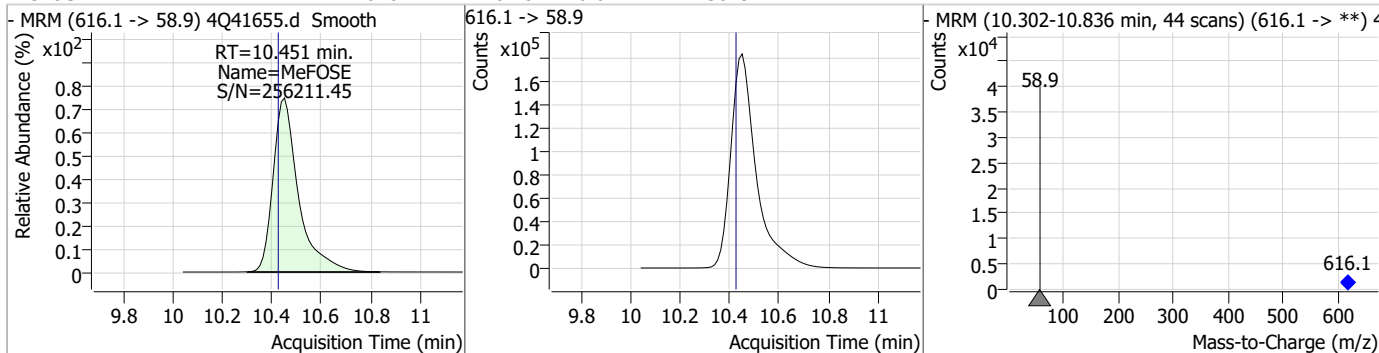
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoS	63.48	9.63	0.01	120114	699.1 -> 98.8	55.8	27.7	83.0



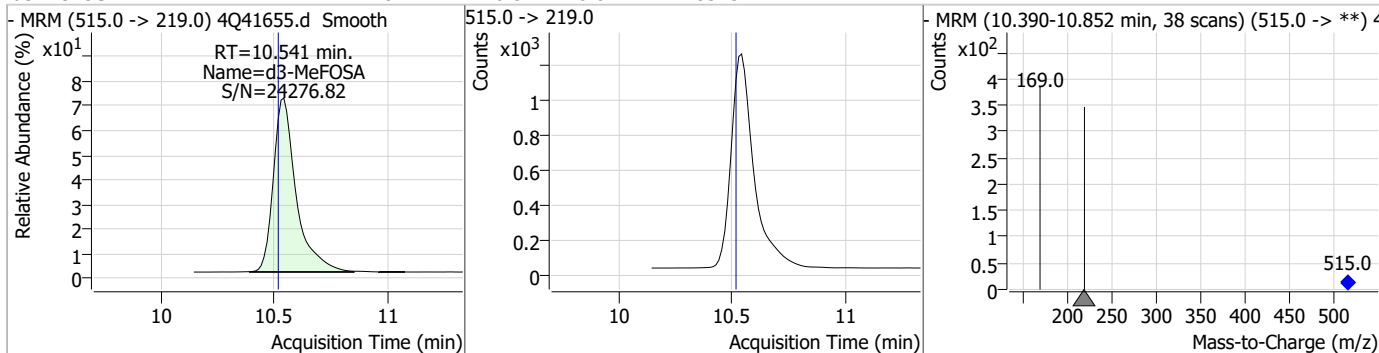
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	23.32	10.43	0.01	53269				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	640.12	10.45	0.02	1301914				



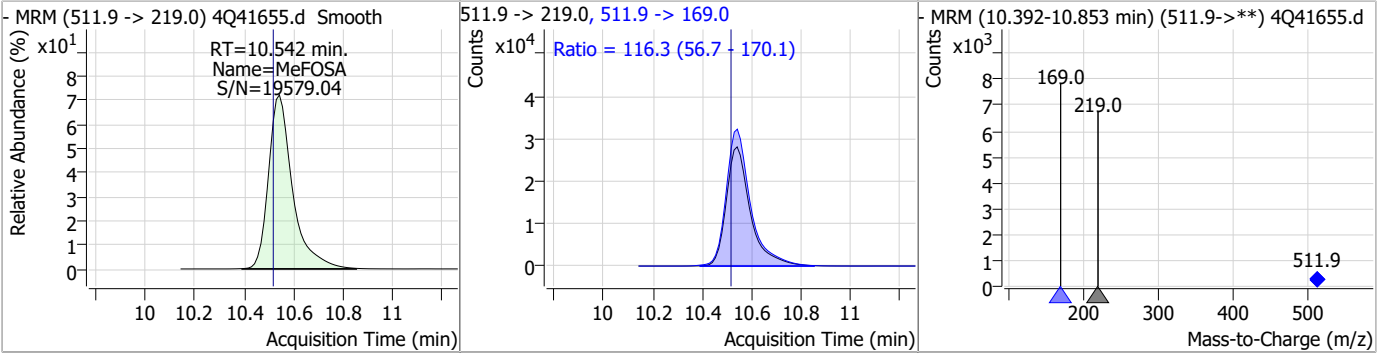
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.82	10.54	0.02	8575				



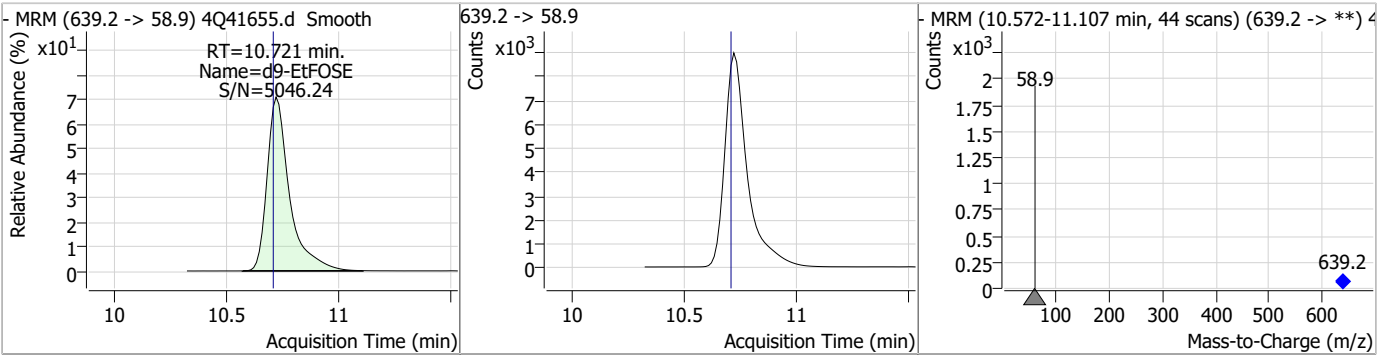
7.7.9
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Perfluorinated Compounds by LC/MS/MS

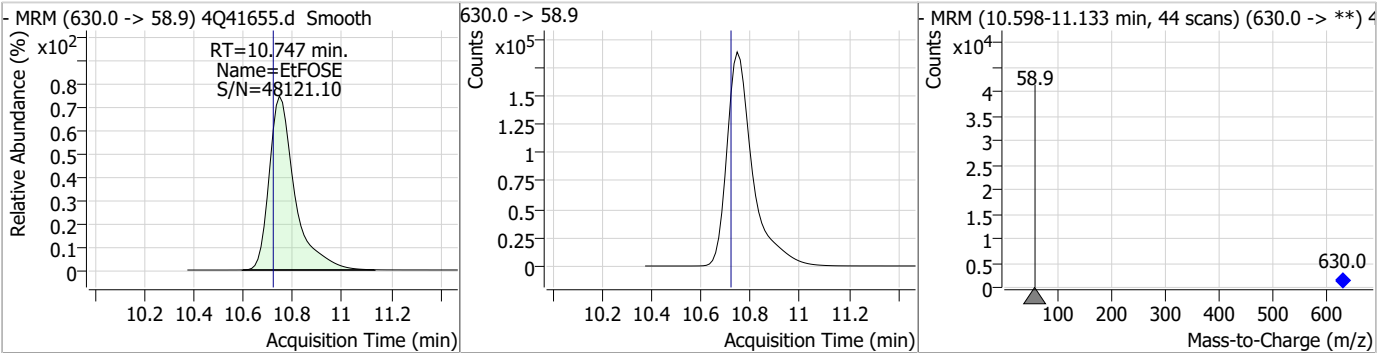
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	61.39	10.54	0.02	189968	511.9 -> 169.0	116.3	56.7	170.1



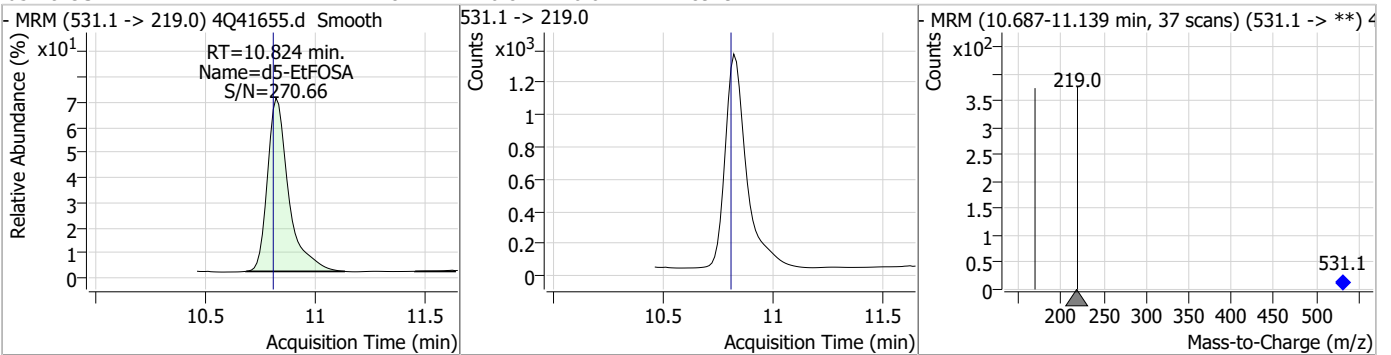
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	24.32	10.72	0.01	62078				



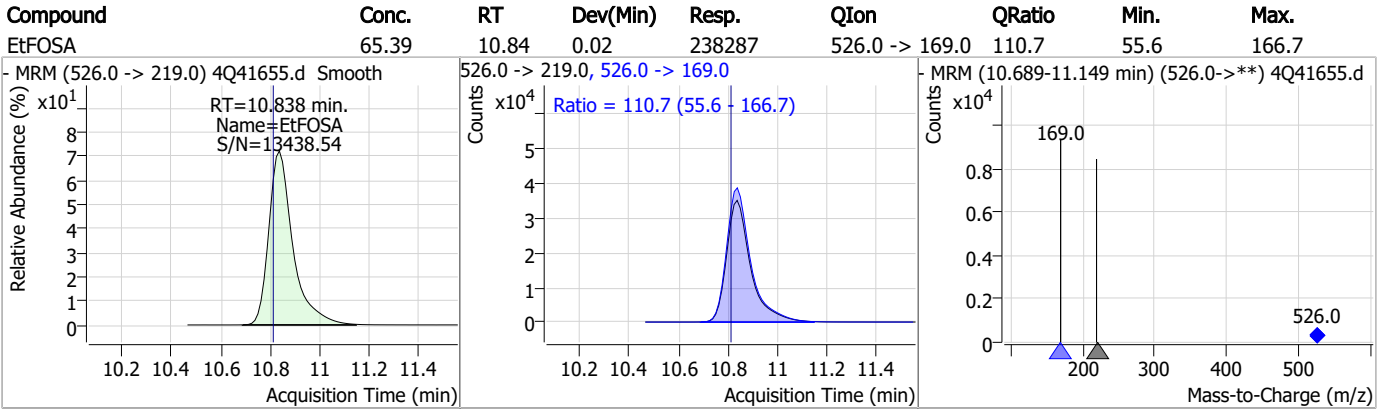
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	618.03	10.75	0.02	1358835				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.78	10.82	0.01	8919				



Perfluorinated Compounds by LC/MS/MS



7.7.9

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Manual Integration Approval Summary

Sample Number: S4Q596-IC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41655.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 19:24 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.09	Split peak
MeFOSAA	2355-31-9		8.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.09	Split peak
EtFOSAA	2991-50-6		8.21	Split peak

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Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41657.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 7:52:57 PM
 Sample Name : icv596-4
 Vial : P1-B1
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.164	216.8 -> 171.9	145066	10.00 µg/L	-0.075
M5-PFPeA	4.512	268.3 -> 223.0	89662	5.00 µg/L	-0.062
M5-PFHxA	5.497	318.0 -> 273.0	70771	2.50 µg/L	-0.025
M4-PFHpA	6.330	367.1 -> 322.0	38962	2.50 µg/L	-0.012
M8-PFOA	6.962	421.1 -> 376.0	41105	2.50 µg/L	0.012
M9-PFNA	7.483	472.1 -> 427.0	23603	1.25 µg/L	-0.012
M6-PFDA	7.942	519.1 -> 474.1	20202	1.25 µg/L	-0.025
M7-PFUnDA	8.373	570.0 -> 525.1	21350	1.25 µg/L	-0.012
M2-PFDoDA	8.793	615.1 -> 570.0	24404	1.25 µg/L	0.026
M2-PFTeDA	9.512	715.2 -> 670.0	21380	1.25 µg/L	0.025
M8-FOSA	9.534	506.1 -> 77.8	17477	2.50 µg/L	0.025
M3-PFBS	5.451	302.1 -> 79.9	15318	2.50 µg/L	-0.038
M3-PFHxS	7.080	402.1 -> 79.9	8480	2.50 µg/L	0.014
M8-PFOS	8.093	507.1 -> 79.9	11964	2.50 µg/L	-0.025
M2-4:2FTS	5.210	329.1 -> 80.9	1802	5.00 µg/L	-0.049
M2-6:2FTS	6.736	429.1 -> 80.9	2592	5.00 µg/L	0.012
M2-8:2FTS	7.741	529.1 -> 80.9	4057	5.00 µg/L	-0.025
M3-MeFOSAA	8.000	573.2 -> 419.0	17776	5.00 µg/L	-0.037
M3-HFPO-DA	5.815	286.9 -> 168.9	32151	10.00 µg/L	-0.012
M5-EtFOSAA	8.197	589.2 -> 419.0	14542	5.00 µg/L	-0.037
M7-MeFOSE	10.462	623.2 -> 58.9	66938	25.00 µg/L	0.049
M9-EtFOSE	10.759	639.2 -> 58.9	74047	25.00 µg/L	0.050
M5-EtFOSA	10.861	531.1 -> 219.0	9123	2.50 µg/L	0.050
M3-MeFOSA	10.566	515.0 -> 219.0	8407	2.50 µg/L	0.050
13C4-PFOS	8.093	502.8 -> 79.9	12097	2.50 µg/L	-0.025
13C3-PFBA	3.155	216.0 -> 172.0	85350	5.00 µg/L	-0.087
18O2-PFHxS	7.079	403.0 -> 83.9	6096	2.50 µg/L	0.014
13C4-PFOA	6.962	417.1 -> 372.0	49883	2.50 µg/L	0.012
13C2-PFDA	7.943	515.1 -> 470.1	18526	1.25 µg/L	-0.025
13C5-PFNA	7.484	468.0 -> 423.0	26807	1.25 µg/L	-0.012
13C2-PFHxA	5.498	315.1 -> 270.0	65406	2.50 µg/L	-0.025
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1802	5.45 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 109.0%		
13C2-6:2FTS	6.736	429.1 -> 80.9	2592	5.53 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 110.7%		
13C2-8:2FTS	7.741	529.1 -> 80.9	4057	5.57 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 111.3%		
13C2-PFDoDA	8.793	615.1 -> 570.0	24404	1.25 µg/L	0.026
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.7%		
13C2-PFTeDA	9.512	715.2 -> 670.0	21380	1.32 µg/L	0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 105.8%		
13C3-PFBS	5.451	302.1 -> 79.9	15318	2.70 µg/L	-0.038
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 108.0%		
13C3-PFHxS	7.080	402.1 -> 79.9	8480	2.56 µg/L	0.014

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.3%	
13C4-PFBA	3.164	216.8 -> 171.9	145066	9.89 µg/L	-0.075
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 98.9%	
13C4-PFHpA	6.330	367.1 -> 322.0	38962	2.51 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C5-PFHxA	5.497	318.0 -> 273.0	70771	2.49 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.7%	
13C5-PFPeA	4.512	268.3 -> 223.0	89662	5.02 µg/L	-0.062
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C6-PFDA	7.942	519.1 -> 474.1	20202	1.27 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 101.8%	
13C7-PFUnDA	8.373	570.0 -> 525.1	21350	1.30 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 103.9%	
13C8-FOSA	9.534	506.1 -> 77.8	17477	2.60 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.9%	
13C8-PFOA	6.962	421.1 -> 376.0	41105	2.49 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.7%	
13C8-PFOS	8.093	507.1 -> 79.9	11964	2.51 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C9-PFNA	7.483	472.1 -> 427.0	23603	1.26 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 100.7%	
d3-MeFOSAA	8.000	573.2 -> 419.0	17776	5.26 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 105.2%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	32151	9.71 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 97.1%	
d3-MeFOSA	10.566	515.0 -> 219.0	8407	2.45 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.2%	
d5-EtFOSAA	8.197	589.2 -> 419.0	14542	5.27 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 105.5%	
d7-MeFOSE	10.462	623.2 -> 58.9	66938	25.98 µg/L	0.049
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 103.9%	
d9-EtFOSE	10.759	639.2 -> 58.9	74047	25.72 µg/L	0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 102.9%	
d5-EtFOSA	10.861	531.1 -> 219.0	9123	2.52 µg/L	0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	24455	9.97 µg/L	95
		327.1 -> 80.9	10264		
6:2FTS	6.737	427.1 -> 407.0	18776	10.01 µg/L	100
		427.1 -> 80.9	8229		
8:2FTS	7.742	527.1 -> 507.0	18390	10.07 µg/L	96
		527.1 -> 80.8	7586		
EtFOSAA	8.210	584.2 -> 419.1	5411	2.31 µg/L	90
		584.2 -> 526.0	2650		
FOSA	9.537	498.1 -> 77.9	15442	2.45 µg/L	99
		498.1 -> 478.0	463		
MeFOSAA	8.001	570.1 -> 419.0	5650	2.31 µg/L	92
		570.1 -> 483.0	1250		
PFBA	3.158	212.8 -> 168.9	30592	9.79 µg/L	100
PFBS	5.452	298.7 -> 79.9	12120	2.21 µg/L	99
		298.7 -> 98.8	4466		
PFDA	7.943	512.9 -> 469.0	28833	2.49 µg/L	99
		512.9 -> 219.0	5720		
PFDoDA	8.794	613.1 -> 569.0	40725	2.57 µg/L	99
		613.1 -> 319.0	5616		
PFDS	8.945	599.0 -> 79.9	6051	2.40 µg/L	97

7.7.10
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.331	599.0 -> 98.8	3133	2.45	µg/L	98
		363.1 -> 319.0	48178			
PFHpS	7.623	363.1 -> 169.0	8115	2.19	µg/L	95
		449.0 -> 79.9	7153			
PFHxA	5.500	449.0 -> 98.9	4054	2.37	µg/L	100
		313.0 -> 269.0	51362			
PFHxS	7.081	313.0 -> 118.9	1461	2.16	µg/L	100
		398.7 -> 79.9	6689			
PFNA	7.484	398.7 -> 98.9	3409	2.36	µg/L	99
		463.0 -> 419.0	29431			
PFNS	8.537	463.0 -> 219.0	7272	2.41	µg/L	98
		548.8 -> 79.9	4563			
PFOA	6.963	548.8 -> 98.9	2371	2.36	µg/L	100
		413.0 -> 369.0	43905			
PFOS	8.094	413.0 -> 169.0	9073	2.22	µg/L	78
		498.9 -> 79.9	11210			
PFPeA	4.514	498.9 -> 98.8	4997	4.90	µg/L	100
		263.0 -> 219.0	84280			
PFPeS	6.407	349.1 -> 79.9	6693	2.35	µg/L	98
		349.1 -> 98.9	2934			
PFTeDA	9.513	713.1 -> 669.0	36923	2.49	µg/L	99
		713.1 -> 168.9	3009			
PFTrDA	9.166	663.0 -> 619.0	50579	2.66	µg/L	99
		663.0 -> 168.9	5079			
PFUnDA	8.374	563.1 -> 519.0	26916	2.45	µg/L	99
		563.1 -> 269.1	5740			
11CI-PF3OUdS	9.218	630.9 -> 450.9	95910	10.46	µg/L	100
		632.9 -> 452.9	29508			
9CI-PF3ONS	8.413	530.8 -> 351.0	104701	9.66	µg/L	99
		532.8 -> 353.0	31432			
ADONA	6.581	376.9 -> 250.9	203195	9.62	µg/L	99
		376.9 -> 84.8	54702			
HFPO-DA	5.816	284.9 -> 168.9	26313	10.40	µg/L	99
		284.9 -> 184.9	3080			
3:3FTCA	4.179	241.0 -> 177.0	10925	11.78	µg/L	98
		241.0 -> 117.0	1037			
5:3FTCA	6.296	341.0 -> 237.1	225300	62.86	µg/L	99
		341.0 -> 217.0	159061			
7:3FTCA	7.649	441.0 -> 316.9	84652	63.42	µg/L	98
		441.0 -> 336.9	192681			
EtFOSA	10.863	526.0 -> 219.0	9009	2.42	µg/L	98
		526.0 -> 169.0	10161			
EtFOSE	10.784	630.0 -> 58.9	66283	25.27	µg/L	100
		511.9 -> 219.0	7347			
MeFOSA	10.567	511.9 -> 169.0	8262	2.42	µg/L	99
		616.1 -> 58.9	62938			
MeFOSE	10.475	699.1 -> 79.9	5340	24.63	µg/L	100
		699.1 -> 98.8	2932			
PFDoDS	9.640	295.0 -> 201.0	3980	5.41	µg/L	95
		295.0 -> 84.9	1053			
NFDHA	5.403	279.0 -> 85.1	47104	4.89	µg/L	100
		229.0 -> 84.9	39544			
PFMBA	3.752	314.8 -> 134.9	69315	4.77	µg/L	100
		314.8 -> 82.9	2342			
PFEESA	5.909			4.24	µg/L	99

= Qualifier out of range, m = manually integrated, + = Area summed

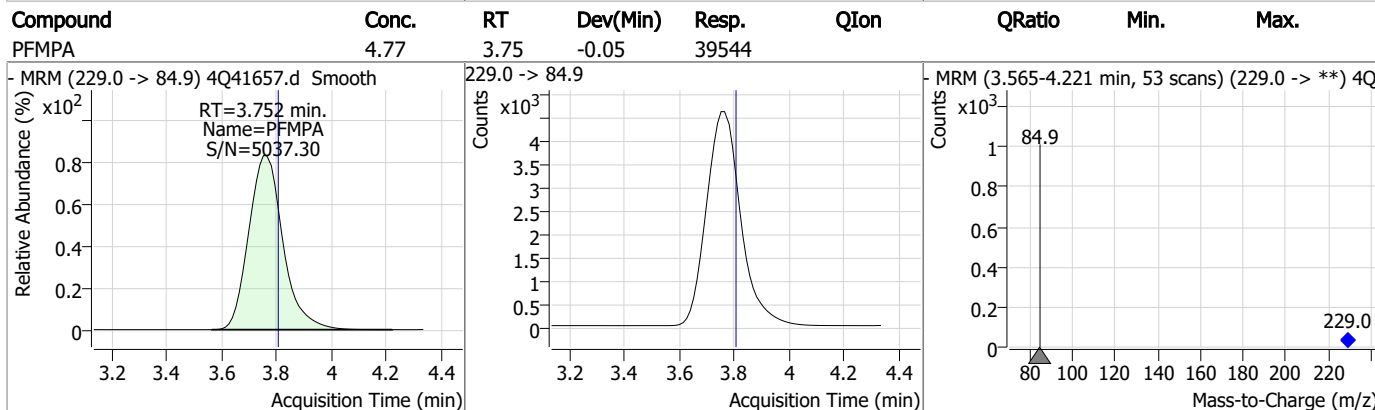
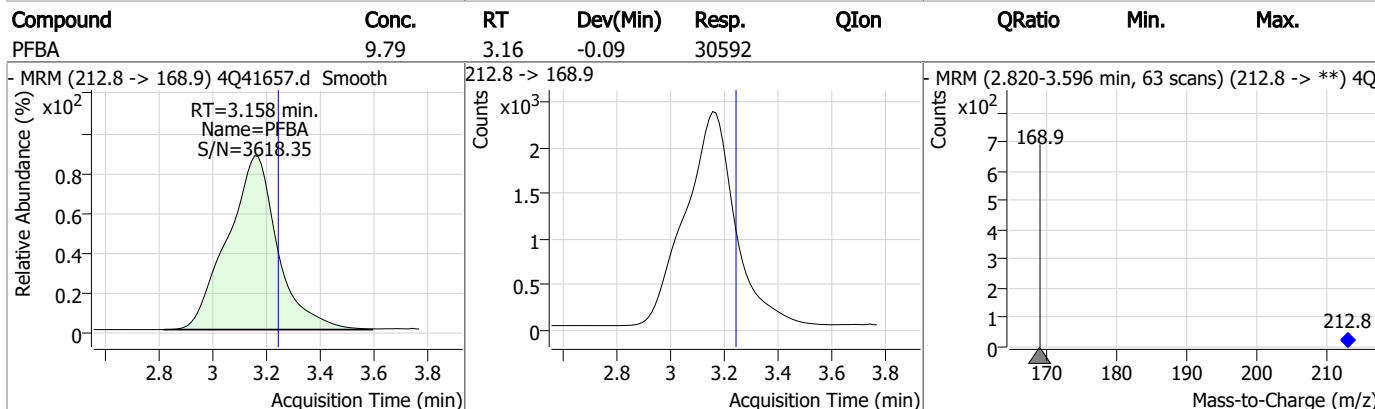
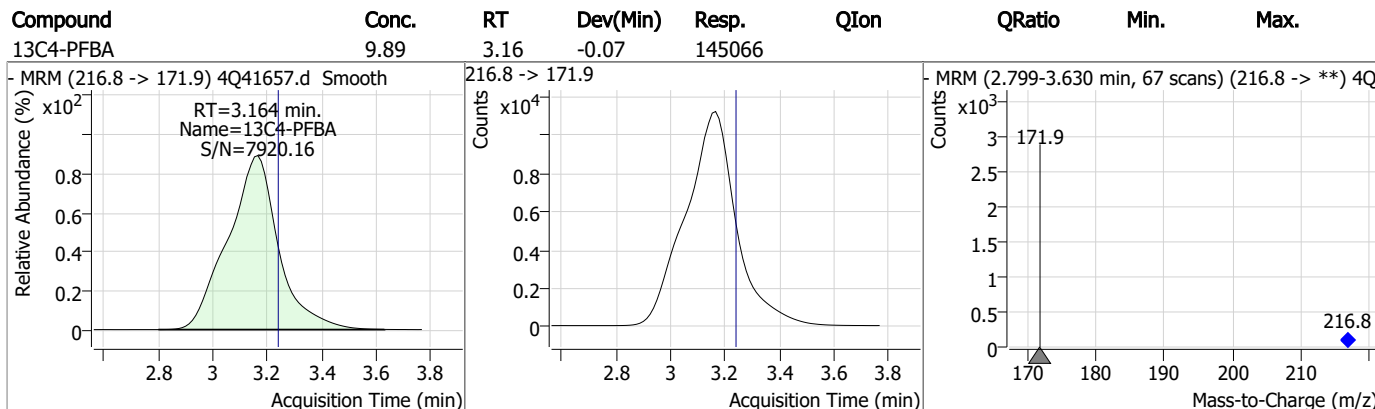
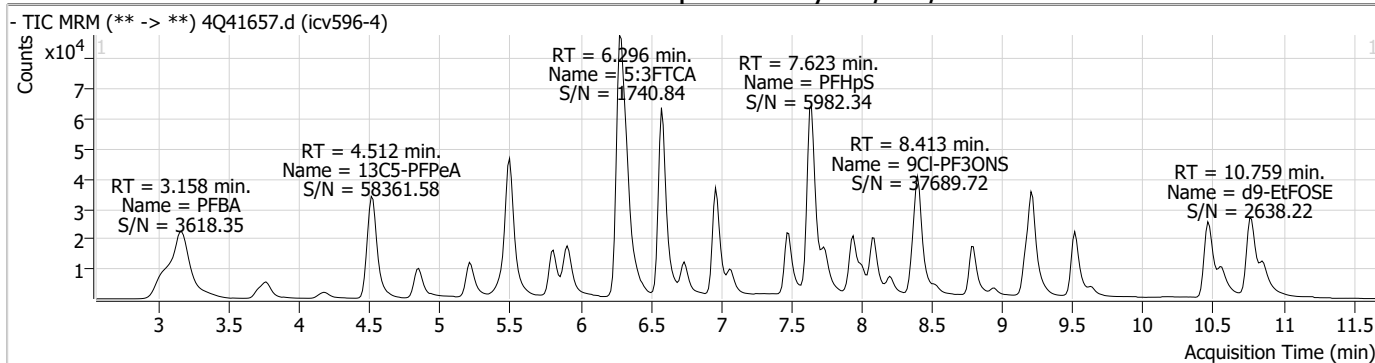
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.7.10

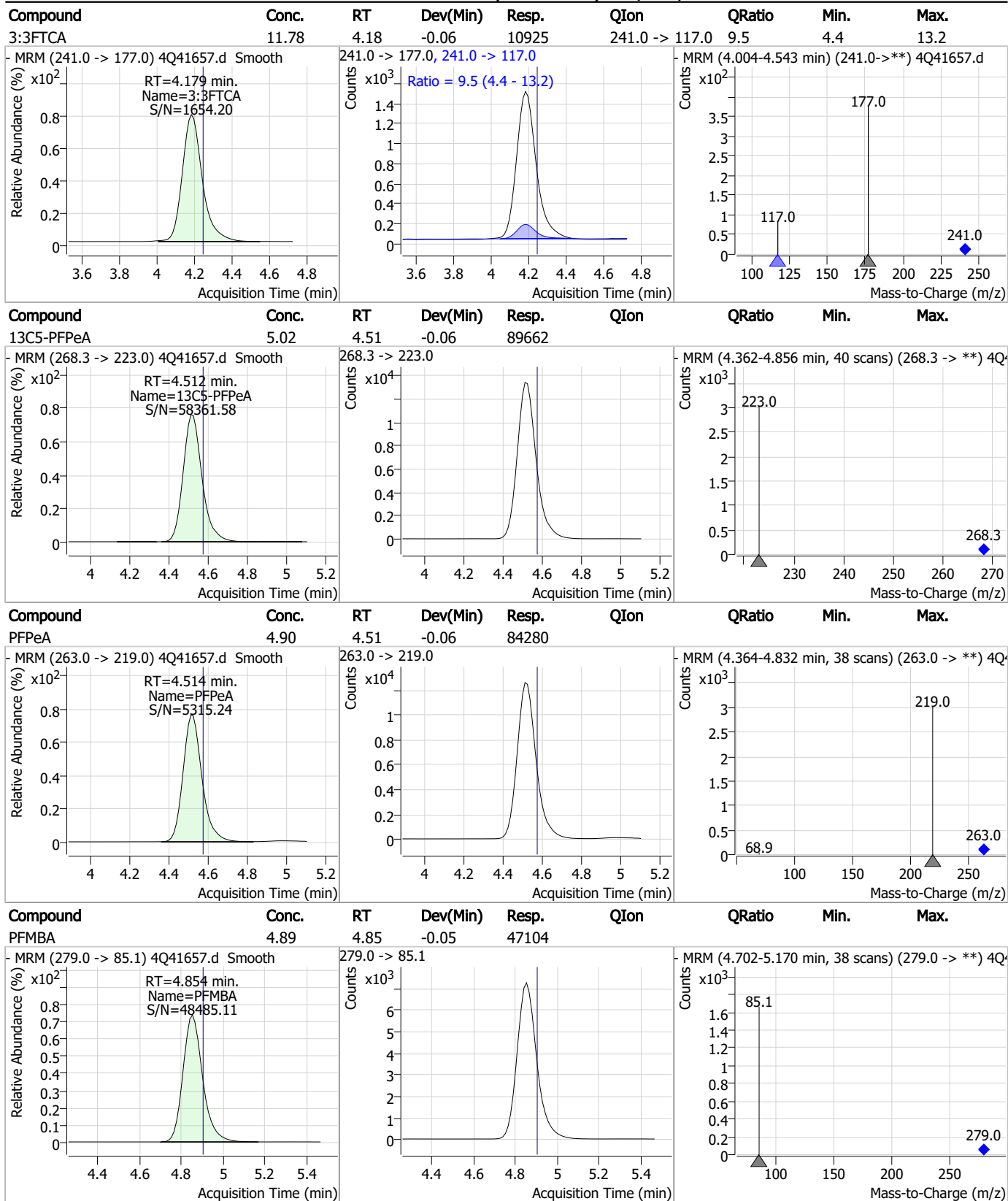
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Perfluorinated Compounds by LC/MS/MS



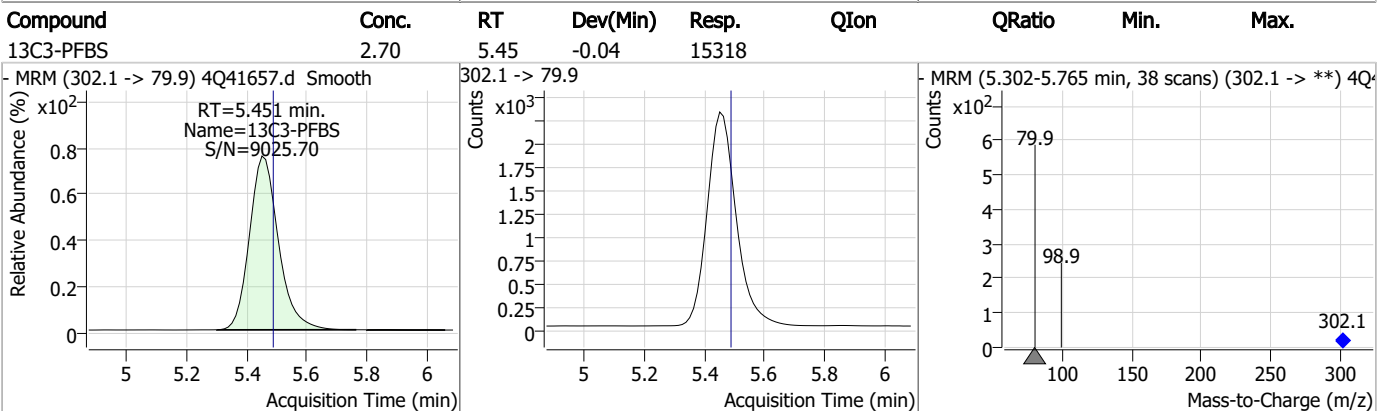
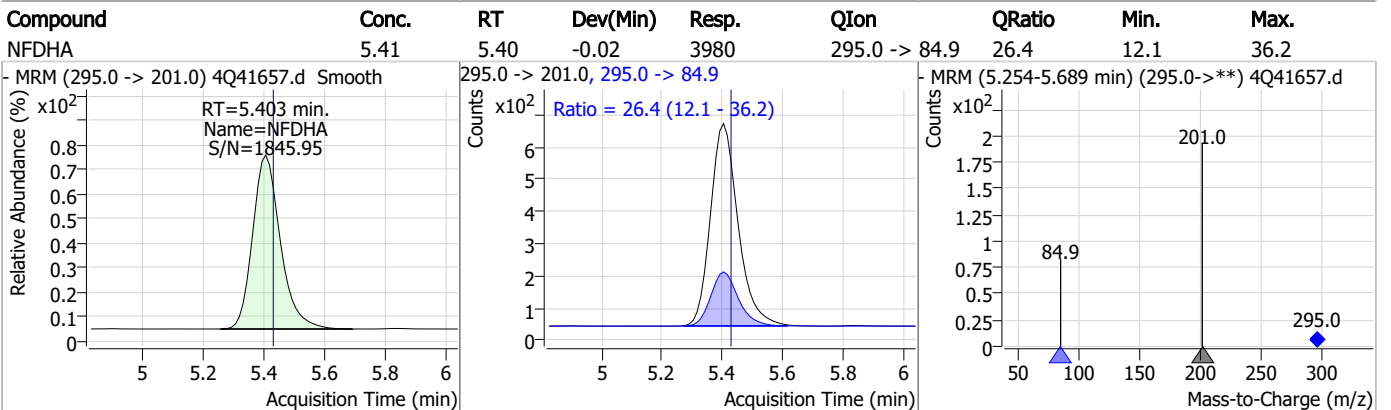
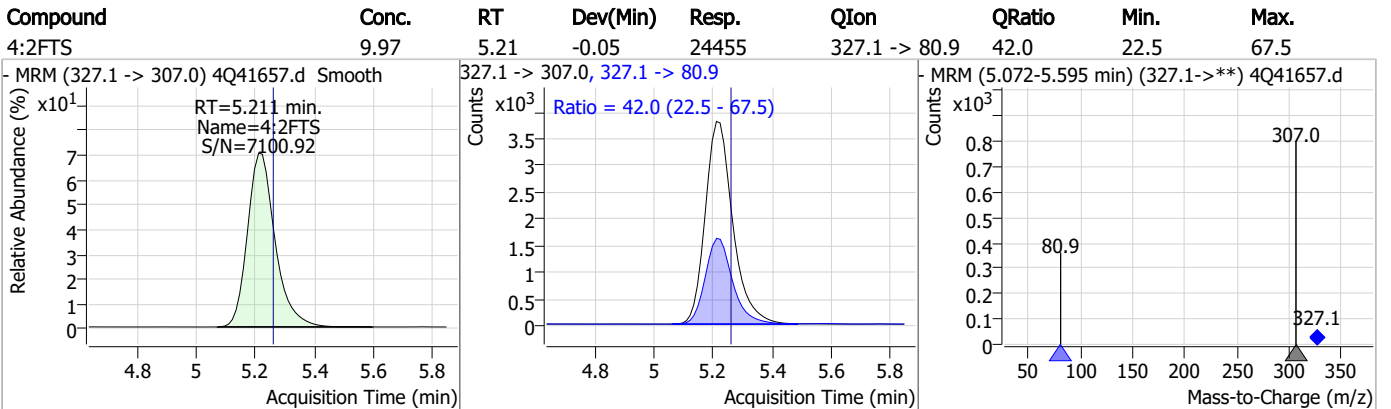
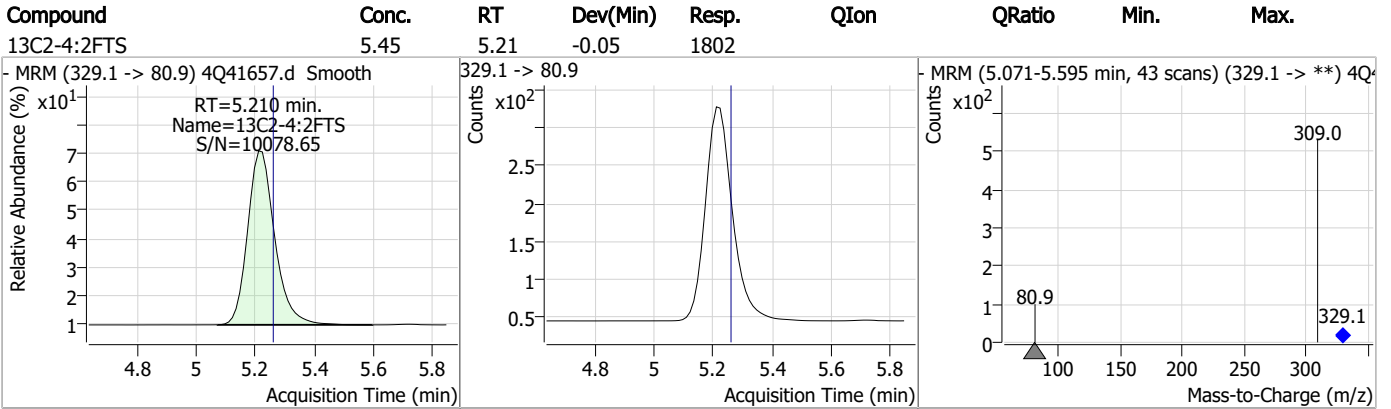
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Perfluorinated Compounds by LC/MS/MS



7.7.10
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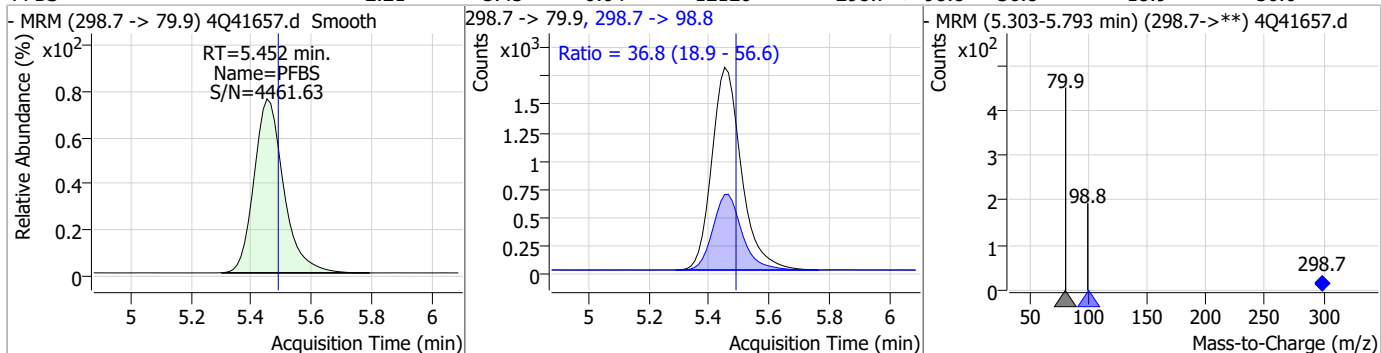
Perfluorinated Compounds by LC/MS/MS



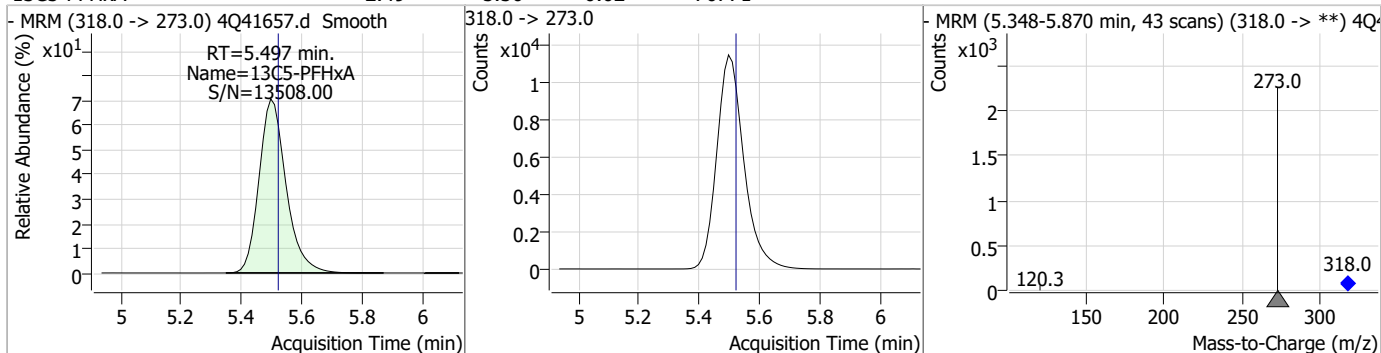
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Perfluorinated Compounds by LC/MS/MS

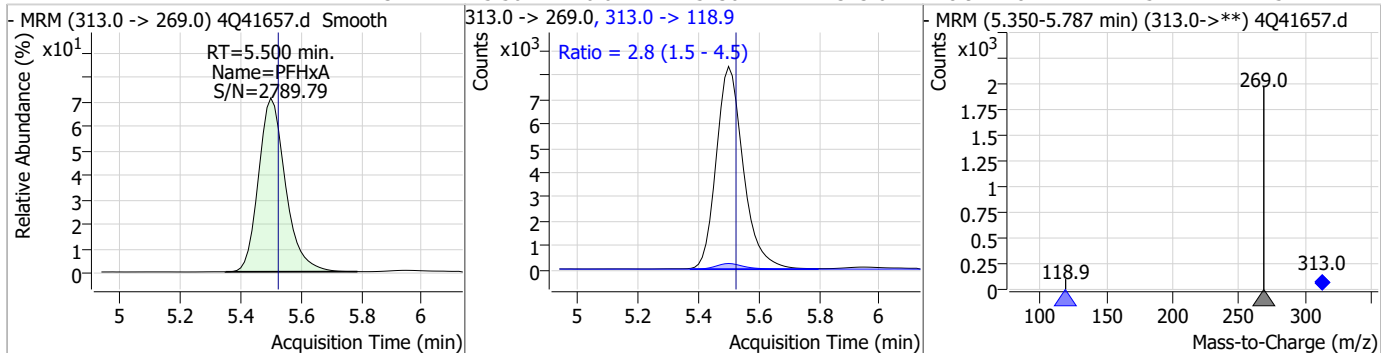
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	2.21	5.45	-0.04	12120	298.7 -> 98.8	36.8	18.9	56.6



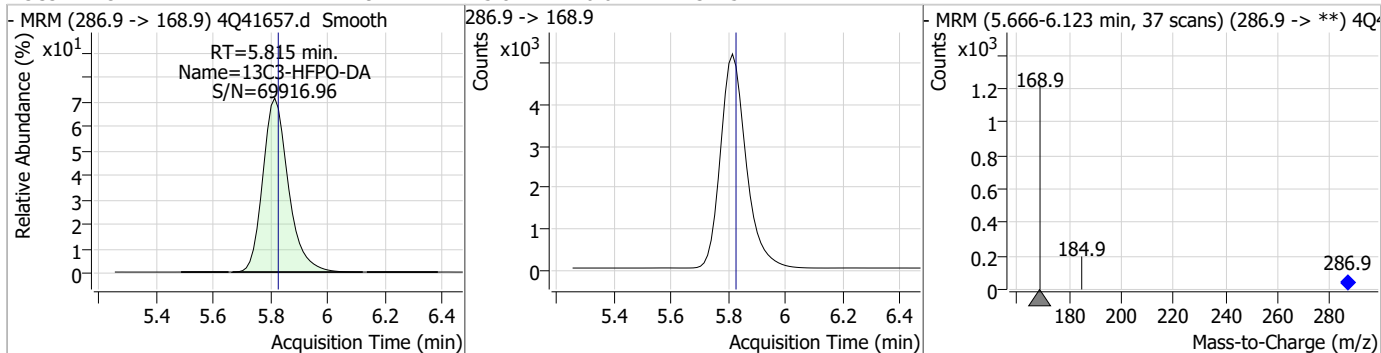
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFHxA	2.49	5.50	-0.02	70771				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	2.37	5.50	-0.02	51362	313.0 -> 118.9	2.8	1.5	4.5

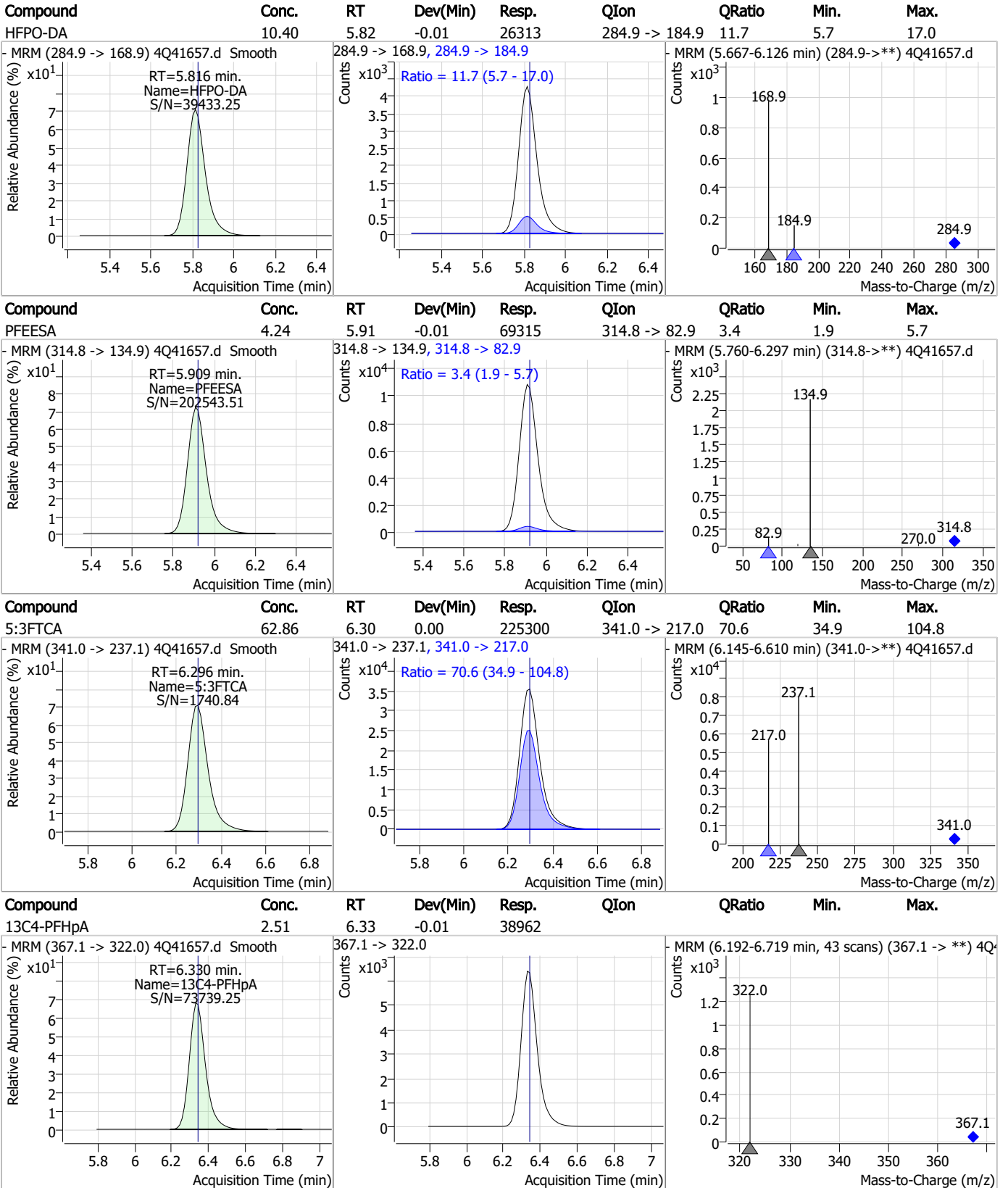


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	9.71	5.81	-0.01	32151				



7.7.10
7

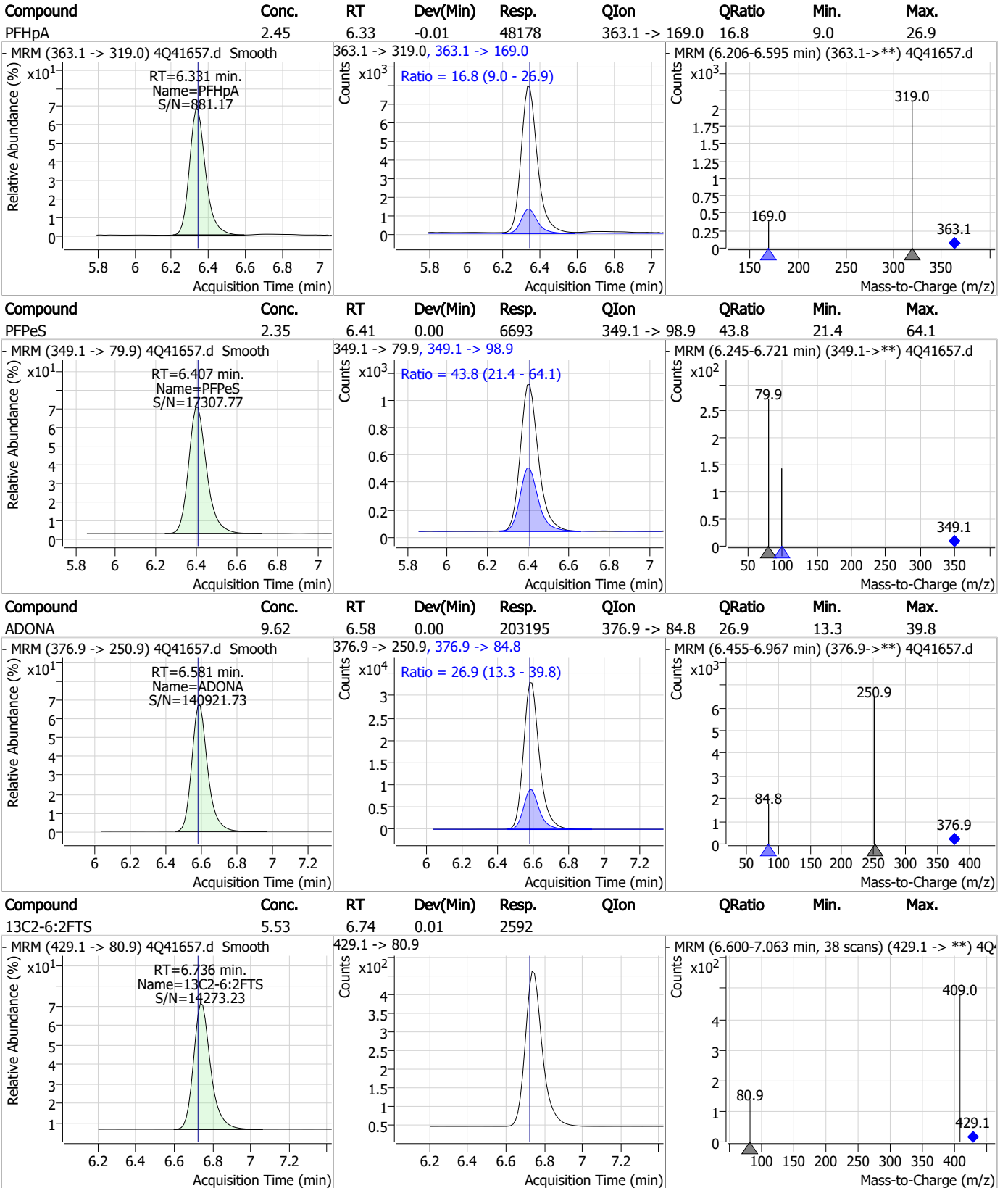
Perfluorinated Compounds by LC/MS/MS



7.7.10 7



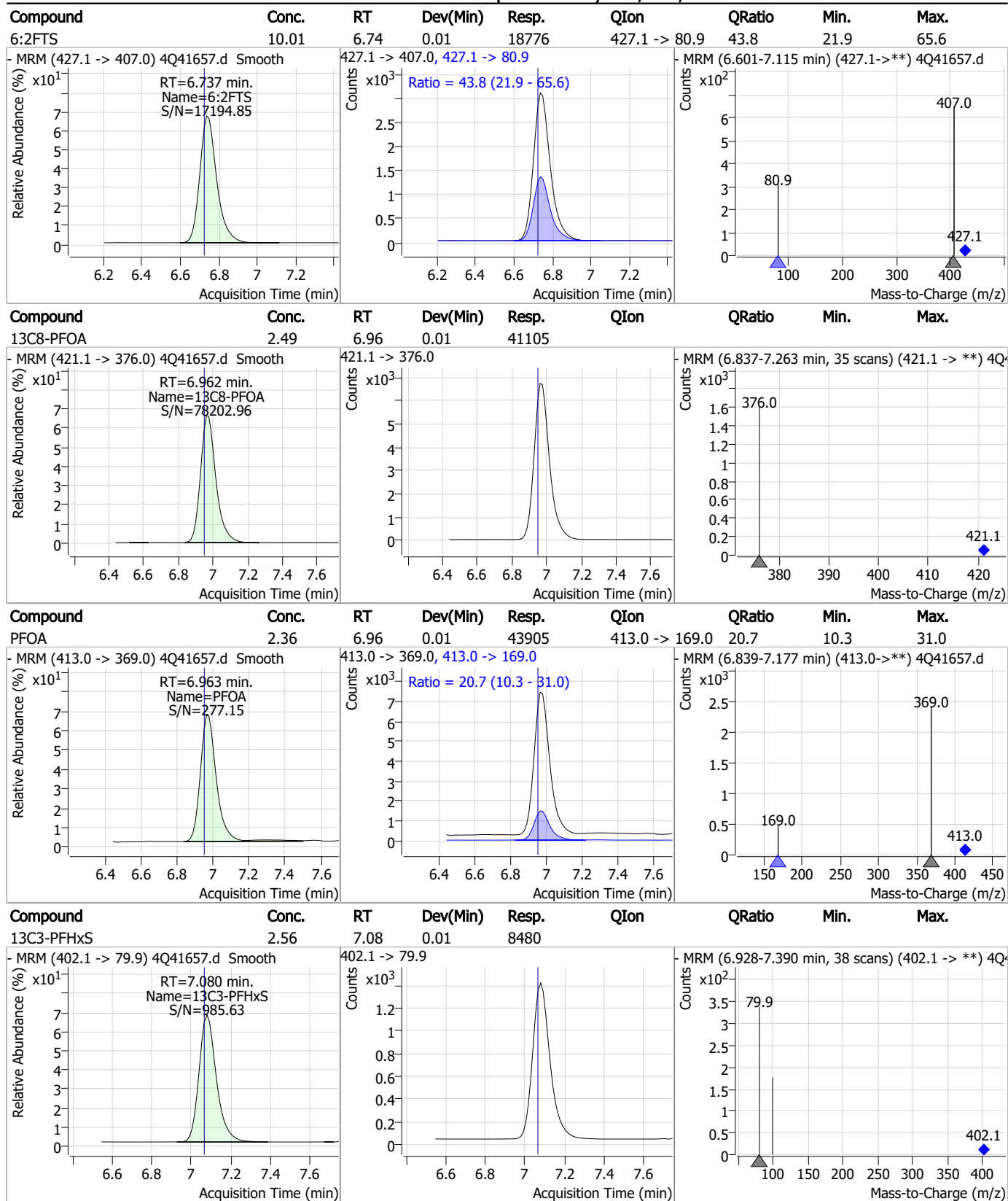
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7.7.10 7



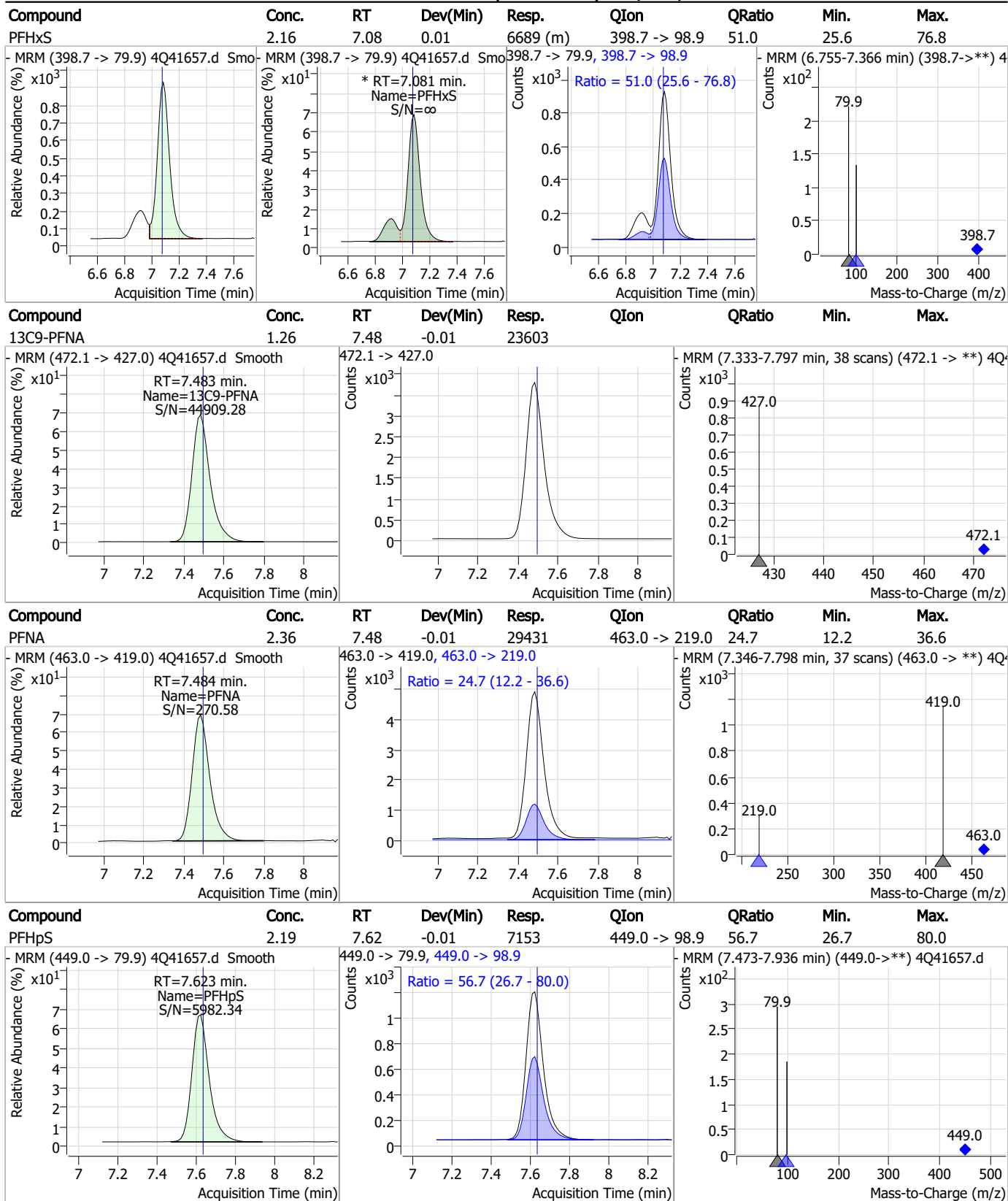
Perfluorinated Compounds by LC/MS/MS



7.7.10 7

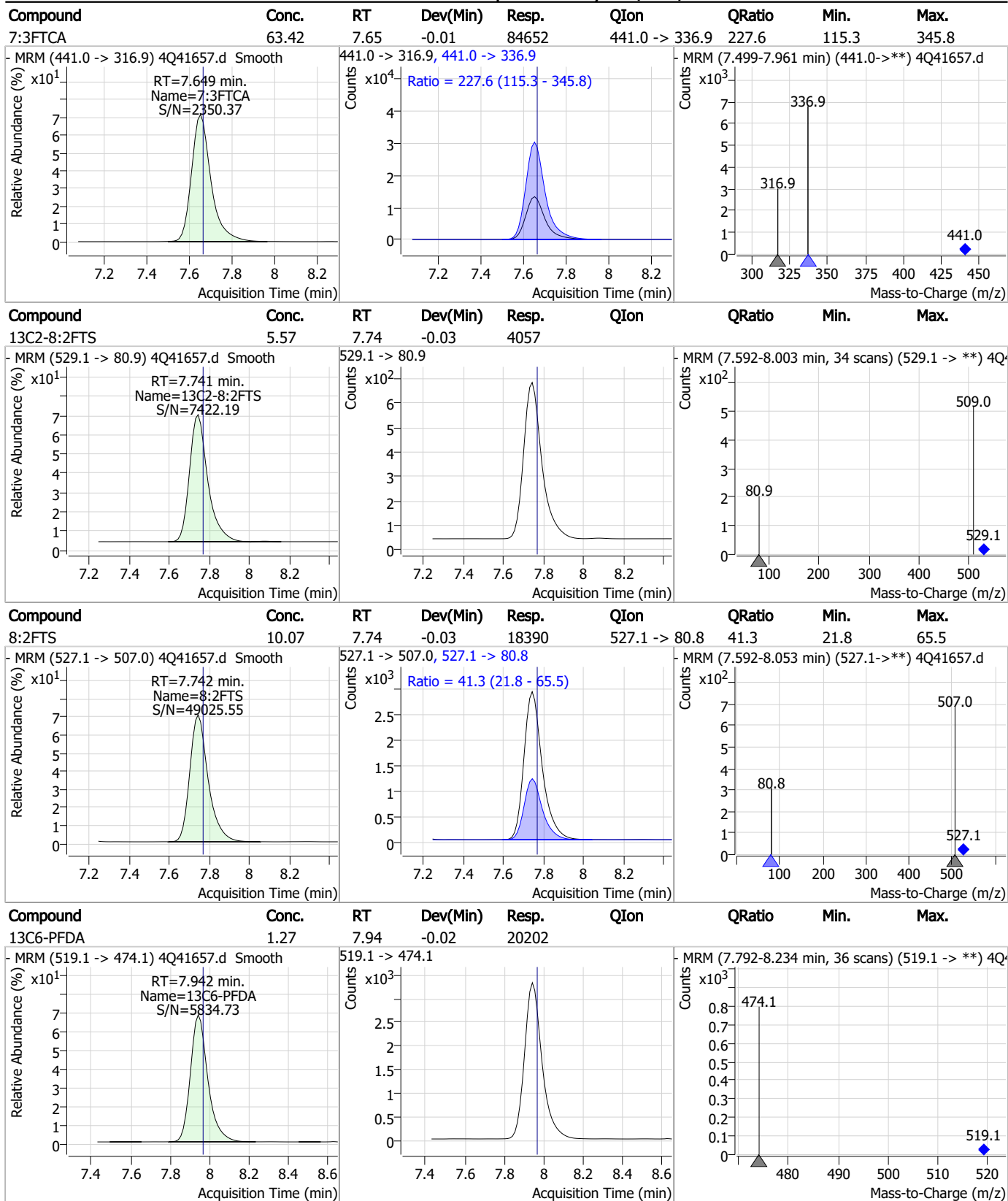


Perfluorinated Compounds by LC/MS/MS



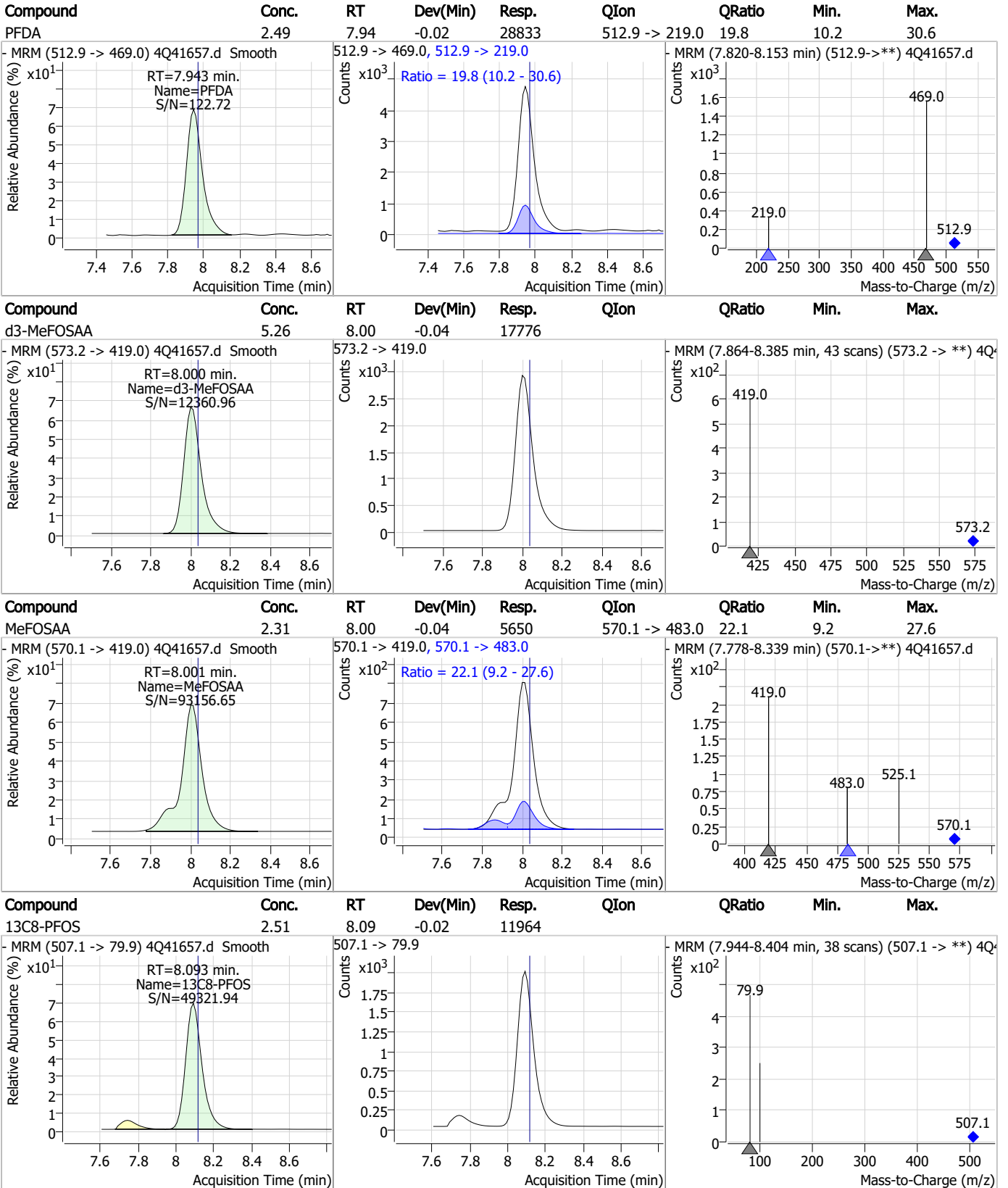
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Perfluorinated Compounds by LC/MS/MS



7.7.10
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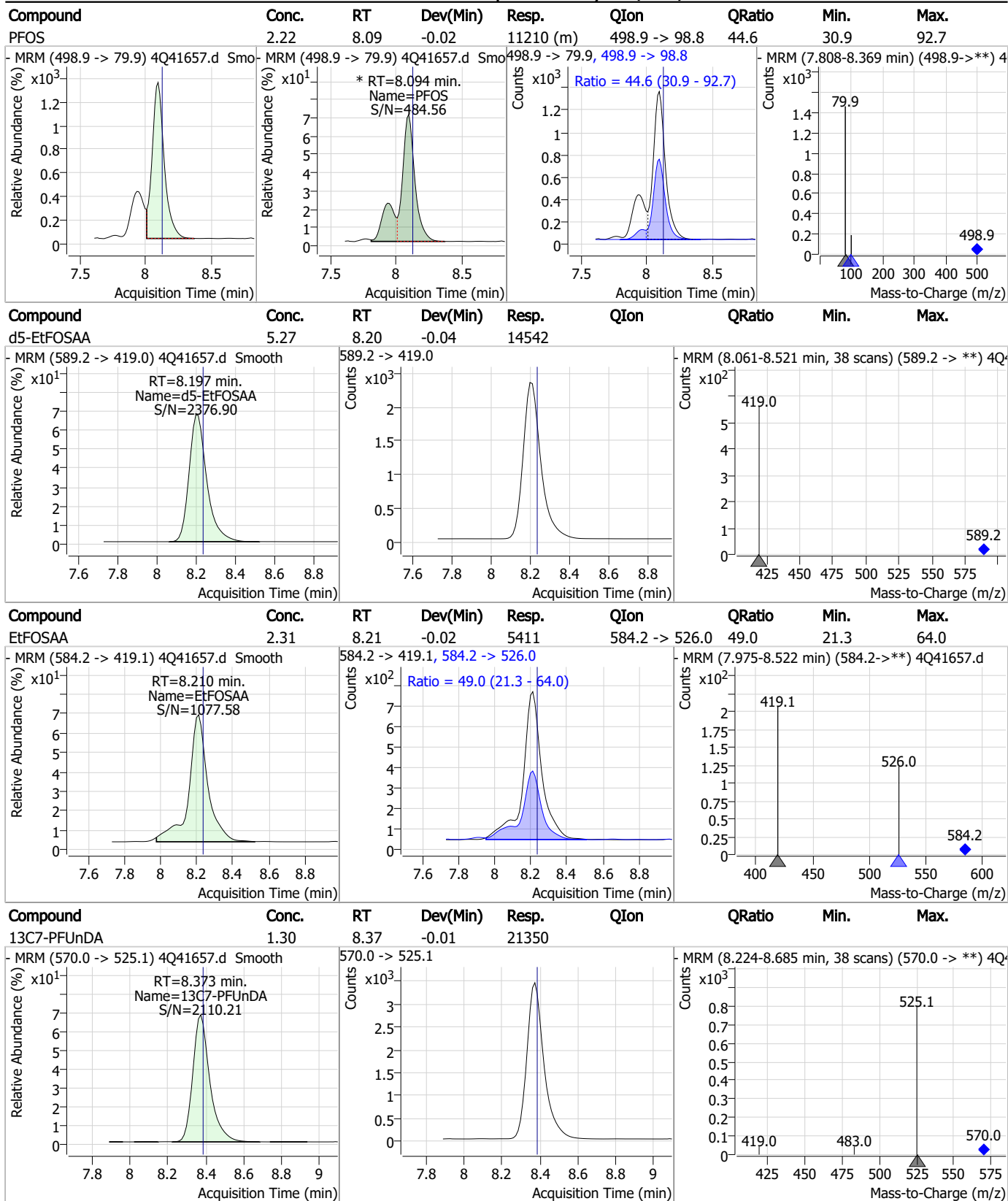
Perfluorinated Compounds by LC/MS/MS



7.7.10 7

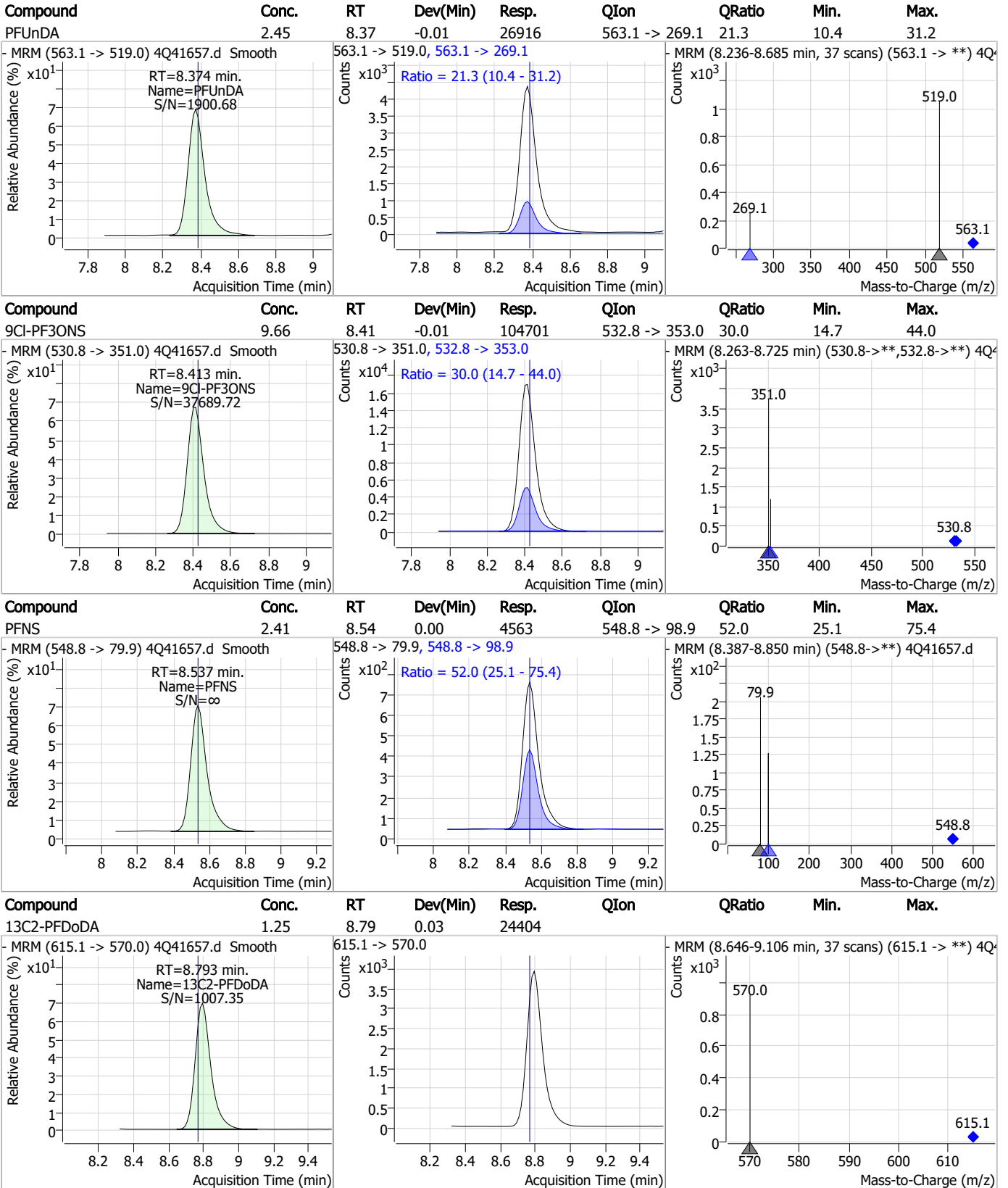


Perfluorinated Compounds by LC/MS/MS



7.7.10
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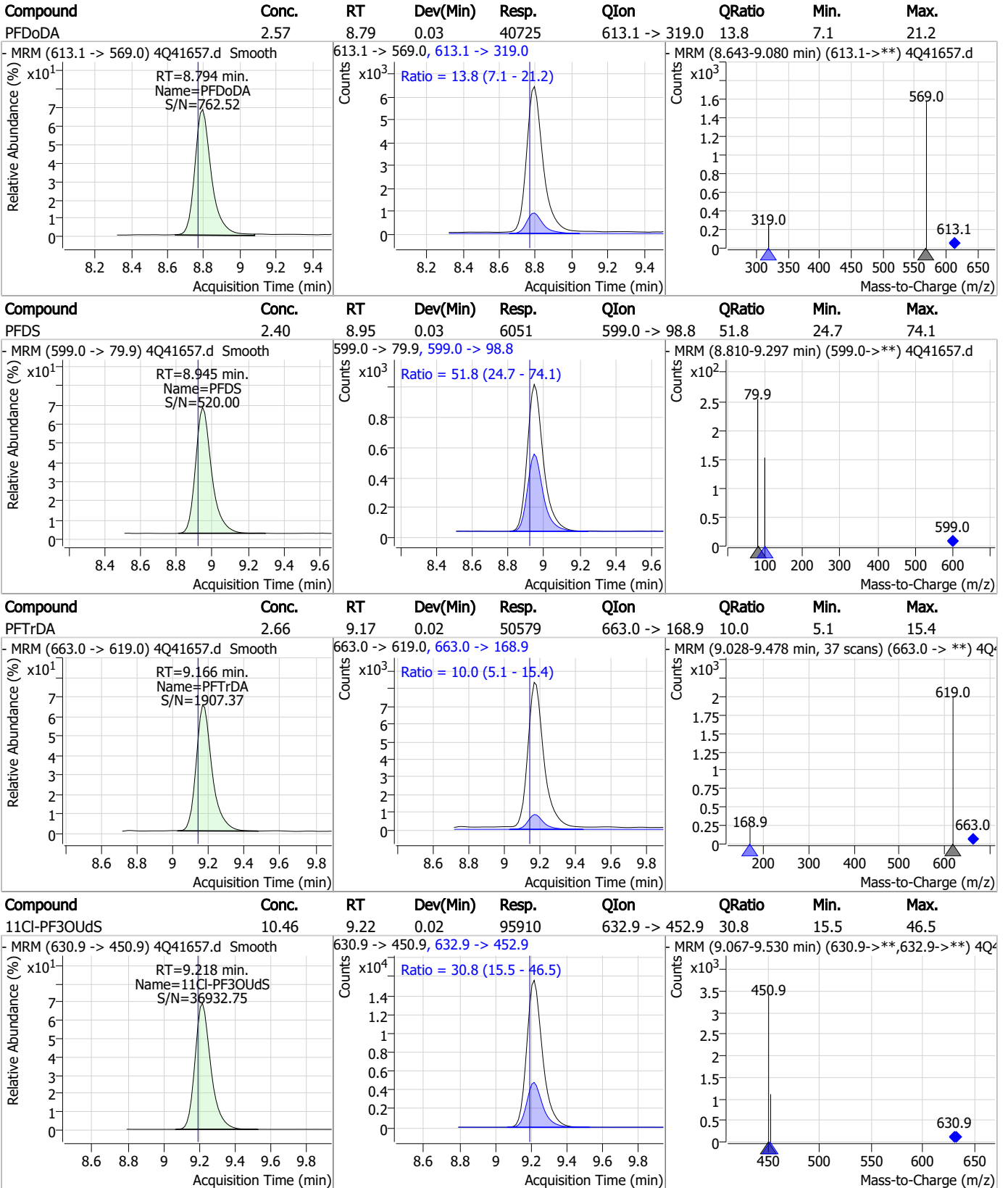
Perfluorinated Compounds by LC/MS/MS



7.7.10 7



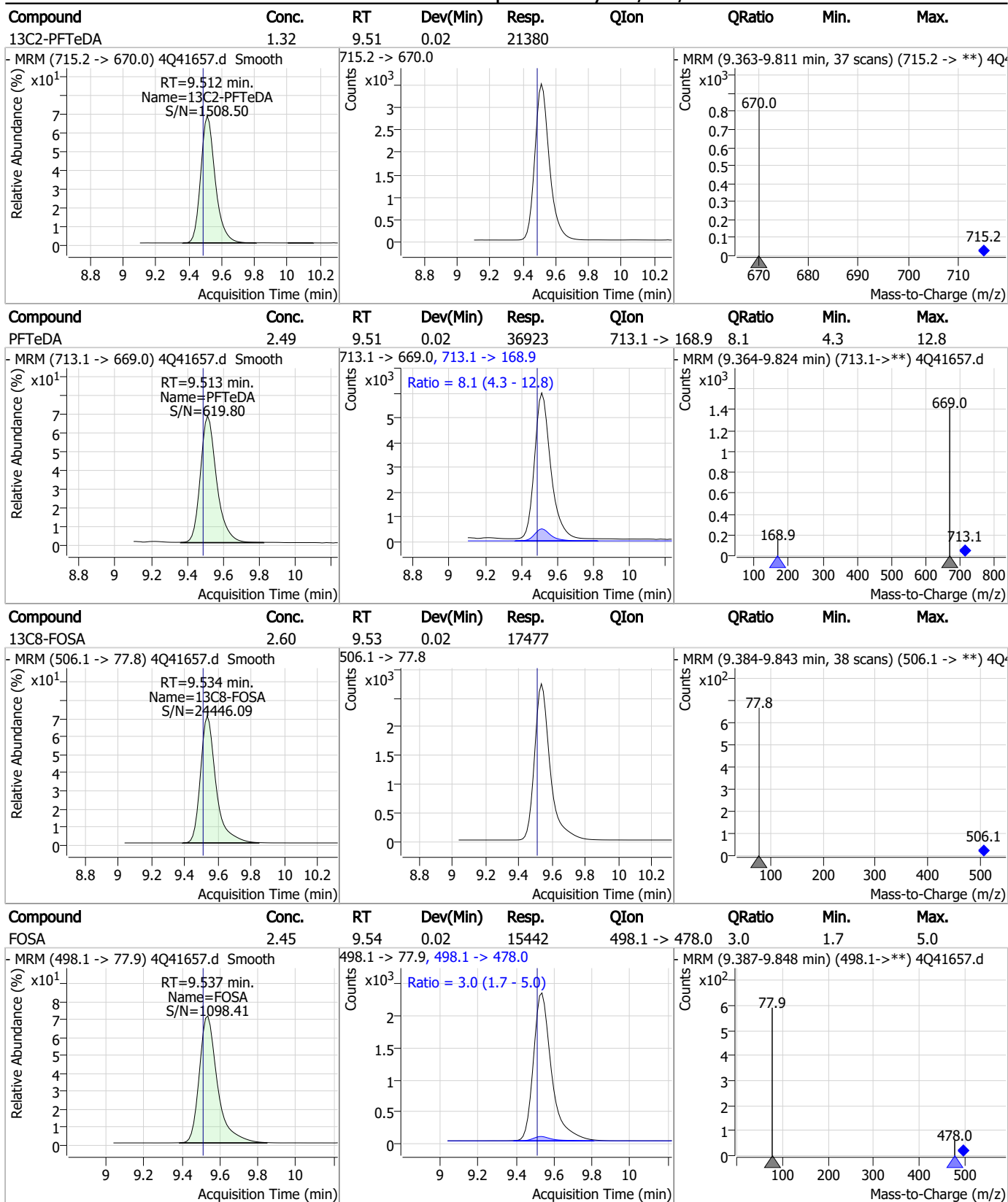
Perfluorinated Compounds by LC/MS/MS



7.7.10 7



Perfluorinated Compounds by LC/MS/MS

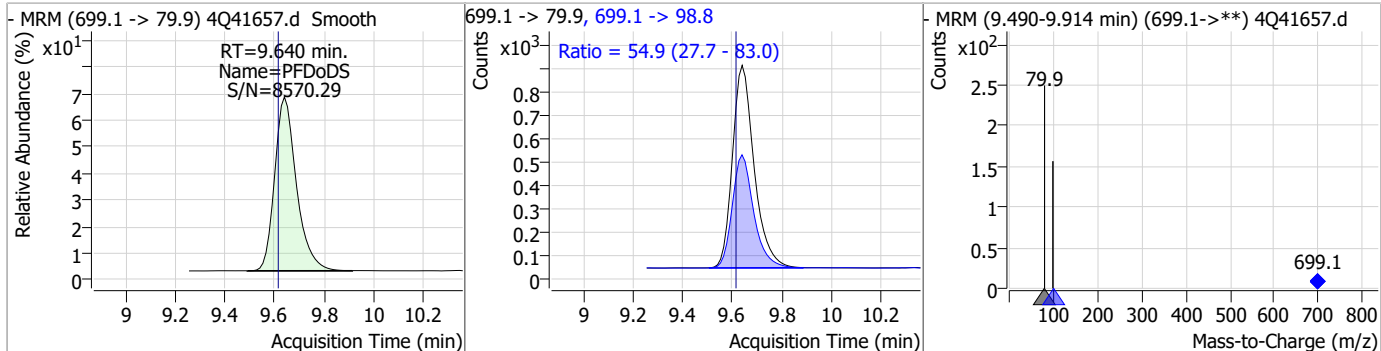


7.7.10
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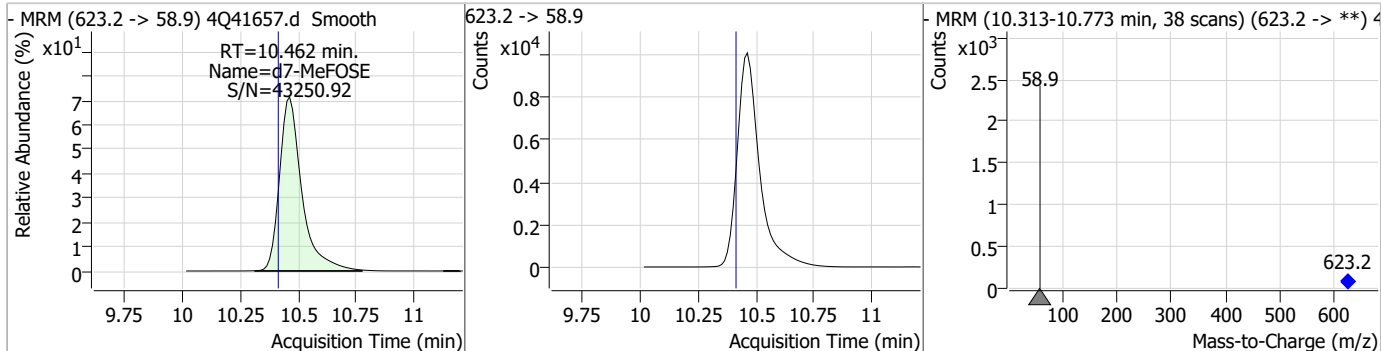


Perfluorinated Compounds by LC/MS/MS

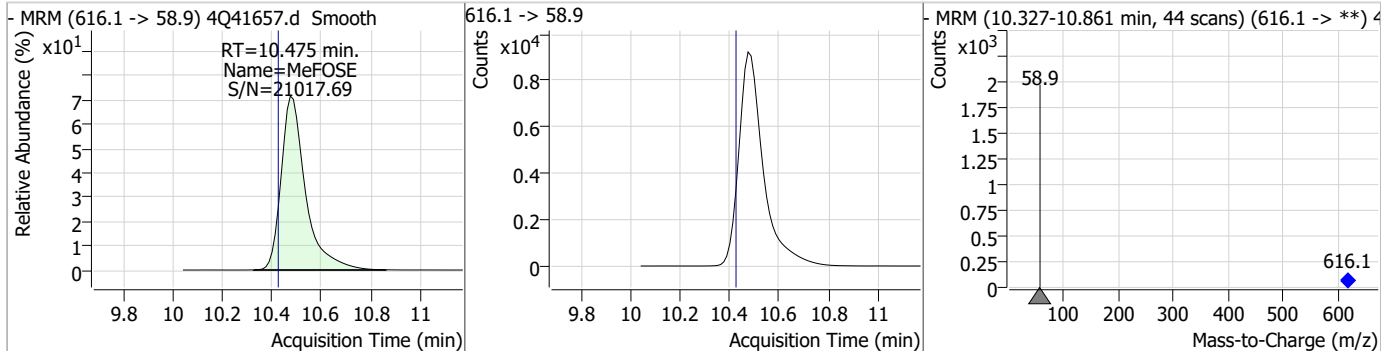
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoS	2.50	9.64	0.02	5340	699.1 -> 98.8	54.9	27.7	83.0



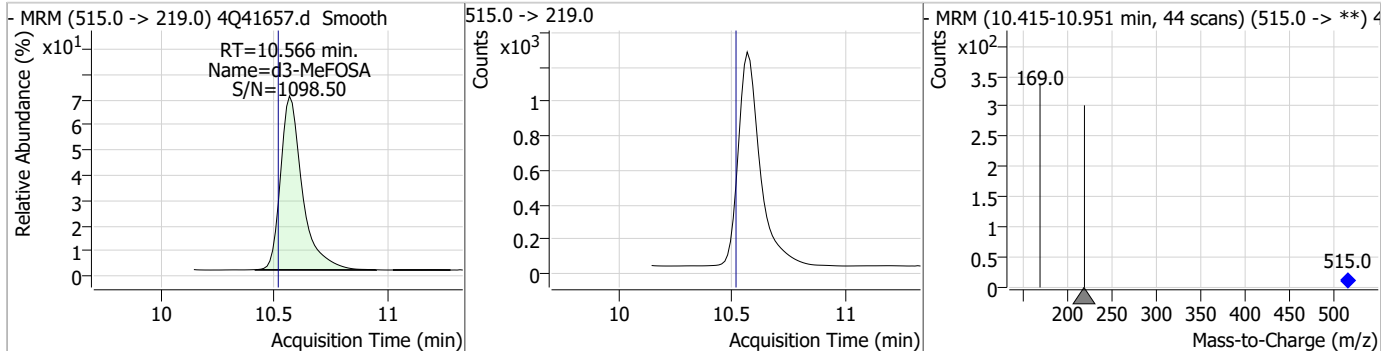
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	25.98	10.46	0.05	66938				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	24.63	10.47	0.05	62938				

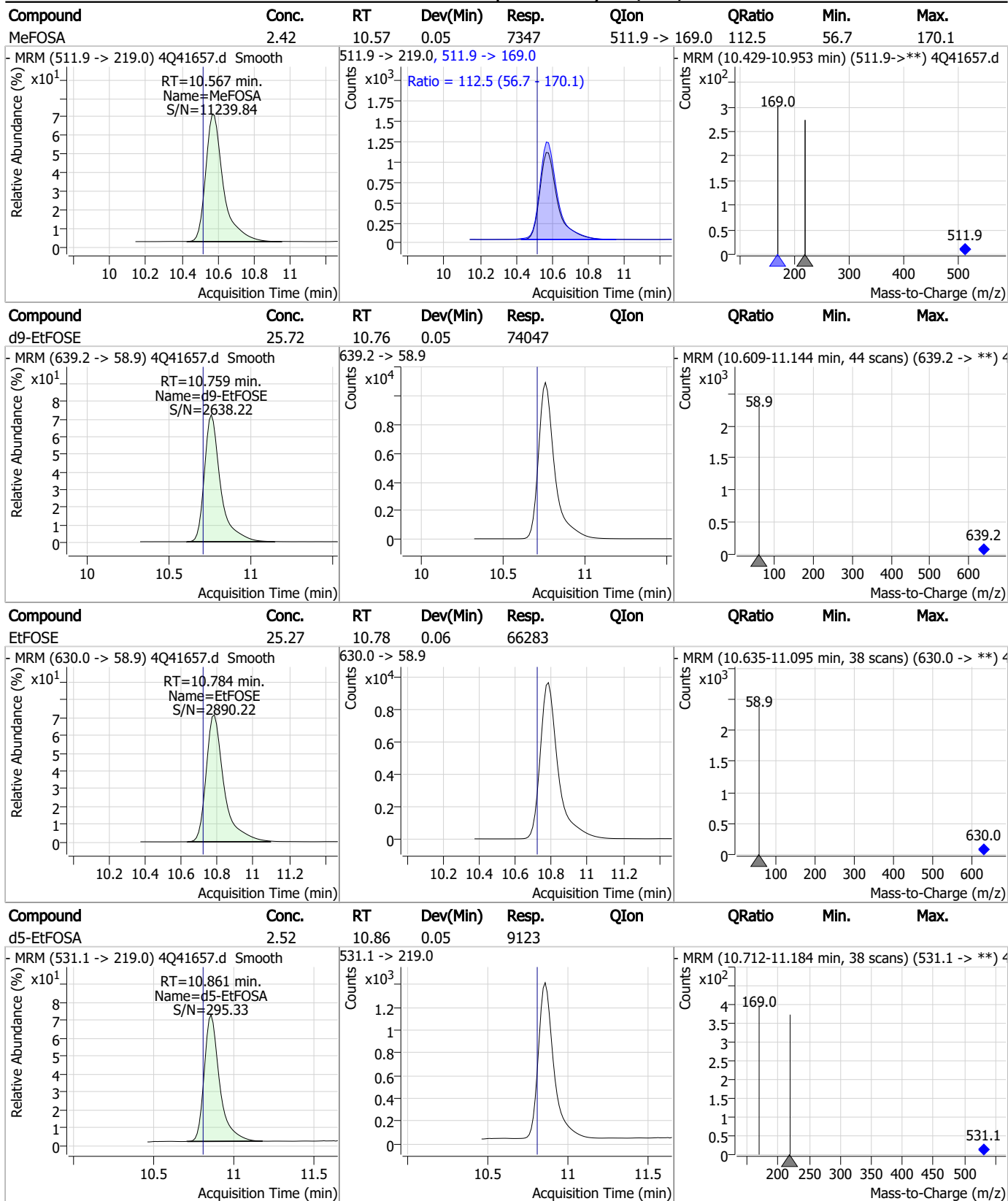


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.45	10.57	0.05	8407				



7.7.10
7

Perfluorinated Compounds by LC/MS/MS

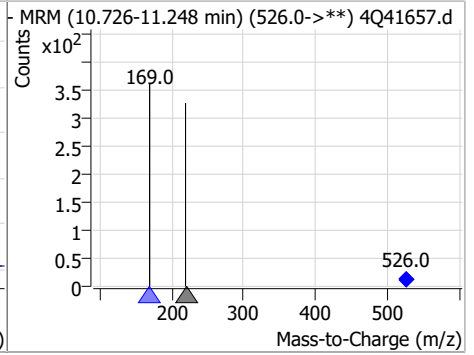
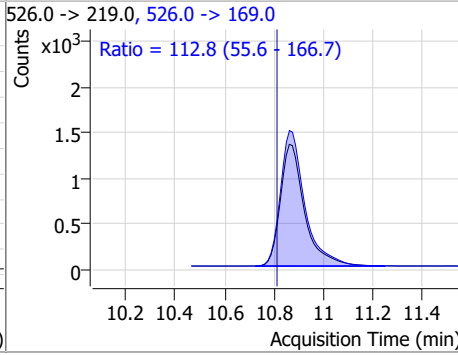
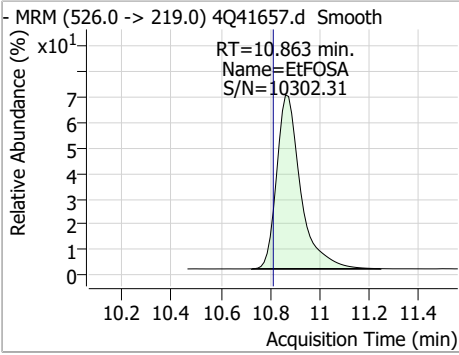


7.7.10
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Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	2.42	10.86	0.05	9009	526.0 -> 169.0	112.8	55.6	166.7



7.7.10
7

Manual Integration Approval Summary

Sample Number: S4Q596-ICV596 Method: EPA DRAFT 1633
Lab FileID: 4Q41657.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 19:52 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.08	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.09	Split peak

7.7.10.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41658.d
 Operator : annal
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/3/2023 8:06:58 PM
 Sample Name : icv596-20
 Vial : P1-B2
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q596.batch.bin
 Sample Information : op95682,S4Q596,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.152	216.8 -> 171.9	142409	10.00 µg/L	-0.087
M5-PFPeA	4.500	268.3 -> 223.0	86322	5.00 µg/L	-0.075
M5-PFHxA	5.484	318.0 -> 273.0	66606	2.50 µg/L	-0.037
M4-PFHpA	6.318	367.1 -> 322.0	36717	2.50 µg/L	-0.025
M8-PFOA	6.975	421.1 -> 376.0	39289	2.50 µg/L	0.026
M9-PFNA	7.496	472.1 -> 427.0	21400	1.25 µg/L	0.000
M6-PFDA	7.967	519.1 -> 474.1	19764	1.25 µg/L	0.000
M7-PFUnDA	8.398	570.0 -> 525.1	20083	1.25 µg/L	0.012
M2-PFDoDA	8.793	615.1 -> 570.0	24481	1.25 µg/L	0.026
M2-PFTeDA	9.512	715.2 -> 670.0	19553	1.25 µg/L	0.025
M8-FOSA	9.534	506.1 -> 77.8	16647	2.50 µg/L	0.025
M3-PFBS	5.439	302.1 -> 79.9	14819	2.50 µg/L	-0.050
M3-PFHxS	7.080	402.1 -> 79.9	8219	2.50 µg/L	0.014
M8-PFOS	8.117	507.1 -> 79.9	11875	2.50 µg/L	0.000
M2-4:2FTS	5.210	329.1 -> 80.9	1795	5.00 µg/L	-0.049
M2-6:2FTS	6.736	429.1 -> 80.9	2373	5.00 µg/L	0.012
M2-8:2FTS	7.754	529.1 -> 80.9	4179	5.00 µg/L	-0.012
M3-MeFOSAA	8.025	573.2 -> 419.0	17461	5.00 µg/L	-0.012
M3-HFPO-DA	5.790	286.9 -> 168.9	32742	10.00 µg/L	-0.037
M5-EtFOSAA	8.234	589.2 -> 419.0	12897	5.00 µg/L	0.000
M7-MeFOSE	10.425	623.2 -> 58.9	61856	25.00 µg/L	0.012
M9-EtFOSE	10.721	639.2 -> 58.9	70268	25.00 µg/L	0.012
M5-EtFOSA	10.824	531.1 -> 219.0	8783	2.50 µg/L	0.012
M3-MeFOSA	10.528	515.0 -> 219.0	8077	2.50 µg/L	0.012
13C4-PFOS	8.118	502.8 -> 79.9	11137	2.50 µg/L	0.000
13C3-PFBA	3.155	216.0 -> 172.0	83820	5.00 µg/L	-0.087
18O2-PFHxS	7.079	403.0 -> 83.9	6148	2.50 µg/L	0.014
13C4-PFOA	6.976	417.1 -> 372.0	47656	2.50 µg/L	0.026
13C2-PFDA	7.967	515.1 -> 470.1	17503	1.25 µg/L	0.000
13C5-PFNA	7.496	468.0 -> 423.0	25360	1.25 µg/L	0.000
13C2-PFHxA	5.485	315.1 -> 270.0	61223	2.50 µg/L	-0.037
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1795	5.38 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 107.7%		
13C2-6:2FTS	6.736	429.1 -> 80.9	2373	5.02 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 100.5%		
13C2-8:2FTS	7.754	529.1 -> 80.9	4179	5.68 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 113.7%		
13C2-PFDoDA	8.793	615.1 -> 570.0	24481	1.32 µg/L	0.026
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 105.8%		
13C2-PFTeDA	9.512	715.2 -> 670.0	19553	1.28 µg/L	0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 102.4%		
13C3-PFBS	5.439	302.1 -> 79.9	14819	2.59 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 103.6%		
13C3-PFHxS	7.080	402.1 -> 79.9	8219	2.46 µg/L	0.014

7.7.11
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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.3%	
13C4-PFBA	3.152	216.8 -> 171.9	142409	9.88 µg/L	-0.087
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 98.8%	
13C4-PFHpA	6.318	367.1 -> 322.0	36717	2.53 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.1%	
13C5-PFHxA	5.484	318.0 -> 273.0	66606	2.51 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C5-PFPeA	4.500	268.3 -> 223.0	86322	5.17 µg/L	-0.075
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 103.3%	
13C6-PFDA	7.967	519.1 -> 474.1	19764	1.32 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 105.4%	
13C7-PFUnDA	8.398	570.0 -> 525.1	20083	1.29 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 103.5%	
13C8-FOSA	9.534	506.1 -> 77.8	16647	2.69 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 107.5%	
13C8-PFOA	6.975	421.1 -> 376.0	39289	2.49 µg/L	0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.7%	
13C8-PFOS	8.117	507.1 -> 79.9	11875	2.71 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 108.3%	
13C9-PFNA	7.496	472.1 -> 427.0	21400	1.21 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 96.5%	
d3-MeFOSAA	8.025	573.2 -> 419.0	17461	5.61 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 112.3%	
13C3-HFPO-DA	5.790	286.9 -> 168.9	32742	10.56 µg/L	-0.037
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 105.6%	
d3-MeFOSA	10.528	515.0 -> 219.0	8077	2.56 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 102.4%	
d5-EtFOSAA	8.234	589.2 -> 419.0	12897	5.08 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 101.6%	
d7-MeFOSE	10.425	623.2 -> 58.9	61856	26.08 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 104.3%	
d9-EtFOSE	10.721	639.2 -> 58.9	70268	26.51 µg/L	0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 106.1%	
d5-EtFOSA	10.824	531.1 -> 219.0	8783	2.64 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 105.5%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	50456	20.64 µg/L	98
		327.1 -> 80.9	21904		
6:2FTS	6.737	427.1 -> 407.0	38140	22.20 µg/L	99
		427.1 -> 80.9	16417		
8:2FTS	7.754	527.1 -> 507.0	37816	20.10 µg/L	97
		527.1 -> 80.8	15676		
EtFOSAA	8.235	584.2 -> 419.1	43833	21.14 µg/L	96
		584.2 -> 526.0	19883		
FOSA	9.537	498.1 -> 77.9	126436	21.09 µg/L	98
		498.1 -> 478.0	3301		
MeFOSAA	8.025	570.1 -> 419.0	45759	19.08 µg/L	m 94
		570.1 -> 483.0	9602		
PFBA	3.158	212.8 -> 168.9	60759	19.81 µg/L	100
PFBS	5.440	298.7 -> 79.9	113198	21.35 µg/L	99
		298.7 -> 98.8	43392		
PFDA	7.968	512.9 -> 469.0	243970	21.55 µg/L	99
		512.9 -> 219.0	49186		
PFDoDA	8.794	613.1 -> 569.0	288238	18.11 µg/L	100
		613.1 -> 319.0	40583		
PFDS	8.945	599.0 -> 79.9	49424	19.73 µg/L	100

7.7.11
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	24513			
PFHpA	6.318	363.1 -> 319.0	380067	20.53	µg/L	98
		363.1 -> 169.0	64852			
PFHpS	7.636	449.0 -> 79.9	65410	20.16	µg/L	97
		449.0 -> 98.9	33674			
PFHxA	5.487	313.0 -> 269.0	431645	21.20	µg/L	100
		313.0 -> 118.9	12931			
PFHxS	7.081	398.7 -> 79.9	62913	20.99	µg/L	m 98
		398.7 -> 98.9	31164			
PFNA	7.497	463.0 -> 419.0	256229	22.66	µg/L	98
		463.0 -> 219.0	65064			
PFNS	8.550	548.8 -> 79.9	37594	19.97	µg/L	99
		548.8 -> 98.9	18684			
PFOA	6.977	413.0 -> 369.0	363113	20.39	µg/L	99
		413.0 -> 169.0	72674			
PFOS	8.119	498.9 -> 79.9	79677	15.87	µg/L	m 81
		498.9 -> 98.8	37308			
PFPeA	4.502	263.0 -> 219.0	360093	21.76	µg/L	100
PFPeS	6.382	349.1 -> 79.9	61083	22.10	µg/L	100
		349.1 -> 98.9	26080			
PFTeDA	9.513	713.1 -> 669.0	303978	22.41	µg/L	100
		713.1 -> 168.9	25363			
PFTrDA	9.166	663.0 -> 619.0	366550	19.23	µg/L	99
		663.0 -> 168.9	36523			
PFUnDA	8.399	563.1 -> 519.0	210846	20.44	µg/L	98
		563.1 -> 269.1	41403			
11Cl-PF3OUdS	9.218	630.9 -> 450.9	203271	21.78	µg/L	99
		632.9 -> 452.9	61822			
9Cl-PF3ONS	8.425	530.8 -> 351.0	226186	20.49	µg/L	100
		532.8 -> 353.0	66859			
ADONA	6.581	376.9 -> 250.9	439945	20.45	µg/L	99
		376.9 -> 84.8	119293			
HFPO-DA	5.791	284.9 -> 168.9	52318	20.30	µg/L	98
		284.9 -> 184.9	6241			
3:3FTCA	4.167	241.0 -> 177.0	17351	19.43	µg/L	99
		241.0 -> 117.0	1619			
5:3FTCA	6.271	341.0 -> 237.1	71805	21.29	µg/L	99
		341.0 -> 217.0	49555			
7:3FTCA	7.661	441.0 -> 316.9	24327	19.37	µg/L	98
		441.0 -> 336.9	55127			
EtFOSA	10.838	526.0 -> 219.0	69944	19.49	µg/L	100
		526.0 -> 169.0	77856			
EtFOSE	10.747	630.0 -> 58.9	228264	91.72	µg/L	100
MeFOSA	10.530	511.9 -> 219.0	56625	19.43	µg/L	97
		511.9 -> 169.0	65941			
MeFOSE	10.439	616.1 -> 58.9	211791	89.68	µg/L	100
PFDoDS	9.640	699.1 -> 79.9	38517	18.15	µg/L	100
		699.1 -> 98.8	21326			
NFDHA	5.391	295.0 -> 201.0	15263	22.05	µg/L	98
		295.0 -> 84.9	3801			
PFMBA	4.842	279.0 -> 85.1	186422	20.09	µg/L	100
PFMPA	3.765	229.0 -> 84.9	159369	19.97	µg/L	100
PFEESA	5.897	314.8 -> 134.9	275347	17.88	µg/L	98
		314.8 -> 82.9	9019			

= Qualifier out of range, m = manually integrated, + = Area summed



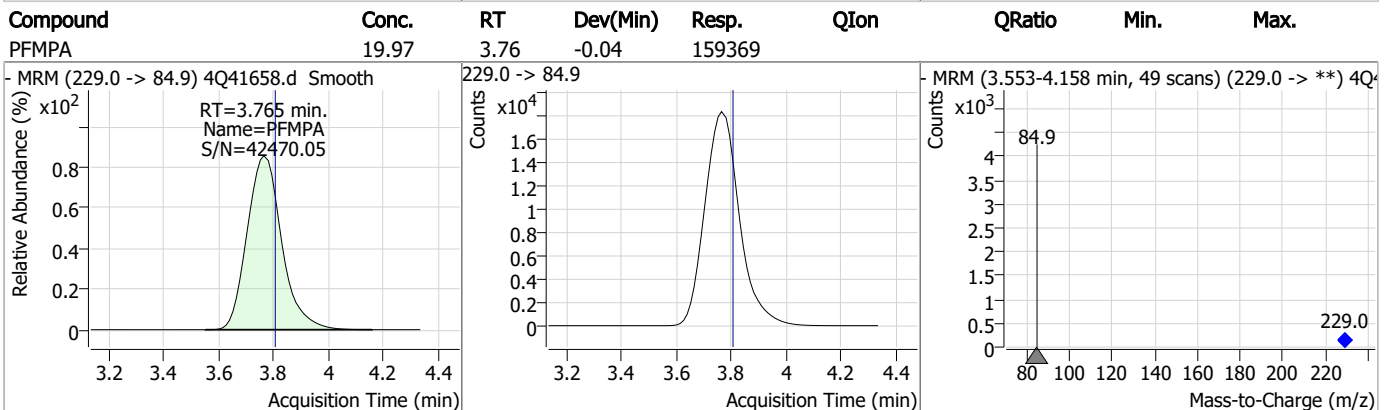
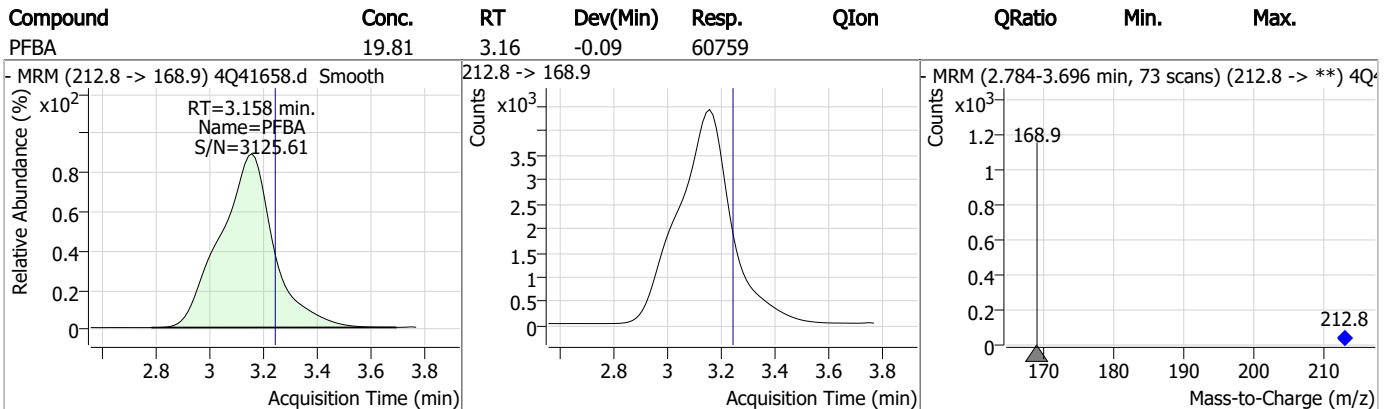
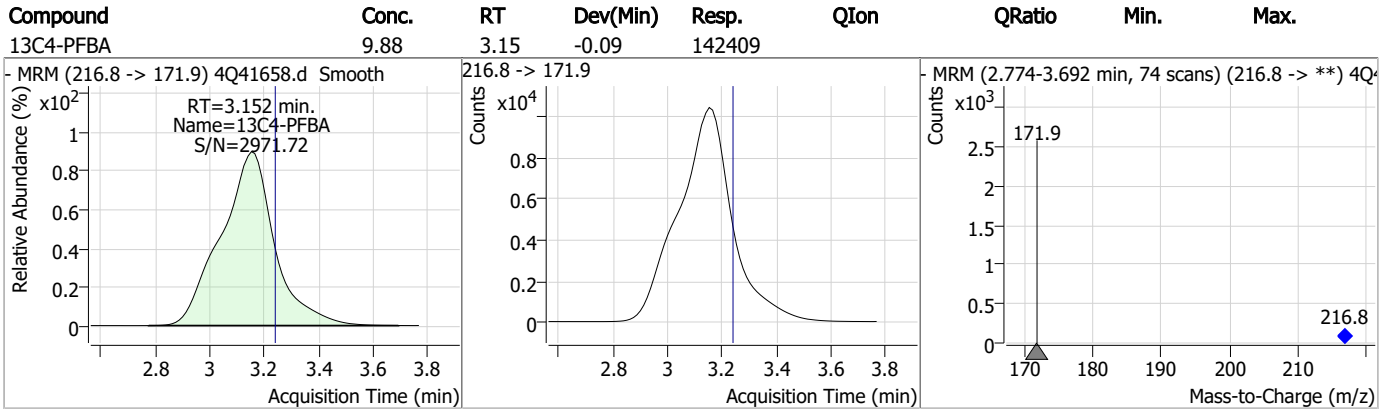
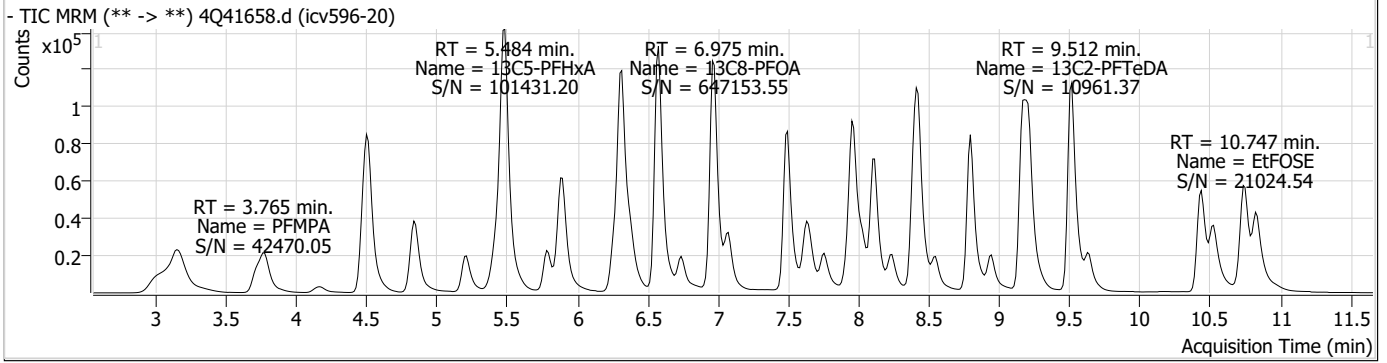
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.7.11

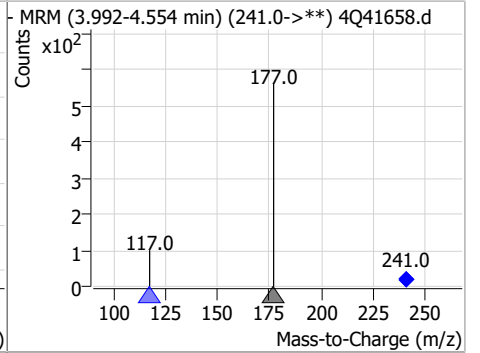
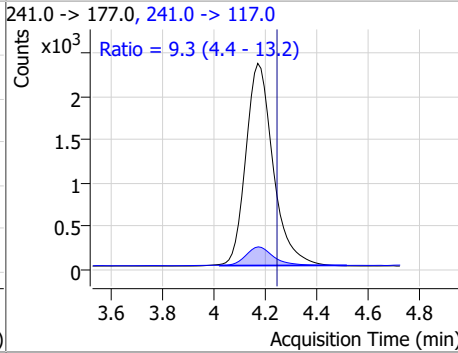
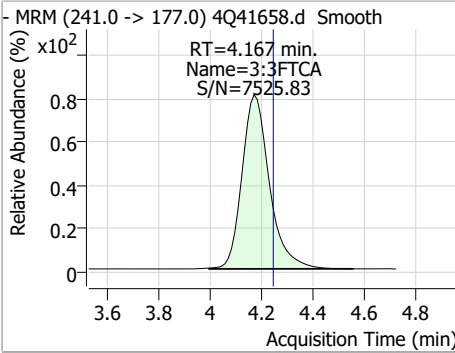
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Perfluorinated Compounds by LC/MS/MS

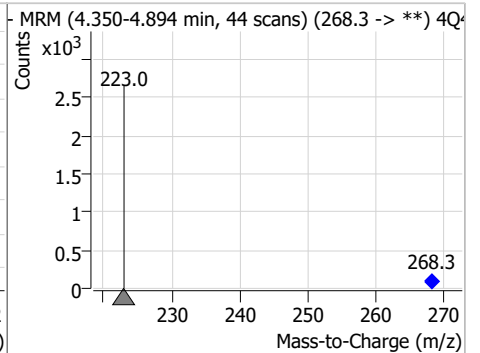
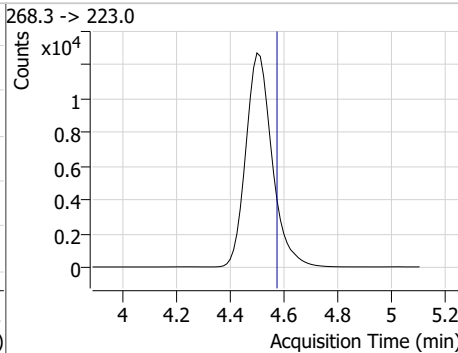
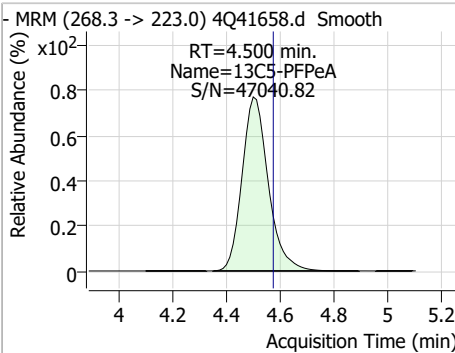


Perfluorinated Compounds by LC/MS/MS

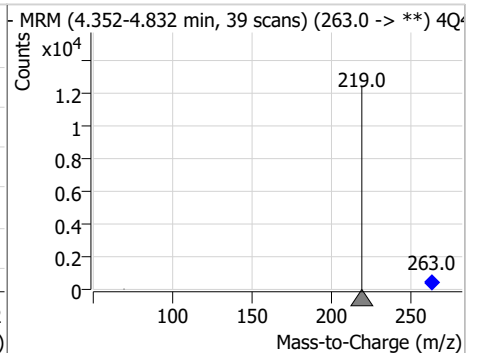
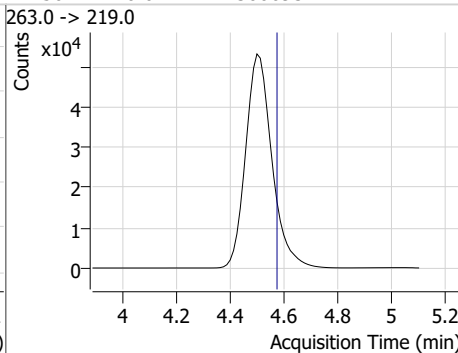
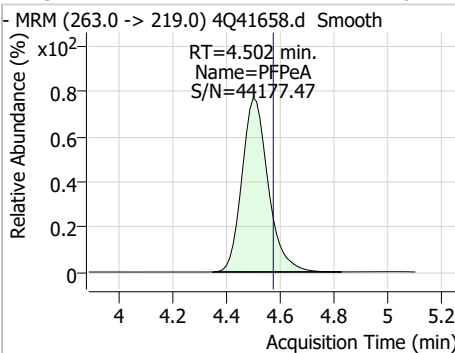
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
3:3FTCA	19.43	4.17	-0.07	17351	241.0 -> 117.0	9.3	4.4	13.2



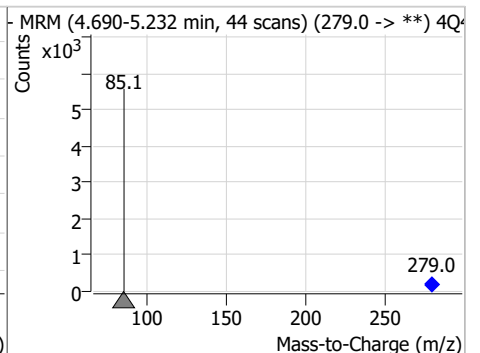
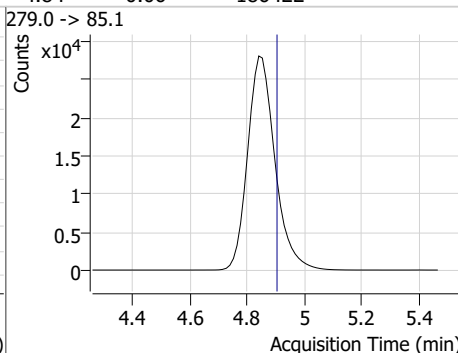
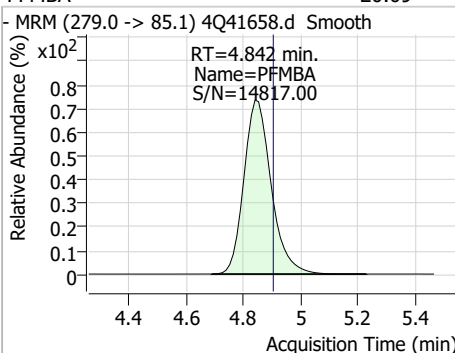
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFPeA	5.17	4.50	-0.07	86322				



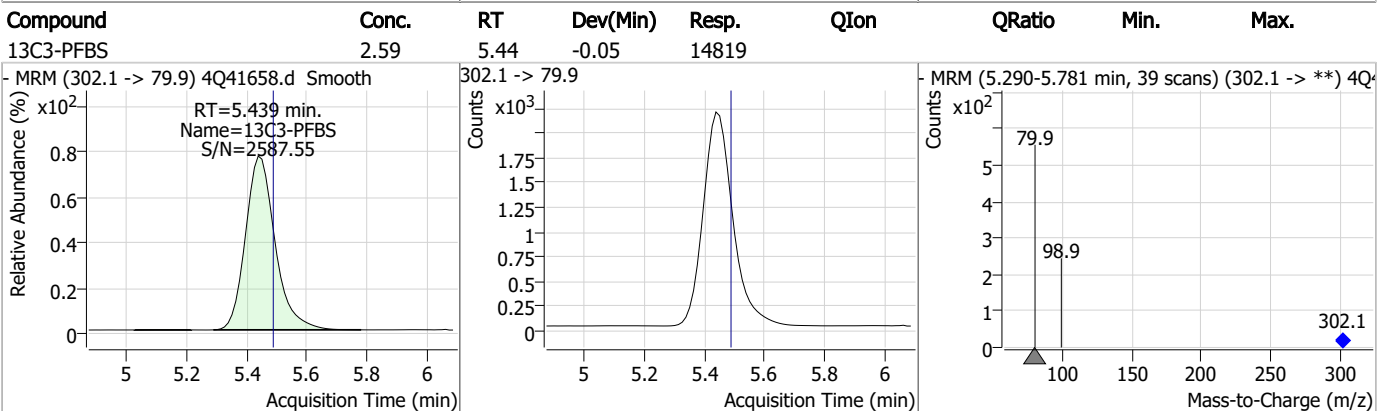
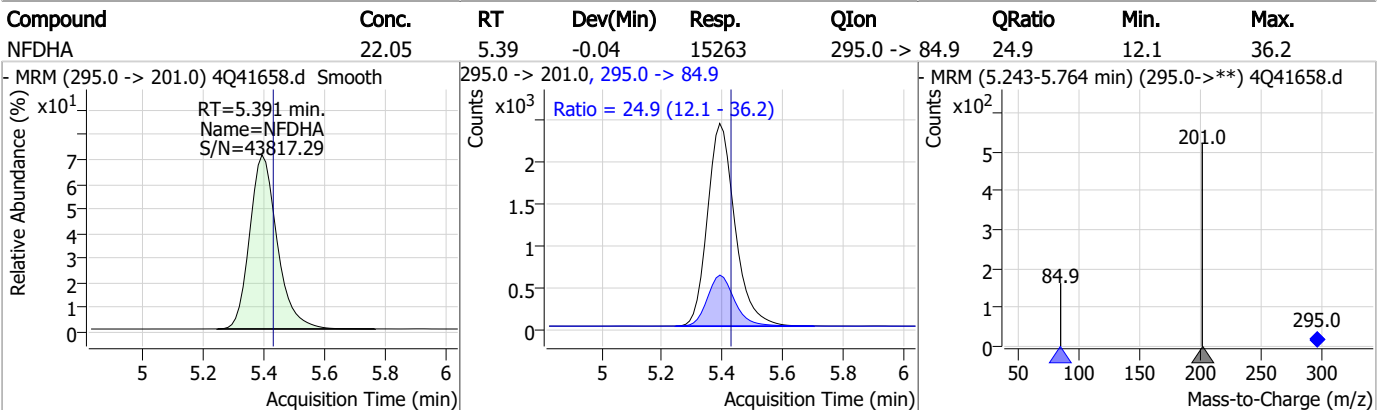
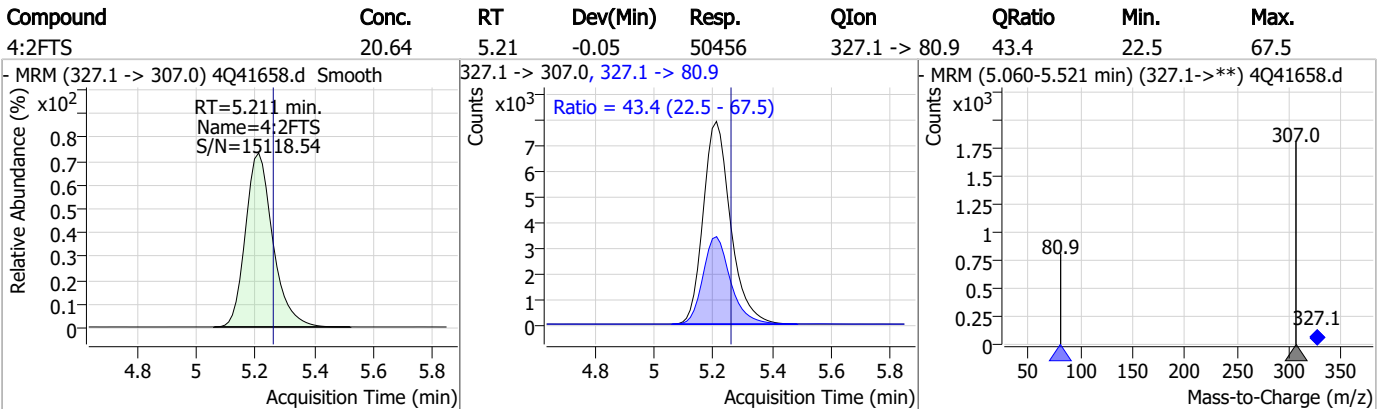
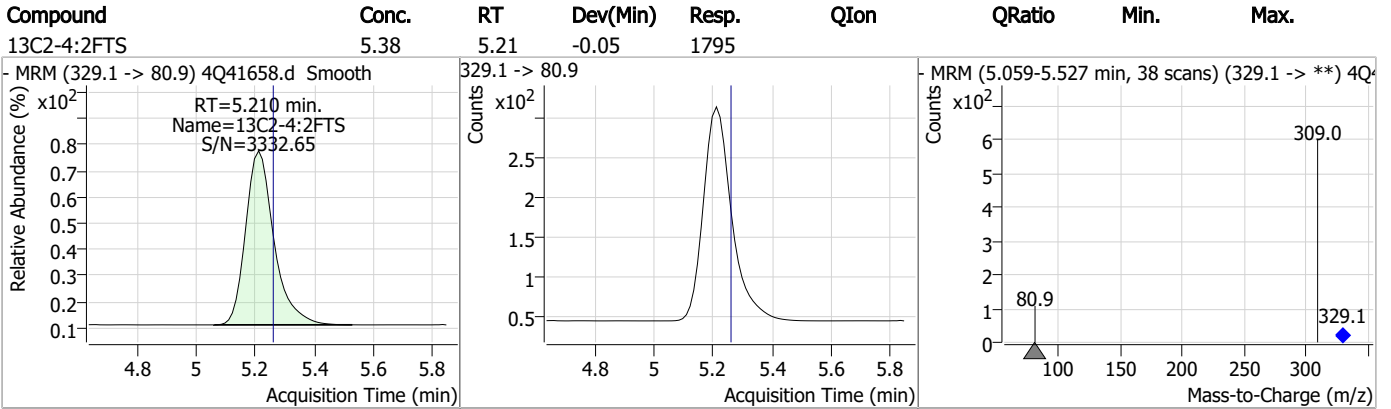
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	21.76	4.50	-0.07	360093				



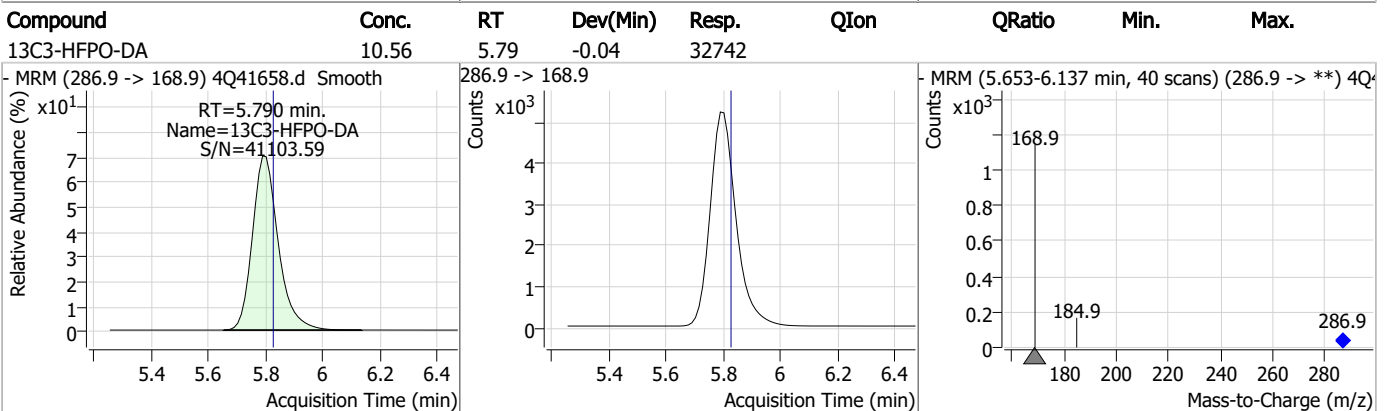
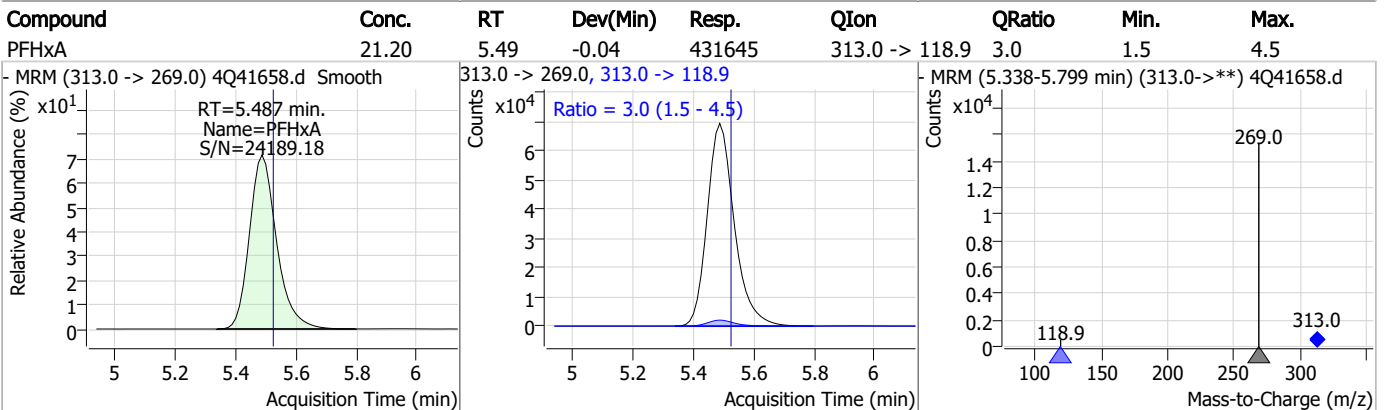
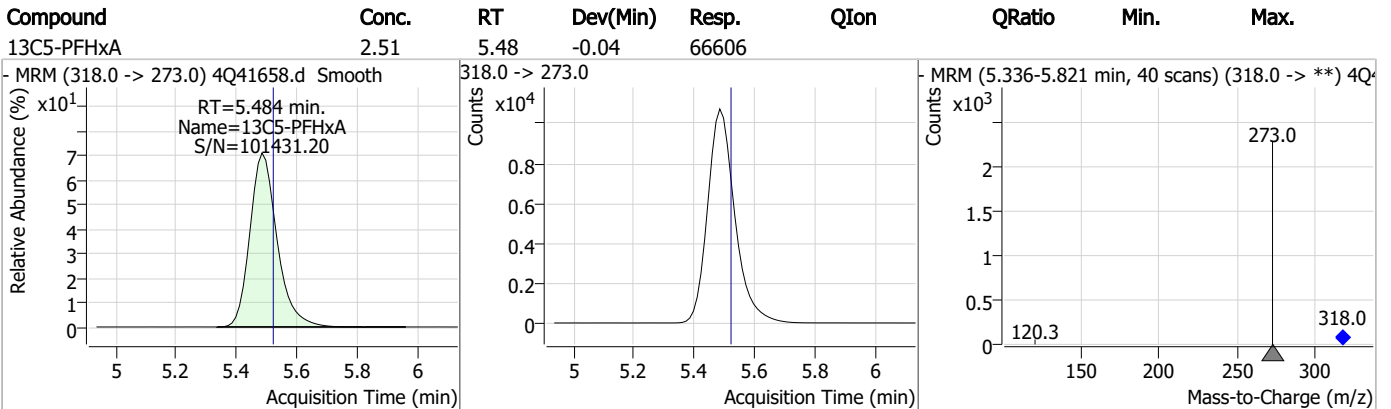
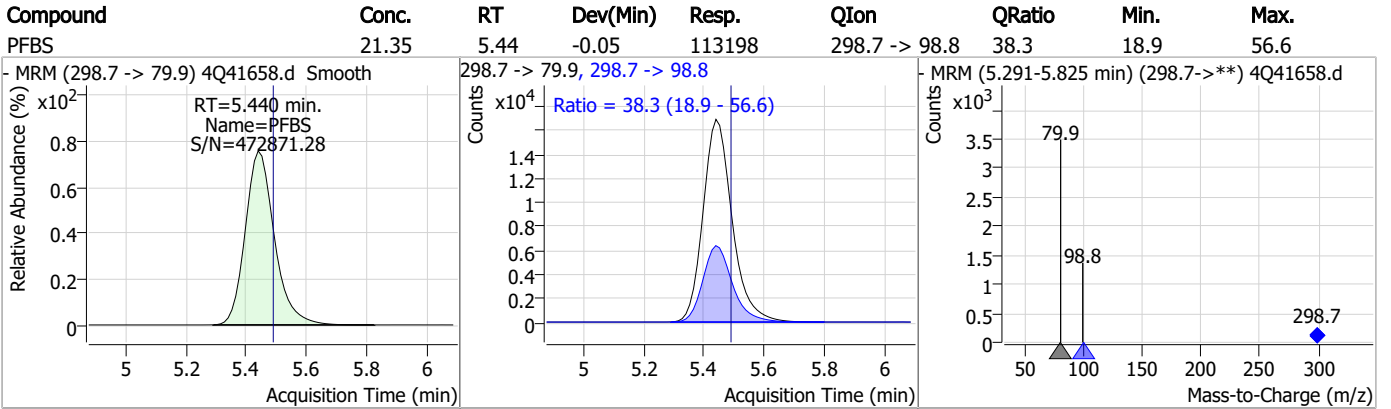
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFMBA	20.09	4.84	-0.06	186422				



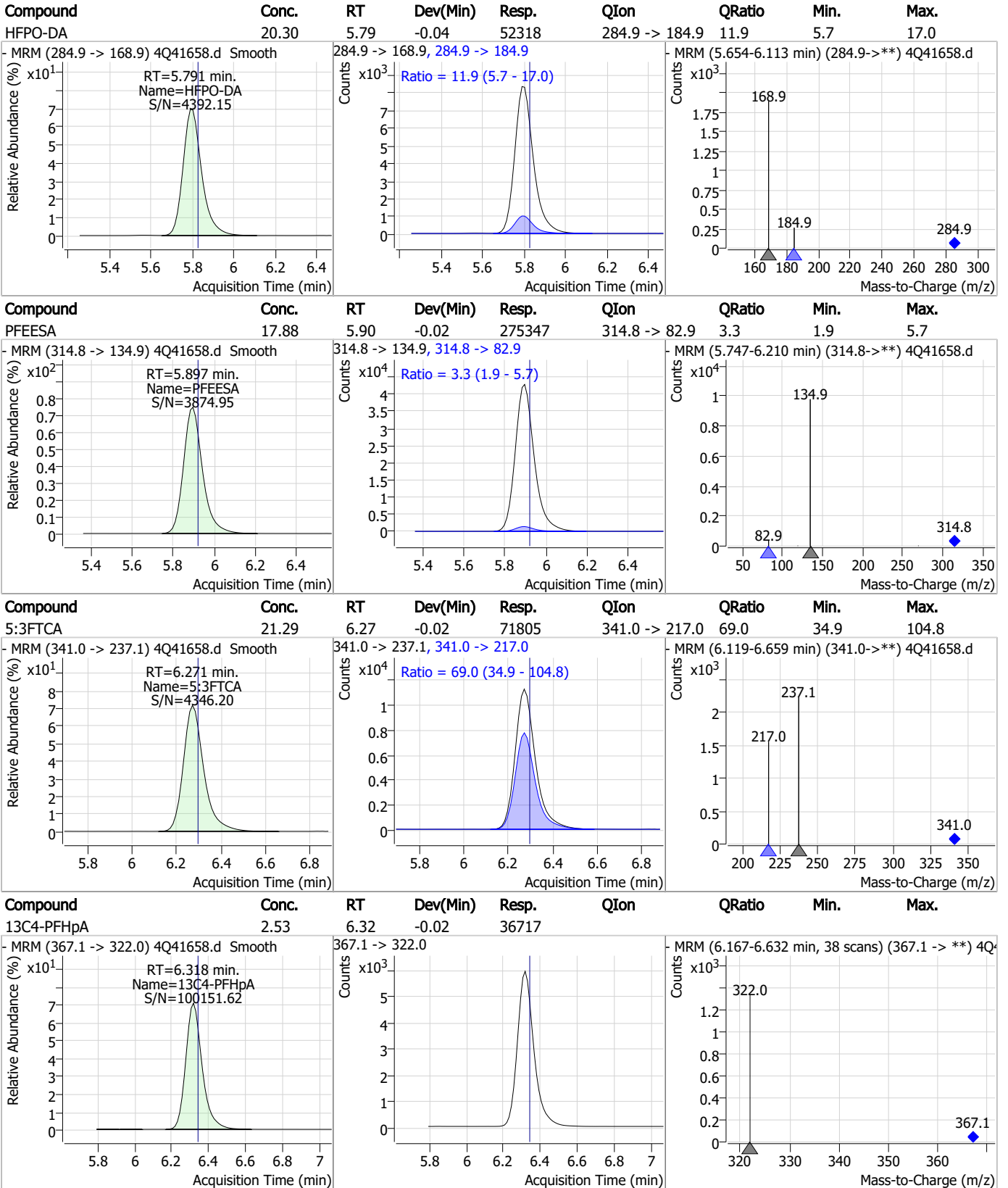
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



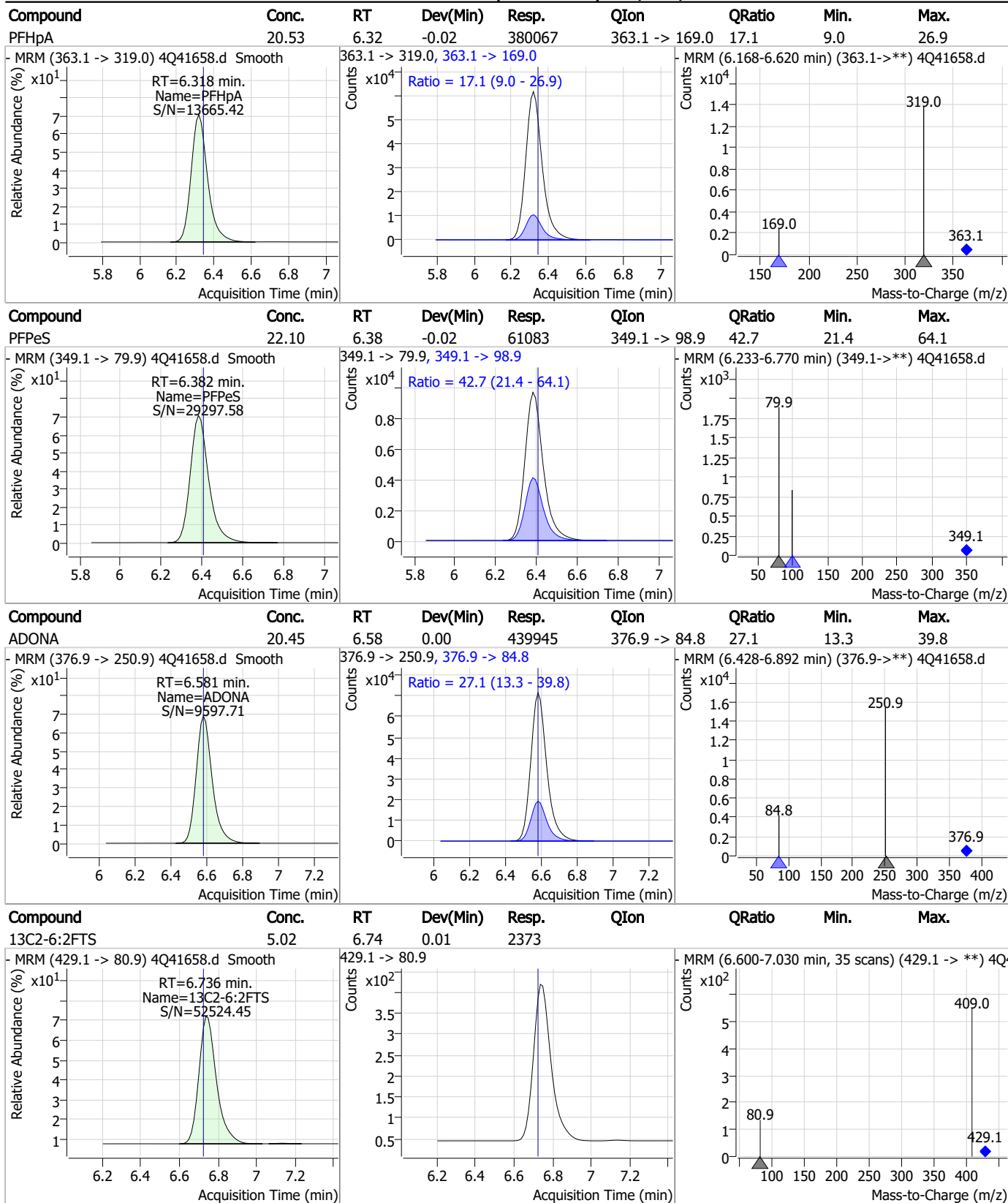
Perfluorinated Compounds by LC/MS/MS



7.7.11

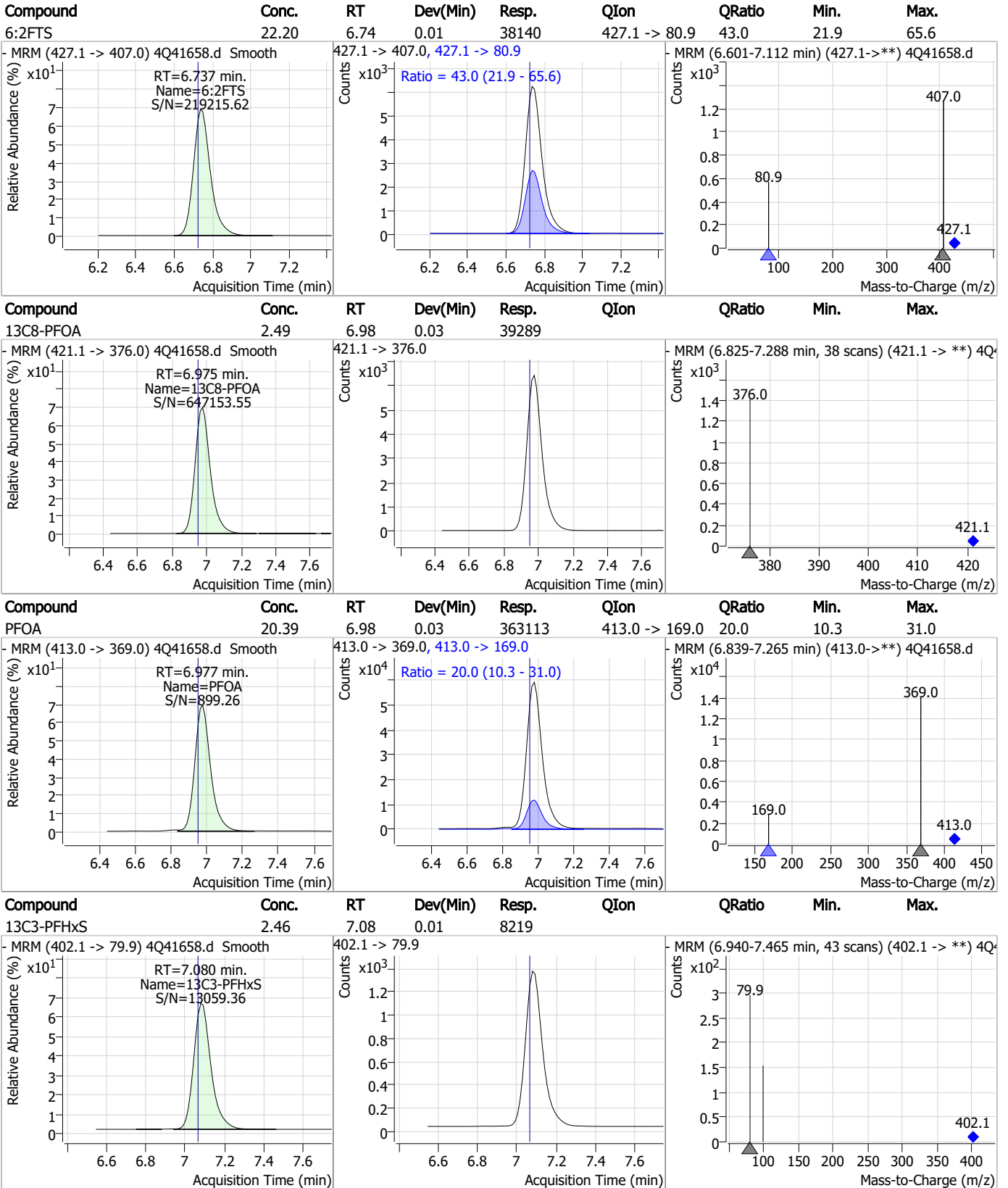
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Perfluorinated Compounds by LC/MS/MS



7.7.11
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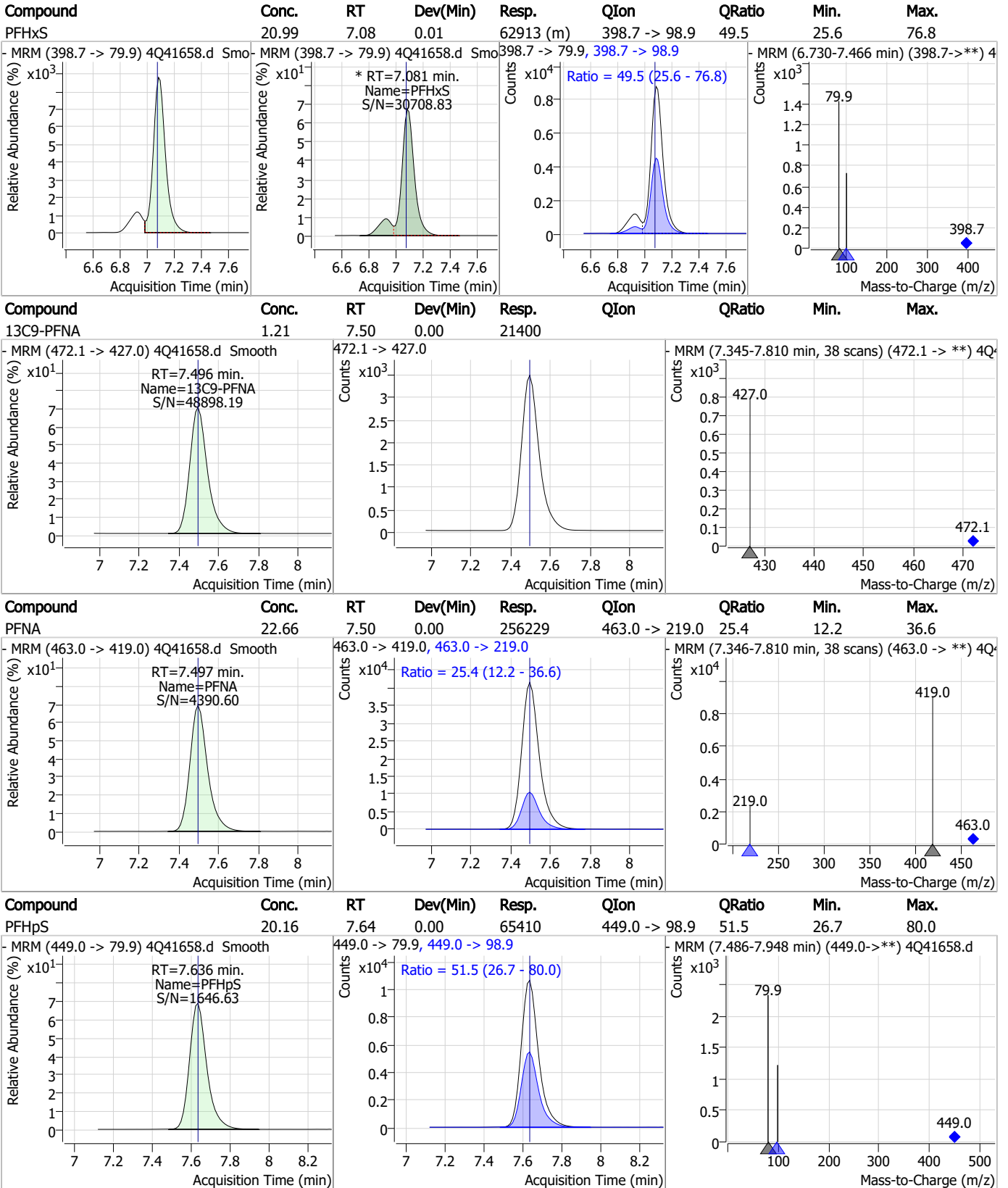
Perfluorinated Compounds by LC/MS/MS



7.7.11

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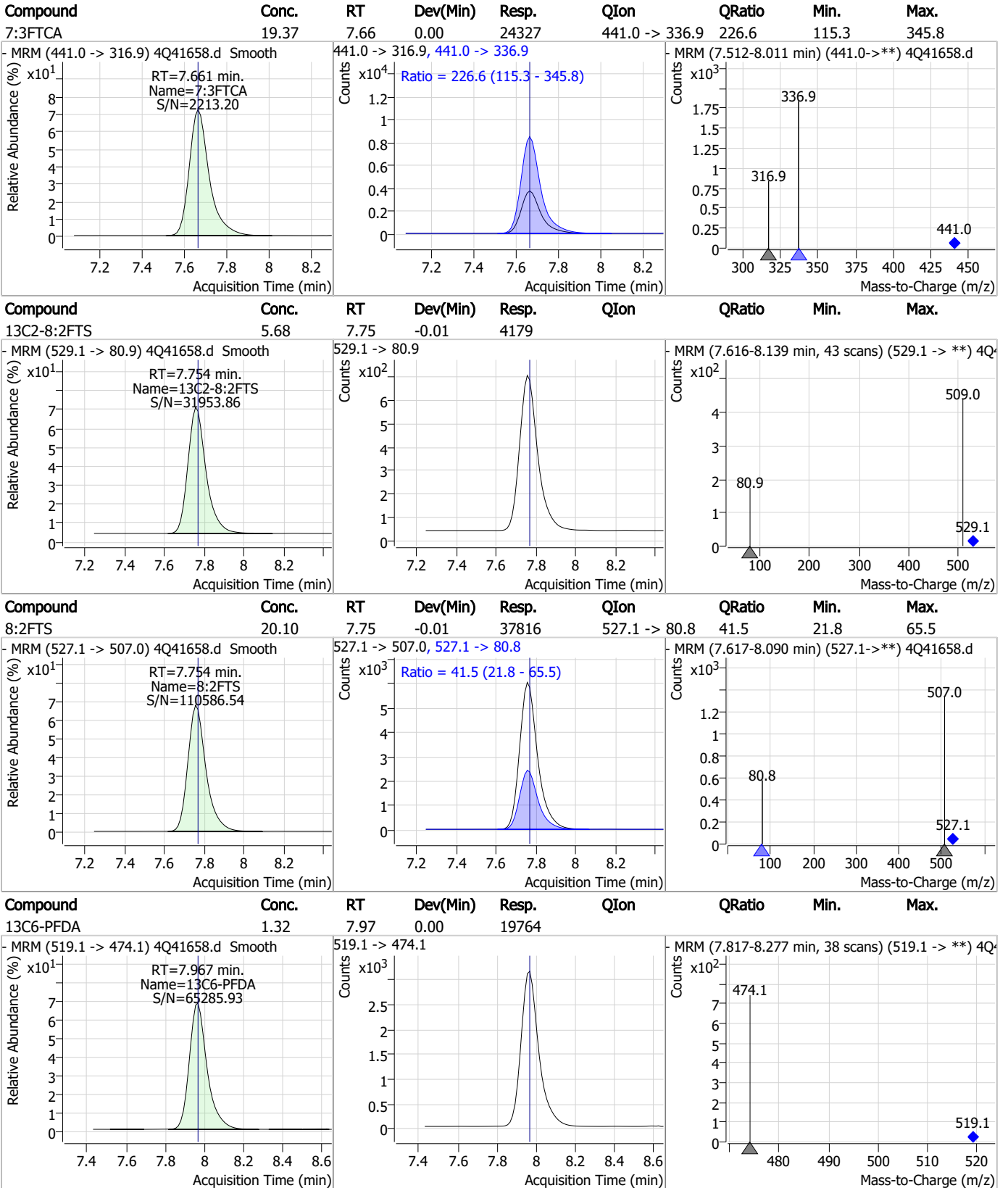
Perfluorinated Compounds by LC/MS/MS



7.7.11



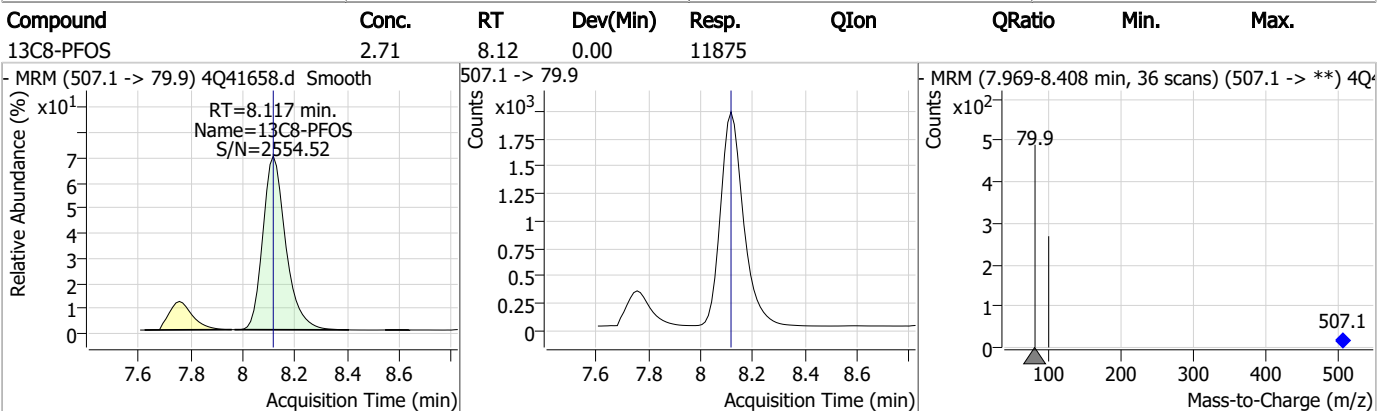
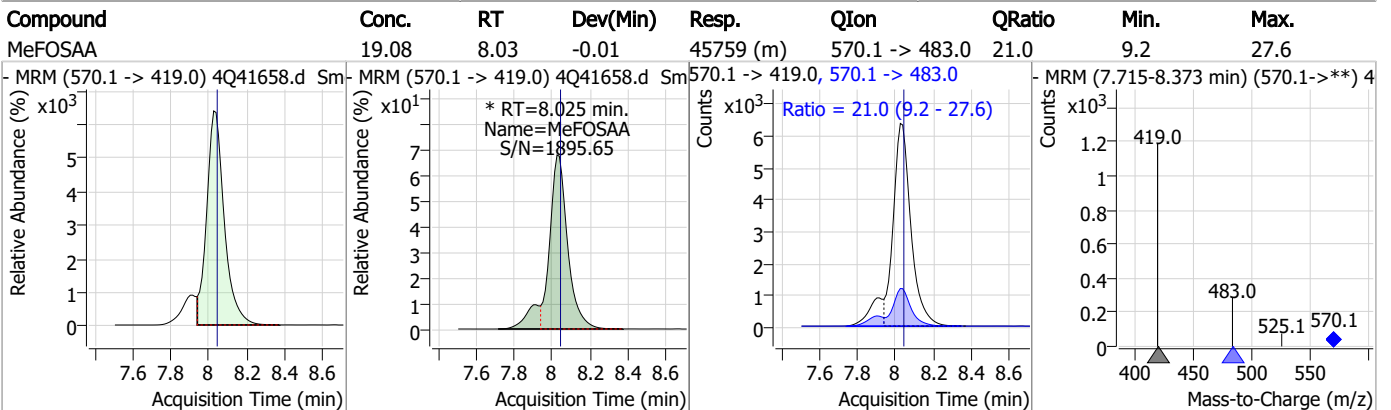
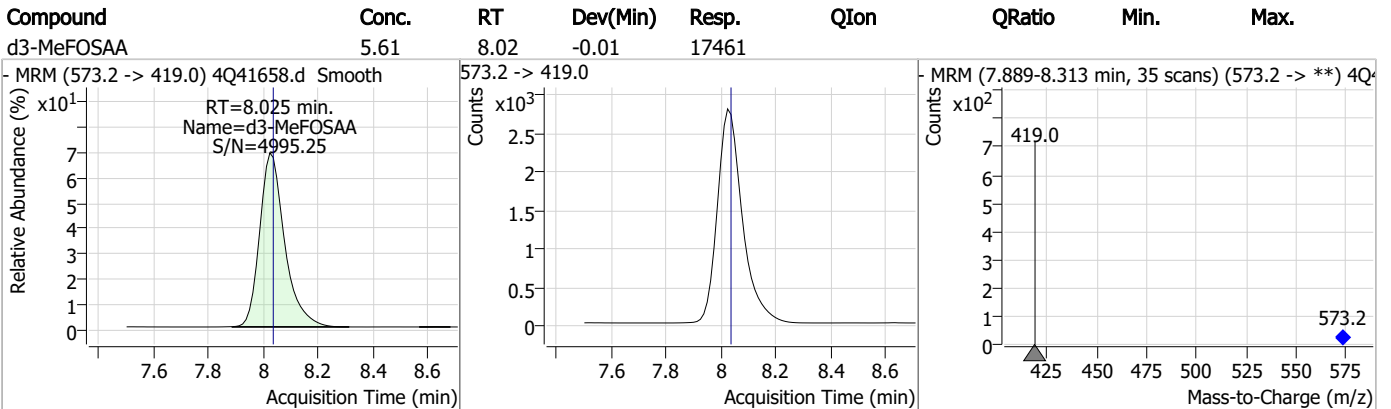
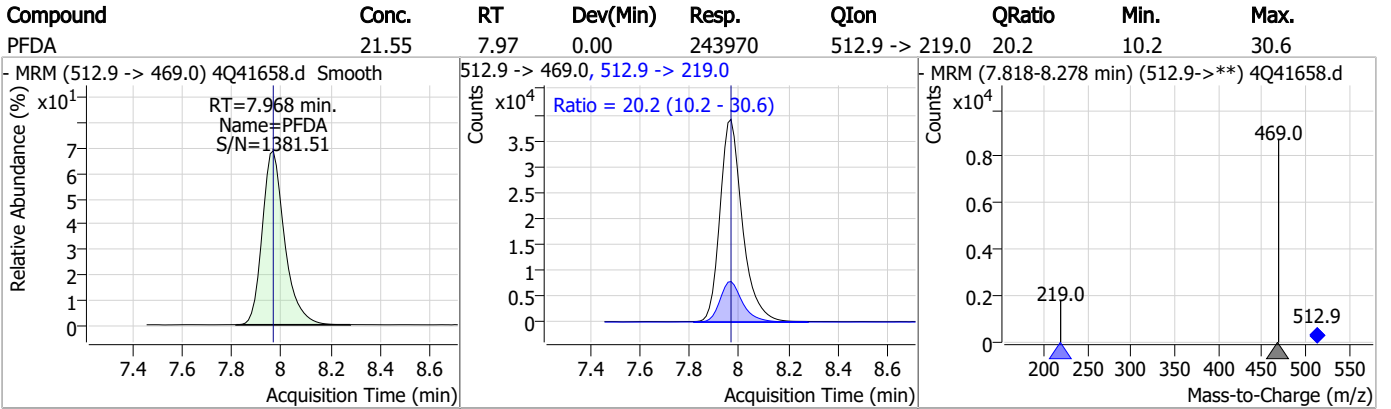
Perfluorinated Compounds by LC/MS/MS



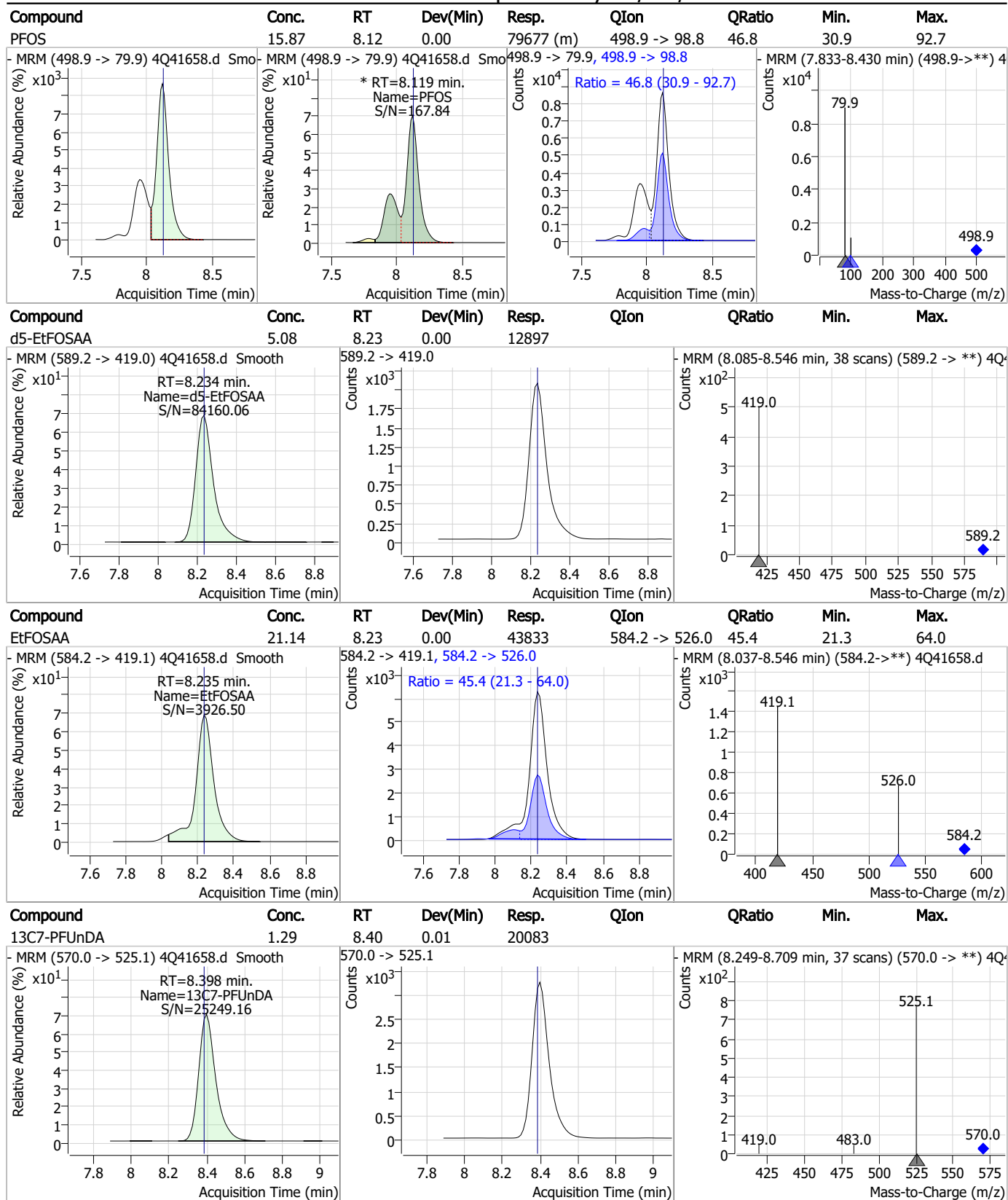
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Perfluorinated Compounds by LC/MS/MS

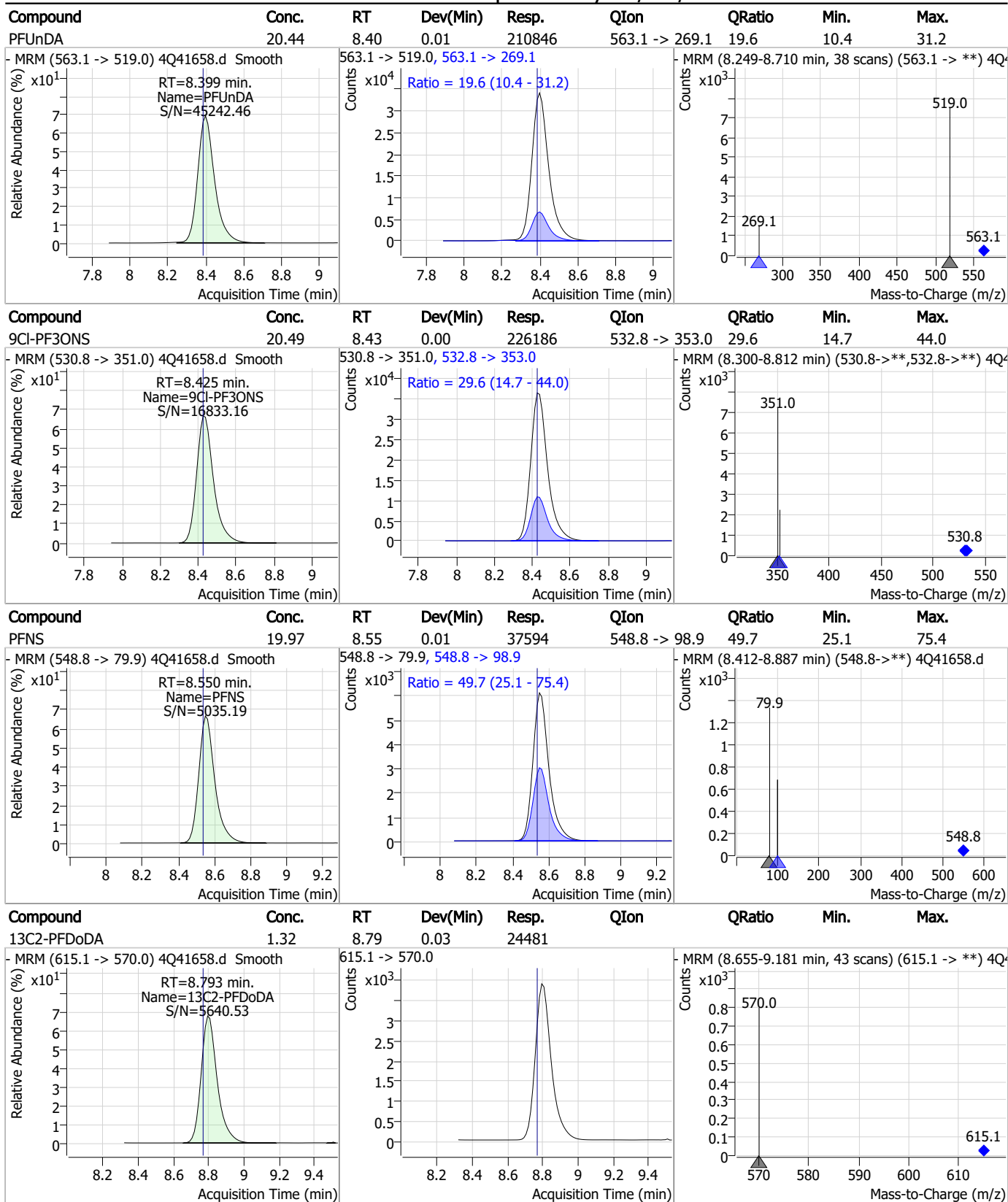


Perfluorinated Compounds by LC/MS/MS



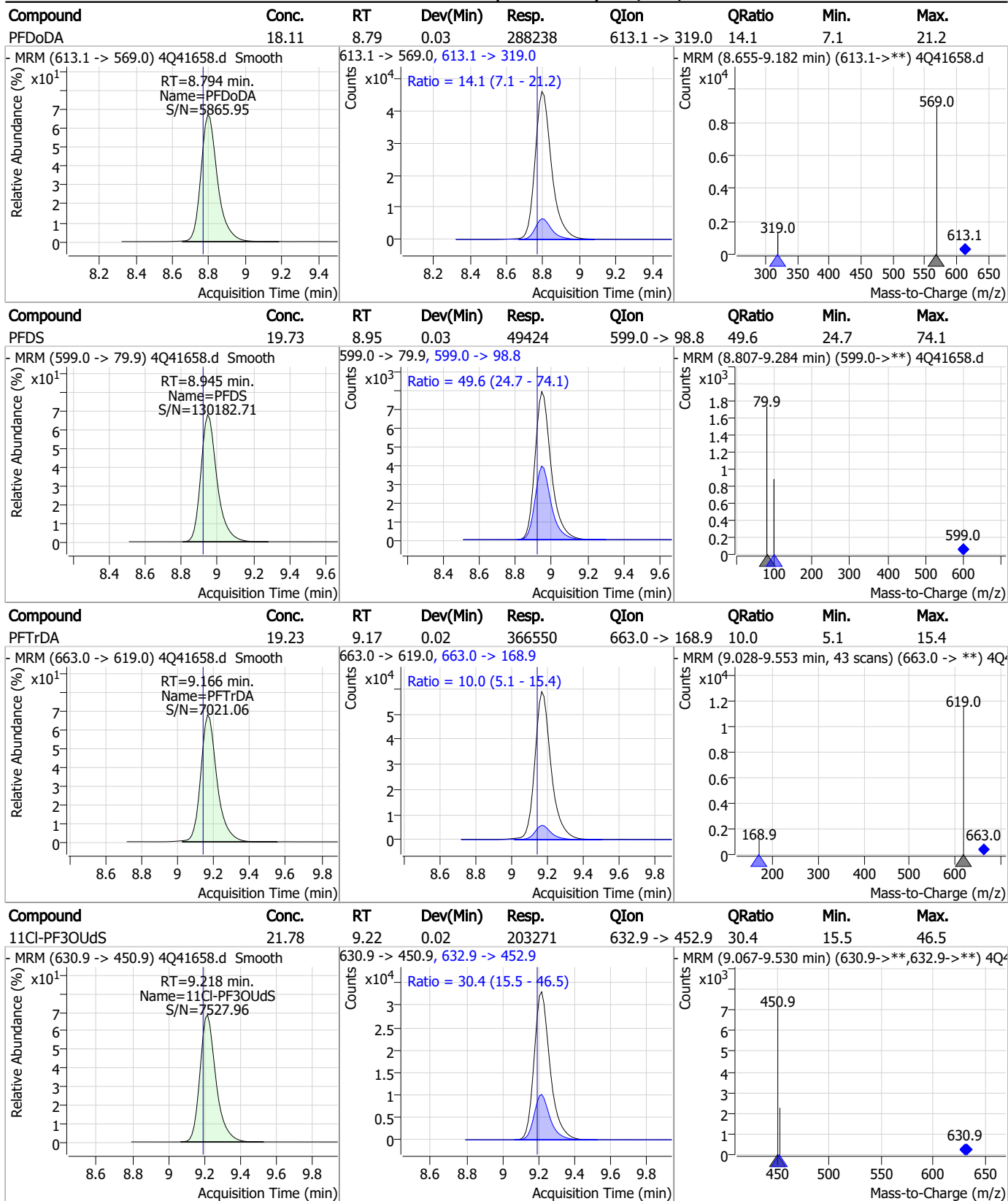
7.7.11
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Perfluorinated Compounds by LC/MS/MS



7.7.11
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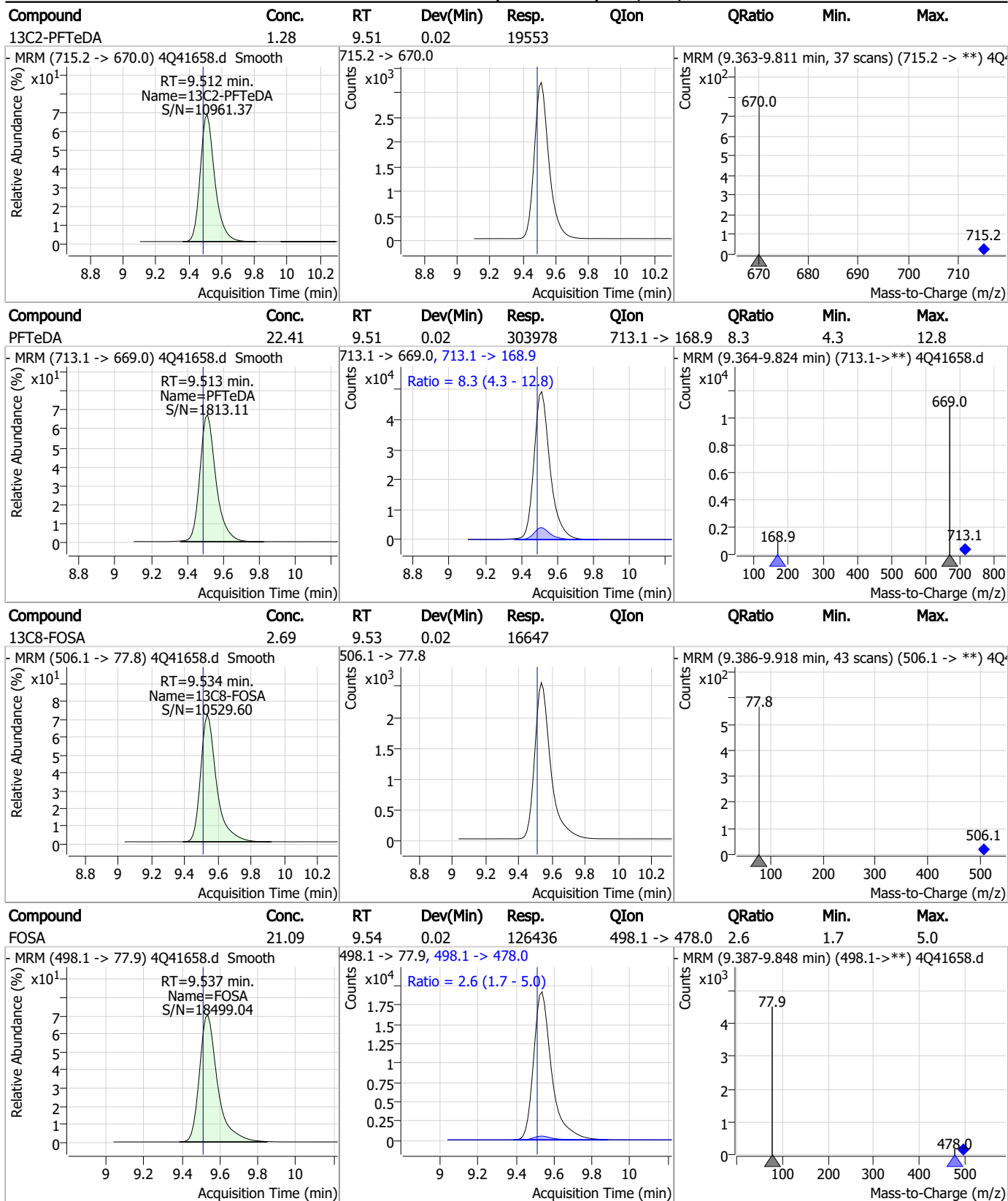
Perfluorinated Compounds by LC/MS/MS



7.7.11
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Perfluorinated Compounds by LC/MS/MS

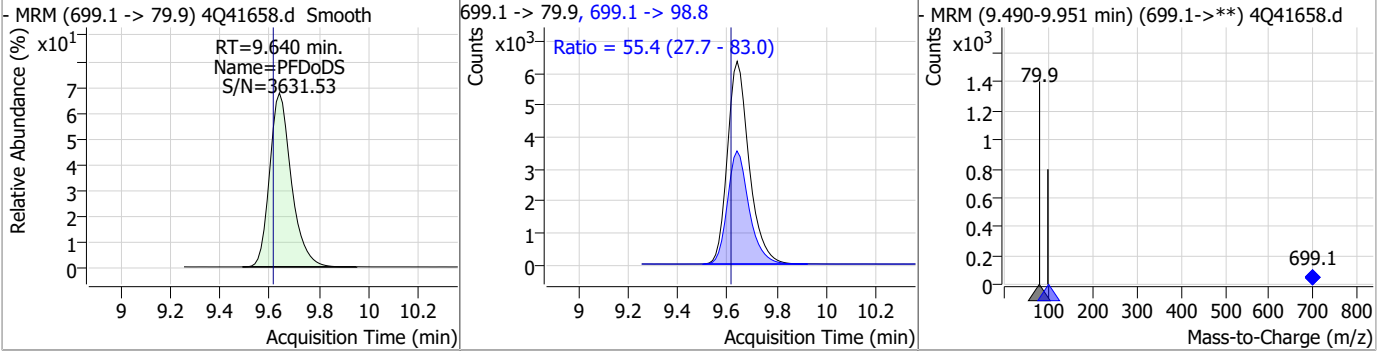


7.7.11
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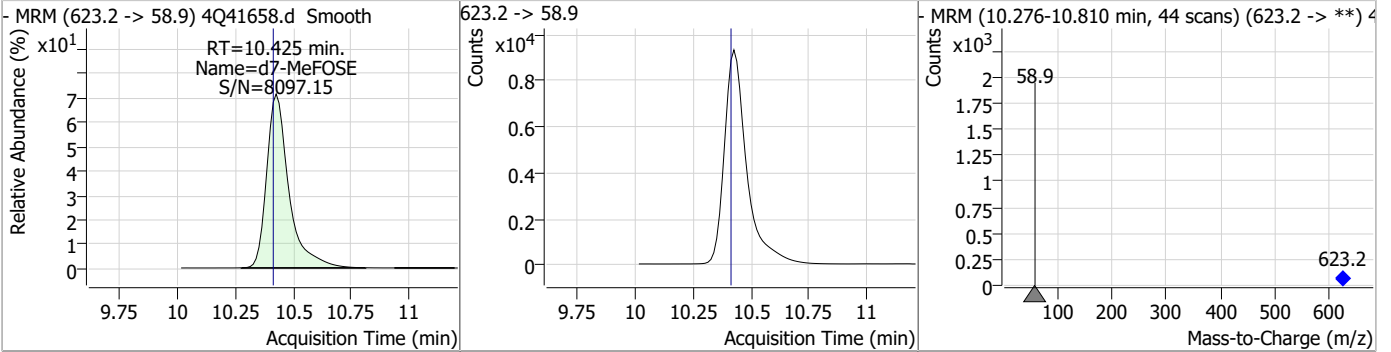


Perfluorinated Compounds by LC/MS/MS

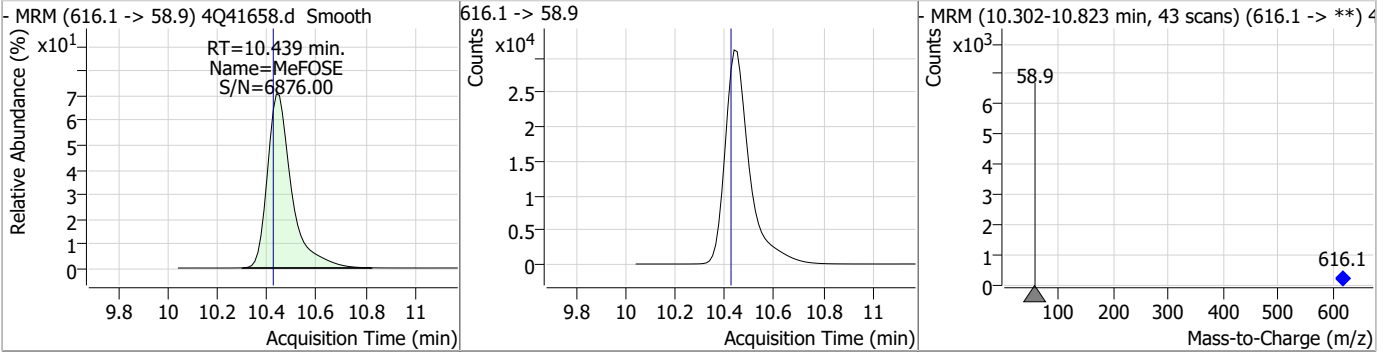
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoS	18.15	9.64	0.02	38517	699.1 -> 98.8	55.4	27.7	83.0



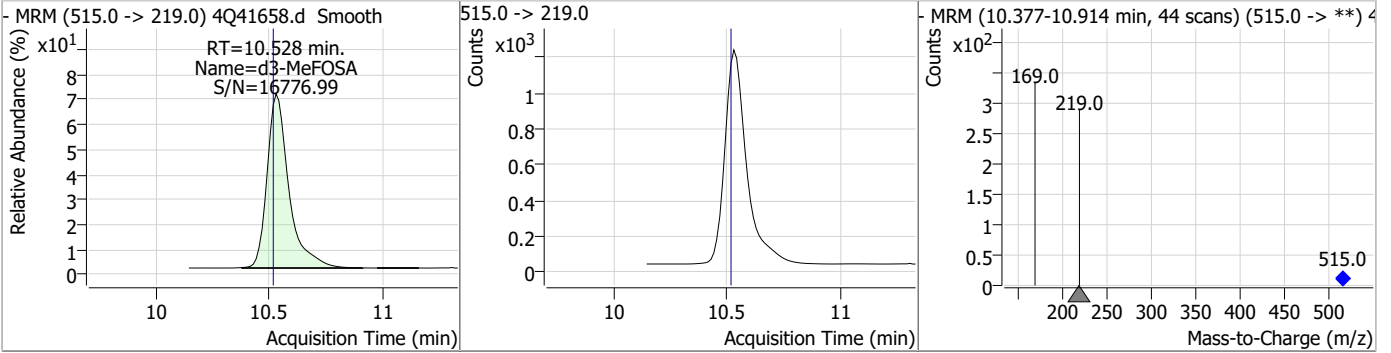
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	26.08	10.43	0.01	61856				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	89.68	10.44	0.01	211791				

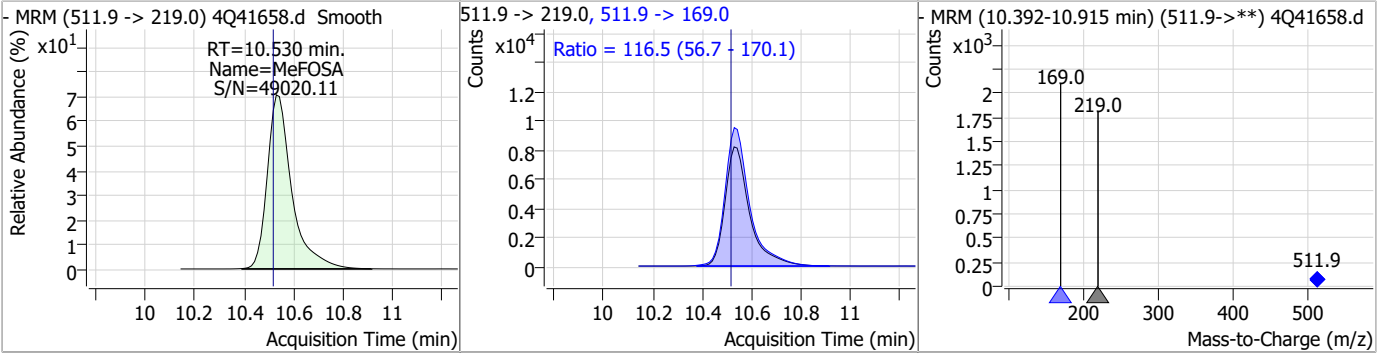


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.56	10.53	0.01	8077				

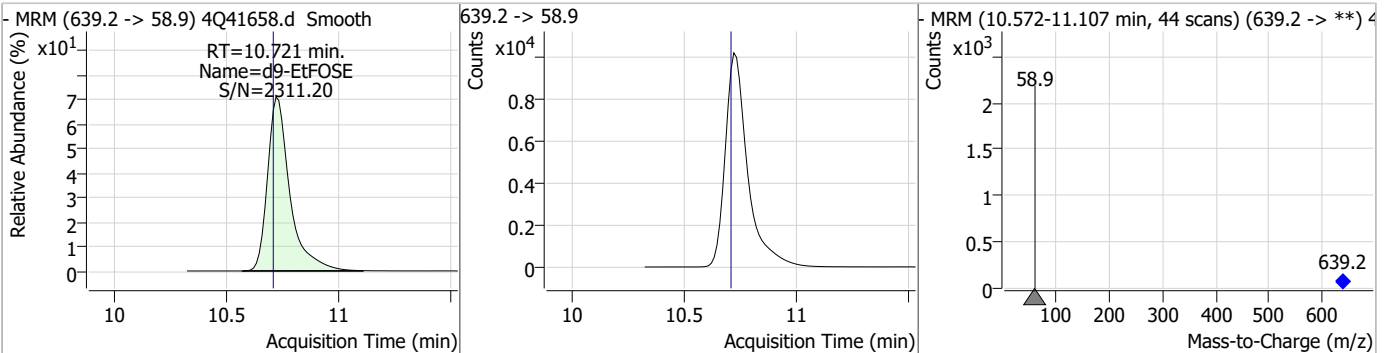


Perfluorinated Compounds by LC/MS/MS

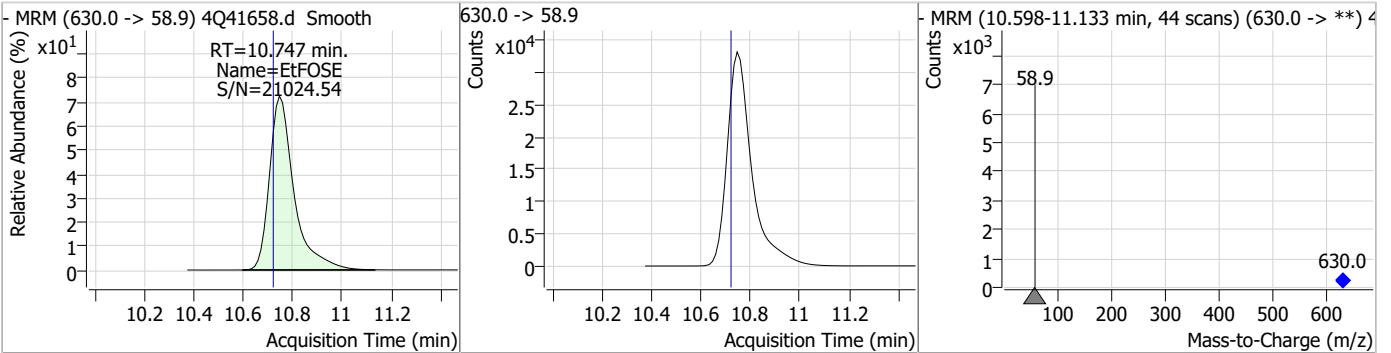
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	19.43	10.53	0.01	56625	511.9 -> 169.0	116.5	56.7	170.1



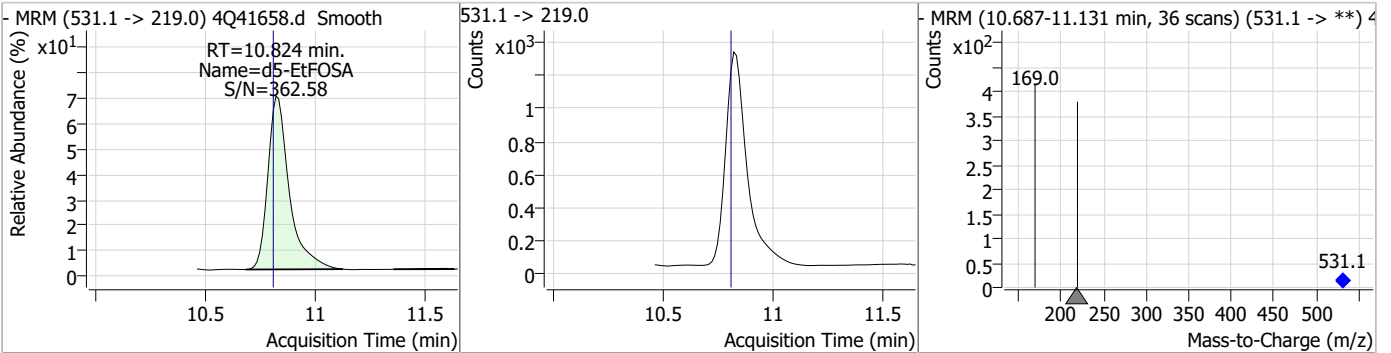
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	26.51	10.72	0.01	70268				



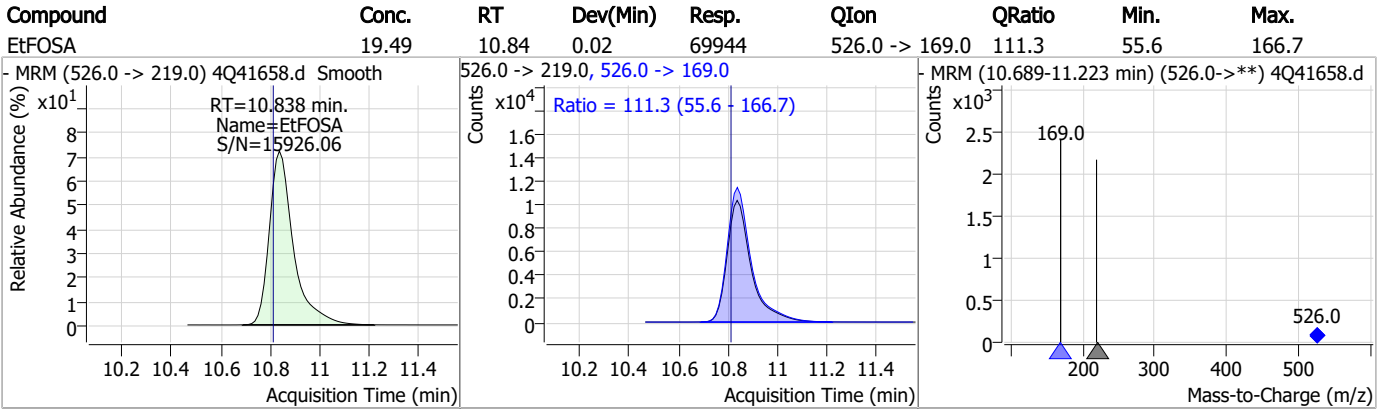
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	91.72	10.75	0.02	228264				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.64	10.82	0.01	8783				



Perfluorinated Compounds by LC/MS/MS



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Manual Integration Approval Summary

Sample Number: S4Q596-ICV596 Method: EPA DRAFT 1633
Lab FileID: 4Q41658.D Analyst approved: 03/06/23 15:43 Martha Valls
Injection Time: 03/03/23 20:06 Supervisor approved: 03/07/23 15:28 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.08	Split peak
MeFOSAA	2355-31-9		8.03	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.12	Split peak

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Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41707.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 5:45:21 PM
 Sample Name : cc596-4
 Vial : P1-A5
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.111	216.8 -> 171.9	156005	10.00 µg/L	0.000
M5-PFPeA	4.462	268.3 -> 223.0	88110	5.00 µg/L	0.000
M5-PFHxA	5.497	318.0 -> 273.0	73915	2.50 µg/L	-0.012
M4-PFHpA	6.355	367.1 -> 322.0	40279	2.50 µg/L	-0.012
M8-PFOA	7.000	421.1 -> 376.0	43529	2.50 µg/L	-0.025
M9-PFNA	7.521	472.1 -> 427.0	22377	1.25 µg/L	-0.025
M6-PFDA	8.004	519.1 -> 474.1	22570	1.25 µg/L	-0.025
M7-PFUnDA	8.448	570.0 -> 525.1	22682	1.25 µg/L	-0.025
M2-PFDoDA	8.868	615.1 -> 570.0	25818	1.25 µg/L	-0.037
M2-PFTeDA	9.612	715.2 -> 670.0	21868	1.25 µg/L	-0.062
M8-FOSA	9.632	506.1 -> 77.8	18282	2.50 µg/L	-0.025
M3-PFBS	5.439	302.1 -> 79.9	16114	2.50 µg/L	-0.012
M3-PFHxS	7.104	402.1 -> 79.9	9745	2.50 µg/L	-0.025
M8-PFOS	8.154	507.1 -> 79.9	13297	2.50 µg/L	-0.026
M2-4:2FTS	5.210	329.1 -> 80.9	1563	5.00 µg/L	-0.012
M2-6:2FTS	6.774	429.1 -> 80.9	2027	5.00 µg/L	-0.012
M2-8:2FTS	7.791	529.1 -> 80.9	3744	5.00 µg/L	-0.037
M3-MeFOSAA	8.062	573.2 -> 419.0	16381	5.00 µg/L	-0.037
M3-HFPO-DA	5.815	286.9 -> 168.9	39734	10.00 µg/L	-0.025
M5-EtFOSAA	8.271	589.2 -> 419.0	13966	5.00 µg/L	-0.025
M7-MeFOSE	10.561	623.2 -> 58.9	71017	25.00 µg/L	-0.075
M9-EtFOSE	10.871	639.2 -> 58.9	80256	25.00 µg/L	-0.087
M5-EtFOSA	10.973	531.1 -> 219.0	9899	2.50 µg/L	-0.100
M3-MeFOSA	10.678	515.0 -> 219.0	9449	2.50 µg/L	-0.075
13C4-PFOS	8.155	502.8 -> 79.9	14783	2.50 µg/L	-0.026
13C3-PFBA	3.115	216.0 -> 172.0	90495	5.00 µg/L	0.000
18O2-PFHxS	7.116	403.0 -> 83.9	6815	2.50 µg/L	-0.013
13C4-PFOA	7.000	417.1 -> 372.0	54370	2.50 µg/L	-0.025
13C2-PFDA	8.004	515.1 -> 470.1	19978	1.25 µg/L	-0.025
13C5-PFNA	7.522	468.0 -> 423.0	26864	1.25 µg/L	-0.025
13C2-PFHxA	5.498	315.1 -> 270.0	67476	2.50 µg/L	-0.012
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1563	4.23 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 84.5%		
13C2-6:2FTS	6.774	429.1 -> 80.9	2027	3.87 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 77.4%		
13C2-8:2FTS	7.791	529.1 -> 80.9	3744	4.59 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 91.9%		
13C2-PFDoDA	8.868	615.1 -> 570.0	25818	1.22 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 97.8%		
13C2-PFTeDA	9.612	715.2 -> 670.0	21868	1.25 µg/L	-0.062
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 100.3%		
13C3-PFBS	5.439	302.1 -> 79.9	16114	2.54 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 101.6%		
13C3-PFHxS	7.104	402.1 -> 79.9	9745	2.63 µg/L	-0.025

7.7.12
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 105.2%	
13C4-PFBA	3.111	216.8 -> 171.9	156005	10.03 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.3%	
13C4-PFHpA	6.355	367.1 -> 322.0	40279	2.52 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.6%	
13C5-PFHxA	5.497	318.0 -> 273.0	73915	2.52 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.0%	
13C5-PFPeA	4.462	268.3 -> 223.0	88110	4.78 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 95.7%	
13C6-PFDA	8.004	519.1 -> 474.1	22570	1.32 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 105.5%	
13C7-PFUnDA	8.448	570.0 -> 525.1	22682	1.28 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 102.4%	
13C8-FOSA	9.632	506.1 -> 77.8	18282	2.22 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.9%	
13C8-PFOA	7.000	421.1 -> 376.0	43529	2.42 µg/L	-0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 96.8%	
13C8-PFOS	8.154	507.1 -> 79.9	13297	2.28 µg/L	-0.026
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 91.3%	
13C9-PFNA	7.521	472.1 -> 427.0	22377	1.19 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 95.3%	
d3-MeFOSAA	8.062	573.2 -> 419.0	16381	3.97 µg/L	-0.037
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 79.4%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	39734	11.63 µg/L	-0.025
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 116.3%	
d3-MeFOSA	10.678	515.0 -> 219.0	9449	2.26 µg/L	-0.075
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 90.3%	
d5-EtFOSAA	8.271	589.2 -> 419.0	13966	4.14 µg/L	-0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 82.9%	
d7-MeFOSE	10.561	623.2 -> 58.9	71017	22.56 µg/L	-0.075
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 90.2%	
d9-EtFOSE	10.871	639.2 -> 58.9	80256	22.81 µg/L	-0.087
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 91.3%	
d5-EtFOSA	10.973	531.1 -> 219.0	9899	2.24 µg/L	-0.100
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.6%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	19401	9.12 µg/L	98
		327.1 -> 80.9	8452		
6:2FTS	6.774	427.1 -> 407.0	15592	10.63 µg/L	98
		427.1 -> 80.9	6636		
8:2FTS	7.792	527.1 -> 507.0	15496	9.20 µg/L	98
		527.1 -> 80.8	6571		
EtFOSAA	8.272	584.2 -> 419.1	5111	2.28 µg/L	m 84
		584.2 -> 526.0	2708		
FOSA	9.624	498.1 -> 77.9	16163	2.45 µg/L	99
		498.1 -> 478.0	470		
MeFOSAA	8.062	570.1 -> 419.0	5511	2.45 µg/L	100
		570.1 -> 483.0	1009		
PFBA	3.120	212.8 -> 168.9	33284	9.91 µg/L	100
PFBS	5.440	298.7 -> 79.9	12883	2.23 µg/L	95
		298.7 -> 98.8	5244		
PFDA	7.992	512.9 -> 469.0	31635	2.45 µg/L	98
		512.9 -> 219.0	6723		
PFDODA	8.869	613.1 -> 569.0	40334	2.40 µg/L	99
		613.1 -> 319.0	5929		
PFDS	9.020	599.0 -> 79.9	6676	2.38 µg/L	99

7.7.12
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.355	599.0 -> 98.8	3263	2.45	µg/L	99
		363.1 -> 319.0	49821			
PFHpS	7.661	363.1 -> 169.0	8610	2.19	µg/L	98
		449.0 -> 79.9	7964			
PFHxA	5.500	449.0 -> 98.9	4152	2.38	µg/L	99
		313.0 -> 269.0	53716			
PFHxS	7.105	313.0 -> 118.9	1505	2.13	µg/L	95
		398.7 -> 79.9	7556			
PFNA	7.522	398.7 -> 98.9	4133	2.57	µg/L	98
		463.0 -> 419.0	30401			
PFNS	8.599	463.0 -> 219.0	7736	2.53	µg/L	96
		548.8 -> 79.9	5337			
PFOA	7.001	548.8 -> 98.9	2832	2.51	µg/L	99
		413.0 -> 369.0	49455			
PFOS	8.143	413.0 -> 169.0	9971	2.19	µg/L	84
		498.9 -> 79.9	12303			
PFPeA	4.464	498.9 -> 98.8	6106	5.19	µg/L	100
		263.0 -> 219.0	87744			
PFPeS	6.407	349.1 -> 79.9	7480	2.28	µg/L	99
		349.1 -> 98.9	3131			
PFTeDA	9.613	713.1 -> 669.0	37218	2.45	µg/L	99
		713.1 -> 168.9	3043			
PFTrDA	9.254	663.0 -> 619.0	50045	2.49	µg/L	100
		663.0 -> 168.9	5172			
PFUnDA	8.449	563.1 -> 519.0	29462	2.53	µg/L	98
		563.1 -> 269.1	5904			
11CI-PF3OUdS	9.306	630.9 -> 450.9	101218	8.94	µg/L	98
		632.9 -> 452.9	30216			
9CI-PF3ONS	8.476	530.8 -> 351.0	121394	9.06	µg/L	100
		532.8 -> 353.0	35613			
ADONA	6.606	376.9 -> 250.9	229990	8.81	µg/L	99
		376.9 -> 84.8	61745			
HFPO-DA	5.828	284.9 -> 168.9	31889	10.20	µg/L	99
		284.9 -> 184.9	3452			
3:3FTCA	4.129	241.0 -> 177.0	12052	13.22	µg/L	97
		241.0 -> 117.0	1189			
5:3FTCA	6.320	341.0 -> 237.1	237759	63.51	µg/L	99
		341.0 -> 217.0	168924			
7:3FTCA	7.699	441.0 -> 316.9	90922	65.22	µg/L	97
		441.0 -> 336.9	204458			
EtFOSA	10.987	526.0 -> 219.0	10866	2.69	µg/L	95
		526.0 -> 169.0	11467			
EtFOSE	10.896	630.0 -> 58.9	74325	26.15	µg/L	100
		511.9 -> 219.0	8414			
MeFOSA	10.679	511.9 -> 169.0	9623	2.47	µg/L	99
		616.1 -> 58.9	68421			
MeFOSE	10.587	699.1 -> 79.9	5628	25.23	µg/L	100
		699.1 -> 98.8	3297			
PFDoDS	9.740	295.0 -> 201.0	4460	2.37	µg/L	95
		295.0 -> 84.9	1135			
NFDHA	5.391	279.0 -> 85.1	51283	5.81	µg/L	97
		229.0 -> 84.9	44126			
PFMBA	4.829	314.8 -> 134.9	76440	5.42	µg/L	100
		314.8 -> 82.9	2560			
PFMPA	3.702			5.42	µg/L	100
PFEESA	5.909			4.47	µg/L	99

= Qualifier out of range, m = manually integrated, + = Area summed

7.7.12
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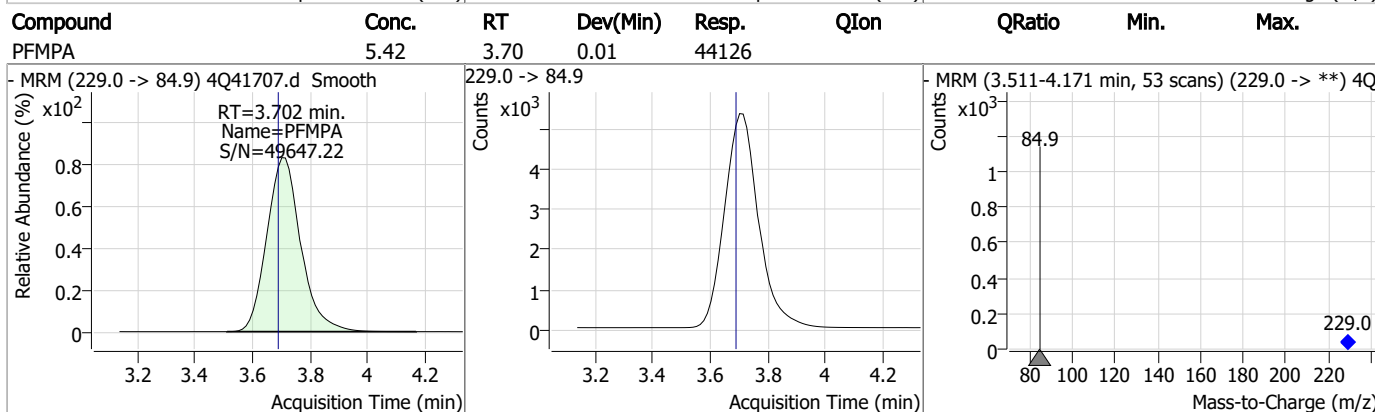
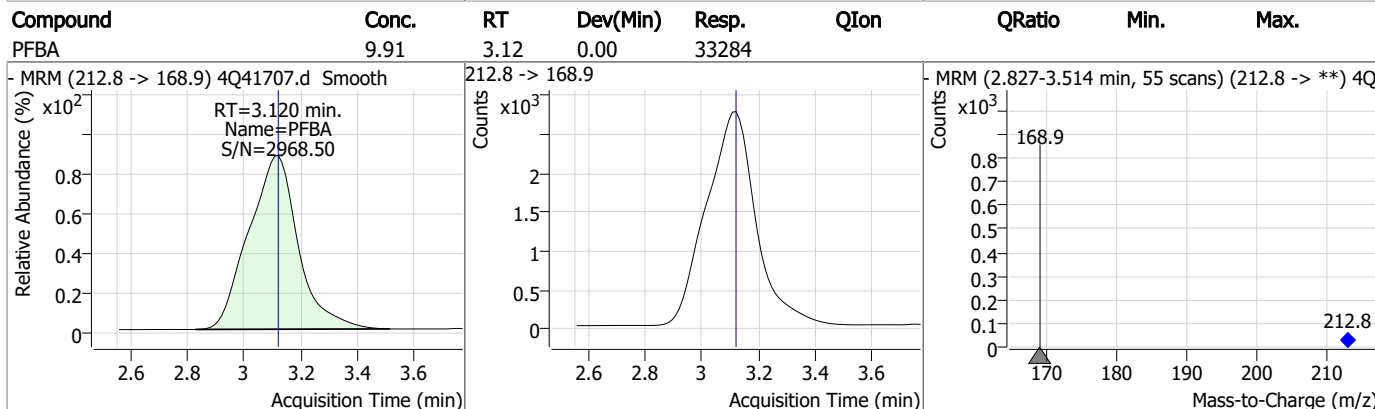
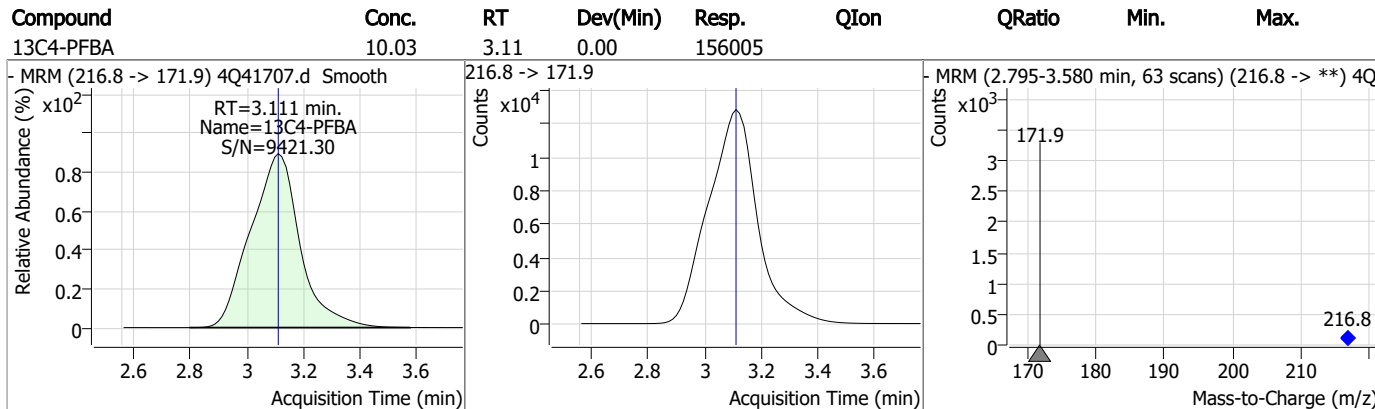
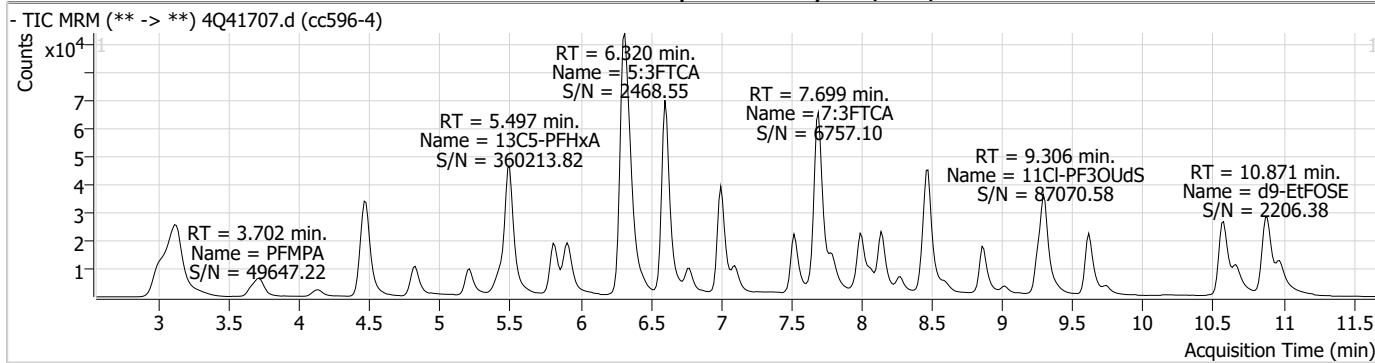
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.7.12

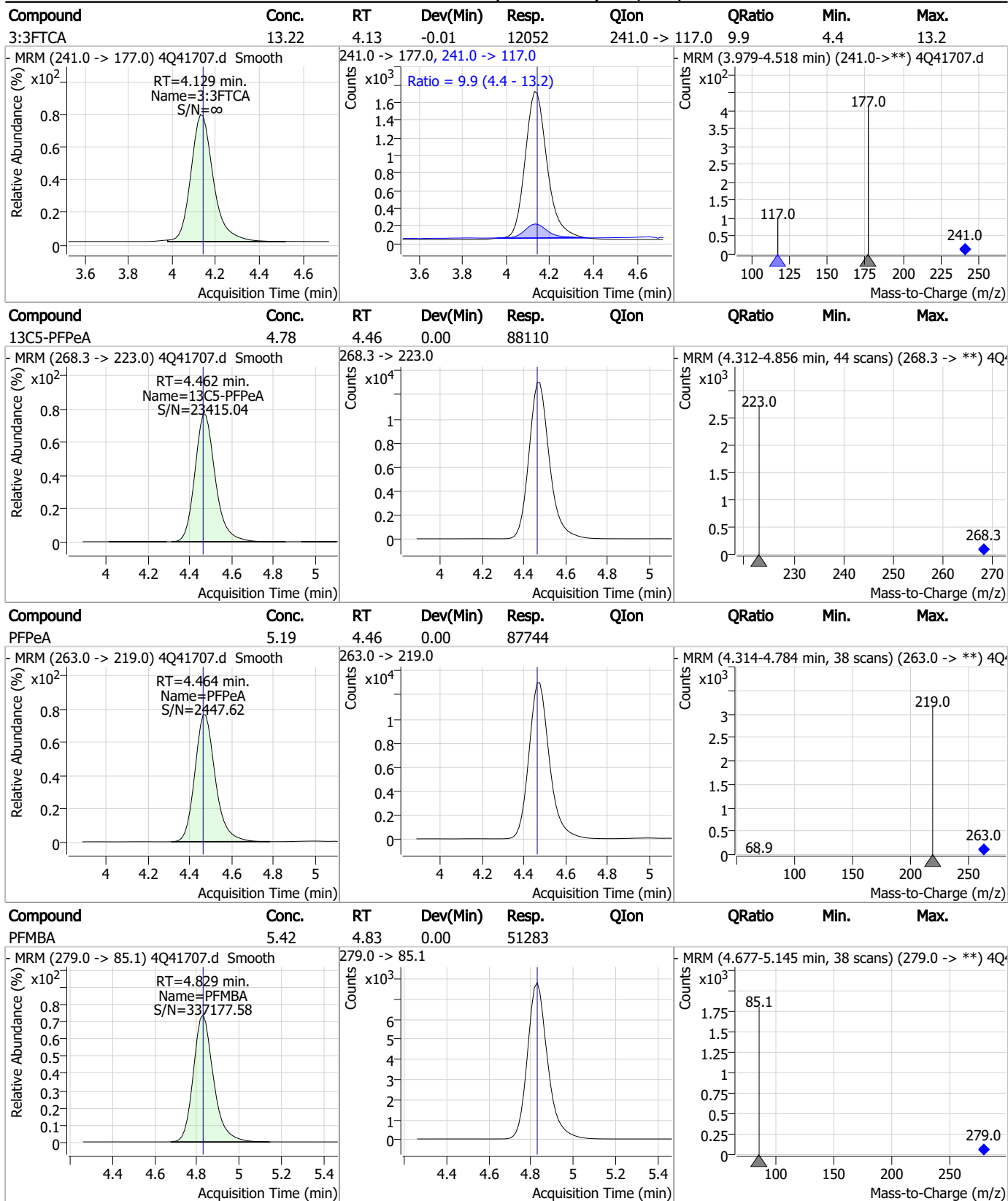
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Perfluorinated Compounds by LC/MS/MS



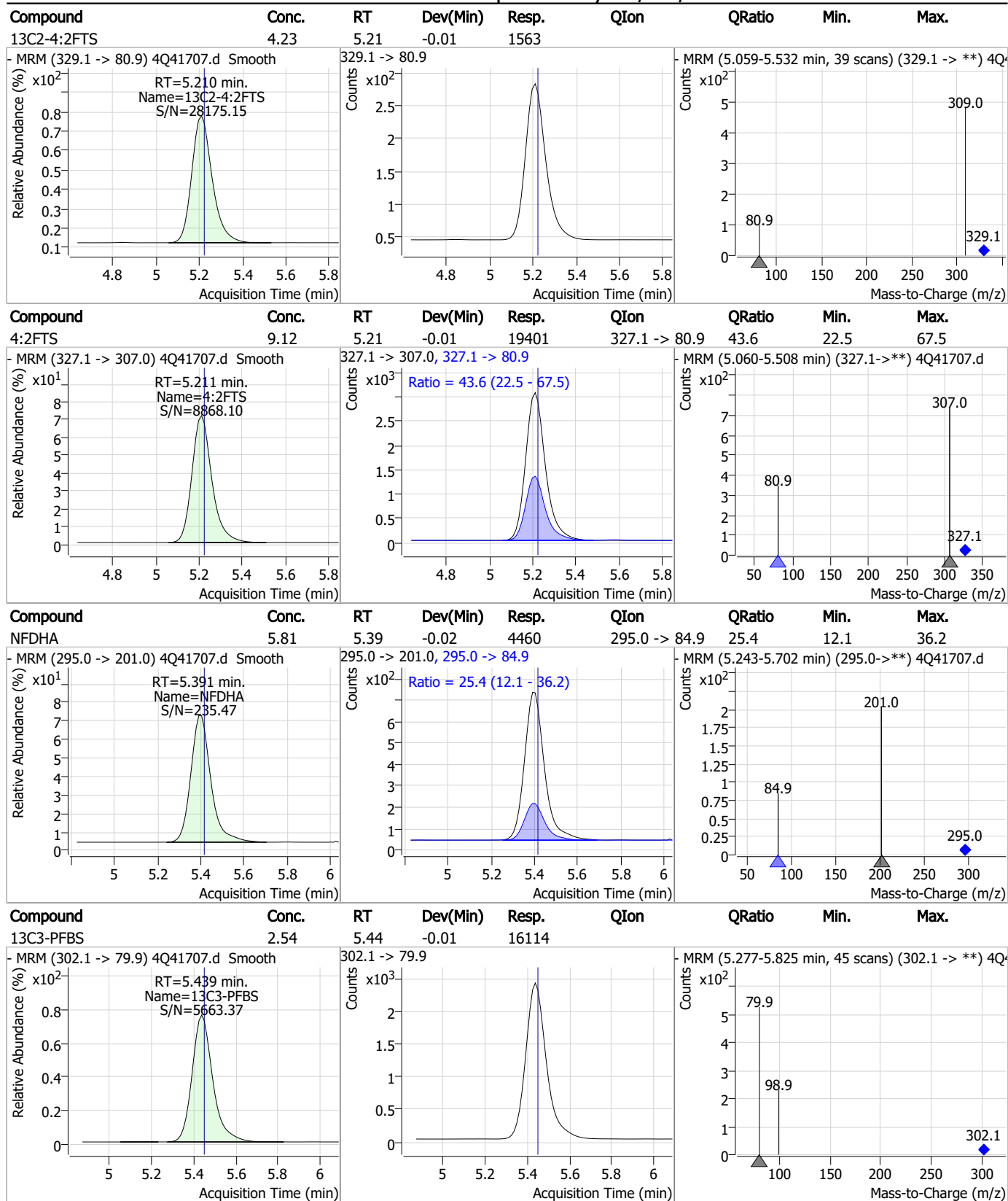
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Perfluorinated Compounds by LC/MS/MS



7.7.12
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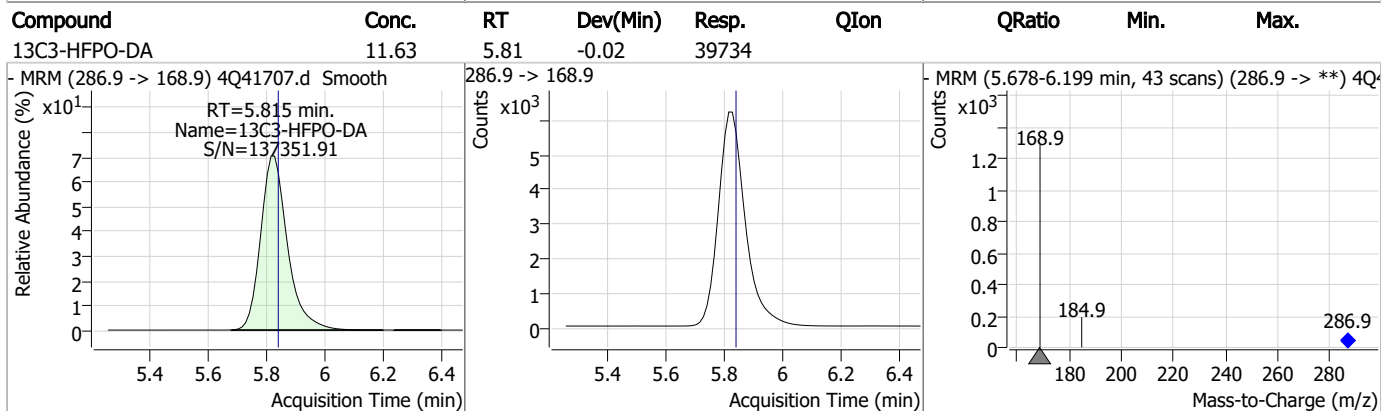
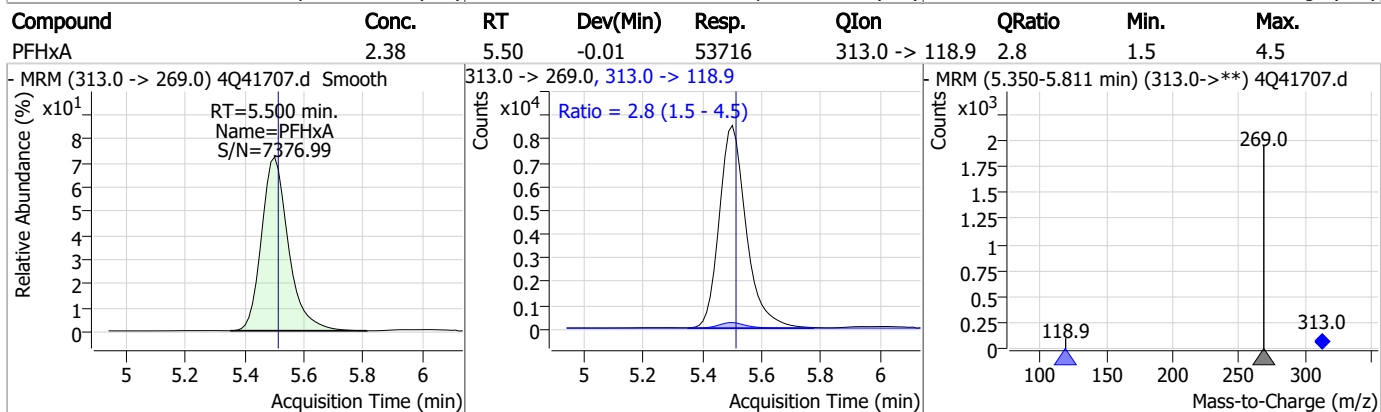
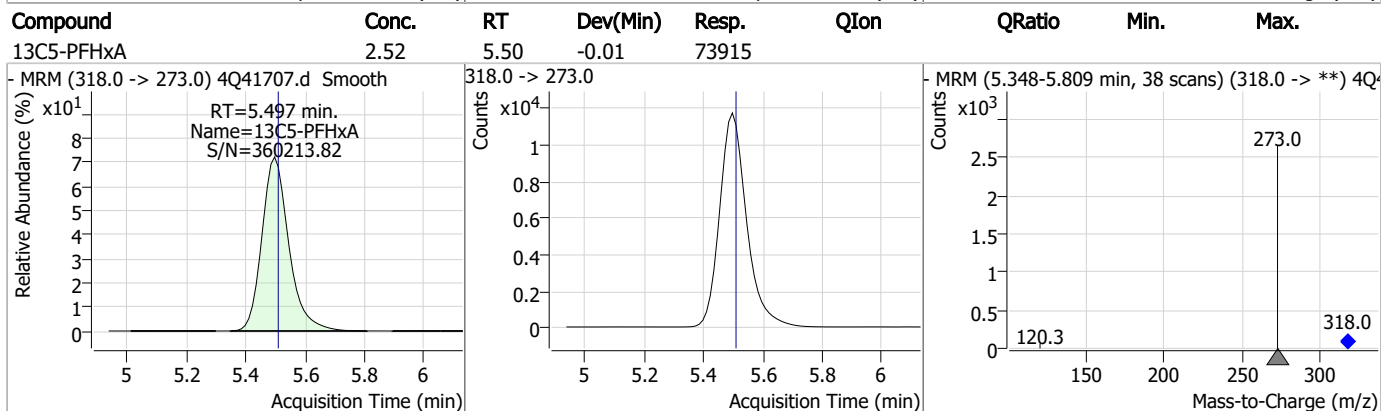
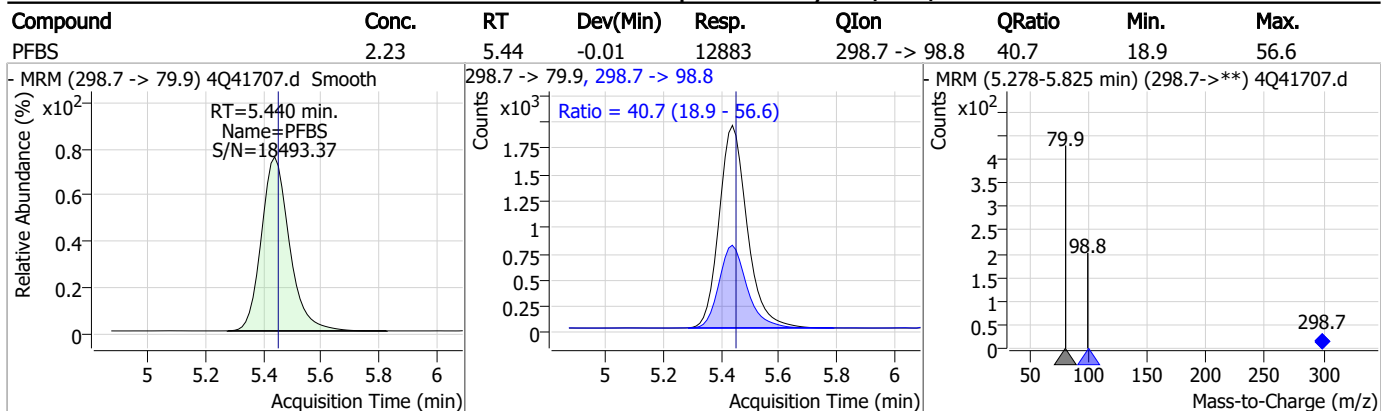
Perfluorinated Compounds by LC/MS/MS



7.7.12
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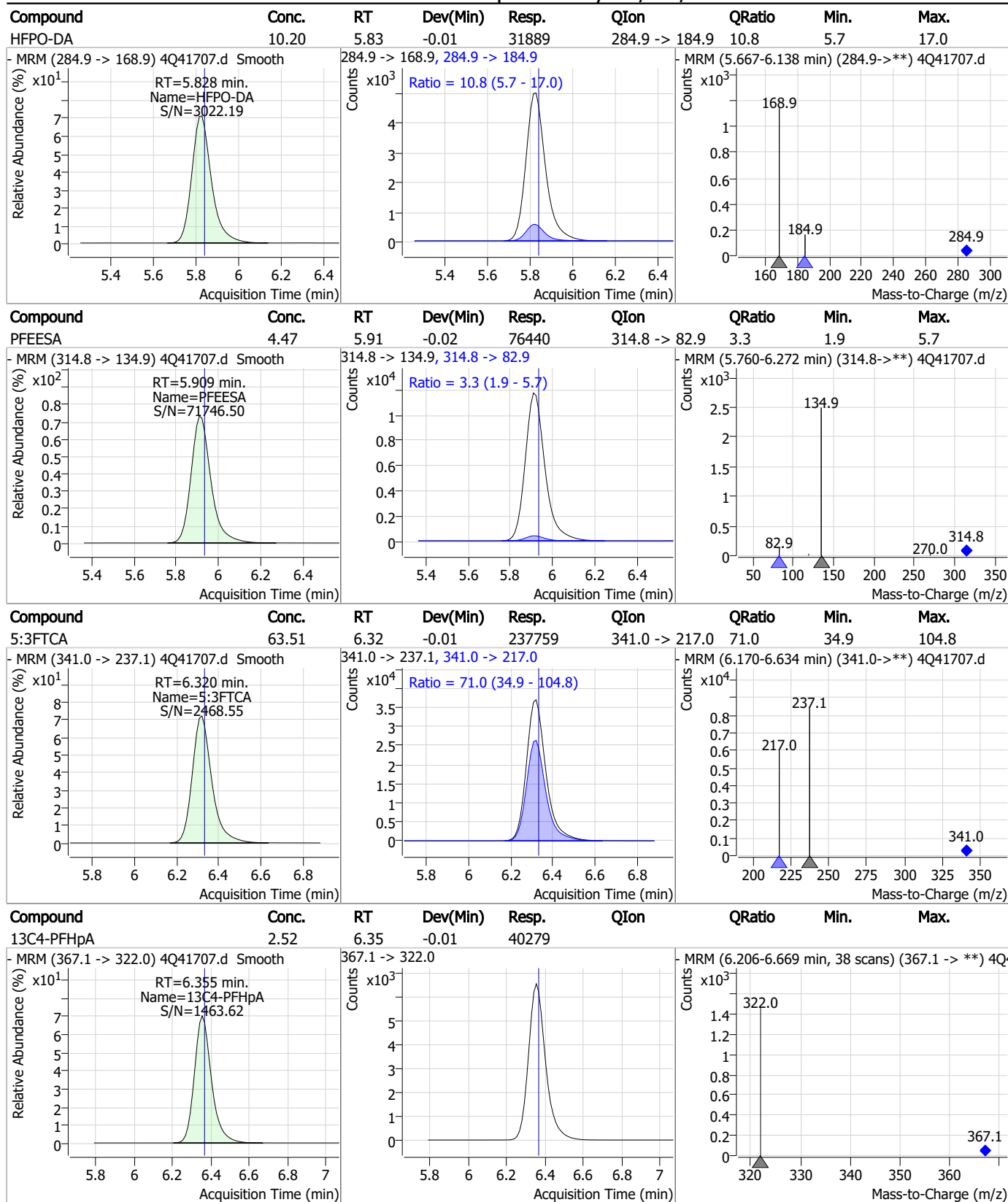


Perfluorinated Compounds by LC/MS/MS



7.7.12
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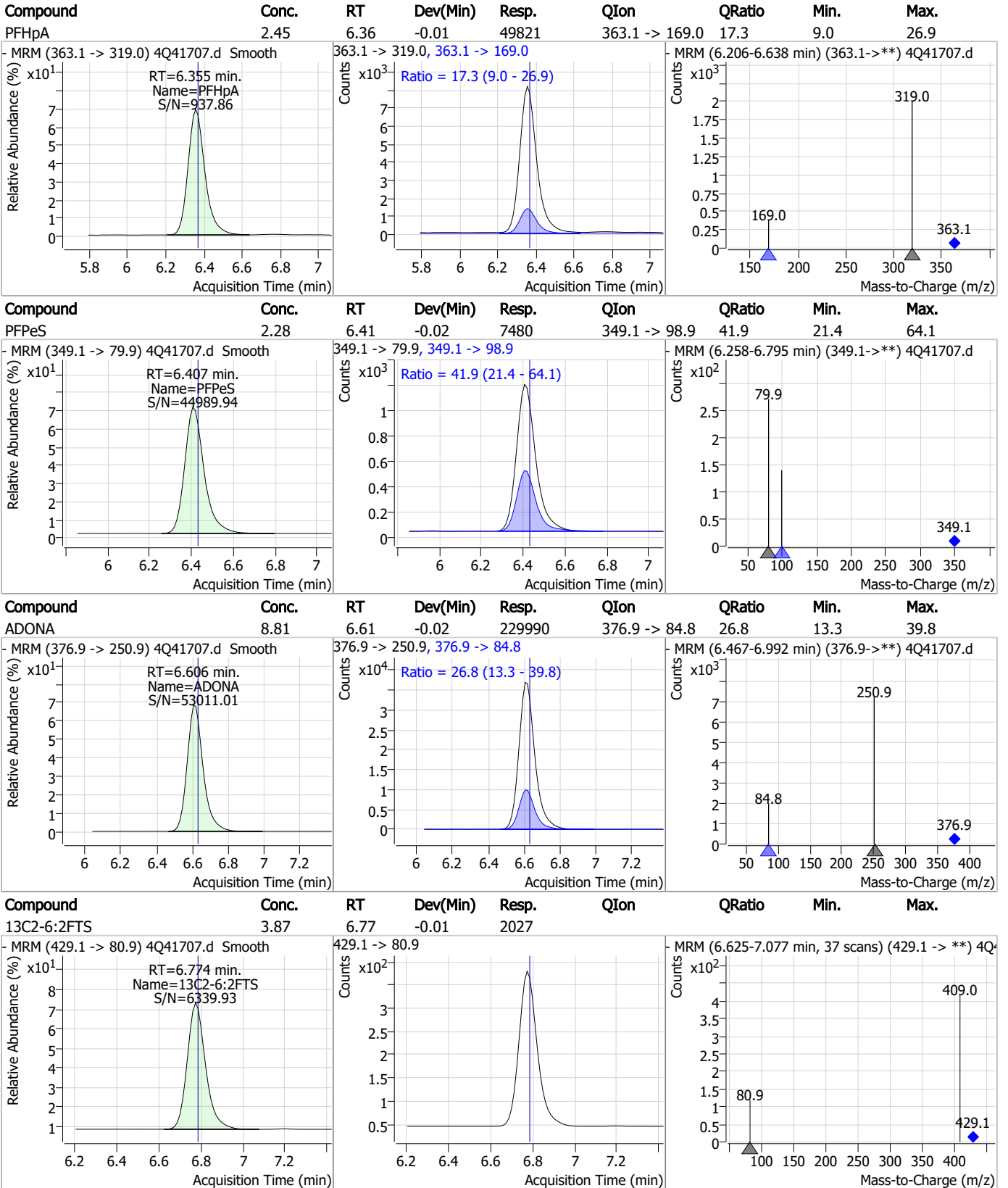
Perfluorinated Compounds by LC/MS/MS



7.7.12
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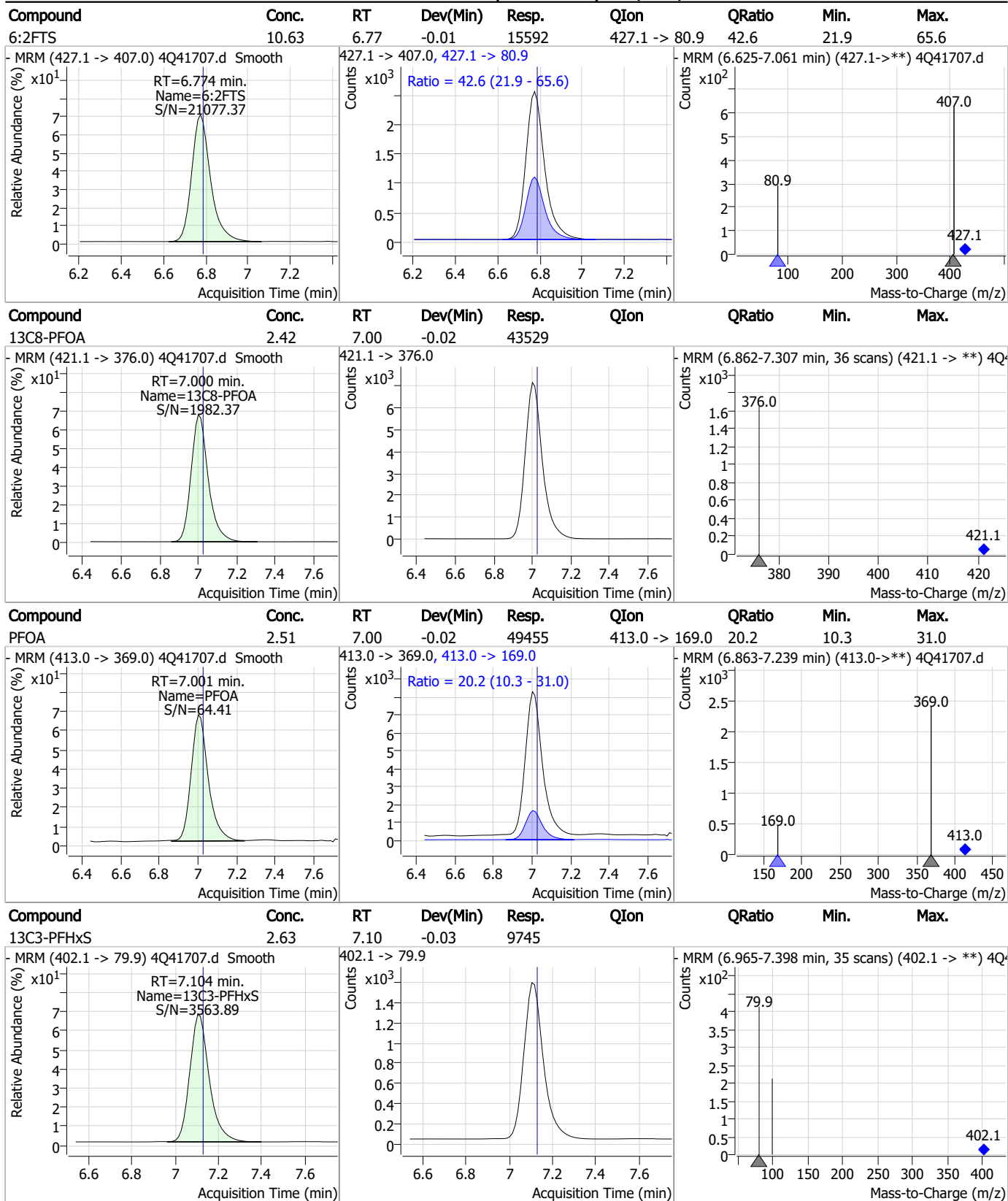
Perfluorinated Compounds by LC/MS/MS



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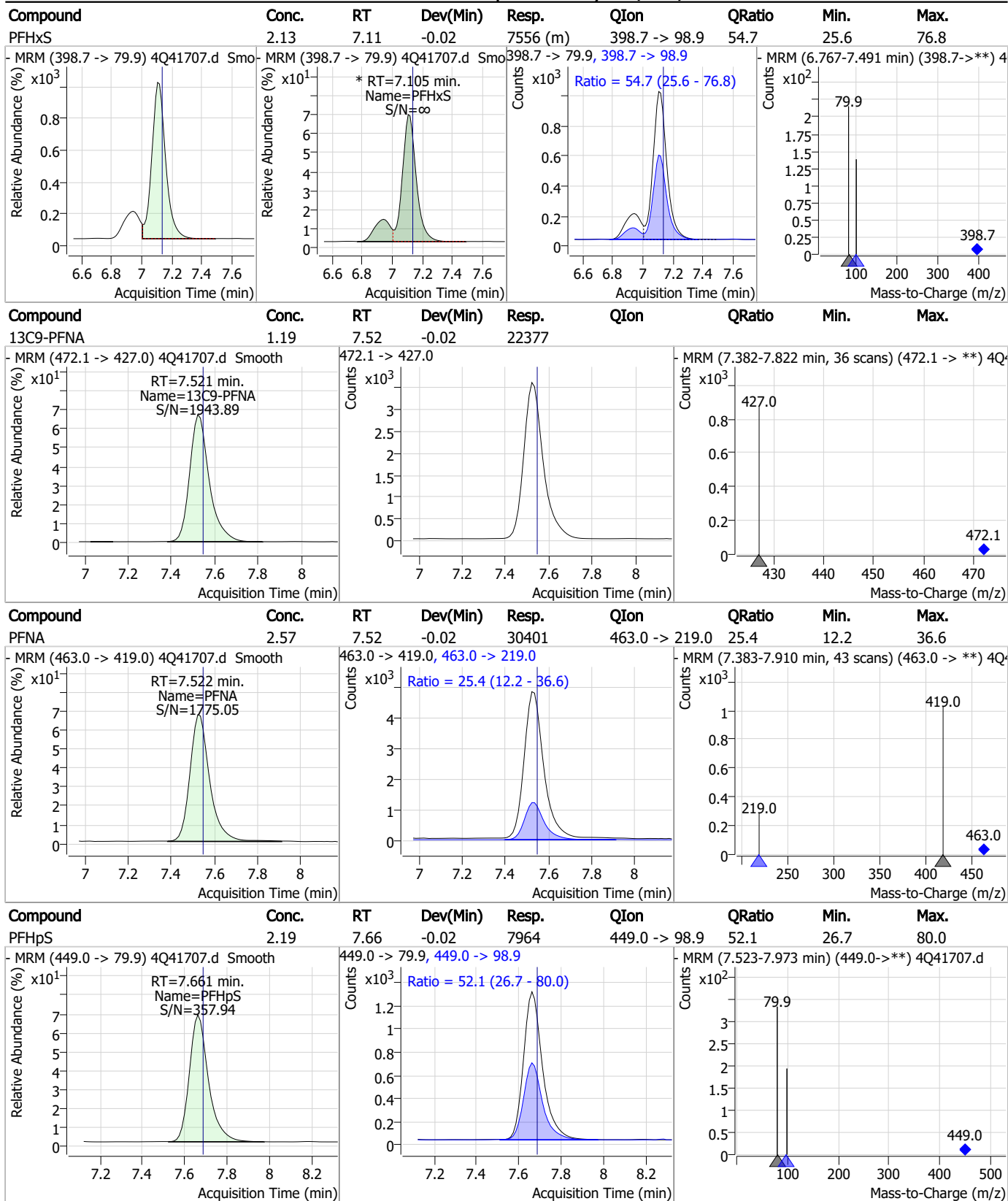
Perfluorinated Compounds by LC/MS/MS



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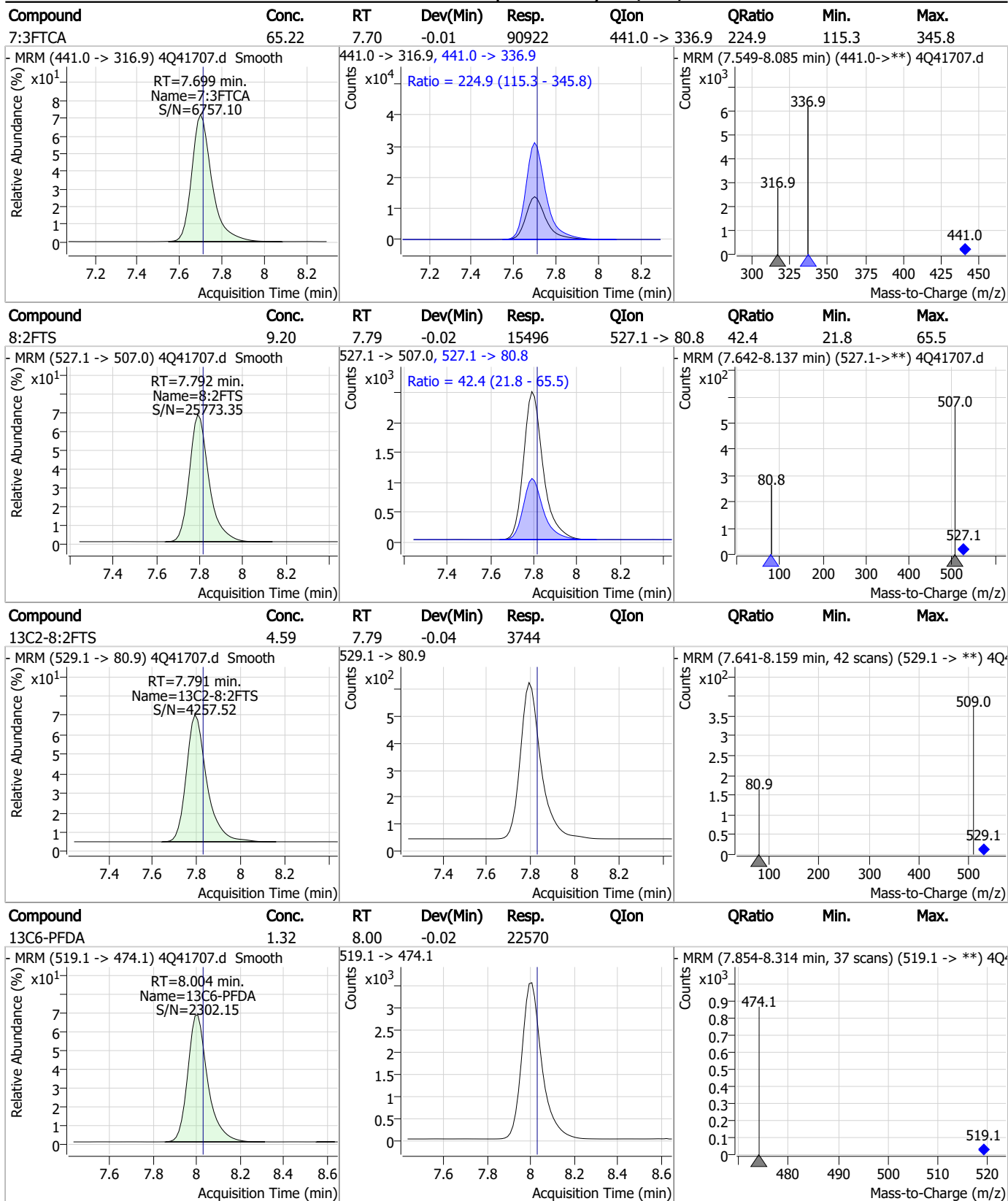


Perfluorinated Compounds by LC/MS/MS



7.7.12
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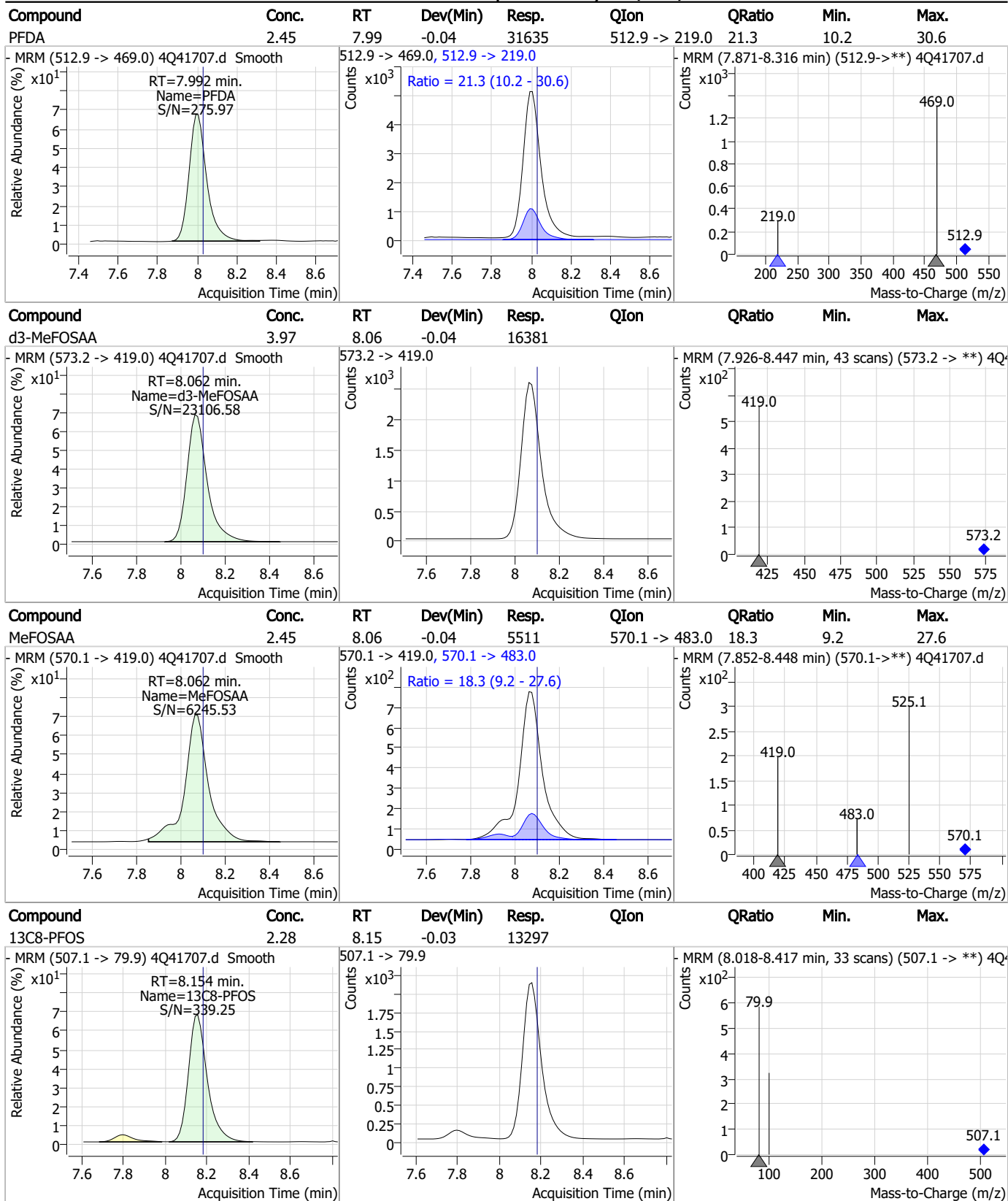
Perfluorinated Compounds by LC/MS/MS



7.7.12
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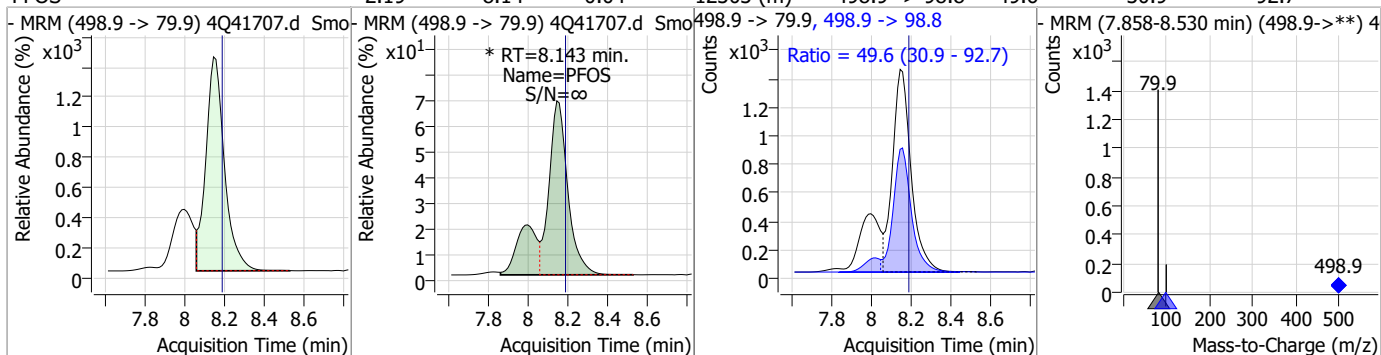
Perfluorinated Compounds by LC/MS/MS



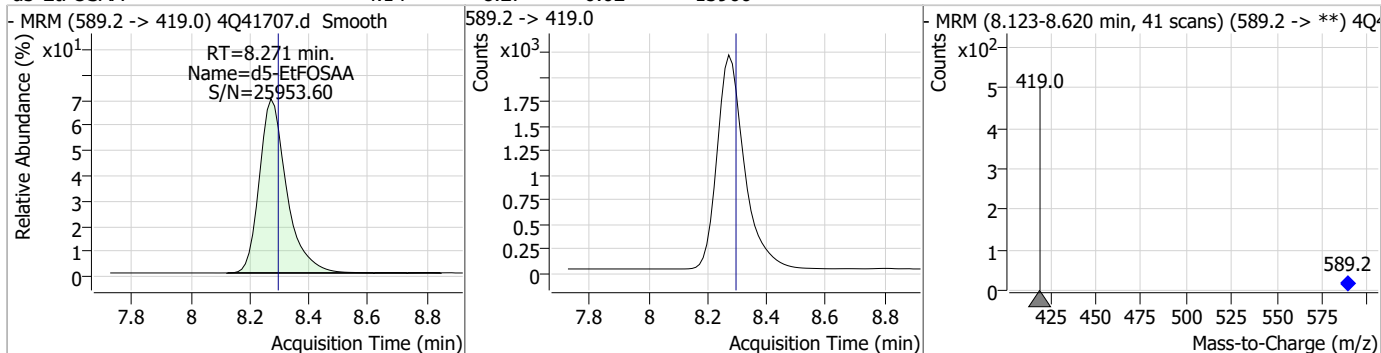
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Perfluorinated Compounds by LC/MS/MS

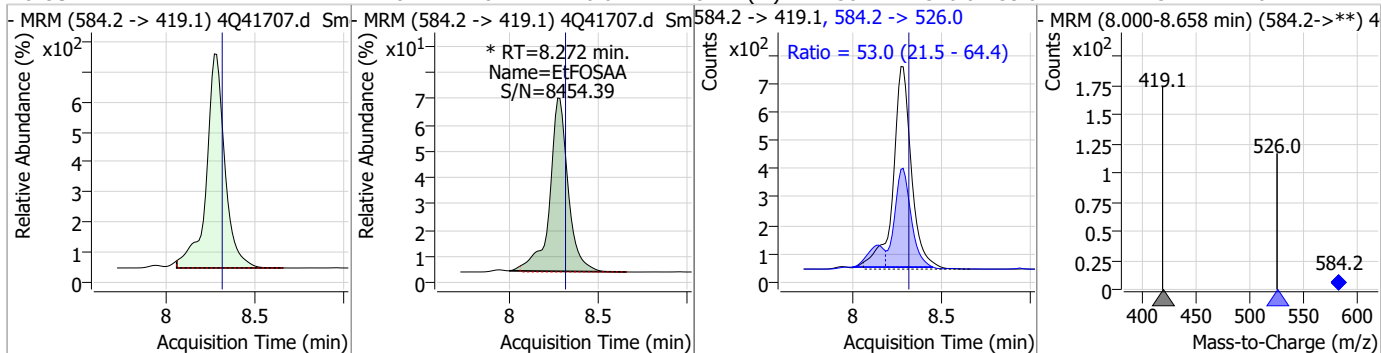
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	2.19	8.14	-0.04	12303 (m)	498.9 -> 98.8	49.6	30.9	92.7



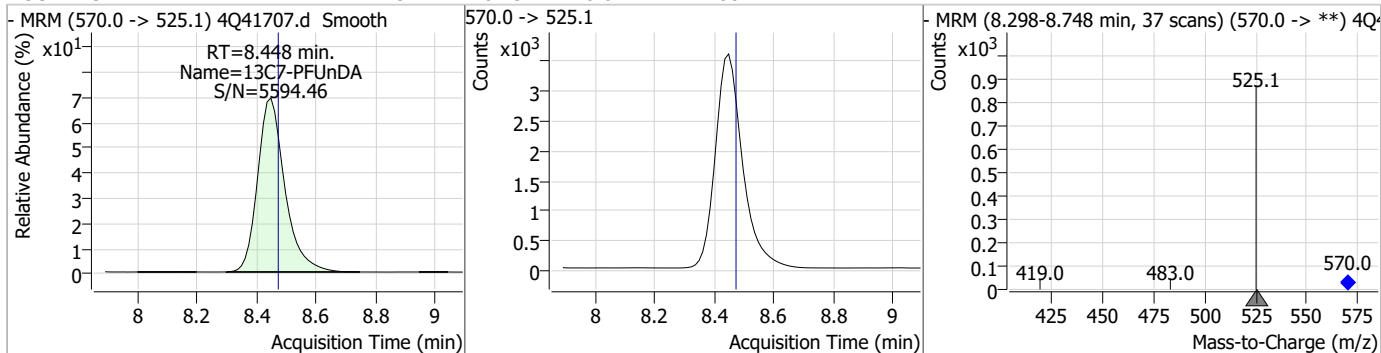
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	4.14	8.27	-0.02	13966				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	2.28	8.27	-0.04	5111 (m)	584.2 -> 526.0	53.0	21.5	64.4



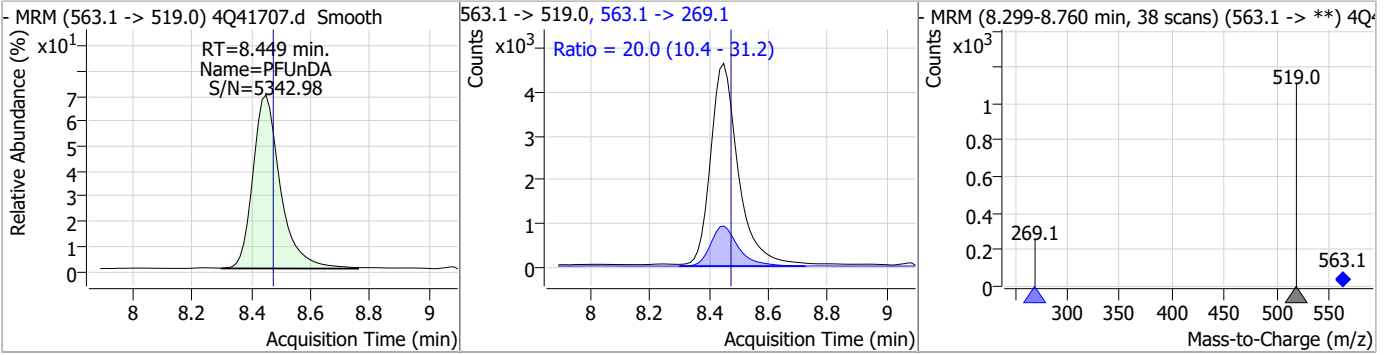
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C7-PFUnDA	1.28	8.45	-0.02	22682				



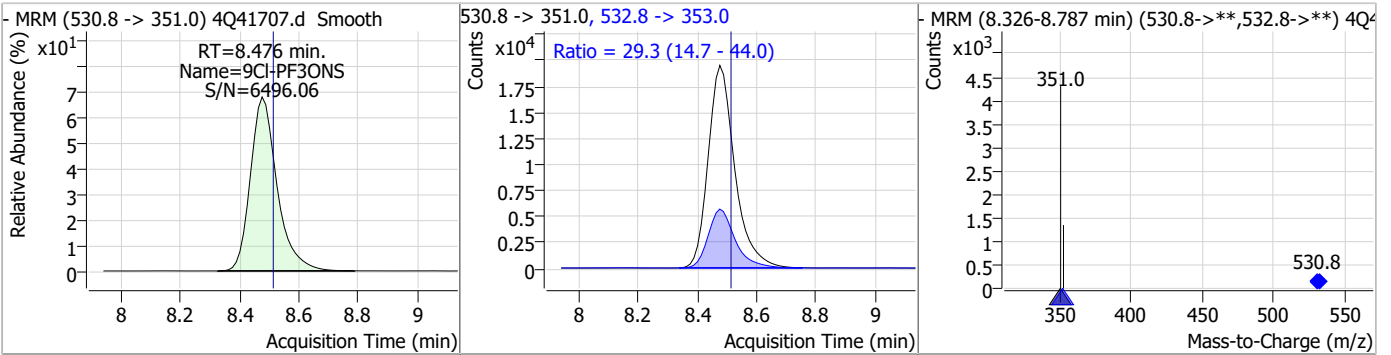
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Perfluorinated Compounds by LC/MS/MS

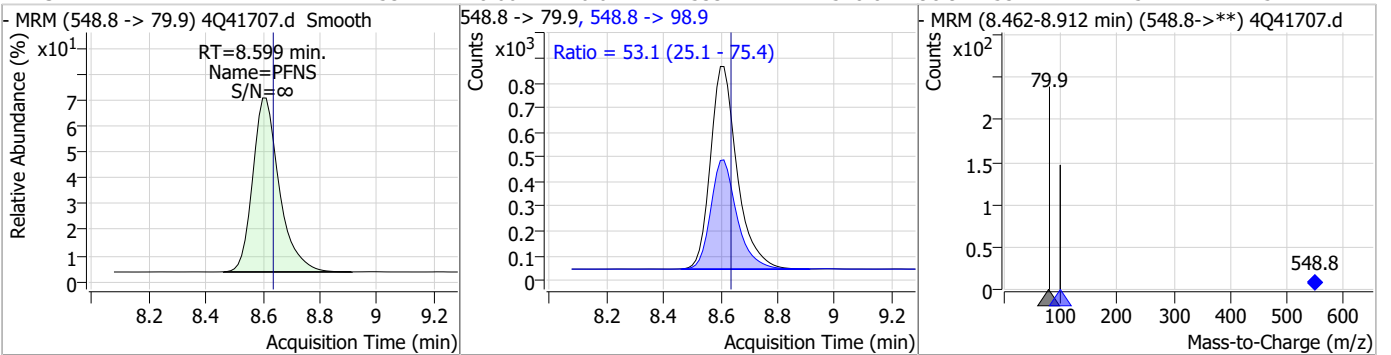
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	2.53	8.45	-0.02	29462	563.1 -> 269.1	20.0	10.4	31.2



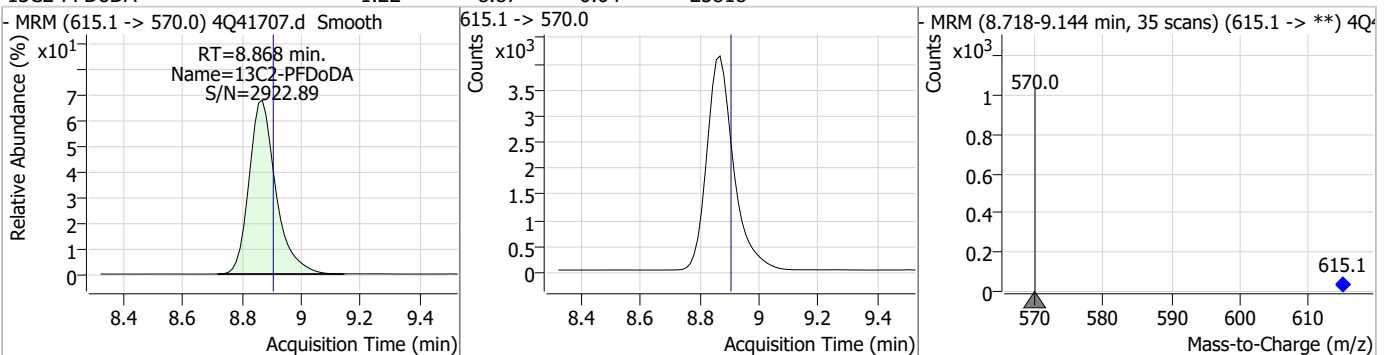
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	9.06	8.48	-0.04	121394	532.8 -> 353.0	29.3	14.7	44.0



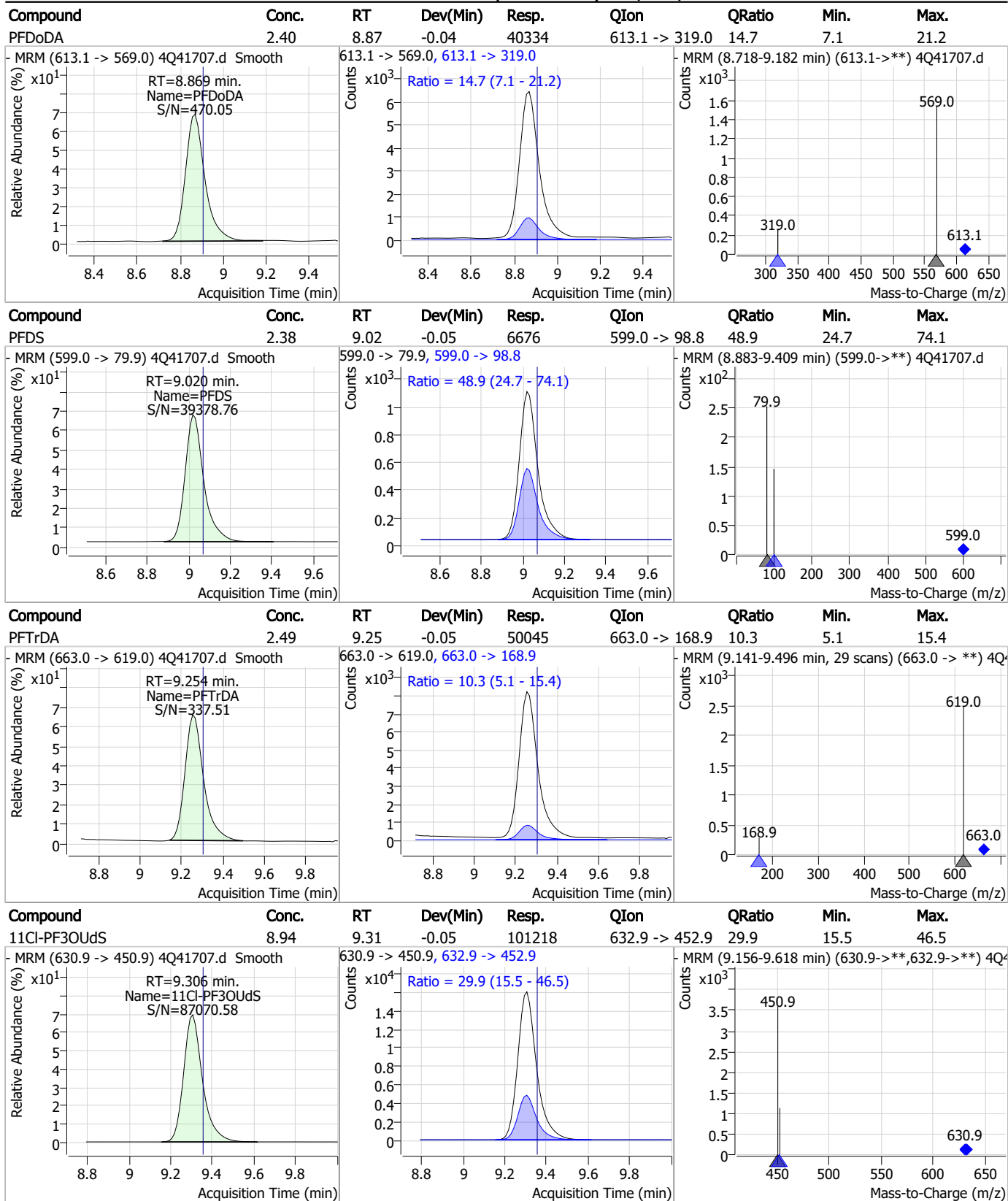
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	2.53	8.60	-0.04	5337	548.8 -> 98.9	53.1	25.1	75.4



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA	1.22	8.87	-0.04	25818	615.1 -> 570.0			

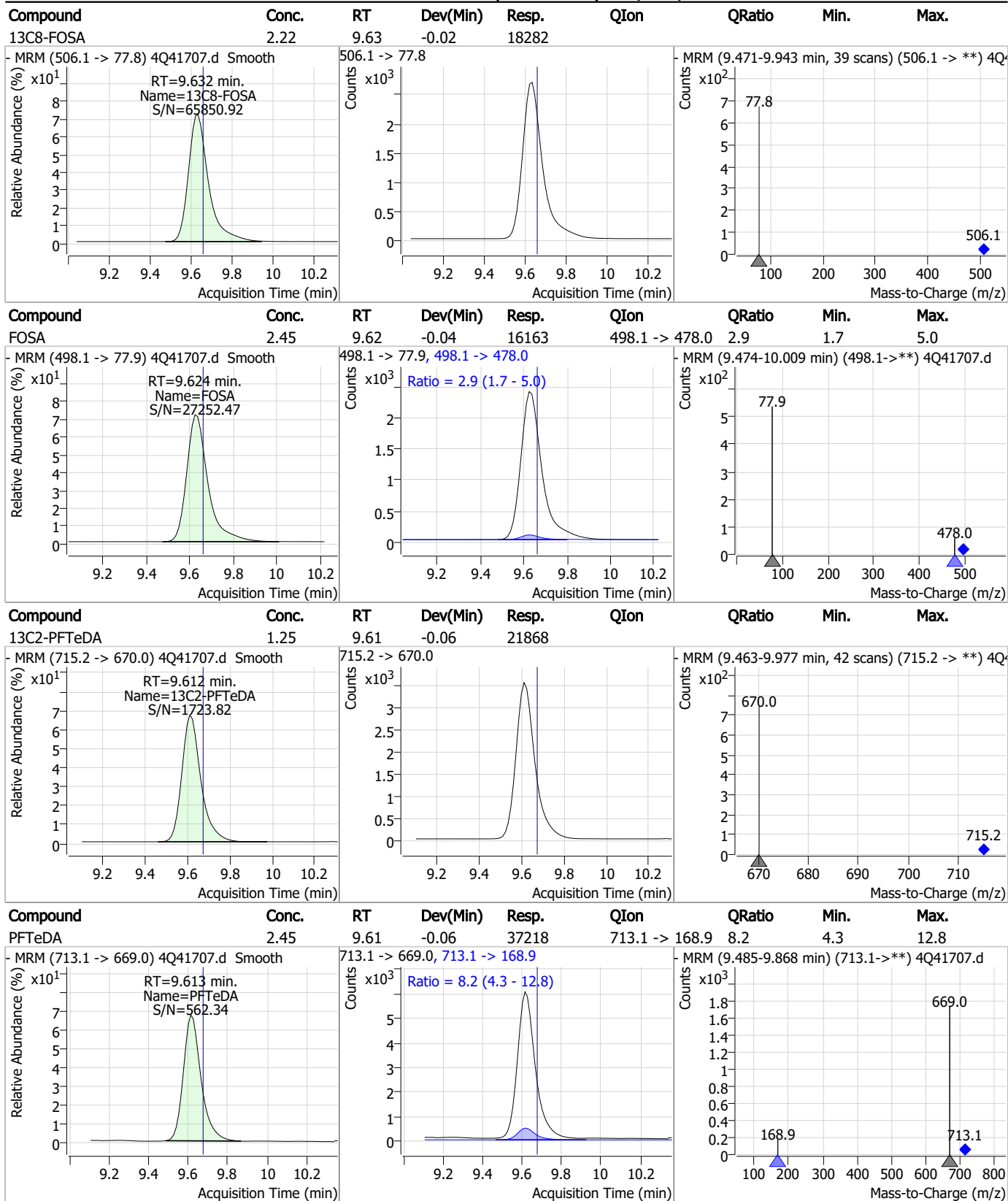


Perfluorinated Compounds by LC/MS/MS



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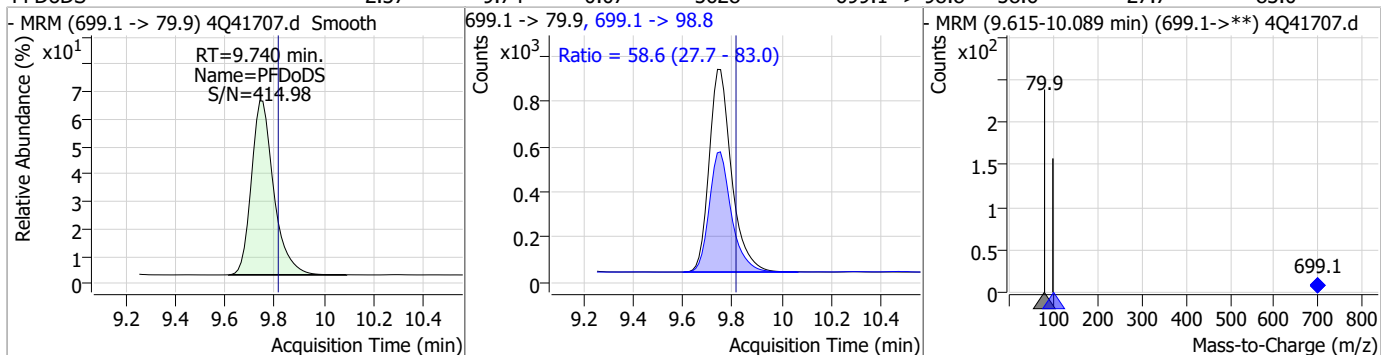
Perfluorinated Compounds by LC/MS/MS



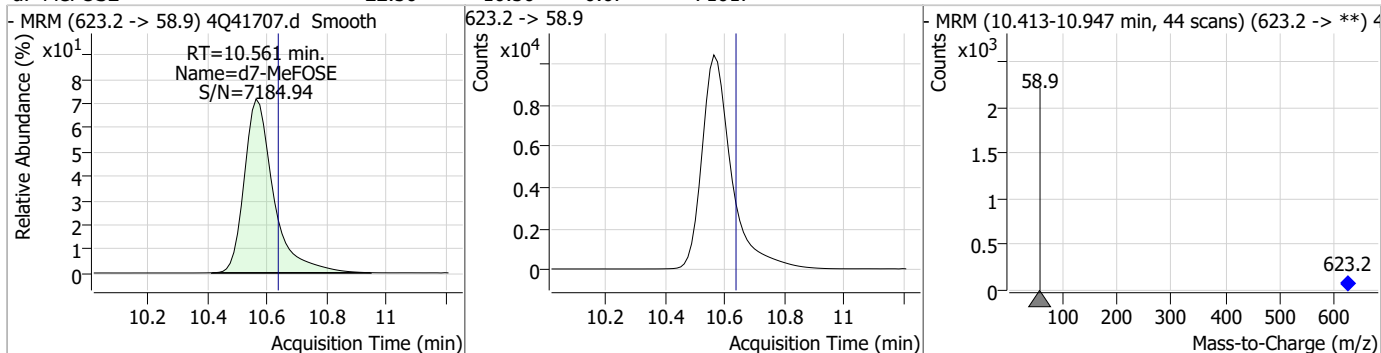
7.7.12
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Perfluorinated Compounds by LC/MS/MS

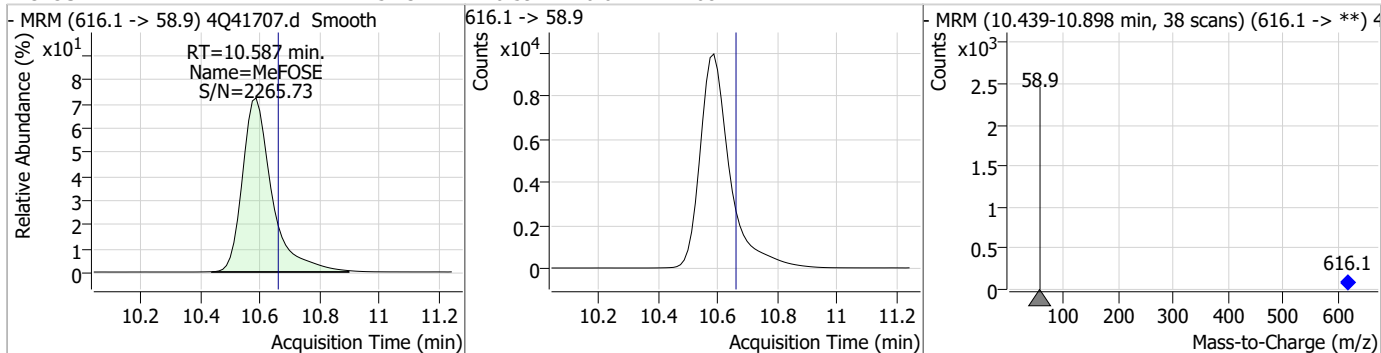
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoS	2.37	9.74	-0.07	5628	699.1 -> 98.8	58.6	27.7	83.0



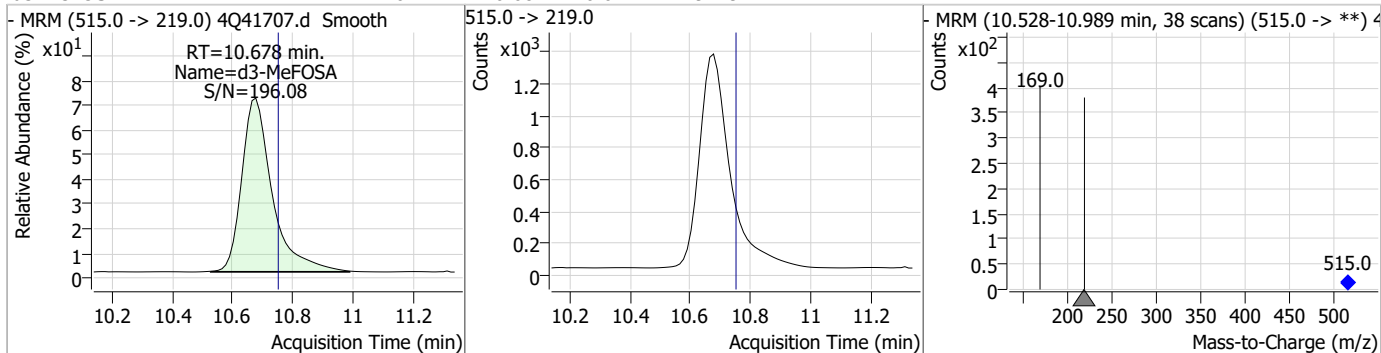
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	22.56	10.56	-0.07	71017				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	25.23	10.59	-0.07	68421				

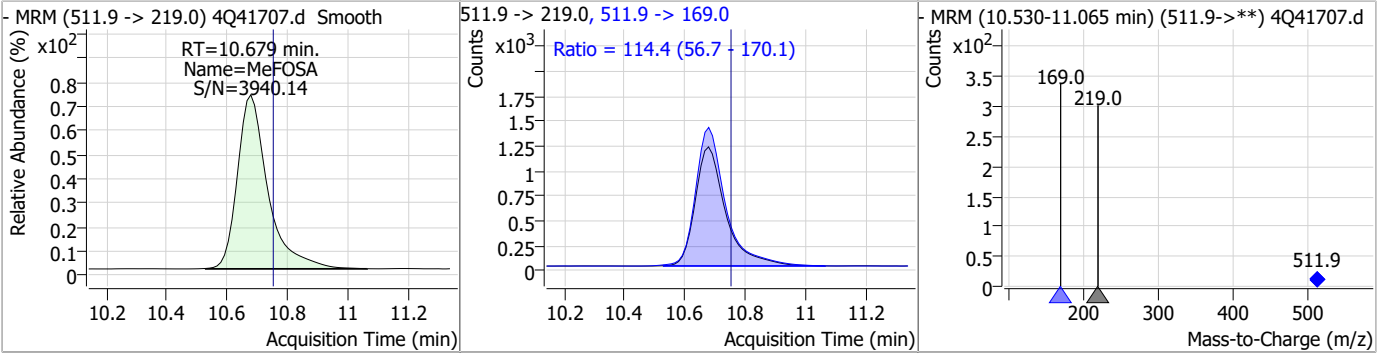


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.26	10.68	-0.07	9449				

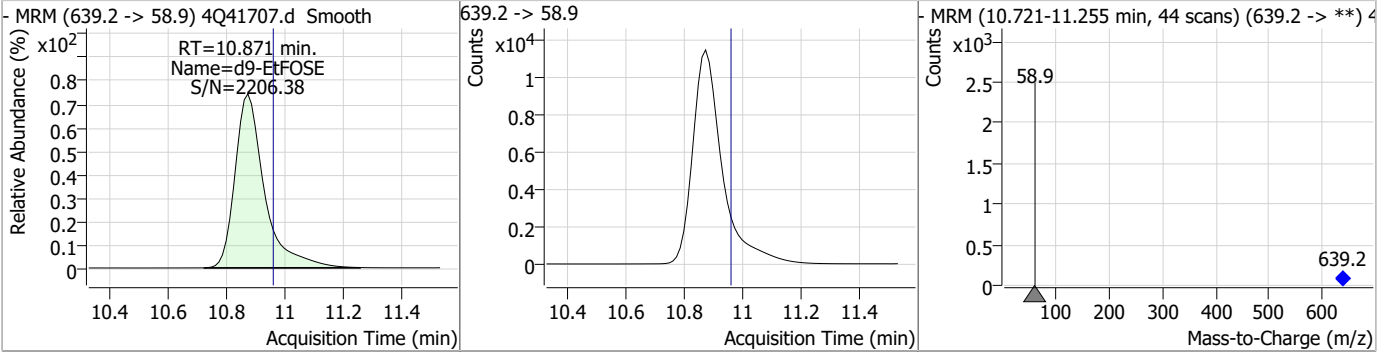


Perfluorinated Compounds by LC/MS/MS

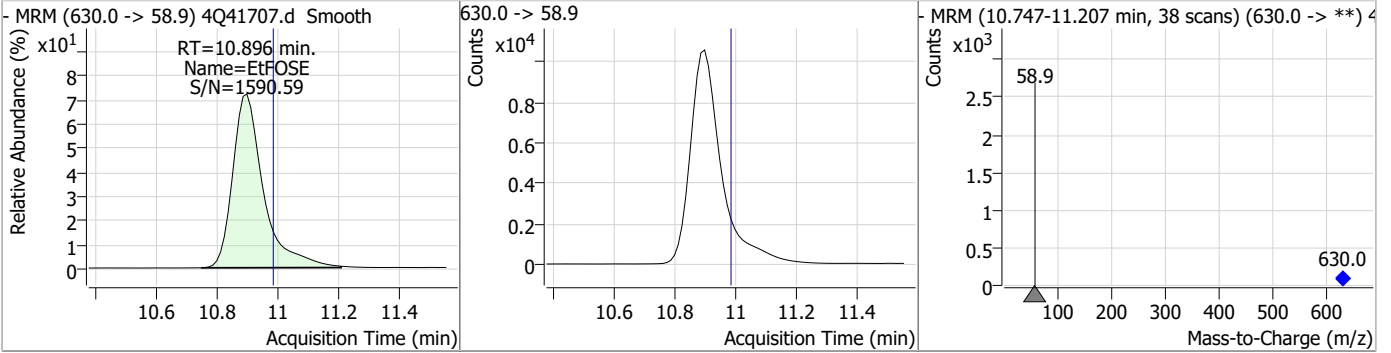
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSA	2.47	10.68	-0.07	8414	511.9 -> 169.0	114.4	56.7	170.1



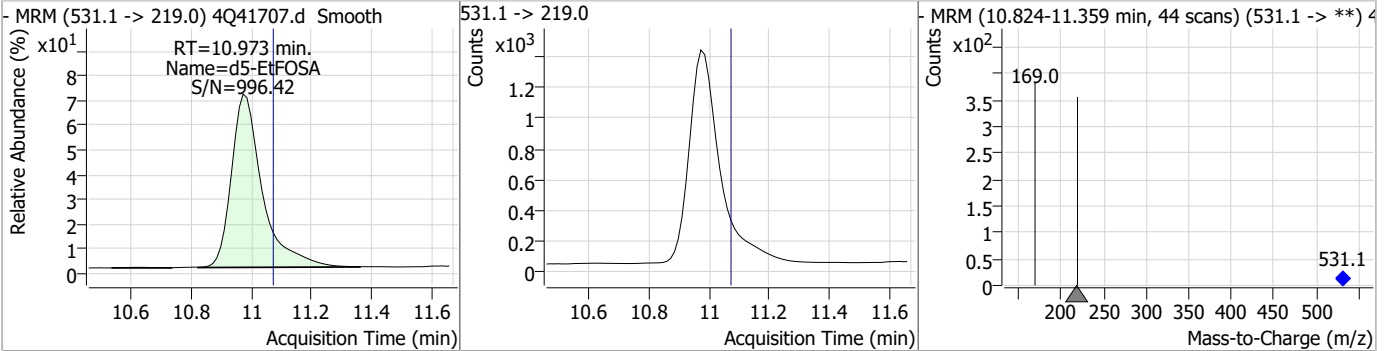
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d9-EtFOSE	22.81	10.87	-0.09	80256				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSE	26.15	10.90	-0.09	74325				



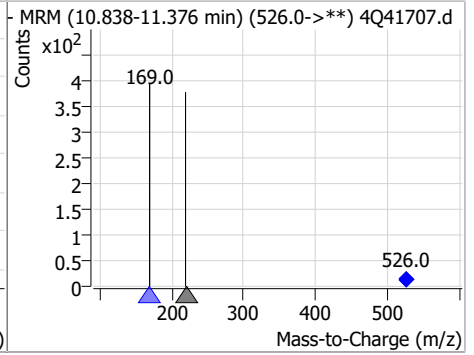
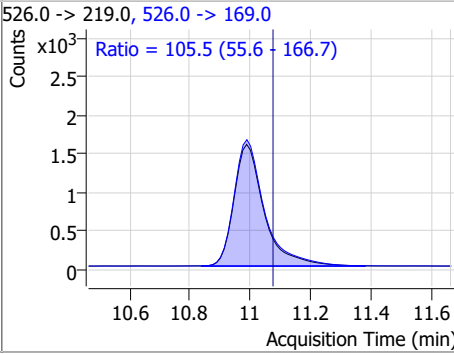
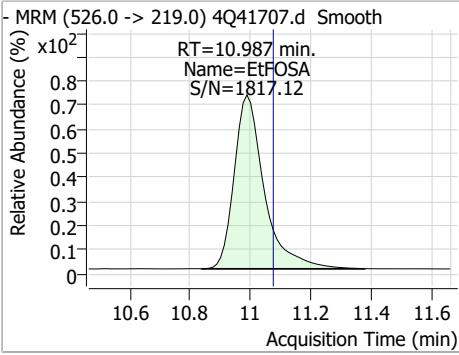
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSA	2.24	10.97	-0.10	9899				



7.7.12
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Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	2.69	10.99	-0.09	10866	526.0 -> 169.0	105.5	55.6	166.7



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Manual Integration Approval Summary

Sample Number: S4Q597-CC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41707.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 17:45 Supervisor approved: 03/08/23 10:59 Natasha Gumtie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak
EtFOSAA	2991-50-6		8.27	Split peak

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Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41708.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 5:59:23 PM
 Sample Name : cc596-1.0LL
 Vial : P1-A2
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.099	216.8 -> 171.9	150195	10.00 µg/L	-0.141
M5-PFPeA	4.475	268.3 -> 223.0	83550	5.00 µg/L	-0.100
M5-PFHxA	5.484	318.0 -> 273.0	70854	2.50 µg/L	-0.037
M4-PFHpA	6.342	367.1 -> 322.0	38185	2.50 µg/L	0.000
M8-PFOA	7.000	421.1 -> 376.0	43089	2.50 µg/L	0.051
M9-PFNA	7.521	472.1 -> 427.0	23267	1.25 µg/L	0.026
M6-PFDA	7.992	519.1 -> 474.1	20880	1.25 µg/L	0.025
M7-PFUnDA	8.435	570.0 -> 525.1	21828	1.25 µg/L	0.049
M2-PFDoDA	8.856	615.1 -> 570.0	25285	1.25 µg/L	0.088
M2-PFTeDA	9.612	715.2 -> 670.0	20253	1.25 µg/L	0.124
M8-FOSA	9.620	506.1 -> 77.8	16399	2.50 µg/L	0.111
M3-PFBS	5.426	302.1 -> 79.9	15368	2.50 µg/L	-0.062
M3-PFHxS	7.104	402.1 -> 79.9	8959	2.50 µg/L	0.039
M8-PFOS	8.142	507.1 -> 79.9	12632	2.50 µg/L	0.025
M2-4:2FTS	5.210	329.1 -> 80.9	1485	5.00 µg/L	-0.049
M2-6:2FTS	6.774	429.1 -> 80.9	2050	5.00 µg/L	0.050
M2-8:2FTS	7.791	529.1 -> 80.9	3689	5.00 µg/L	0.025
M3-MeFOSAA	8.062	573.2 -> 419.0	16903	5.00 µg/L	0.025
M3-HFPO-DA	5.815	286.9 -> 168.9	37541	10.00 µg/L	-0.012
M5-EtFOSAA	8.259	589.2 -> 419.0	13886	5.00 µg/L	0.025
M7-MeFOSE	10.561	623.2 -> 58.9	67364	25.00 µg/L	0.148
M9-EtFOSE	10.871	639.2 -> 58.9	76055	25.00 µg/L	0.162
M5-EtFOSA	10.986	531.1 -> 219.0	9079	2.50 µg/L	0.174
M3-MeFOSA	10.678	515.0 -> 219.0	8574	2.50 µg/L	0.162
13C4-PFOS	8.143	502.8 -> 79.9	13634	2.50 µg/L	0.025
13C3-PFBA	3.103	216.0 -> 172.0	86685	5.00 µg/L	-0.140
18O2-PFHxS	7.103	403.0 -> 83.9	6366	2.50 µg/L	0.039
13C4-PFOA	7.000	417.1 -> 372.0	52018	2.50 µg/L	0.051
13C2-PFDA	7.992	515.1 -> 470.1	18579	1.25 µg/L	0.025
13C5-PFNA	7.522	468.0 -> 423.0	26797	1.25 µg/L	0.026
13C2-PFHxA	5.485	315.1 -> 270.0	64124	2.50 µg/L	-0.037
System Monitoring Compounds					
13C2-4:2FTS	5.210	329.1 -> 80.9	1485	4.30 µg/L	-0.049
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 86.0%		
13C2-6:2FTS	6.774	429.1 -> 80.9	2050	4.19 µg/L	0.050
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 83.8%		
13C2-8:2FTS	7.791	529.1 -> 80.9	3689	4.85 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 96.9%		
13C2-PFDoDA	8.856	615.1 -> 570.0	25285	1.29 µg/L	0.088
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 103.0%		
13C2-PFTeDA	9.612	715.2 -> 670.0	20253	1.25 µg/L	0.124
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 99.9%		
13C3-PFBS	5.426	302.1 -> 79.9	15368	2.59 µg/L	-0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 103.8%		
13C3-PFHxS	7.104	402.1 -> 79.9	8959	2.59 µg/L	0.039

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 103.5%	
13C4-PFBA	3.099	216.8 -> 171.9	150195	10.08 µg/L	-0.141
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.8%	
13C4-PFHpA	6.342	367.1 -> 322.0	38185	2.51 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.4%	
13C5-PFHxA	5.484	318.0 -> 273.0	70854	2.55 µg/L	-0.037
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.8%	
13C5-PFPeA	4.475	268.3 -> 223.0	83550	4.77 µg/L	-0.100
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 95.5%	
13C6-PFDA	7.992	519.1 -> 474.1	20880	1.31 µg/L	0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 104.9%	
13C7-PFUnDA	8.435	570.0 -> 525.1	21828	1.32 µg/L	0.049
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 105.9%	
13C8-FOSA	9.620	506.1 -> 77.8	16399	2.16 µg/L	0.111
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 86.5%	
13C8-PFOA	7.000	421.1 -> 376.0	43089	2.50 µg/L	0.051
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.2%	
13C8-PFOS	8.142	507.1 -> 79.9	12632	2.35 µg/L	0.025
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.1%	
13C9-PFNA	7.521	472.1 -> 427.0	23267	1.24 µg/L	0.026
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.3%	
d3-MeFOSAA	8.062	573.2 -> 419.0	16903	4.44 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 88.8%	
13C3-HFPO-DA	5.815	286.9 -> 168.9	37541	11.56 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 115.6%	
d3-MeFOSA	10.678	515.0 -> 219.0	8574	2.22 µg/L	0.162
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.8%	
d5-EtFOSAA	8.259	589.2 -> 419.0	13886	4.47 µg/L	0.025
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 89.4%	
d7-MeFOSE	10.561	623.2 -> 58.9	67364	23.20 µg/L	0.148
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 92.8%	
d9-EtFOSE	10.871	639.2 -> 58.9	76055	23.44 µg/L	0.162
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 93.8%	
d5-EtFOSA	10.986	531.1 -> 219.0	9079	2.23 µg/L	0.174
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 89.1%	
Target Compounds					QValue
4:2FTS	5.211	327.1 -> 307.0	1501	0.74 µg/L	94
		327.1 -> 80.9	617		
6:2FTS	6.762	427.1 -> 407.0	1228	0.83 µg/L	97
		427.1 -> 80.9	511		
8:2FTS	7.792	527.1 -> 507.0	1368	0.82 µg/L	94
		527.1 -> 80.8	543		
EtFOSAA	8.272	584.2 -> 419.1	323	0.14 µg/L	#m 66
		584.2 -> 526.0	207		
FOSA	9.624	498.1 -> 77.9	1306	0.22 µg/L	100
		498.1 -> 478.0	42		
MeFOSAA	8.075	570.1 -> 419.0	523	0.23 µg/L	m 96
		570.1 -> 483.0	86		
PFBA	3.107	212.8 -> 168.9	2502	0.77 µg/L	100
PFBS	5.427	298.7 -> 79.9	1001	0.18 µg/L	98
		298.7 -> 98.8	391		
PFDA	7.992	512.9 -> 469.0	2672	0.22 µg/L	99
		512.9 -> 219.0	530		
PFDODA	8.856	613.1 -> 569.0	3145	0.19 µg/L	99
		613.1 -> 319.0	429		
PFDS	9.007	599.0 -> 79.9	557	0.21 µg/L	96

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.343	599.0 -> 98.8	261	0.19	µg/L	94
		363.1 -> 319.0	3576			
PFHpS	7.661	363.1 -> 169.0	731	0.22	µg/L	98
		449.0 -> 79.9	775			
PFHxA	5.487	449.0 -> 98.9	404	0.23	µg/L	100
		313.0 -> 269.0	4999			
PFHxS	7.105	313.0 -> 118.9	148	0.23	µg/L	96
		398.7 -> 79.9	745			
PFNA	7.522	398.7 -> 98.9	360	0.21	µg/L	98
		463.0 -> 419.0	2535			
PFNS	8.587	463.0 -> 219.0	597	0.19	µg/L	70
		548.8 -> 79.9	371			
PFOA	7.001	548.8 -> 98.9	263	0.21	µg/L	97
		413.0 -> 369.0	4187			
PFOS	8.143	413.0 -> 169.0	933	0.24	µg/L	87
		498.9 -> 79.9	1288			
PFPeA	4.477	498.9 -> 98.8	666	0.41	µg/L	100
		263.0 -> 219.0	6526			
PFPeS	6.394	349.1 -> 79.9	489	0.16	µg/L	83
		349.1 -> 98.9	260			
PFTeDA	9.613	713.1 -> 669.0	2867	0.20	µg/L	99
		713.1 -> 168.9	256			
PFTrDA	9.254	663.0 -> 619.0	4309	0.22	µg/L	97
		663.0 -> 168.9	397			
PFUnDA	8.436	563.1 -> 519.0	2149	0.19	µg/L	98
		563.1 -> 269.1	432			
11Cl-PF3OUdS	9.294	630.9 -> 450.9	7120	0.67	µg/L	99
		632.9 -> 452.9	2160			
9Cl-PF3ONS	8.463	530.8 -> 351.0	8515	0.67	µg/L	96
		532.8 -> 353.0	2664			
ADONA	6.606	376.9 -> 250.9	16349	0.66	µg/L	97
		376.9 -> 84.8	4621			
HFPO-DA	5.816	284.9 -> 168.9	2115	0.72	µg/L	96
		284.9 -> 184.9	274			
3:3FTCA	4.142	241.0 -> 177.0	902	1.04	µg/L	93
		241.0 -> 117.0	102			
5:3FTCA	6.308	341.0 -> 237.1	17208	4.80	µg/L	96
		341.0 -> 217.0	12568			
7:3FTCA	7.699	441.0 -> 316.9	6808	5.09	µg/L	95
		441.0 -> 336.9	15147			
EtFOSA	11.000	526.0 -> 219.0	869	0.23	µg/L	94
		526.0 -> 169.0	906			
EtFOSE	10.896	630.0 -> 58.9	5440	2.02	µg/L	100
		511.9 -> 219.0	669			
MeFOSA	10.679	511.9 -> 169.0	671	0.22	µg/L	88
		616.1 -> 58.9	5253			
MeFOSE	10.587	699.1 -> 79.9	456	2.04	µg/L	100
		699.1 -> 98.8	253			
PFDoDS	9.740	295.0 -> 201.0	314	0.20	µg/L	100
		295.0 -> 84.9	112			
NFDHA	5.391	279.0 -> 85.1	3842	0.43	µg/L	100
		229.0 -> 84.9	3255			
PFMBA	4.829	314.8 -> 134.9	5219	0.42	µg/L	100
		314.8 -> 82.9	161			
PFMPA	3.715			0.32	µg/L	98
PFEESA	5.897					

= Qualifier out of range, m = manually integrated, + = Area summed

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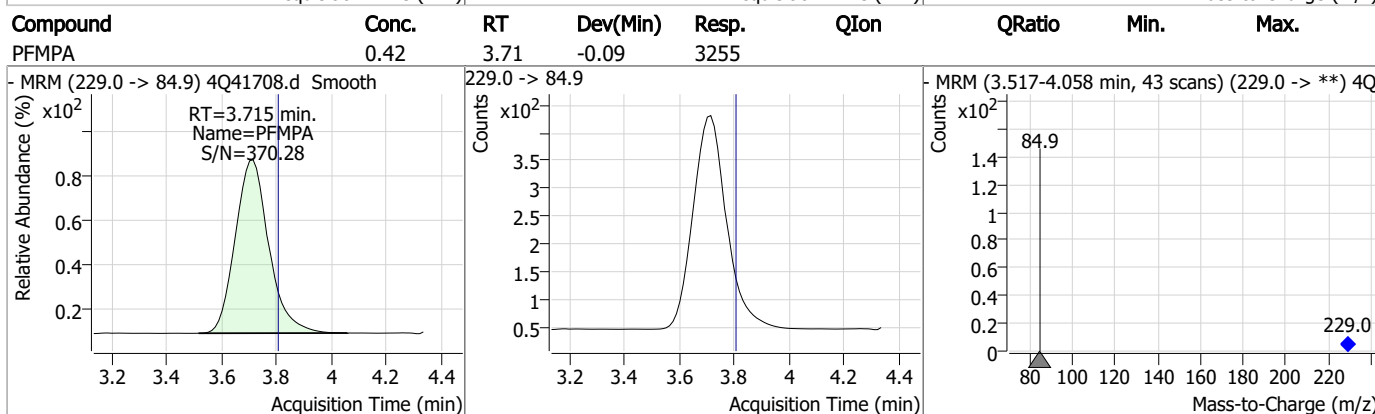
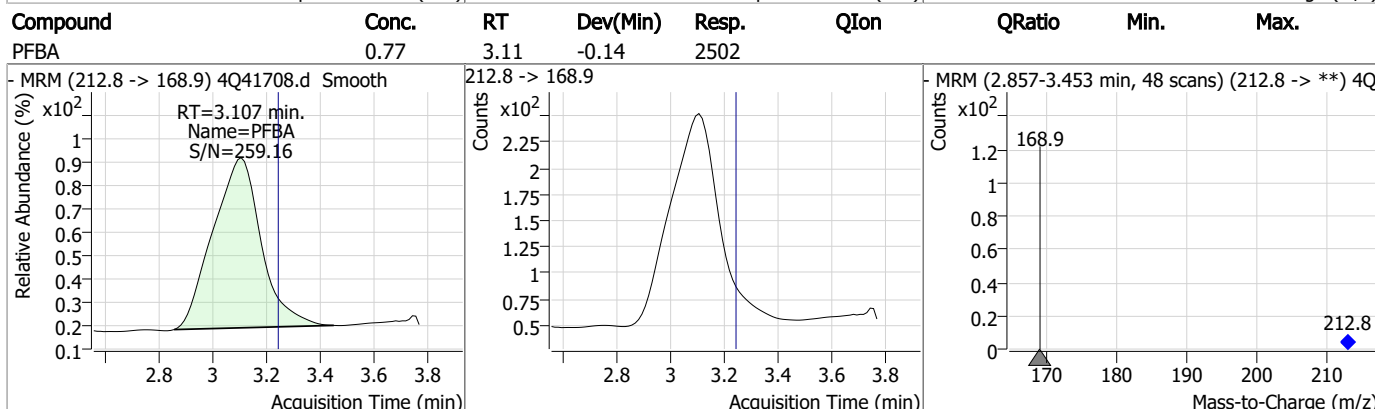
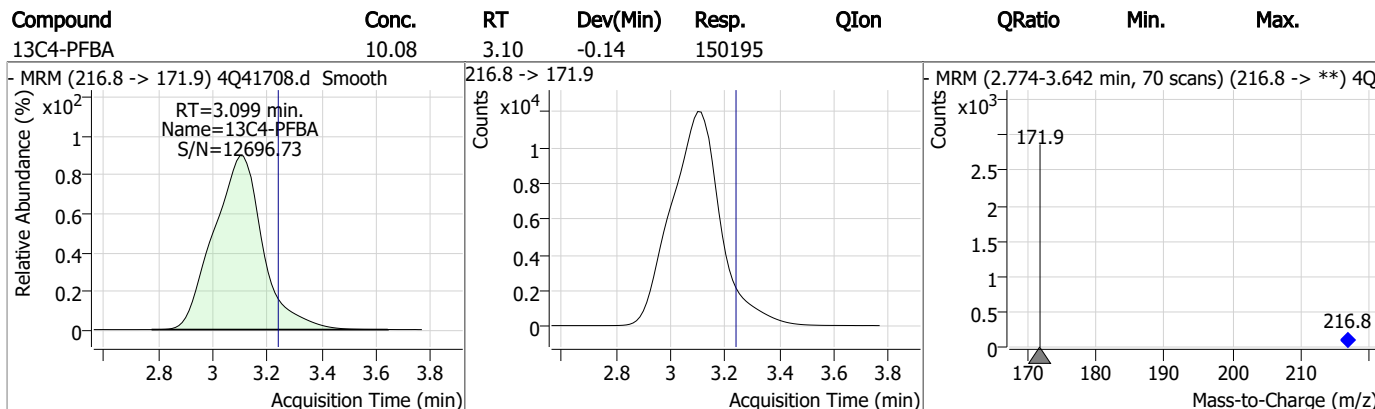
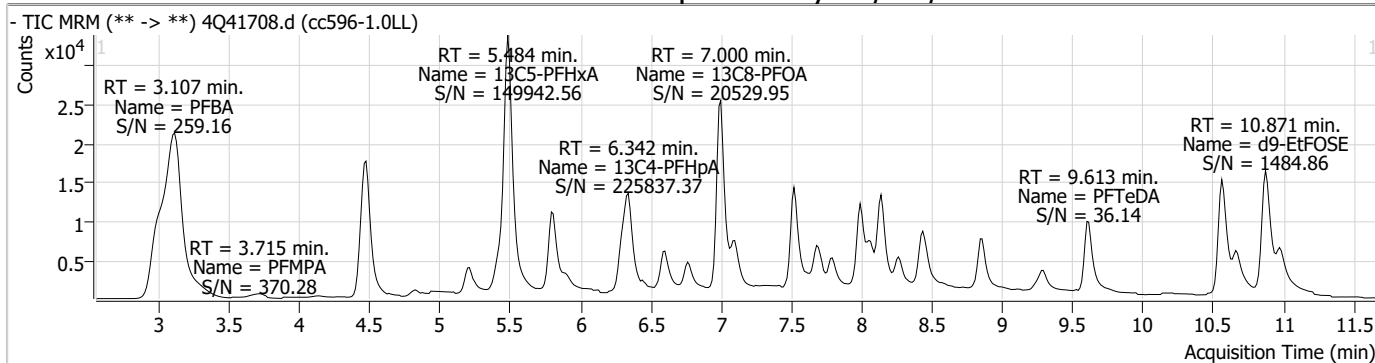
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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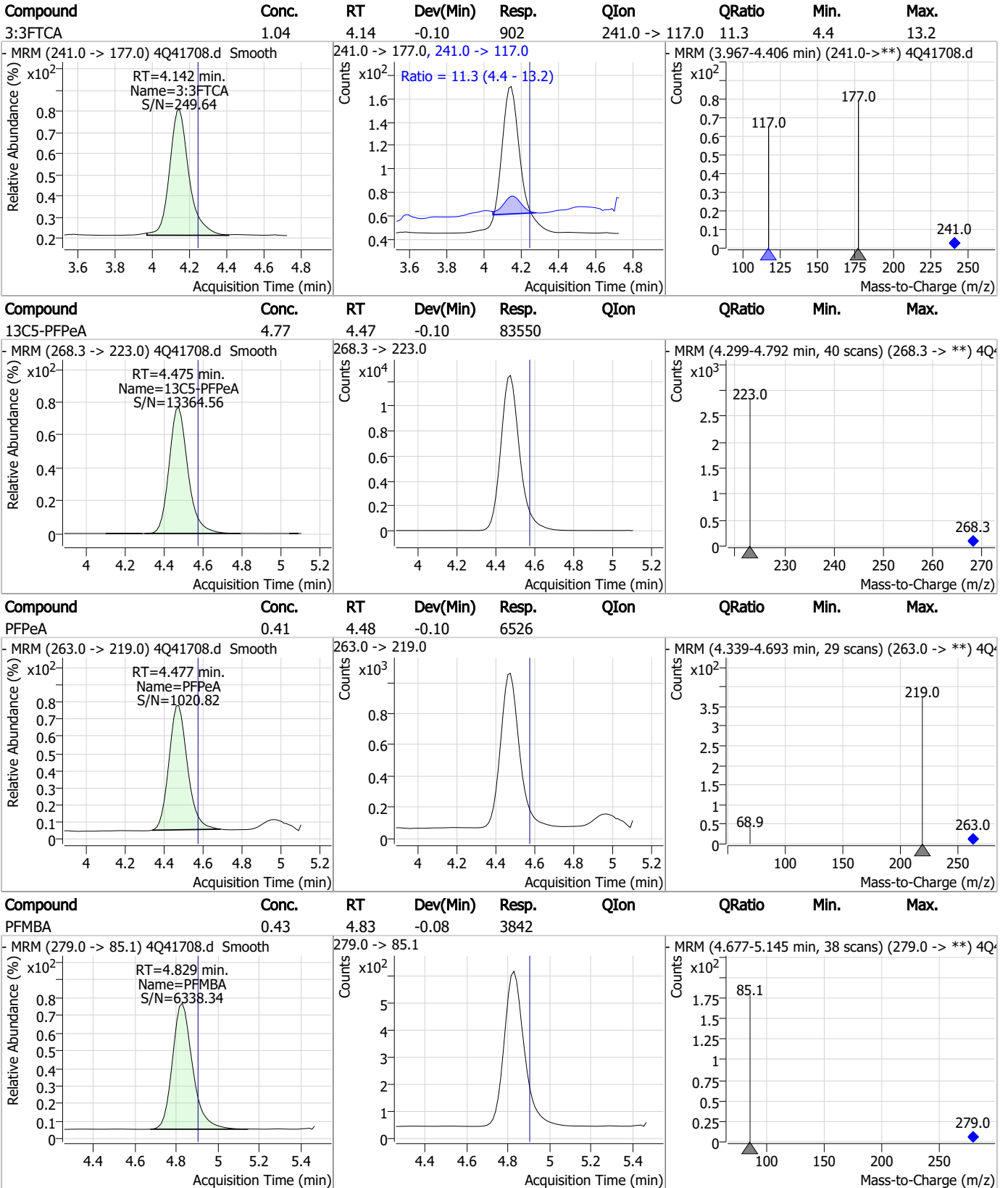
7.7.13

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Perfluorinated Compounds by LC/MS/MS



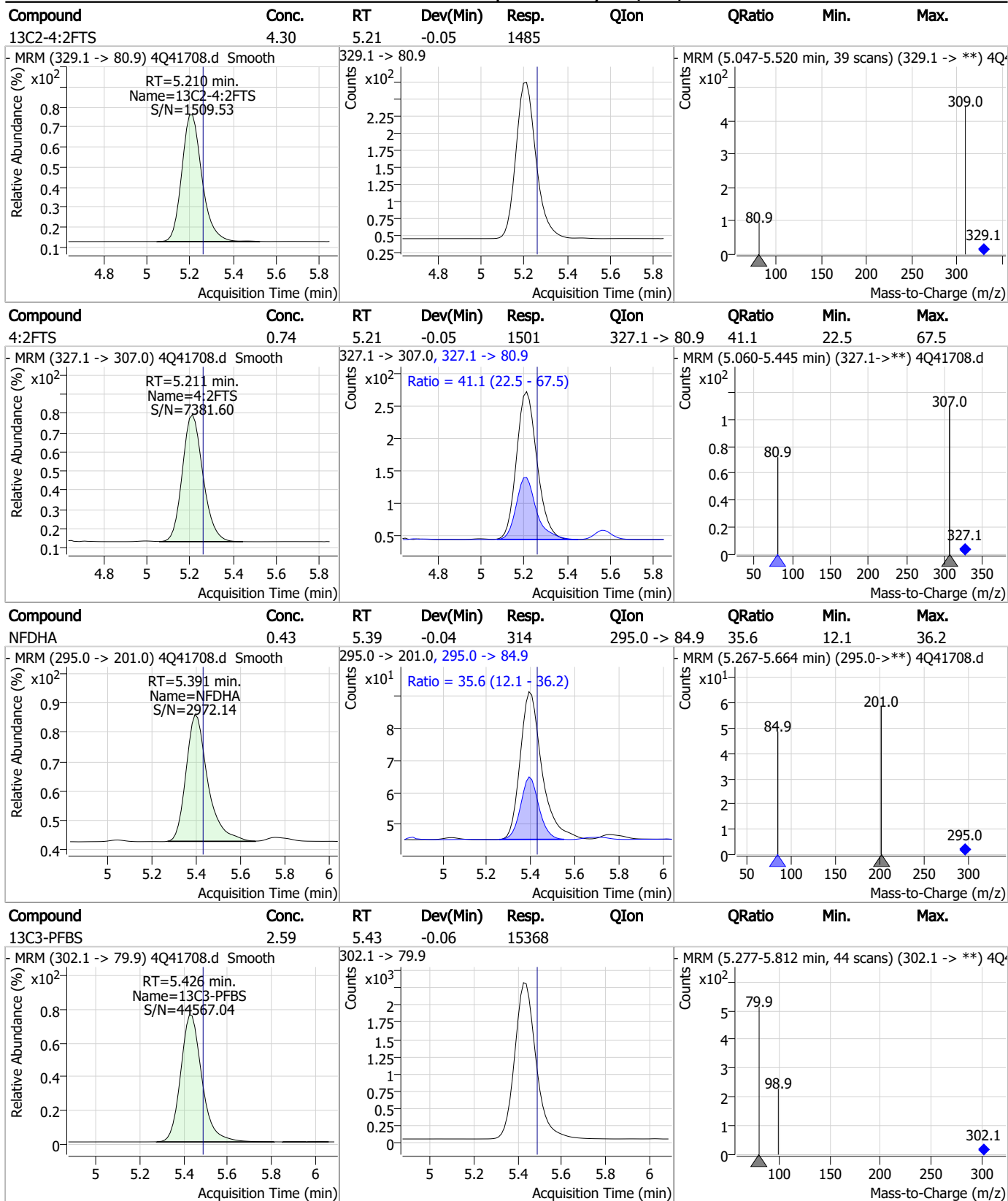
Perfluorinated Compounds by LC/MS/MS



7.7.13 7

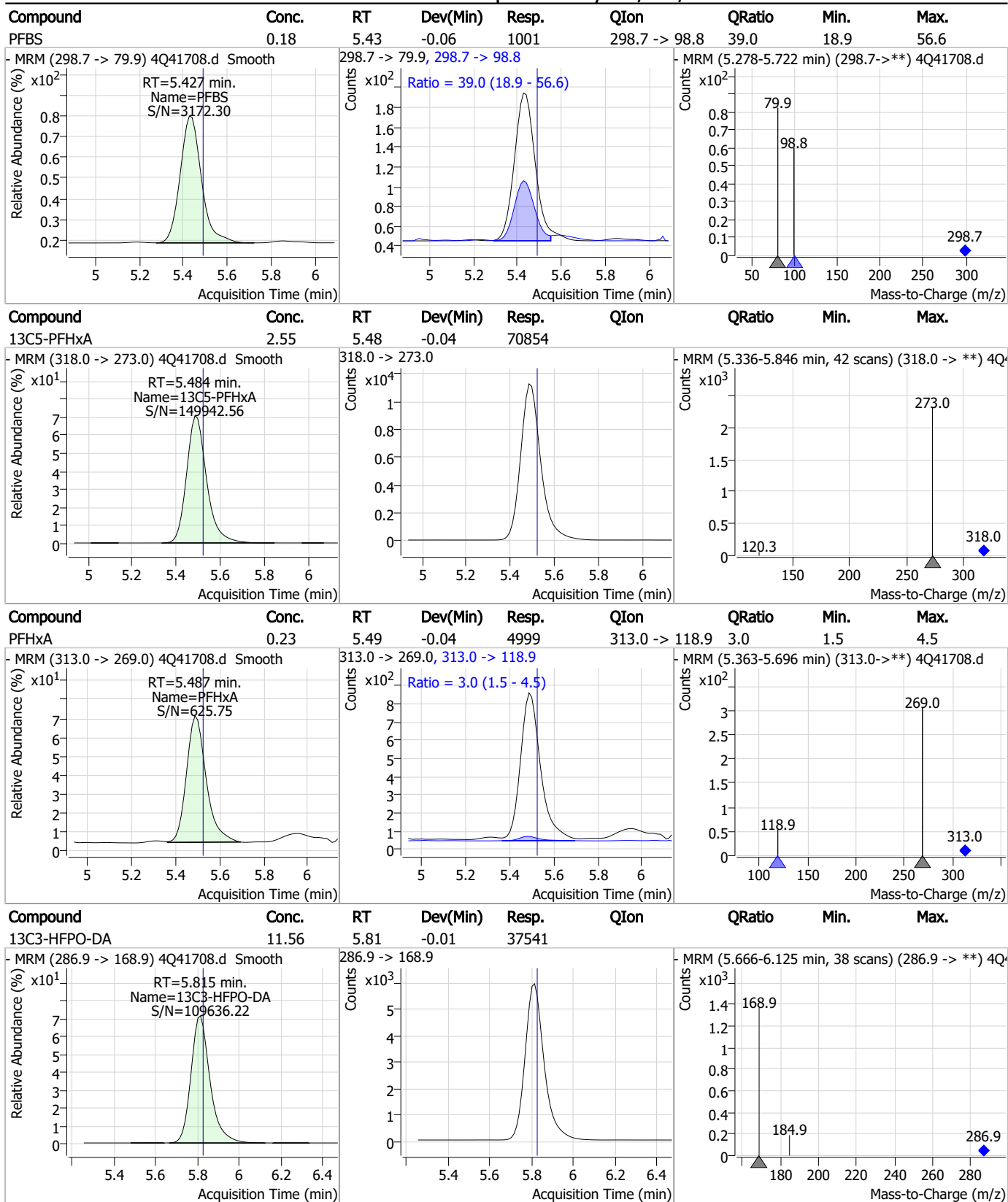


Perfluorinated Compounds by LC/MS/MS



7.7.13
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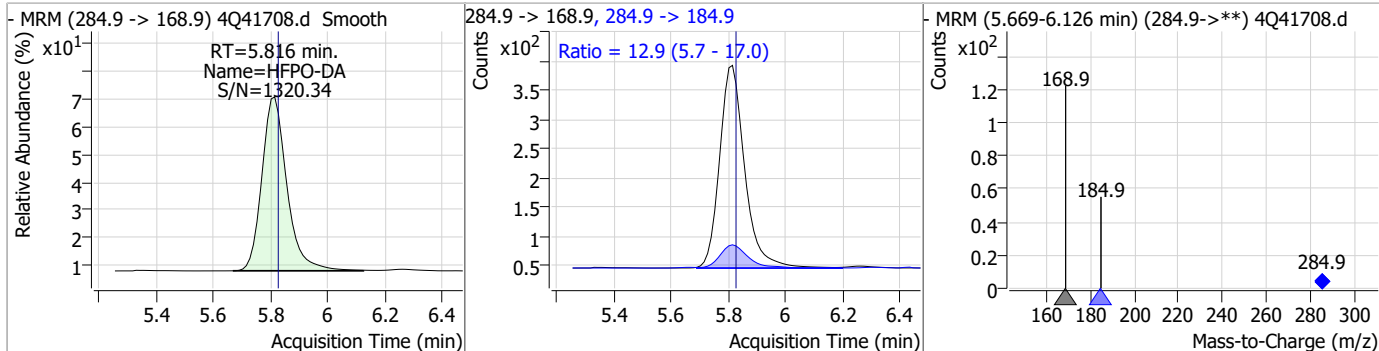
Perfluorinated Compounds by LC/MS/MS



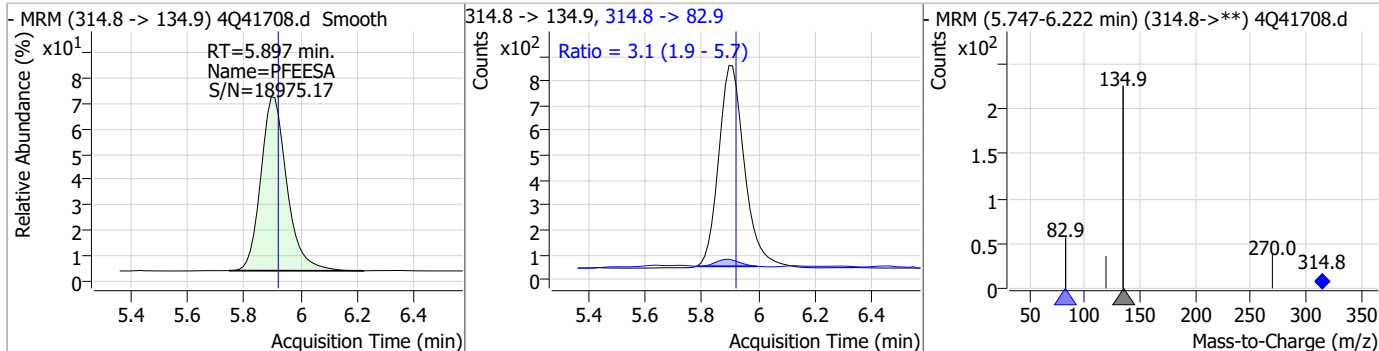
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Perfluorinated Compounds by LC/MS/MS

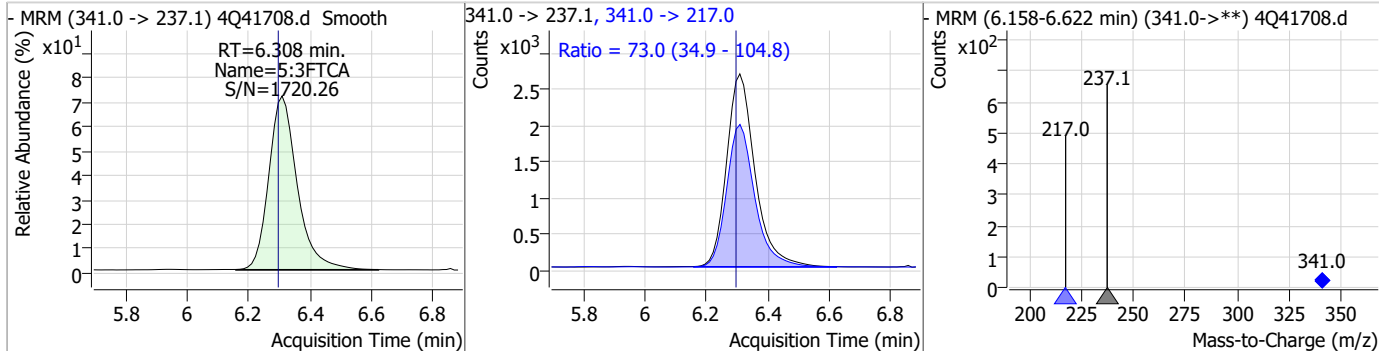
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	0.72	5.82	-0.01	2115	284.9 -> 184.9	12.9	5.7	17.0



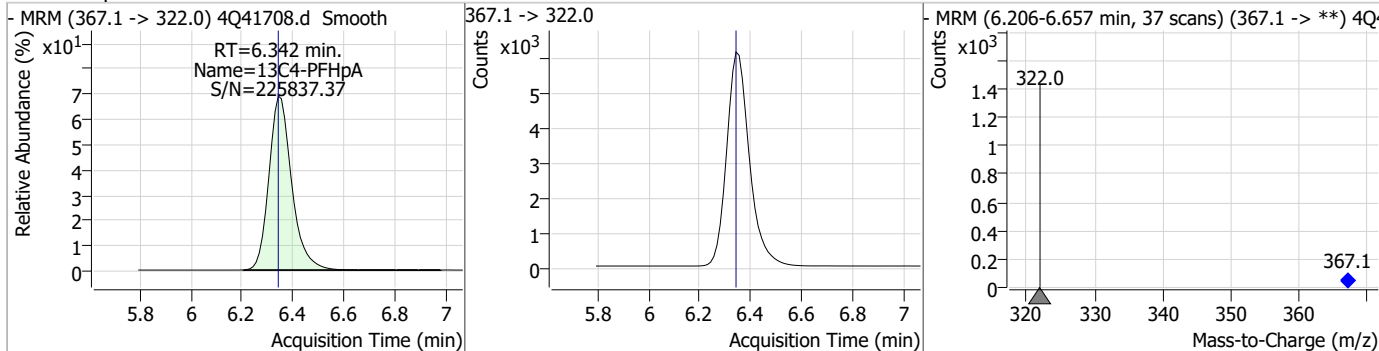
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFEESA	0.32	5.90	-0.02	5219	314.8 -> 82.9	3.1	1.9	5.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
5:3FTCA	4.80	6.31	0.01	17208	341.0 -> 217.0	73.0	34.9	104.8

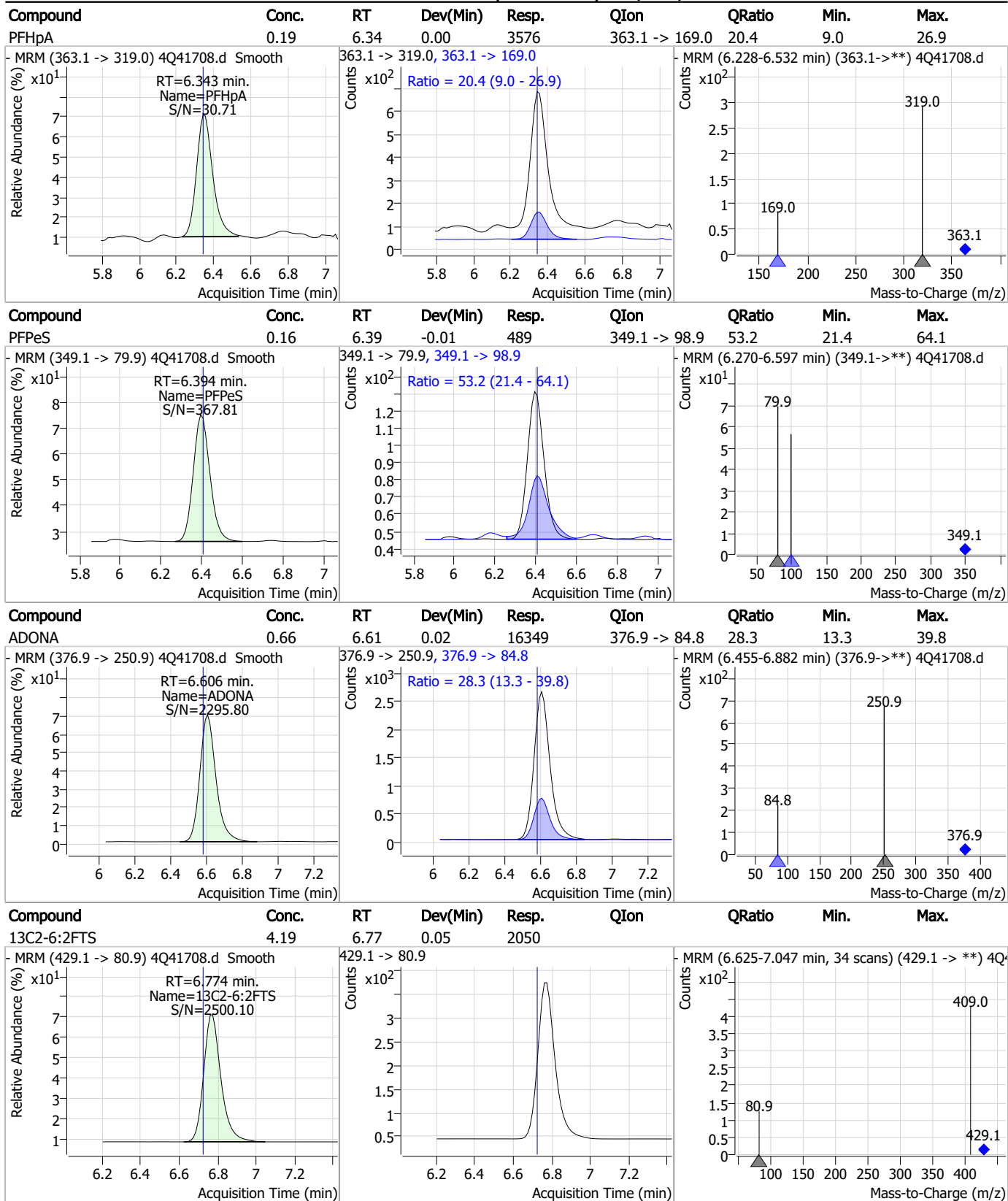


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C4-PFHpA	2.51	6.34	0.00	38185	367.1 -> 322.0	-	-	-



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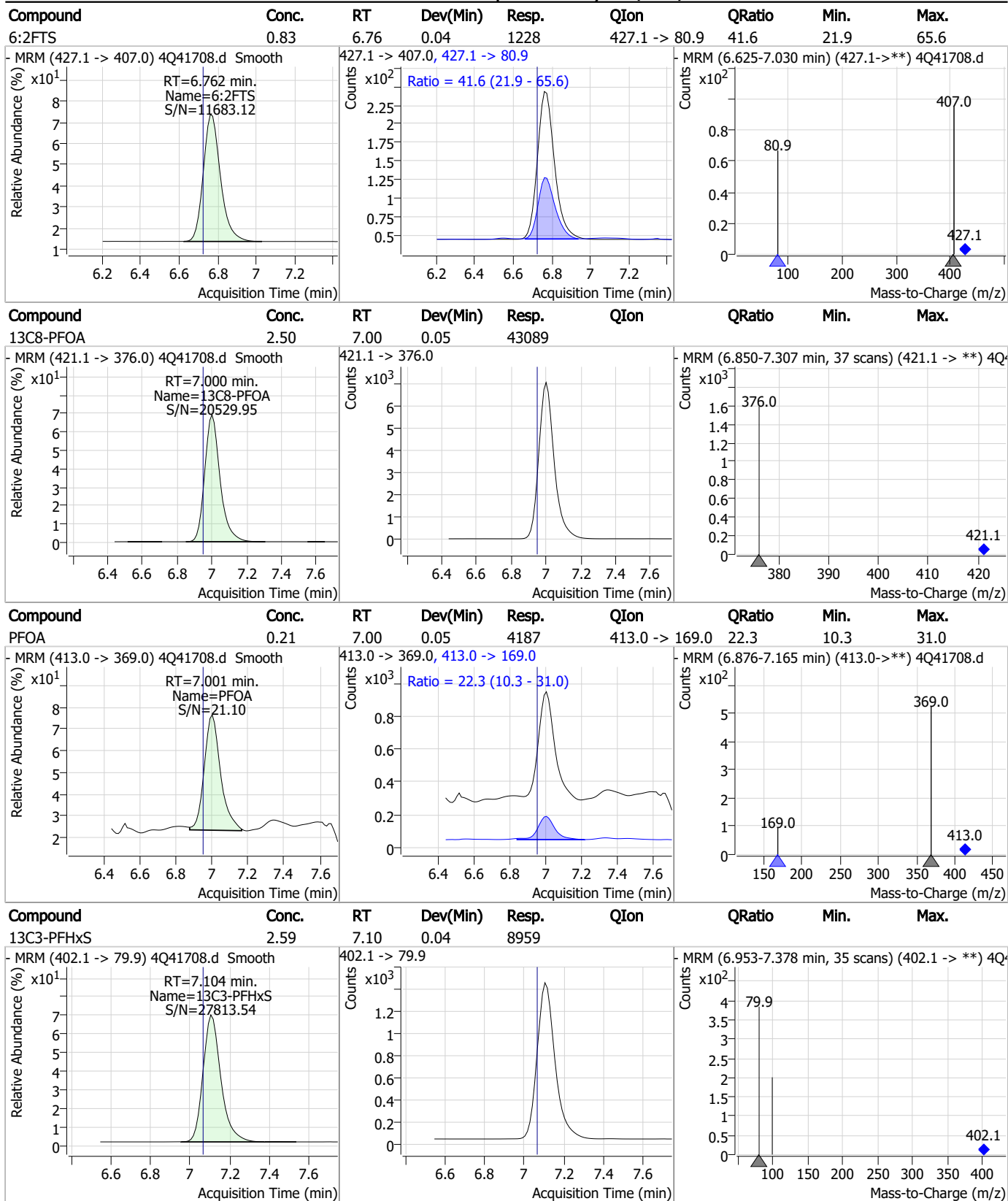
Perfluorinated Compounds by LC/MS/MS



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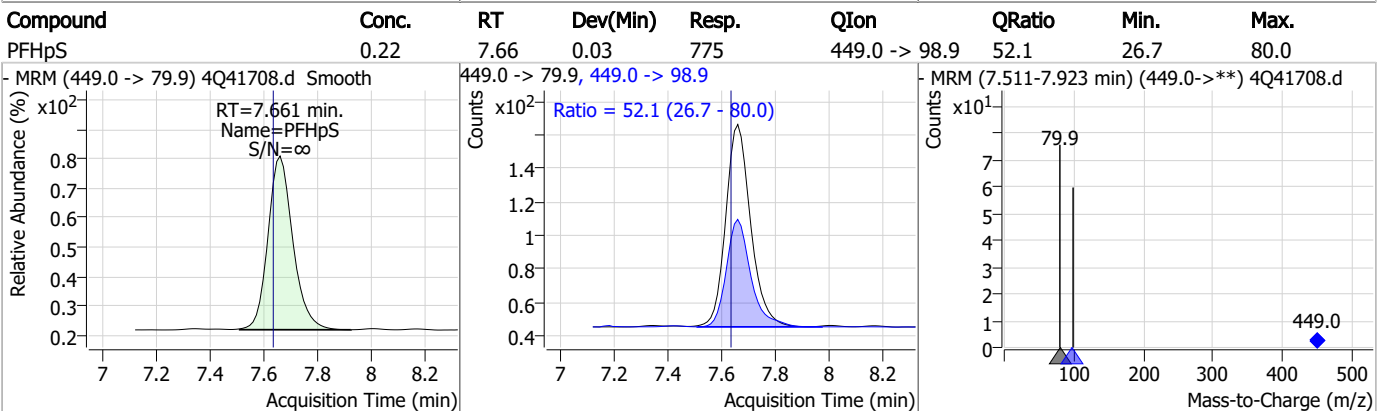
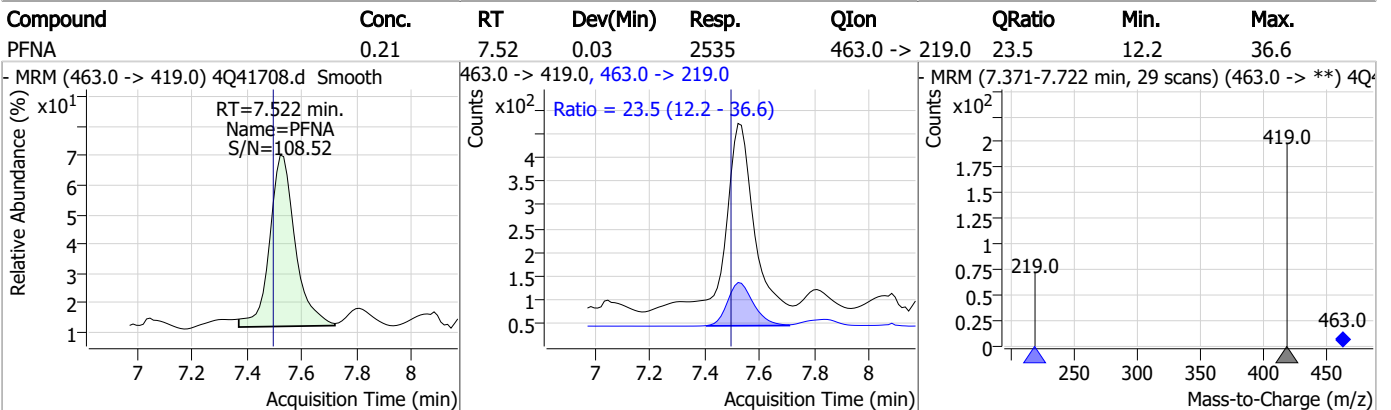
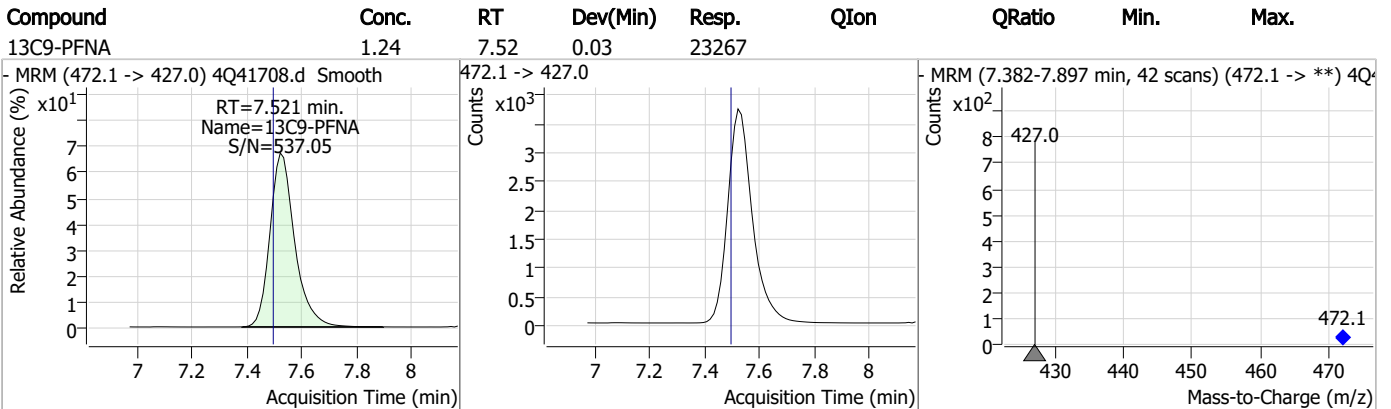
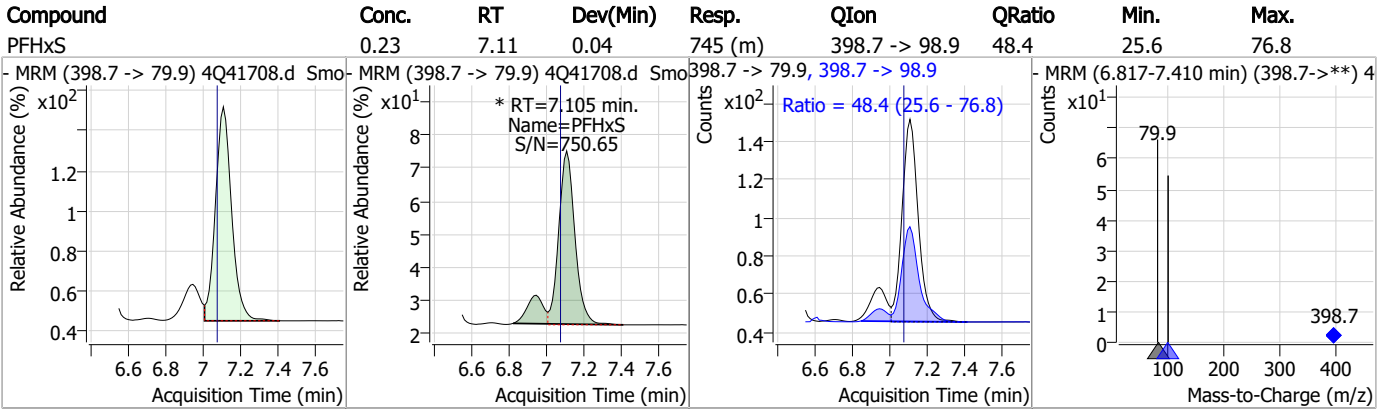
Perfluorinated Compounds by LC/MS/MS



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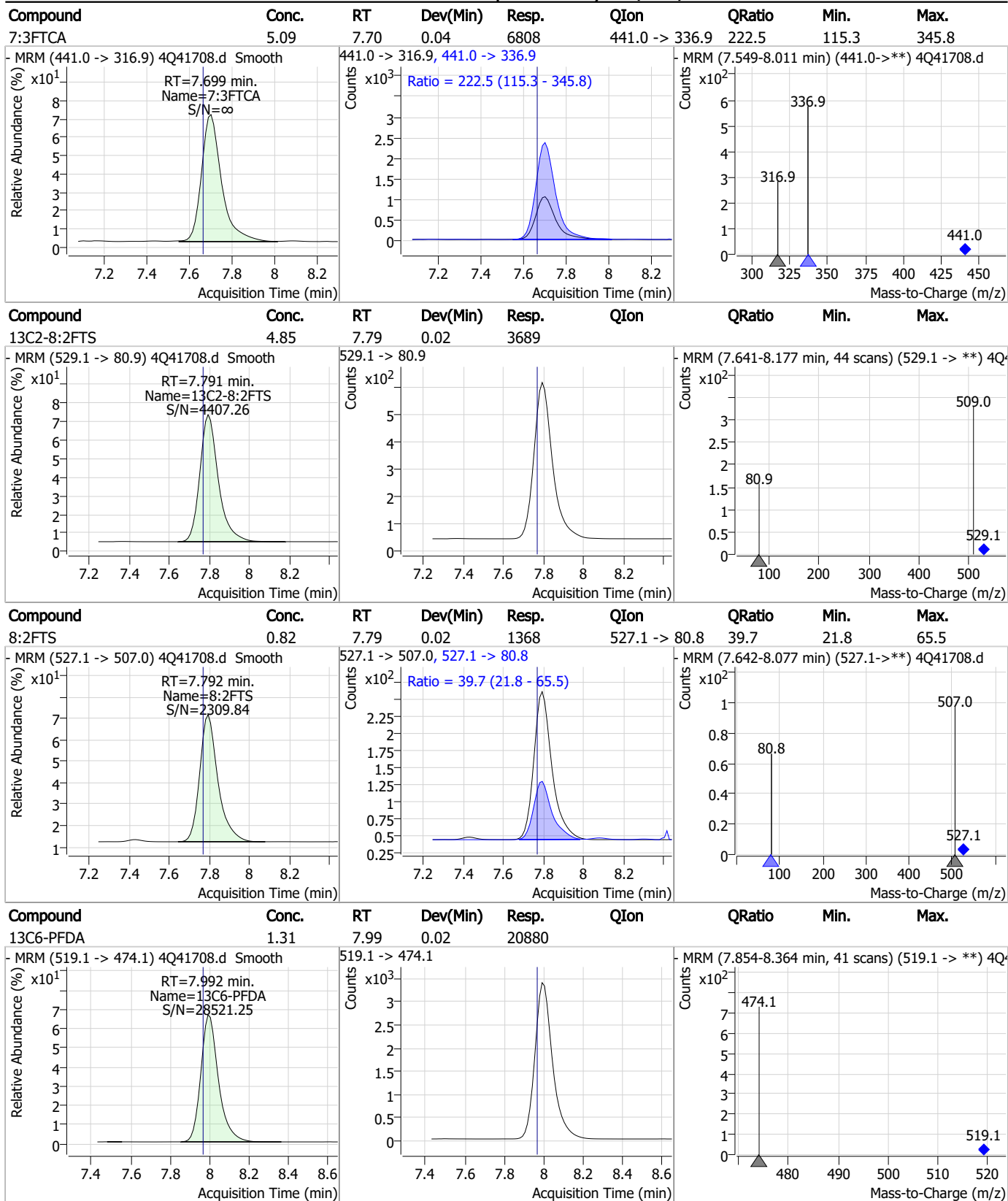
Perfluorinated Compounds by LC/MS/MS



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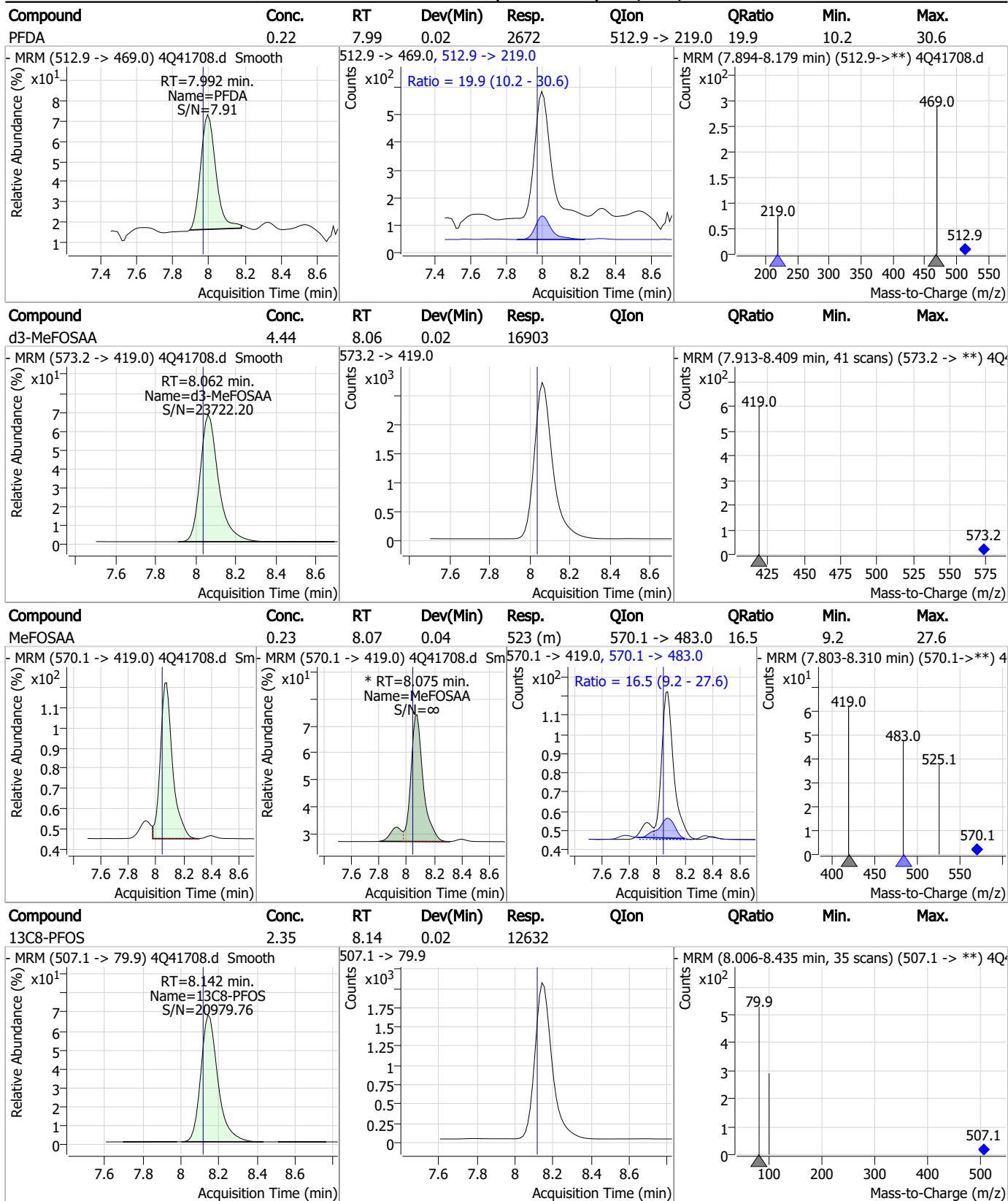


Perfluorinated Compounds by LC/MS/MS



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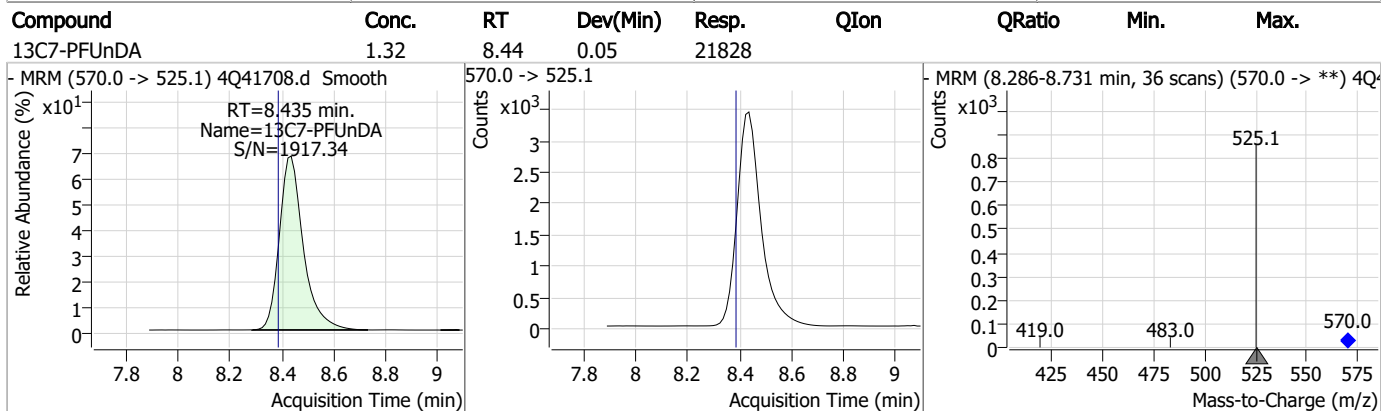
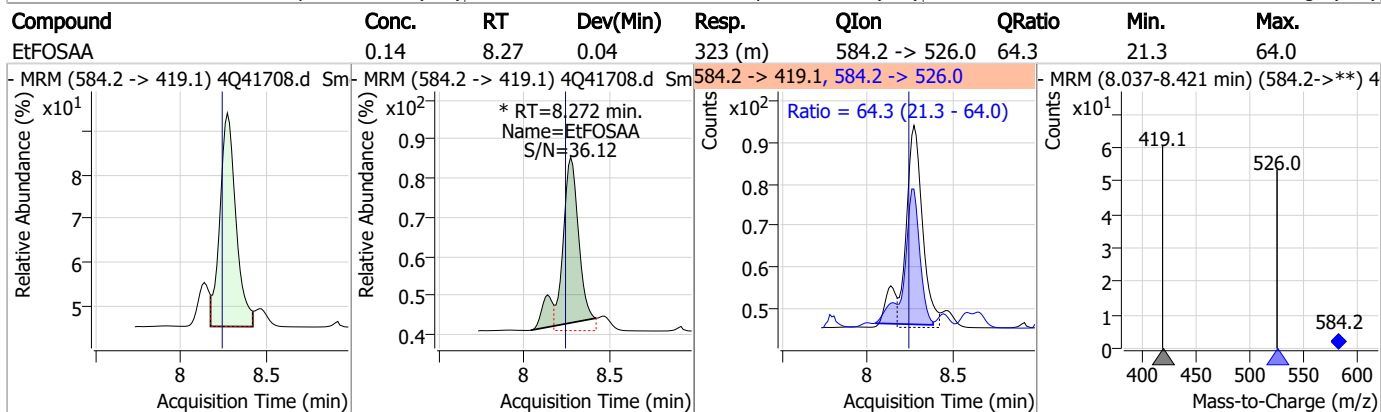
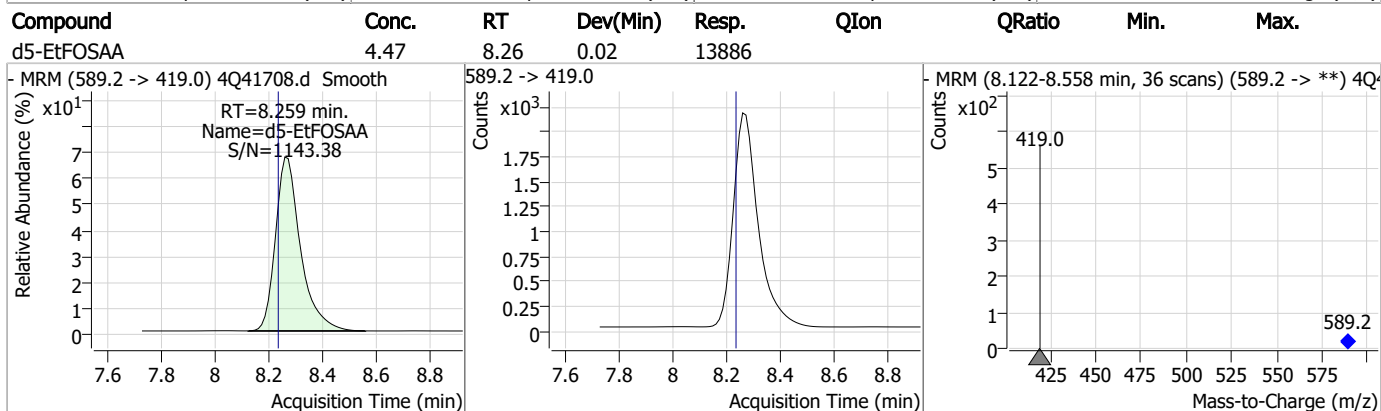
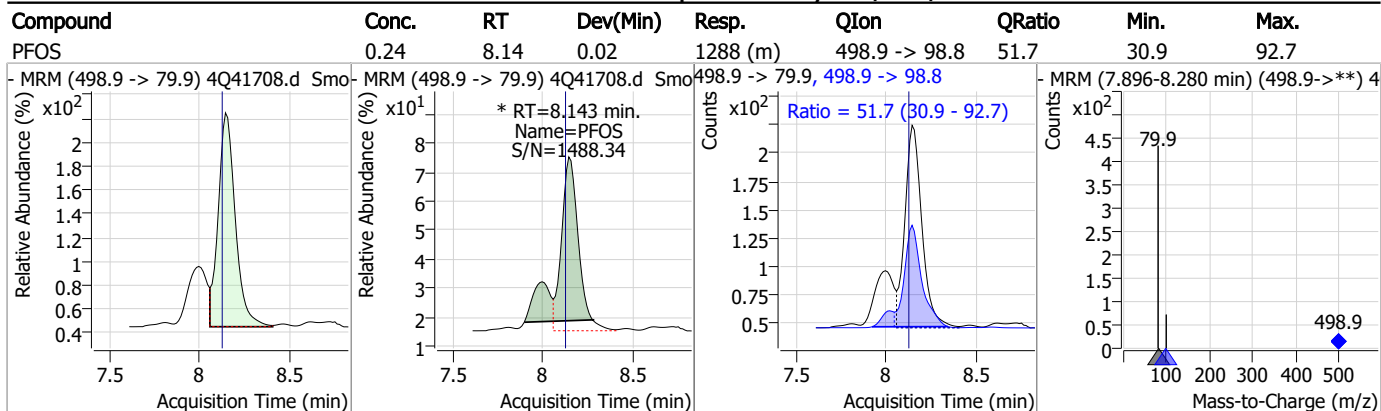
Perfluorinated Compounds by LC/MS/MS



7.7.13
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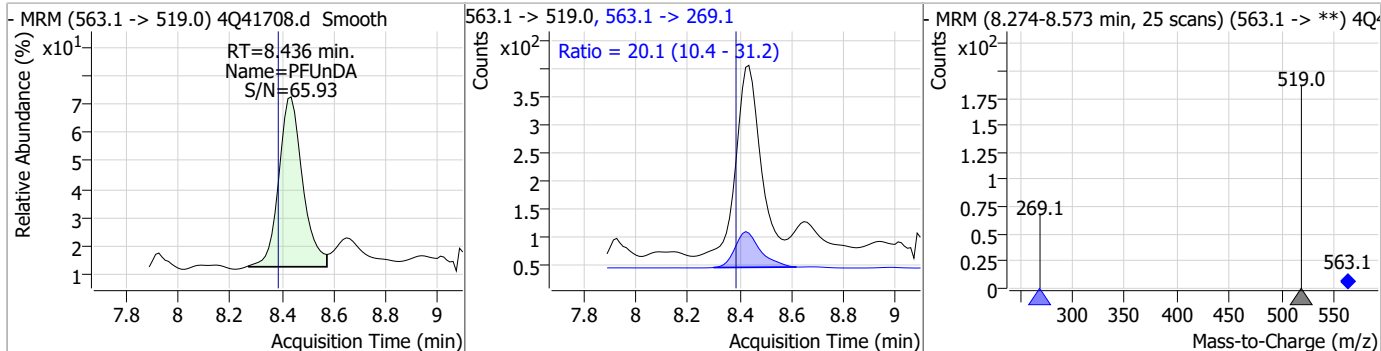
Perfluorinated Compounds by LC/MS/MS



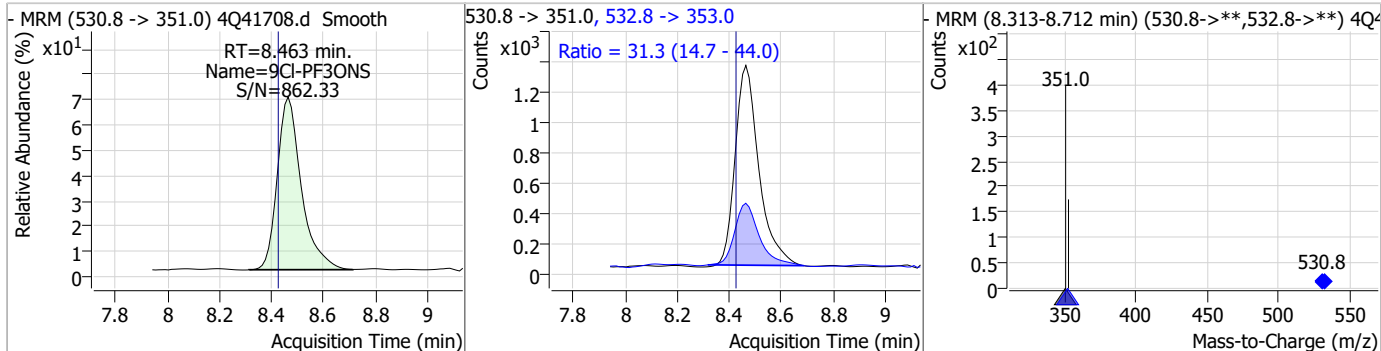
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Perfluorinated Compounds by LC/MS/MS

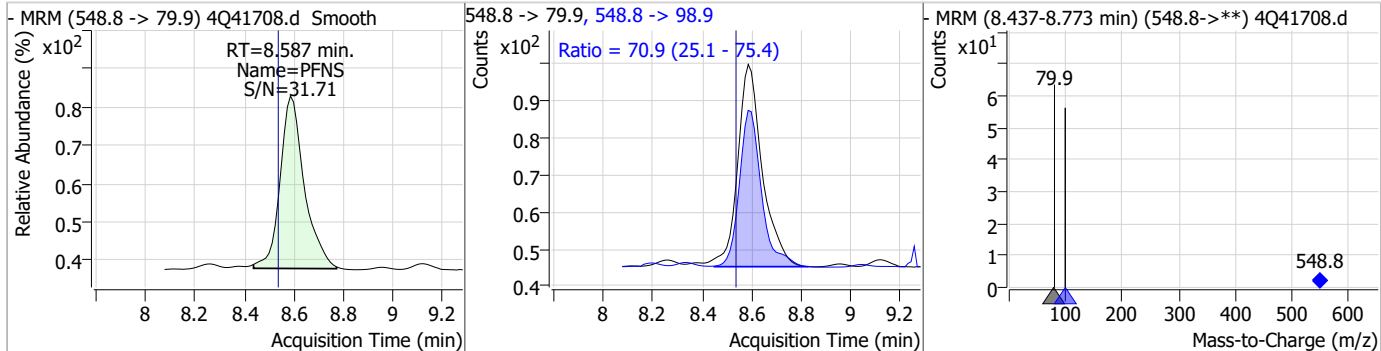
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	0.19	8.44	0.05	2149	563.1 -> 269.1	20.1	10.4	31.2



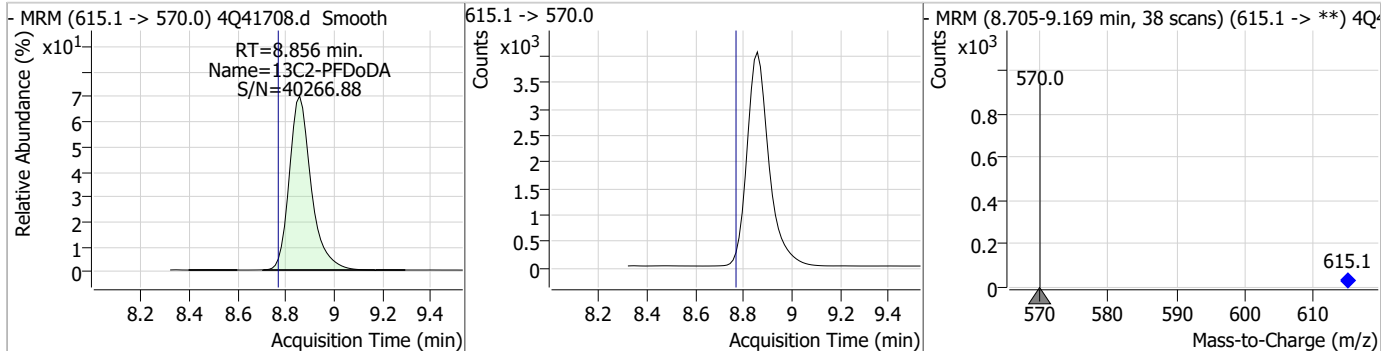
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	0.67	8.46	0.04	8515	532.8 -> 353.0	31.3	14.7	44.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	0.19	8.59	0.05	371	548.8 -> 98.9	70.9	25.1	75.4

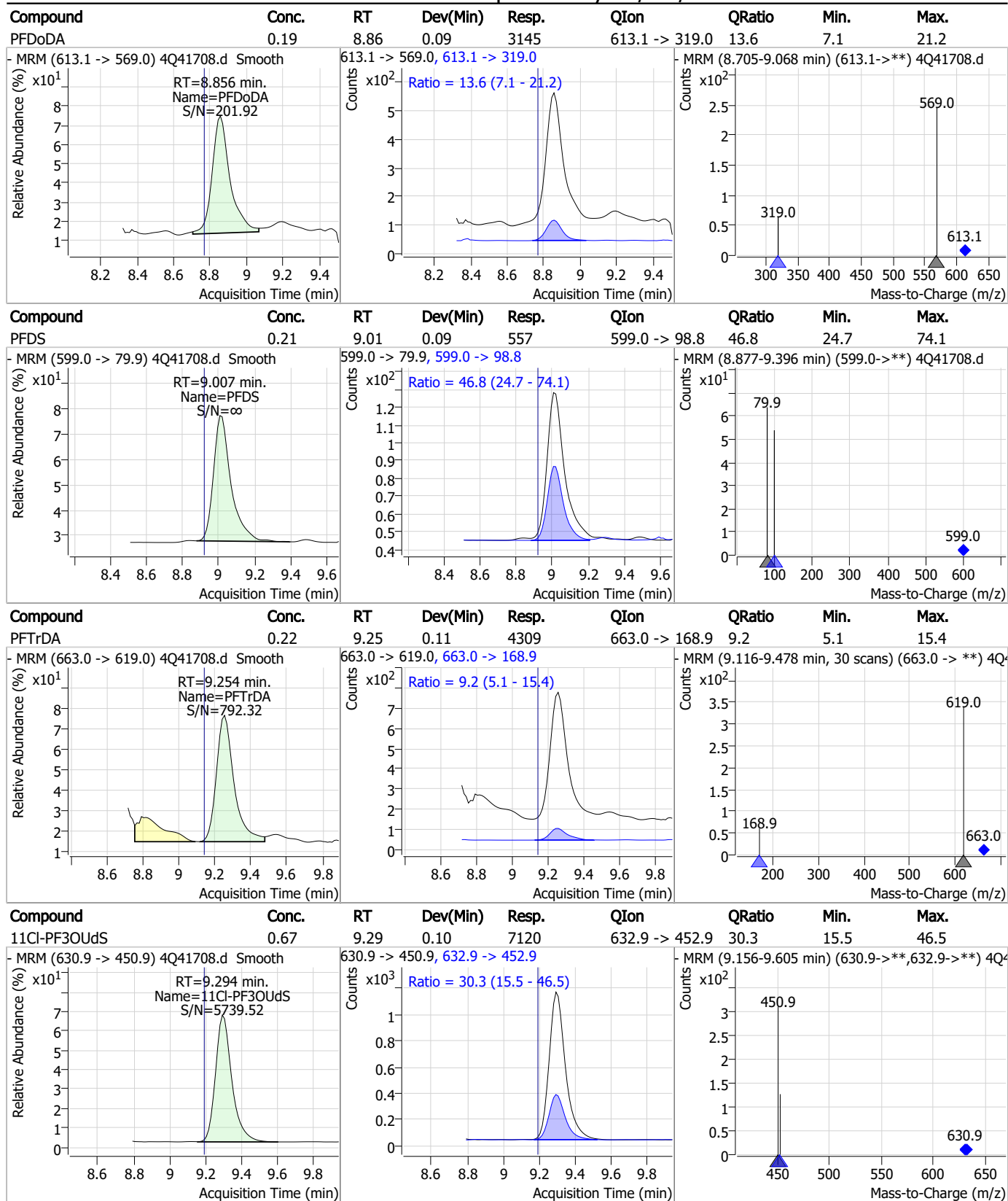


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA	1.29	8.86	0.09	25285	615.1 -> 570.0			



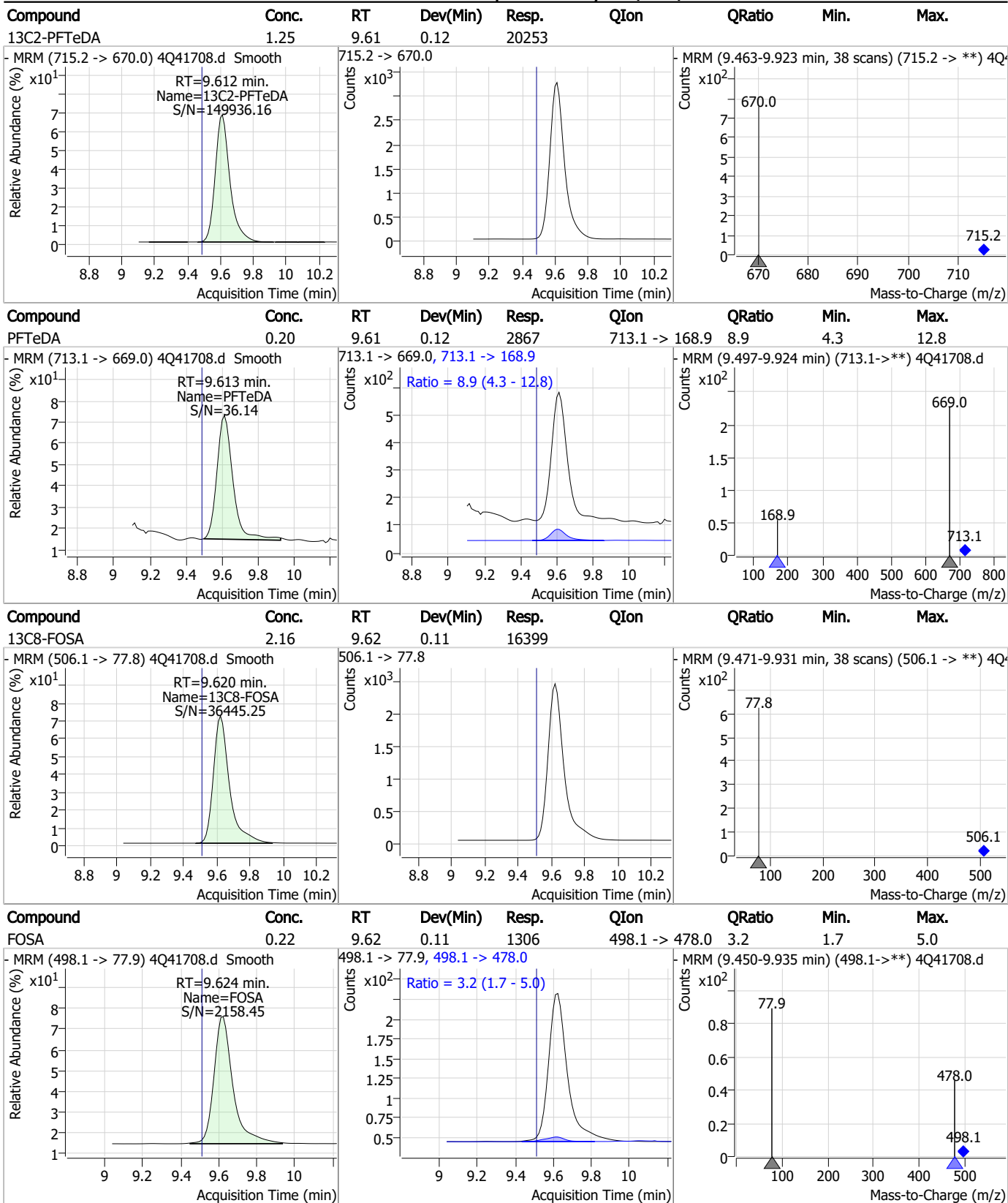
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Perfluorinated Compounds by LC/MS/MS



7.7.13
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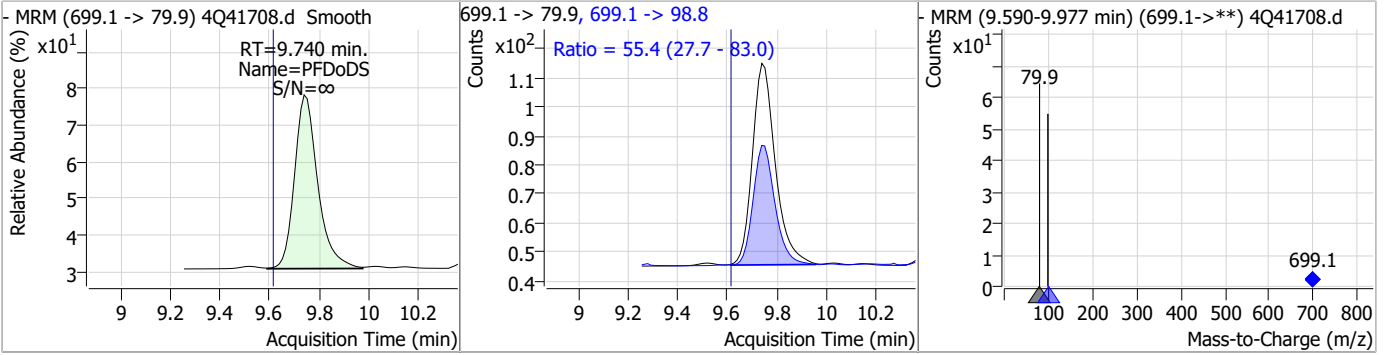
Perfluorinated Compounds by LC/MS/MS



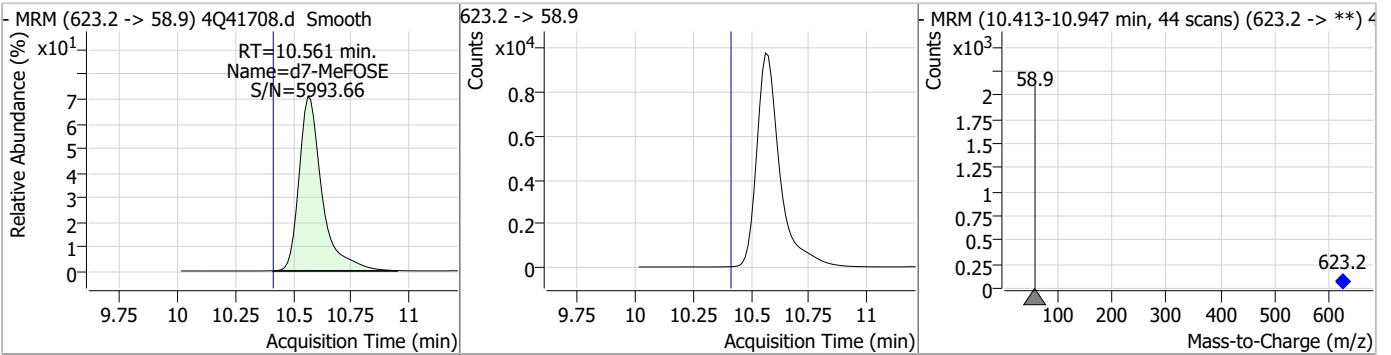
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Perfluorinated Compounds by LC/MS/MS

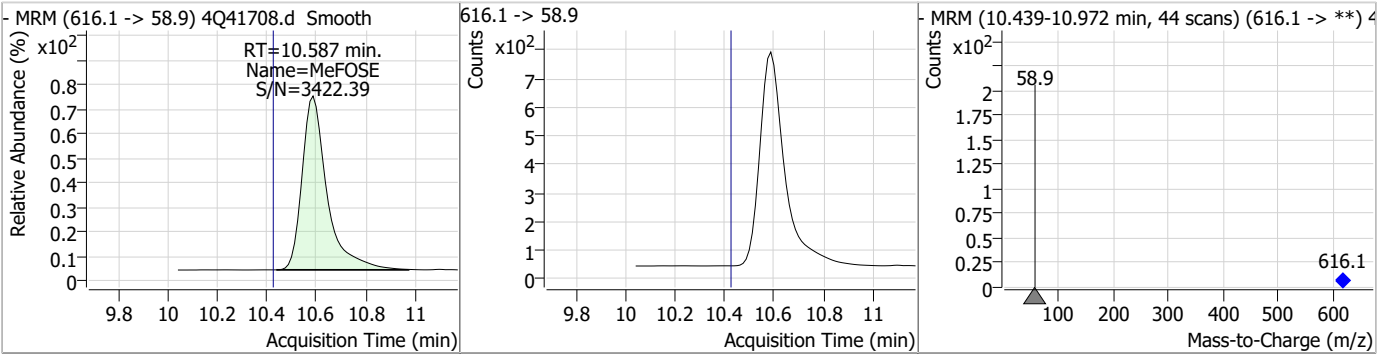
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDS	0.20	9.74	0.12	456	699.1 -> 98.8	55.4	27.7	83.0



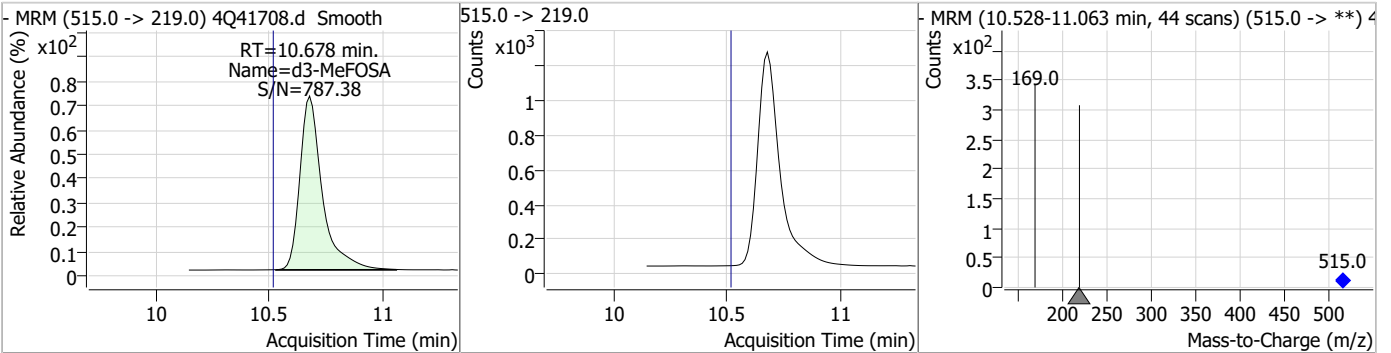
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	23.20	10.56	0.15	67364				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	2.04	10.59	0.16	5253				

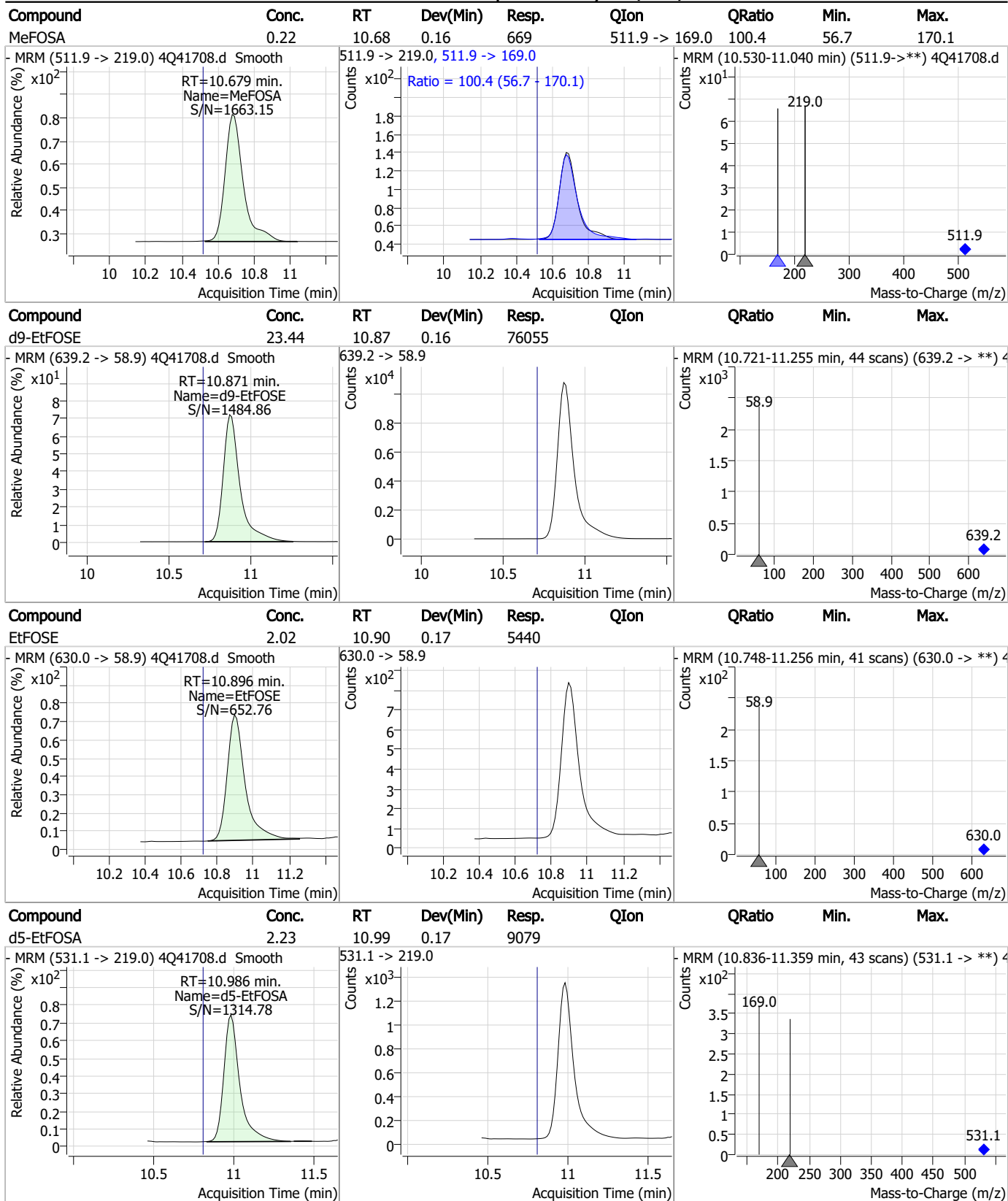


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.22	10.68	0.16	8574				



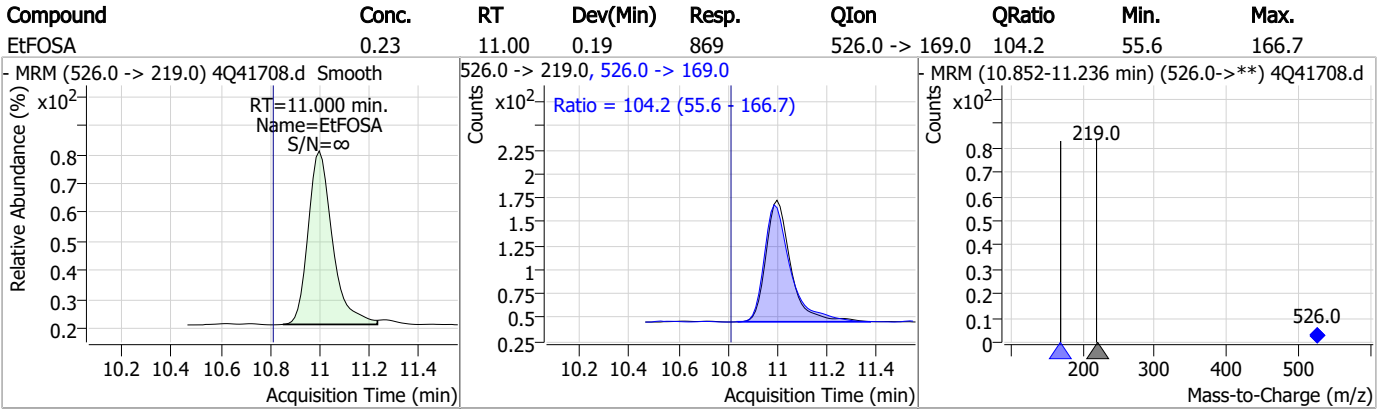
7.7.13
7

Perfluorinated Compounds by LC/MS/MS



7.7.13
7

Perfluorinated Compounds by LC/MS/MS



7.7.13

7

Manual Integration Approval Summary

Sample Number: S4Q597-CC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41708.D Analyst approved: 03/08/23 10:20 Anna Ludwig
Injection Time: 03/06/23 17:59 Supervisor approved: 03/08/23 10:59 Natasha Guntie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.11	Split peak
MeFOSAA	2355-31-9		8.07	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.14	Split peak
EtFOSAA	2991-50-6		8.27	Split peak

7.7.13.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41719.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 8:33:58 PM
 Sample Name : cc596-4
 Vial : P1-A5
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.111	216.8 -> 171.9	160157	10.00 µg/L	0.000
M5-PFPeA	4.475	268.3 -> 223.0	89033	5.00 µg/L	0.012
M5-PFHxA	5.509	318.0 -> 273.0	75318	2.50 µg/L	0.000
M4-PFHpA	6.367	367.1 -> 322.0	40901	2.50 µg/L	0.000
M8-PFOA	7.025	421.1 -> 376.0	45476	2.50 µg/L	0.000
M9-PFNA	7.546	472.1 -> 427.0	24801	1.25 µg/L	0.000
M6-PFDA	8.029	519.1 -> 474.1	23744	1.25 µg/L	0.000
M7-PFUnDA	8.461	570.0 -> 525.1	23856	1.25 µg/L	-0.012
M2-PFDoDA	8.881	615.1 -> 570.0	25898	1.25 µg/L	-0.025
M2-PFTeDA	9.637	715.2 -> 670.0	22489	1.25 µg/L	-0.037
M8-FOSA	9.645	506.1 -> 77.8	17966	2.50 µg/L	-0.012
M3-PFBS	5.451	302.1 -> 79.9	16269	2.50 µg/L	0.000
M3-PFHxS	7.129	402.1 -> 79.9	9398	2.50 µg/L	0.000
M8-PFOS	8.167	507.1 -> 79.9	13557	2.50 µg/L	-0.013
M2-4:2FTS	5.223	329.1 -> 80.9	1812	5.00 µg/L	0.000
M2-6:2FTS	6.786	429.1 -> 80.9	2475	5.00 µg/L	0.000
M2-8:2FTS	7.816	529.1 -> 80.9	3904	5.00 µg/L	-0.012
M3-MeFOSAA	8.086	573.2 -> 419.0	17317	5.00 µg/L	-0.012
M3-HFPO-DA	5.827	286.9 -> 168.9	38895	10.00 µg/L	-0.012
M5-EtFOSAA	8.296	589.2 -> 419.0	15032	5.00 µg/L	0.000
M7-MeFOSE	10.599	623.2 -> 58.9	71187	25.00 µg/L	-0.037
M9-EtFOSE	10.908	639.2 -> 58.9	81423	25.00 µg/L	-0.050
M5-EtFOSA	11.011	531.1 -> 219.0	9790	2.50 µg/L	-0.062
M3-MeFOSA	10.702	515.0 -> 219.0	9236	2.50 µg/L	-0.050
13C4-PFOS	8.167	502.8 -> 79.9	14033	2.50 µg/L	-0.013
13C3-PFBA	3.103	216.0 -> 172.0	93092	5.00 µg/L	-0.013
18O2-PFHxS	7.128	403.0 -> 83.9	6970	2.50 µg/L	0.000
13C4-PFOA	7.025	417.1 -> 372.0	56133	2.50 µg/L	0.000
13C2-PFDA	8.029	515.1 -> 470.1	20248	1.25 µg/L	0.000
13C5-PFNA	7.547	468.0 -> 423.0	28121	1.25 µg/L	0.000
13C2-PFHxA	5.510	315.1 -> 270.0	68361	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1812	4.79 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 95.9%		
13C2-6:2FTS	6.786	429.1 -> 80.9	2475	4.62 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 92.4%		
13C2-8:2FTS	7.816	529.1 -> 80.9	3904	4.68 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 93.7%		
13C2-PFDoDA	8.881	615.1 -> 570.0	25898	1.21 µg/L	-0.025
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.8%		
13C2-PFTeDA	9.637	715.2 -> 670.0	22489	1.27 µg/L	-0.037
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 101.8%		
13C3-PFBS	5.451	302.1 -> 79.9	16269	2.51 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 100.3%		
13C3-PFHxS	7.129	402.1 -> 79.9	9398	2.48 µg/L	0.000

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.2%	
13C4-PFBA	3.111	216.8 -> 171.9	160157	10.01 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.1%	
13C4-PFHpA	6.367	367.1 -> 322.0	40901	2.52 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 100.9%	
13C5-PFHxA	5.509	318.0 -> 273.0	75318	2.54 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.6%	
13C5-PFPeA	4.475	268.3 -> 223.0	89033	4.77 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 95.4%	
13C6-PFDA	8.029	519.1 -> 474.1	23744	1.37 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 109.5%	
13C7-PFUnDA	8.461	570.0 -> 525.1	23856	1.33 µg/L	-0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 106.2%	
13C8-FOSA	9.645	506.1 -> 77.8	17966	2.30 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 92.1%	
13C8-PFOA	7.025	421.1 -> 376.0	45476	2.45 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.0%	
13C8-PFOS	8.167	507.1 -> 79.9	13557	2.45 µg/L	-0.013
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.1%	
13C9-PFNA	7.546	472.1 -> 427.0	24801	1.26 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 100.9%	
d3-MeFOSAA	8.086	573.2 -> 419.0	17317	4.42 µg/L	-0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 88.4%	
13C3-HFPO-DA	5.827	286.9 -> 168.9	38895	11.24 µg/L	-0.012
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 112.4%	
d3-MeFOSA	10.702	515.0 -> 219.0	9236	2.32 µg/L	-0.050
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 93.0%	
d5-EtFOSAA	8.296	589.2 -> 419.0	15032	4.70 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 94.0%	
d7-MeFOSE	10.599	623.2 -> 58.9	71187	23.82 µg/L	-0.037
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 95.3%	
d9-EtFOSE	10.908	639.2 -> 58.9	81423	24.38 µg/L	-0.050
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 97.5%	
d5-EtFOSA	11.011	531.1 -> 219.0	9790	2.33 µg/L	-0.062
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 93.4%	
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0	21958	8.90 µg/L	99
		327.1 -> 80.9	9778		
6:2FTS	6.787	427.1 -> 407.0	17024	9.50 µg/L	95
		427.1 -> 80.9	7936		
8:2FTS	7.816	527.1 -> 507.0	17459	9.93 µg/L	99
		527.1 -> 80.8	7723		
EtFOSAA	8.297	584.2 -> 419.1	5840	2.42 µg/L	m 91
		584.2 -> 526.0	2831		
FOSA	9.636	498.1 -> 77.9	16452	2.54 µg/L	98
		498.1 -> 478.0	456		
MeFOSAA	8.087	570.1 -> 419.0	5879	2.47 µg/L	m 92
		570.1 -> 483.0	1289		
PFBA	3.107	212.8 -> 168.9	34100	9.89 µg/L	100
PFBS	5.440	298.7 -> 79.9	13168	2.26 µg/L	96
		298.7 -> 98.8	5255		
PFDA	8.029	512.9 -> 469.0	33058	2.43 µg/L	98
		512.9 -> 219.0	6430		
PFDODA	8.881	613.1 -> 569.0	42426	2.52 µg/L	99
		613.1 -> 319.0	6184		
PFDS	9.045	599.0 -> 79.9	6829	2.39 µg/L	97

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
		599.0 -> 98.8	3224			
PFHpA	6.368	363.1 -> 319.0	52996	2.57	µg/L	99
		363.1 -> 169.0	9220			
PFHpS	7.685	449.0 -> 79.9	8665	2.34	µg/L	97
		449.0 -> 98.9	4414			
PFHxA	5.500	313.0 -> 269.0	56438	2.45	µg/L	99
		313.0 -> 118.9	1806			
PFHxS	7.130	398.7 -> 79.9	7759	2.26	µg/L	m 97
		398.7 -> 98.9	4115			
PFNA	7.547	463.0 -> 419.0	32054	2.45	µg/L	99
		463.0 -> 219.0	7941			
PFNS	8.624	548.8 -> 79.9	5119	2.38	µg/L	90
		548.8 -> 98.9	2941			
PFOA	7.026	413.0 -> 369.0	49754	2.41	µg/L	100
		413.0 -> 169.0	10336			
PFOS	8.168	498.9 -> 79.9	12450	2.17	µg/L	m 85
		498.9 -> 98.8	6305			
PFPeA	4.477	263.0 -> 219.0	89775	5.26	µg/L	100
PFPeS	6.419	349.1 -> 79.9	7093	2.24	µg/L	97
		349.1 -> 98.9	3170			
PFTeDA	9.638	713.1 -> 669.0	38305	2.46	µg/L	100
		713.1 -> 168.9	3289			
PFTrDA	9.279	663.0 -> 619.0	53161	2.64	µg/L	99
		663.0 -> 168.9	5255			
PFUnDA	8.461	563.1 -> 519.0	28999	2.37	µg/L	100
		563.1 -> 269.1	5968			
11CI-PF3OUdS	9.319	630.9 -> 450.9	100810	9.09	µg/L	99
		632.9 -> 452.9	30934			
9CI-PF3ONS	8.488	530.8 -> 351.0	118343	9.03	µg/L	97
		532.8 -> 353.0	36621			
ADONA	6.631	376.9 -> 250.9	234940	9.19	µg/L	100
		376.9 -> 84.8	62206			
HFPO-DA	5.828	284.9 -> 168.9	30967	10.11	µg/L	97
		284.9 -> 184.9	3798			
3:3FTCA	4.142	241.0 -> 177.0	12372	13.43	µg/L	99
		241.0 -> 117.0	1154			
5:3FTCA	6.320	341.0 -> 237.1	242402	63.54	µg/L	99
		341.0 -> 217.0	171754			
7:3FTCA	7.723	441.0 -> 316.9	89808	63.22	µg/L	99
		441.0 -> 336.9	206140			
EtFOSA	11.024	526.0 -> 219.0	10564	2.64	µg/L	99
		526.0 -> 169.0	11655			
EtFOSE	10.934	630.0 -> 58.9	74137	25.71	µg/L	100
MeFOSA	10.716	511.9 -> 219.0	8141	2.44	µg/L	93
		511.9 -> 169.0	9803			
MeFOSE	10.612	616.1 -> 58.9	68250	25.11	µg/L	100
PFDoDS	9.777	699.1 -> 79.9	5631	2.32	µg/L	99
		699.1 -> 98.8	3170			
NFDHA	5.403	295.0 -> 201.0	4456	5.69	µg/L	90
		295.0 -> 84.9	1289			
PFMBA	4.829	279.0 -> 85.1	50969	5.33	µg/L	100
PFMPA	3.702	229.0 -> 84.9	45081	5.48	µg/L	100
PFEESA	5.921	314.8 -> 134.9	76014	4.37	µg/L	100
		314.8 -> 82.9	2937			

= Qualifier out of range, m = manually integrated, + = Area summed

7.7.14
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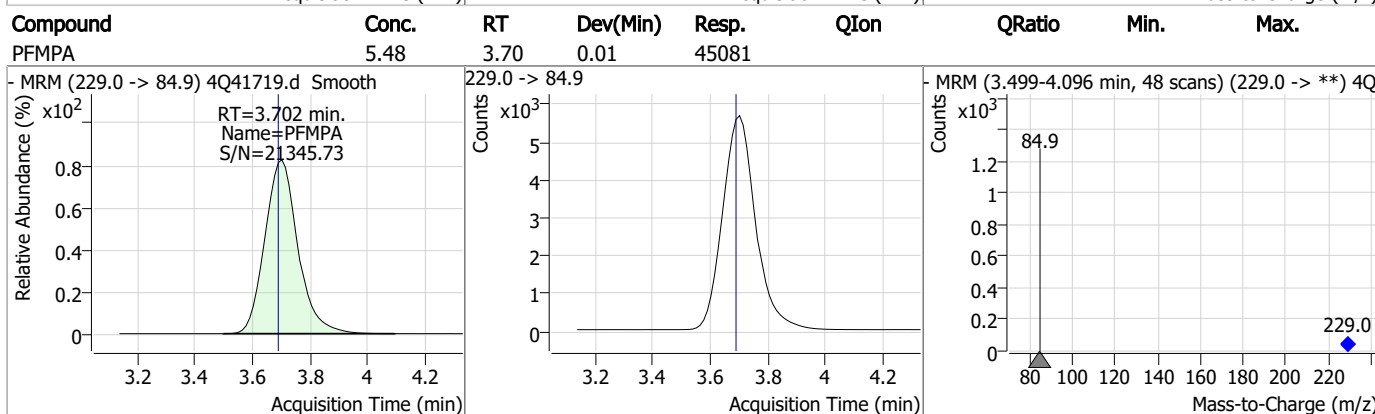
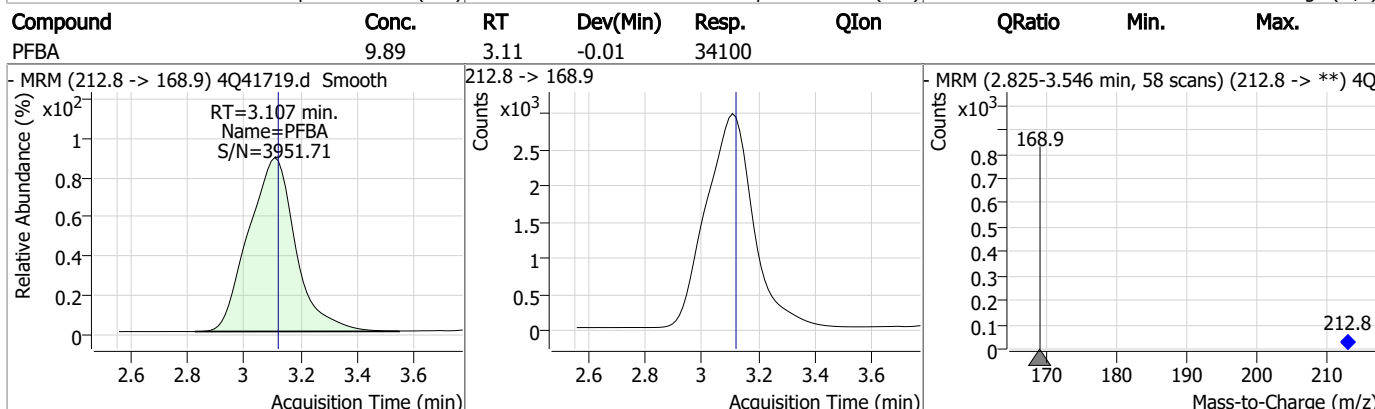
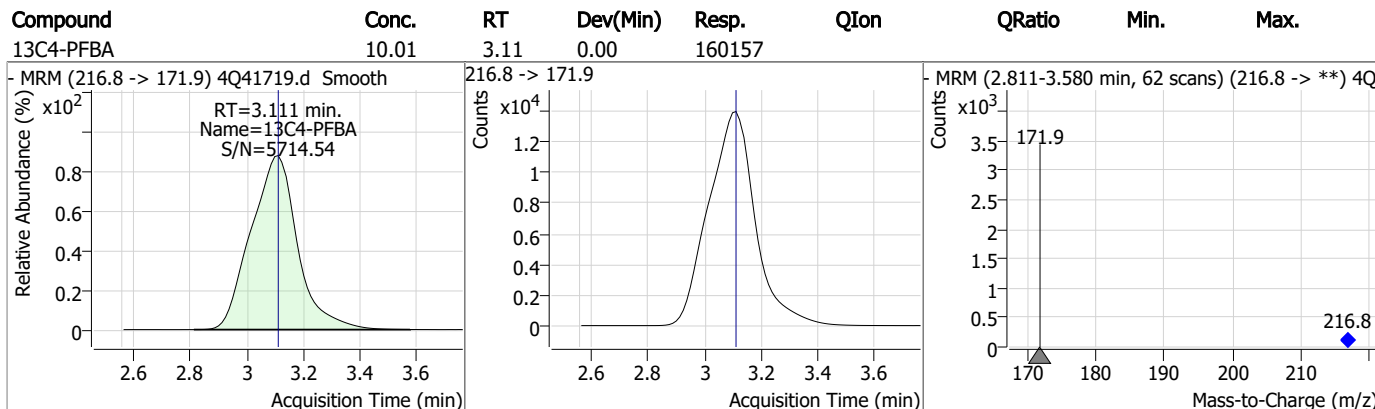
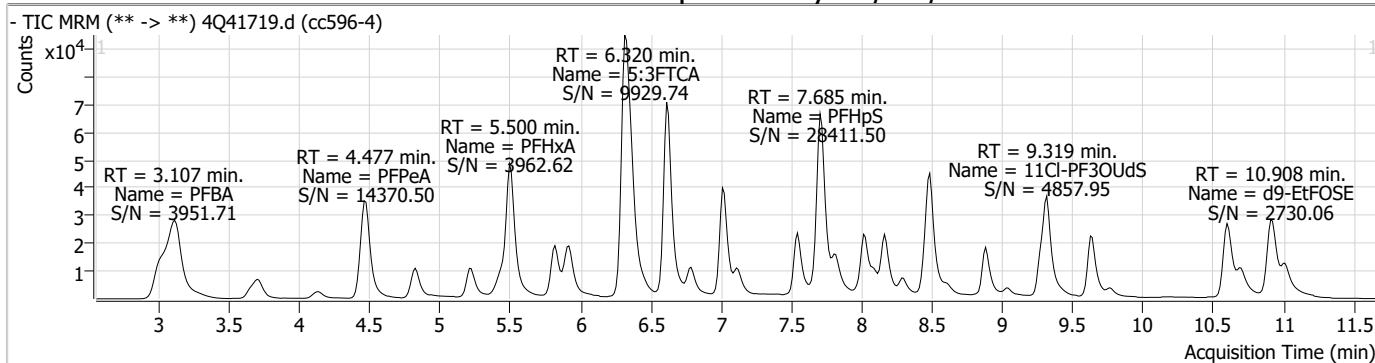
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.7.14

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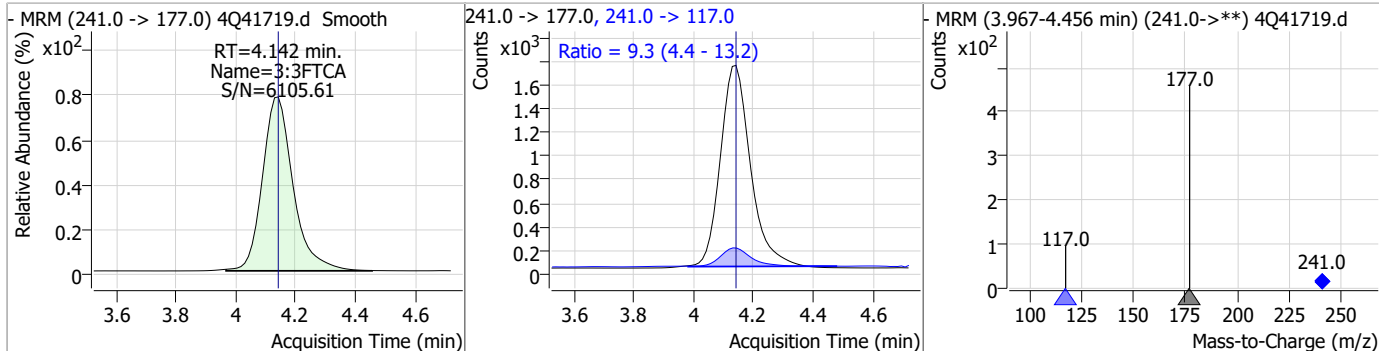
Perfluorinated Compounds by LC/MS/MS



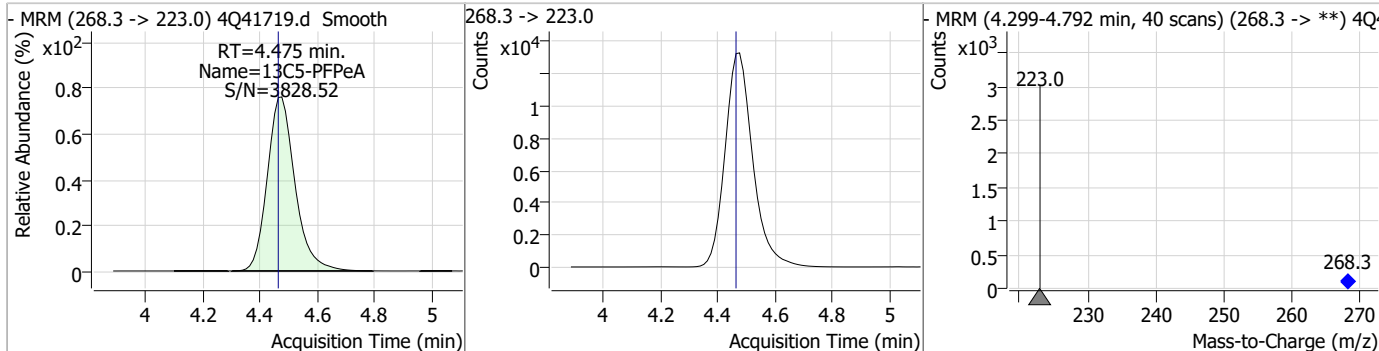
7.7.14
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Perfluorinated Compounds by LC/MS/MS

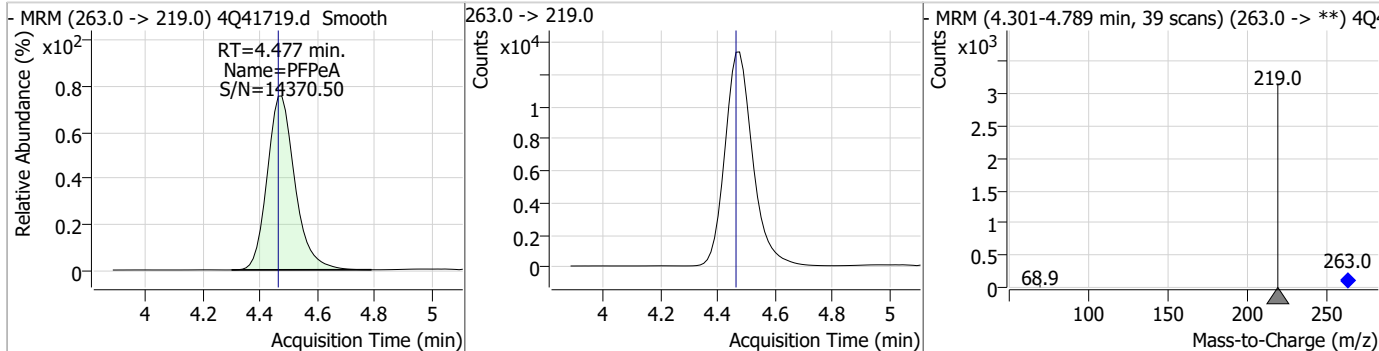
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
3:3FTCA	13.43	4.14	0.00	12372	241.0 -> 117.0	9.3	4.4	13.2



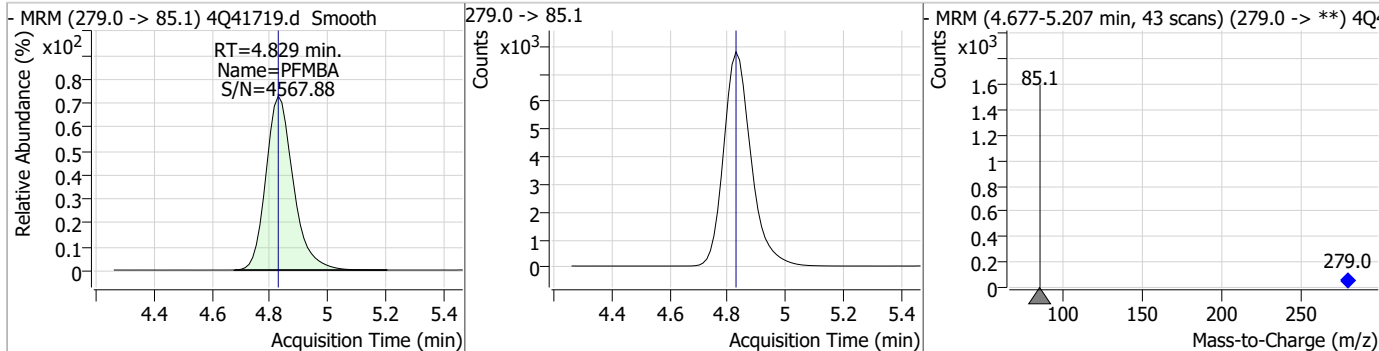
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C5-PFPeA	4.77	4.47	0.01	89033				



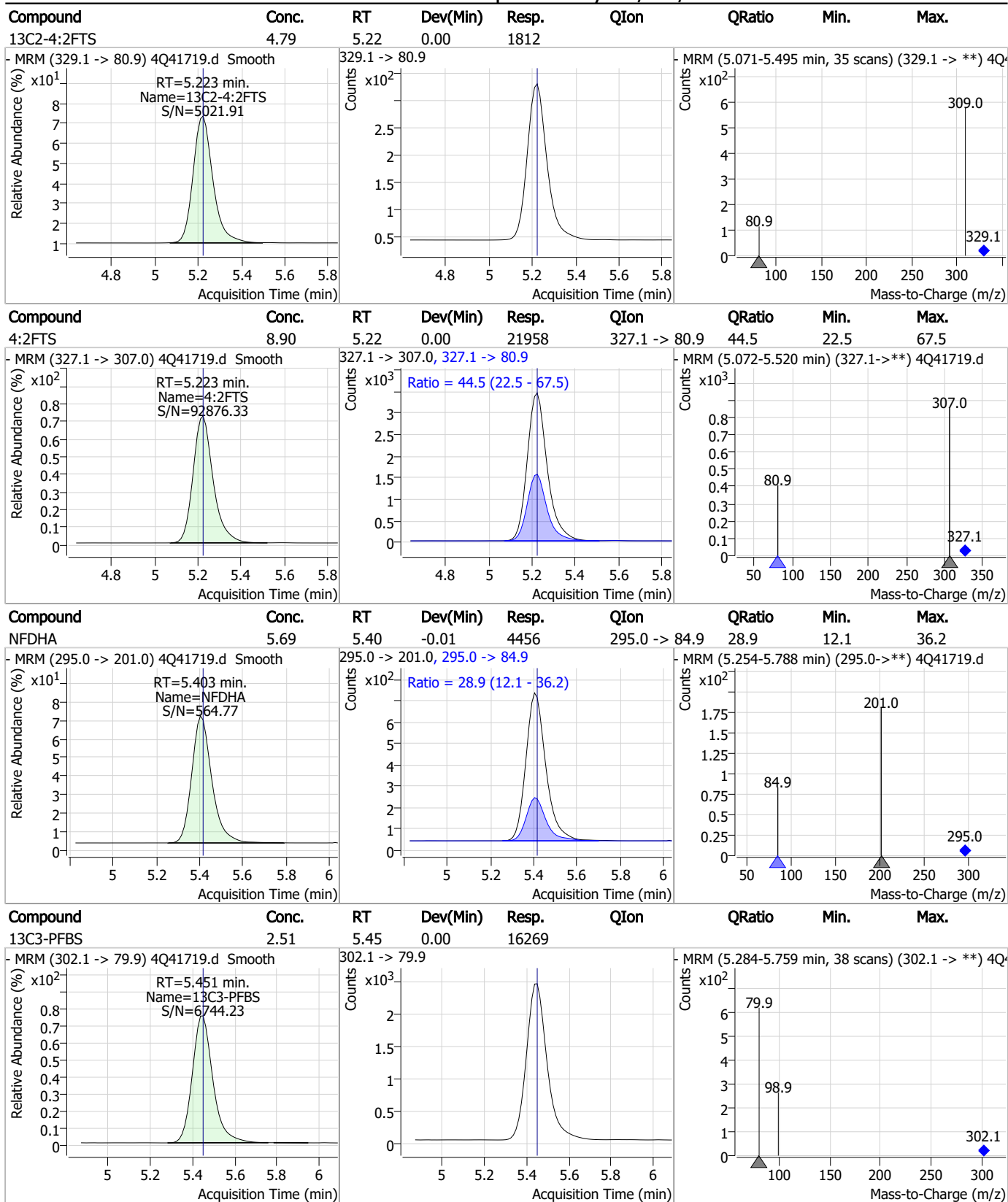
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	5.26	4.48	0.01	89775				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFMBA	5.33	4.83	0.00	50969				

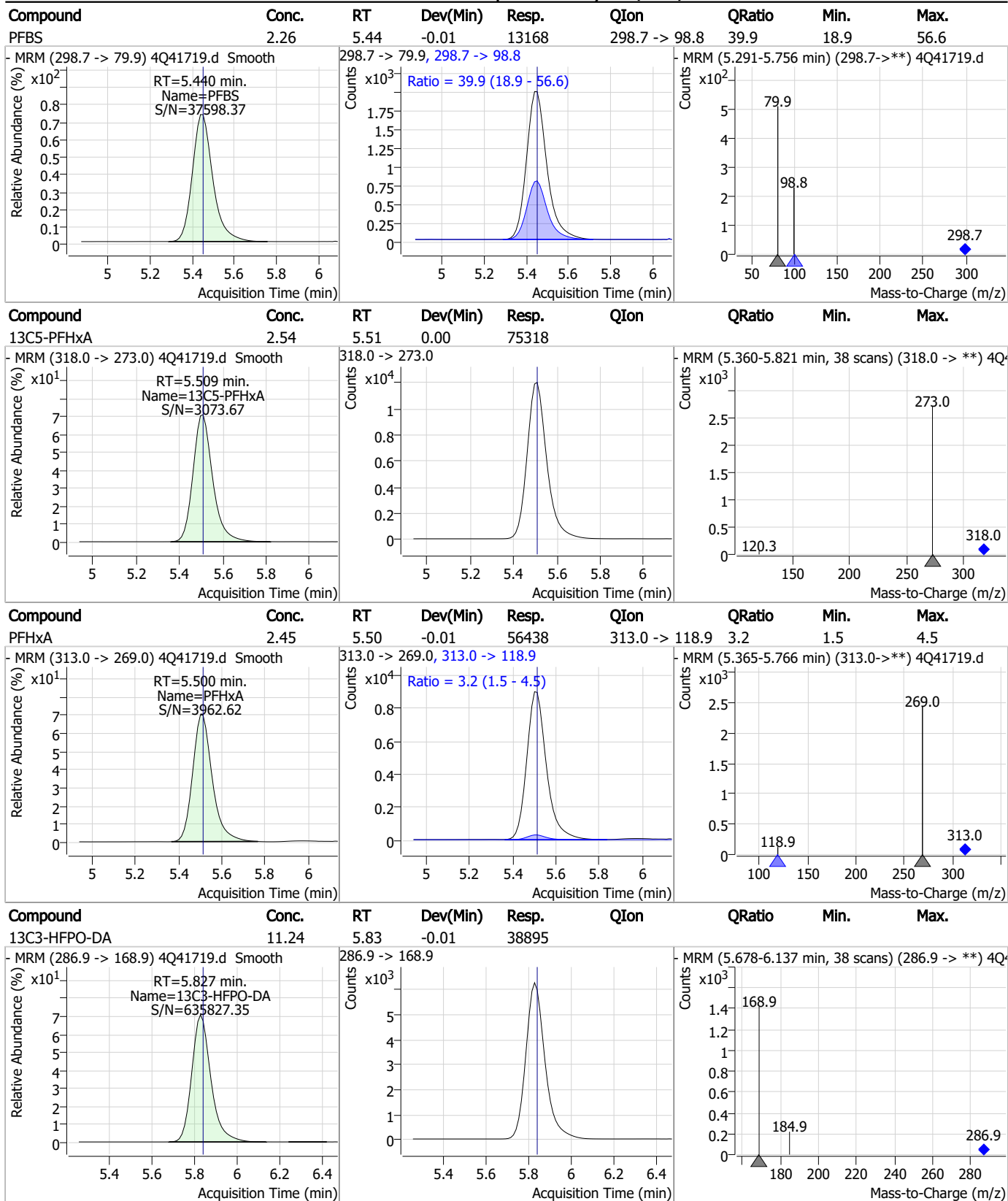


Perfluorinated Compounds by LC/MS/MS



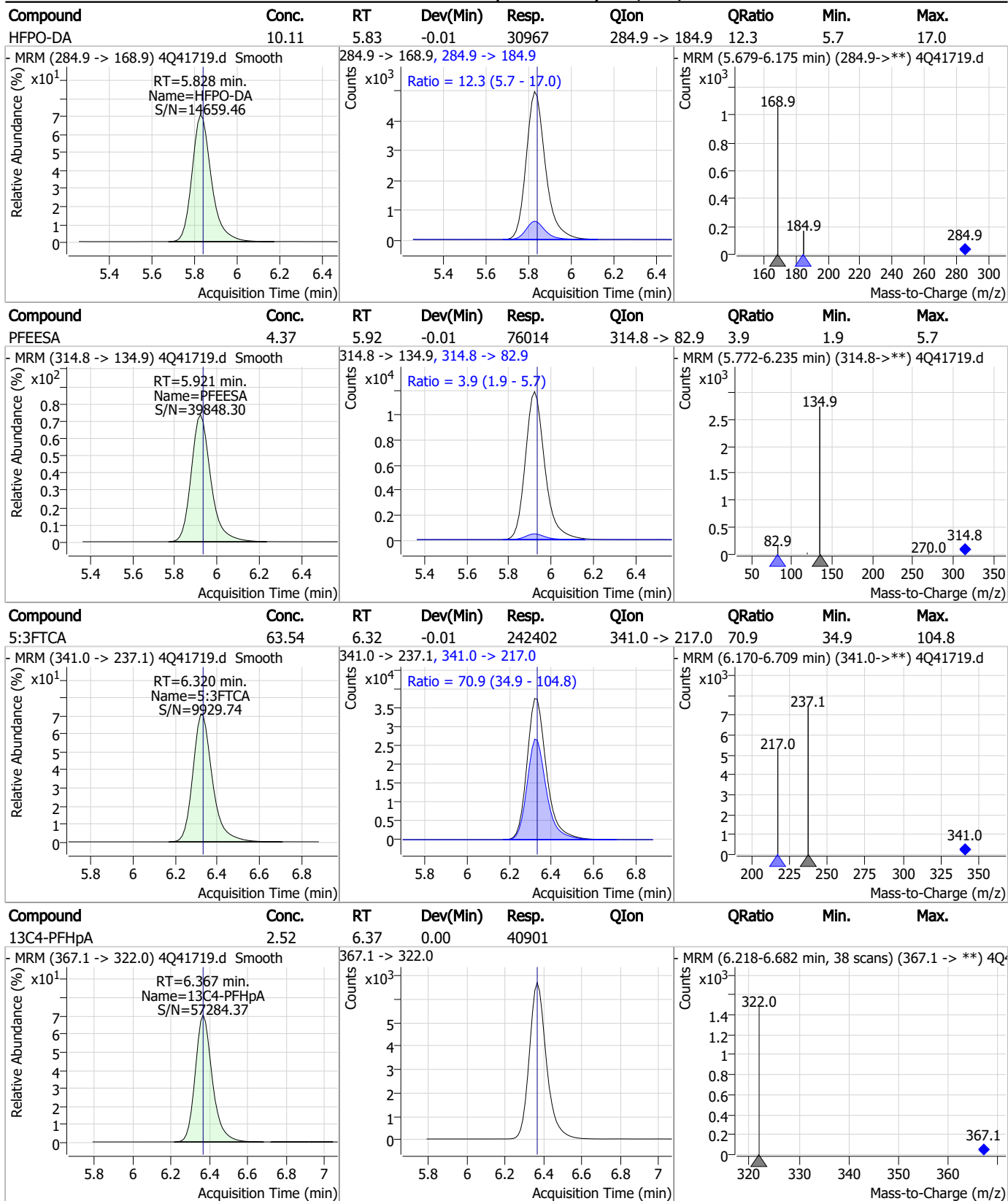
7.7.14

Perfluorinated Compounds by LC/MS/MS



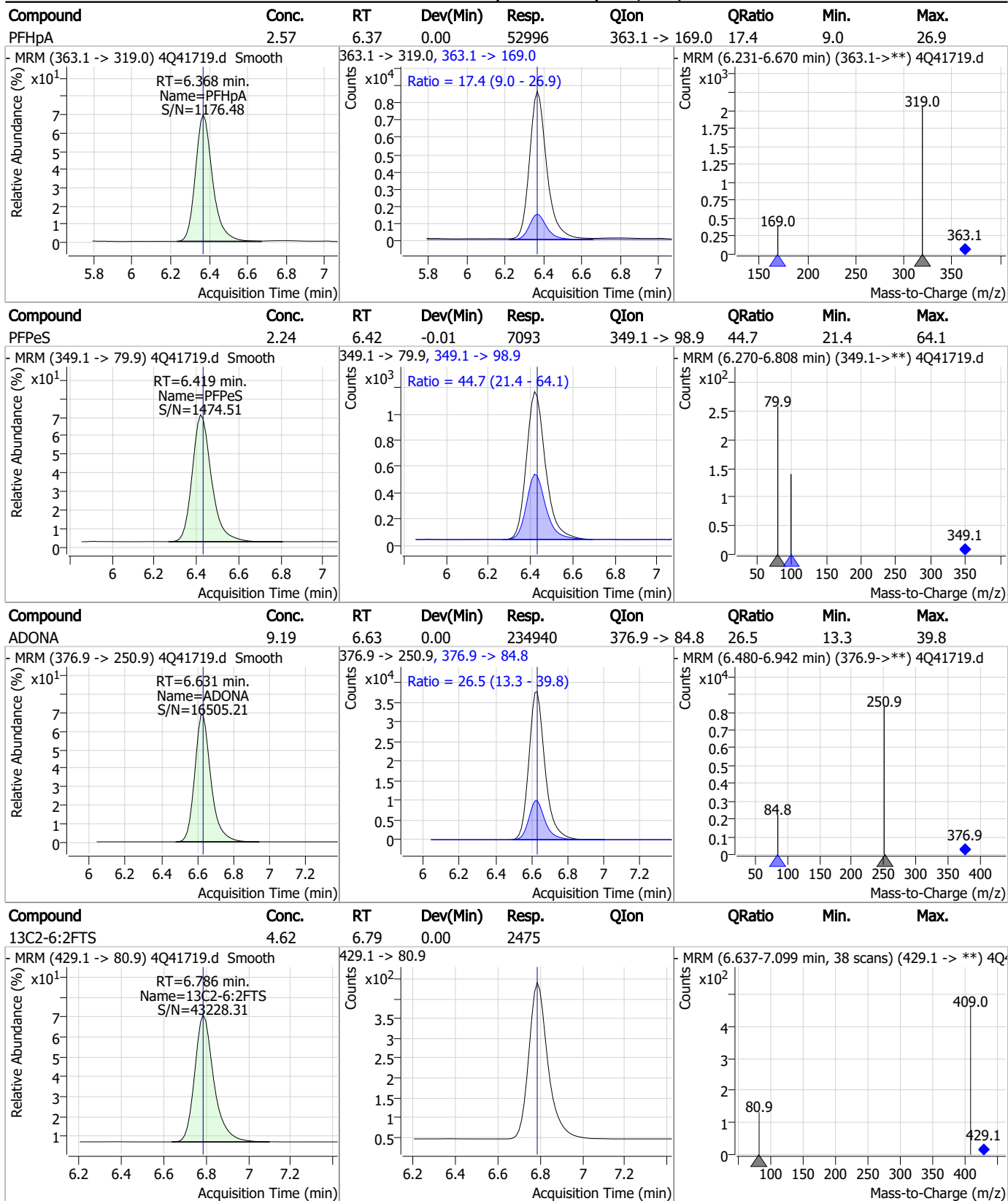
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Perfluorinated Compounds by LC/MS/MS



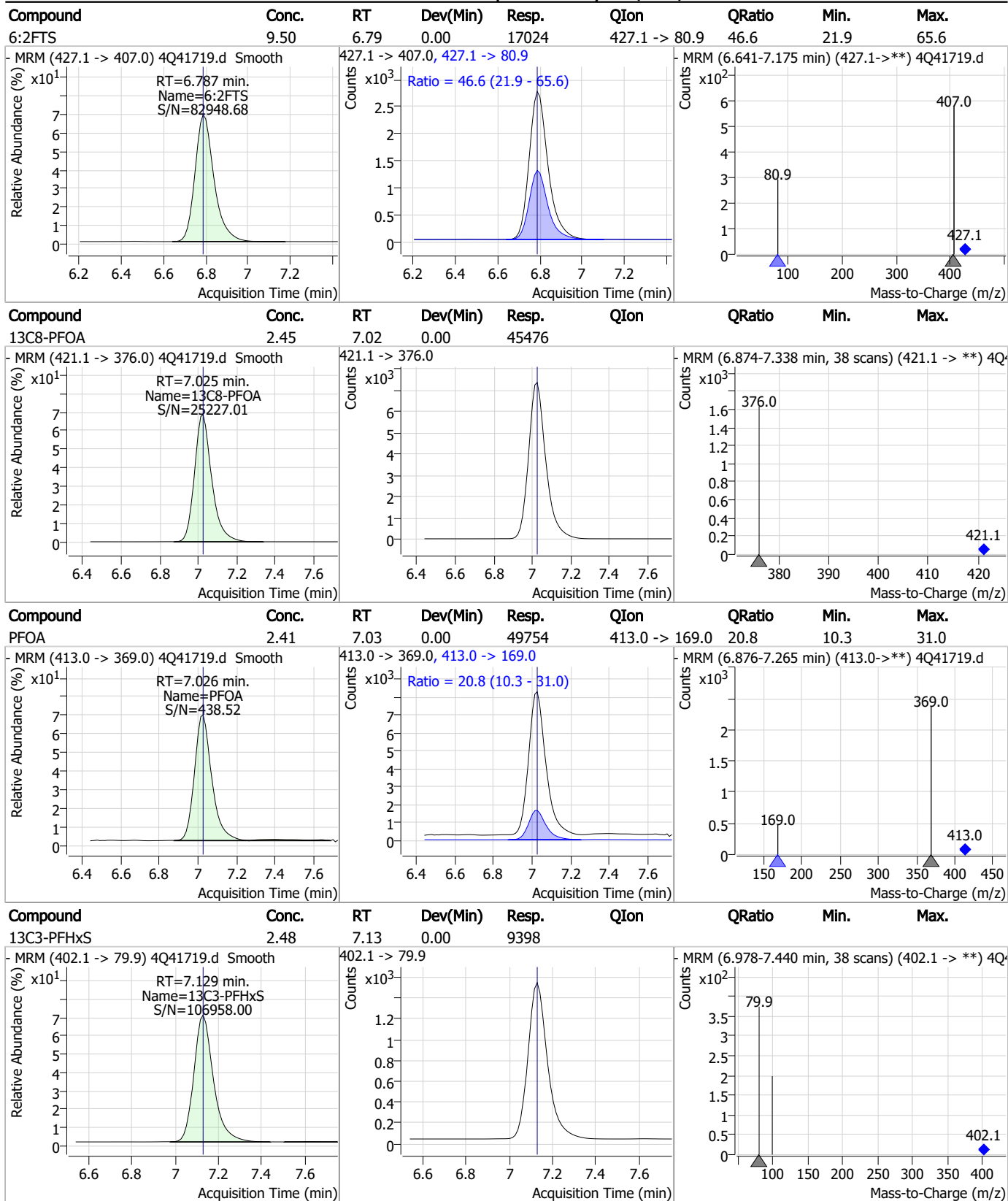
7.7.14
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Perfluorinated Compounds by LC/MS/MS



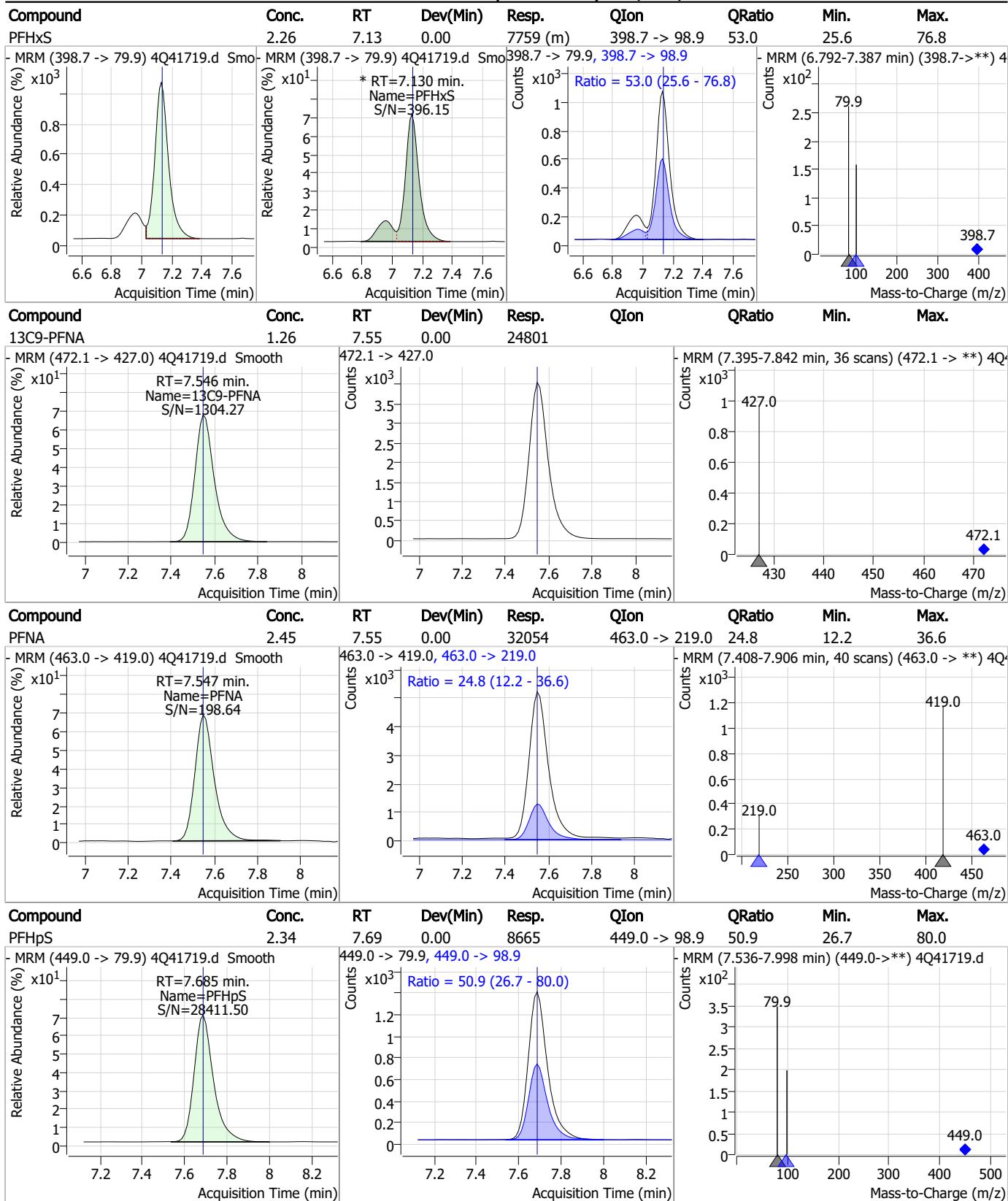
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Perfluorinated Compounds by LC/MS/MS



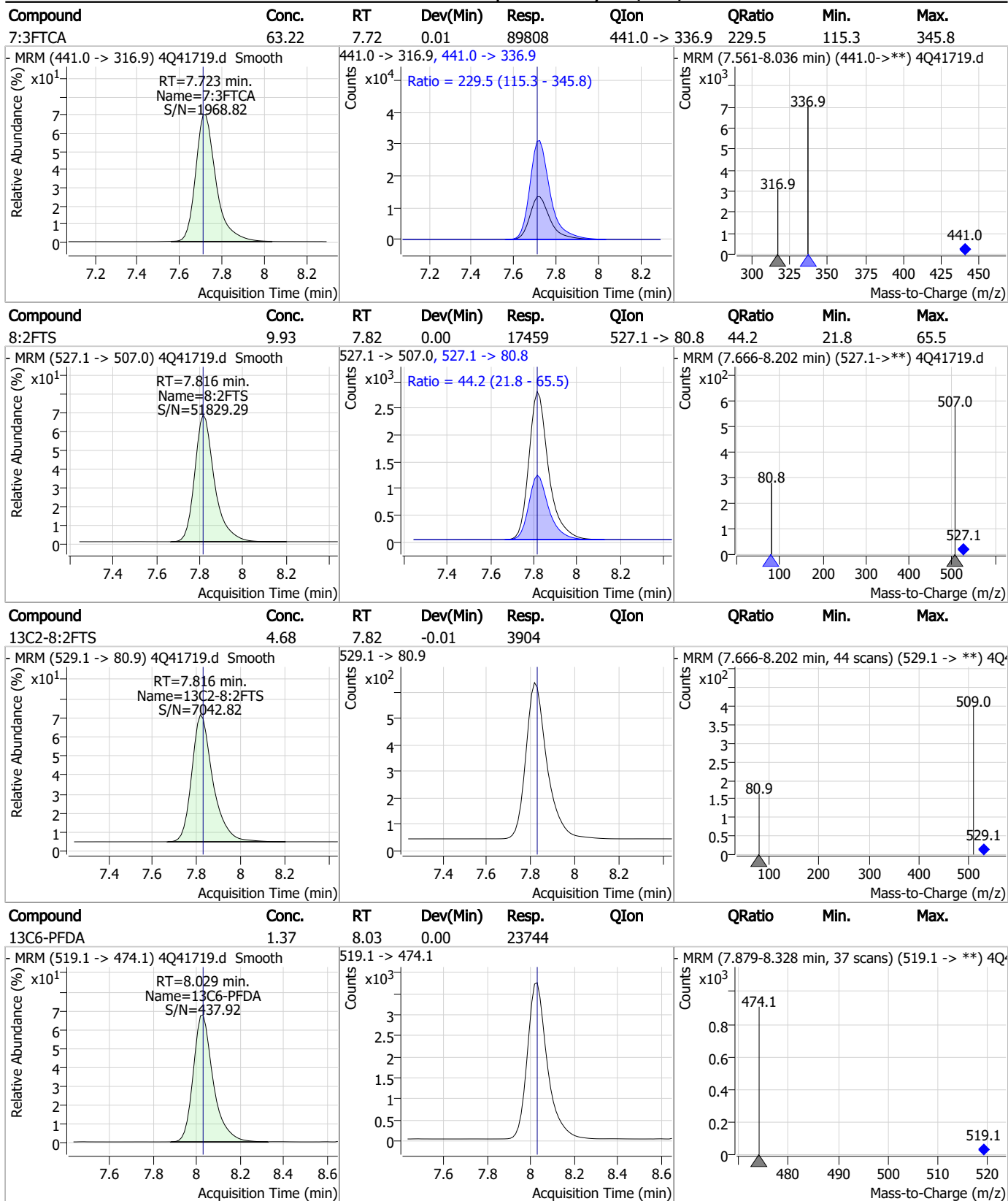
7.7.14
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Perfluorinated Compounds by LC/MS/MS



7.7.14
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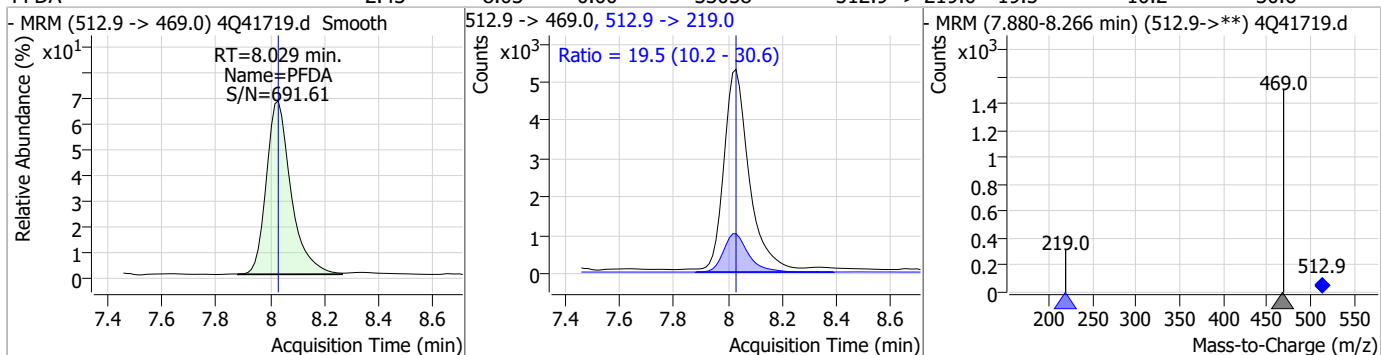
Perfluorinated Compounds by LC/MS/MS



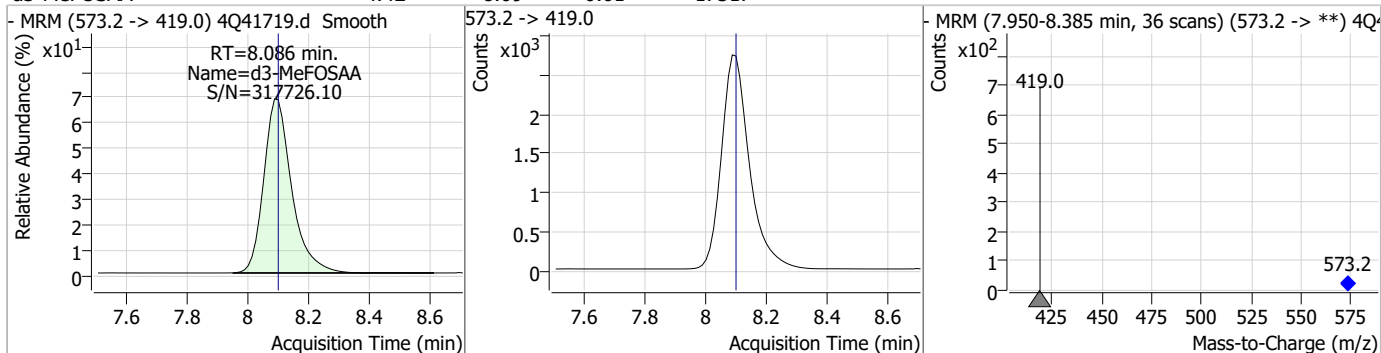
7.7.14
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Perfluorinated Compounds by LC/MS/MS

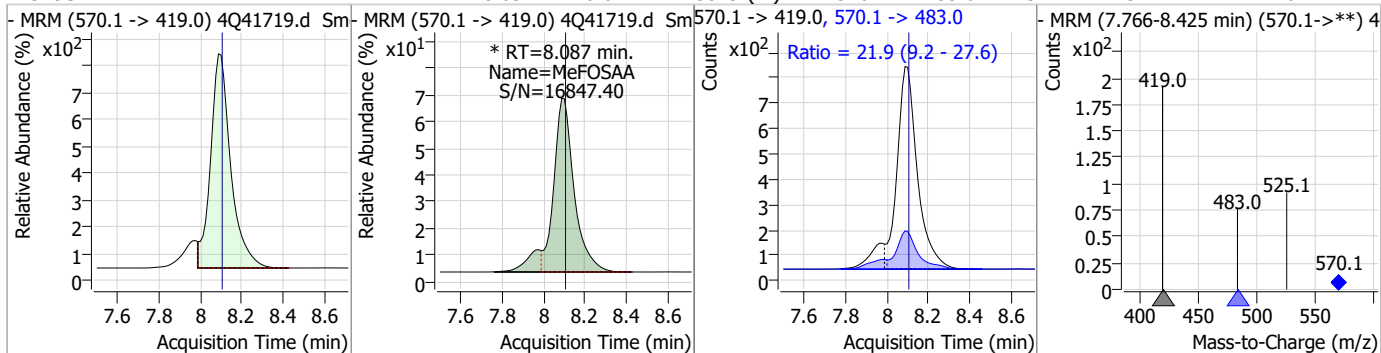
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	2.43	8.03	0.00	33058	512.9 -> 219.0	19.5	10.2	30.6



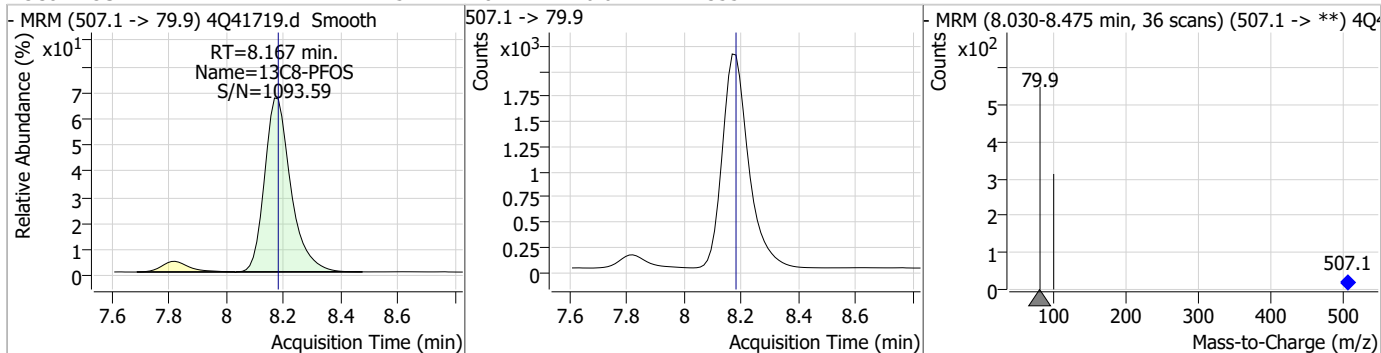
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSAA	4.42	8.09	-0.01	17317				



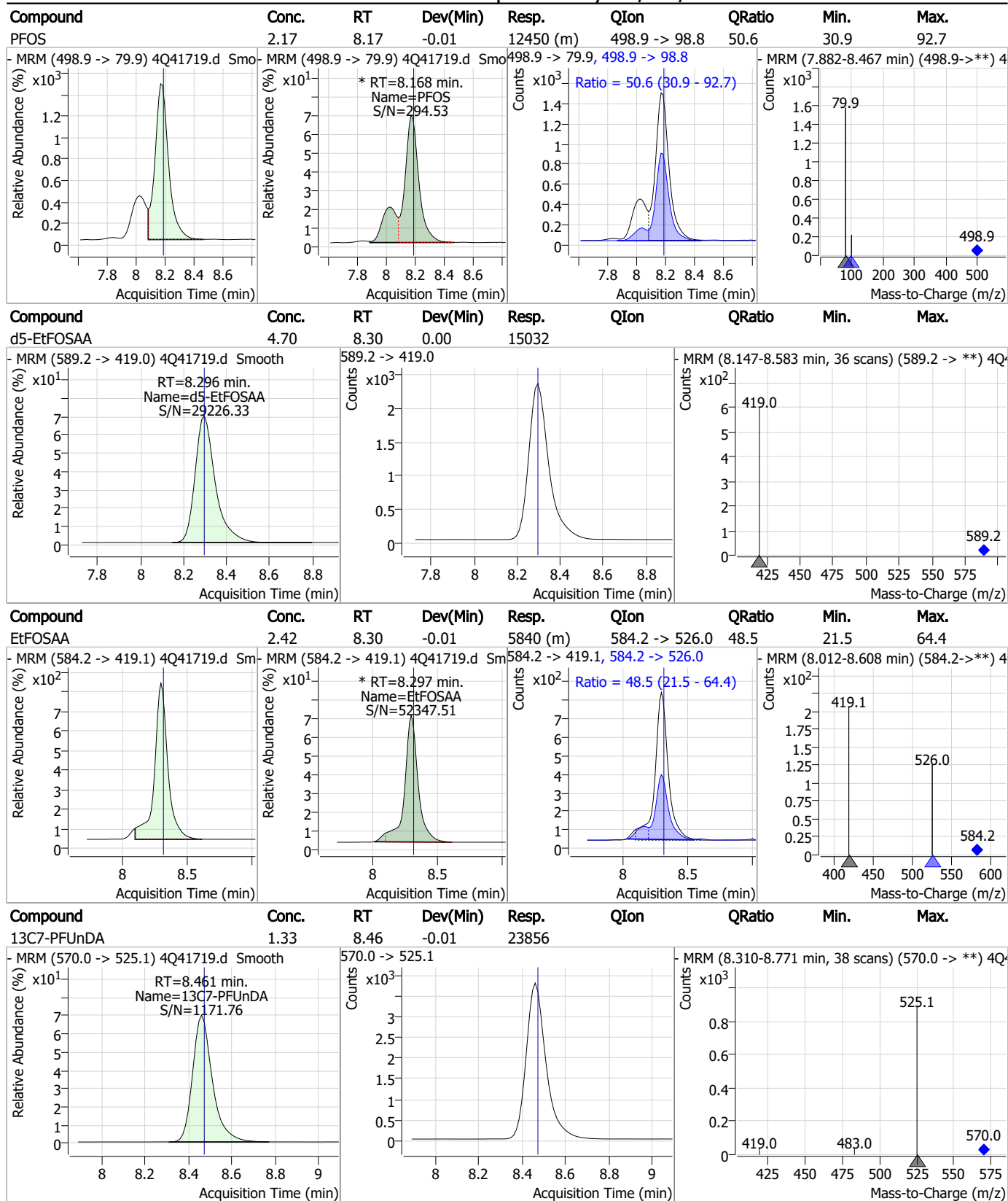
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	2.47	8.09	-0.01	5879 (m)	570.1 -> 483.0	21.9	9.2	27.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C8-PFOS	2.45	8.17	-0.01	13557				

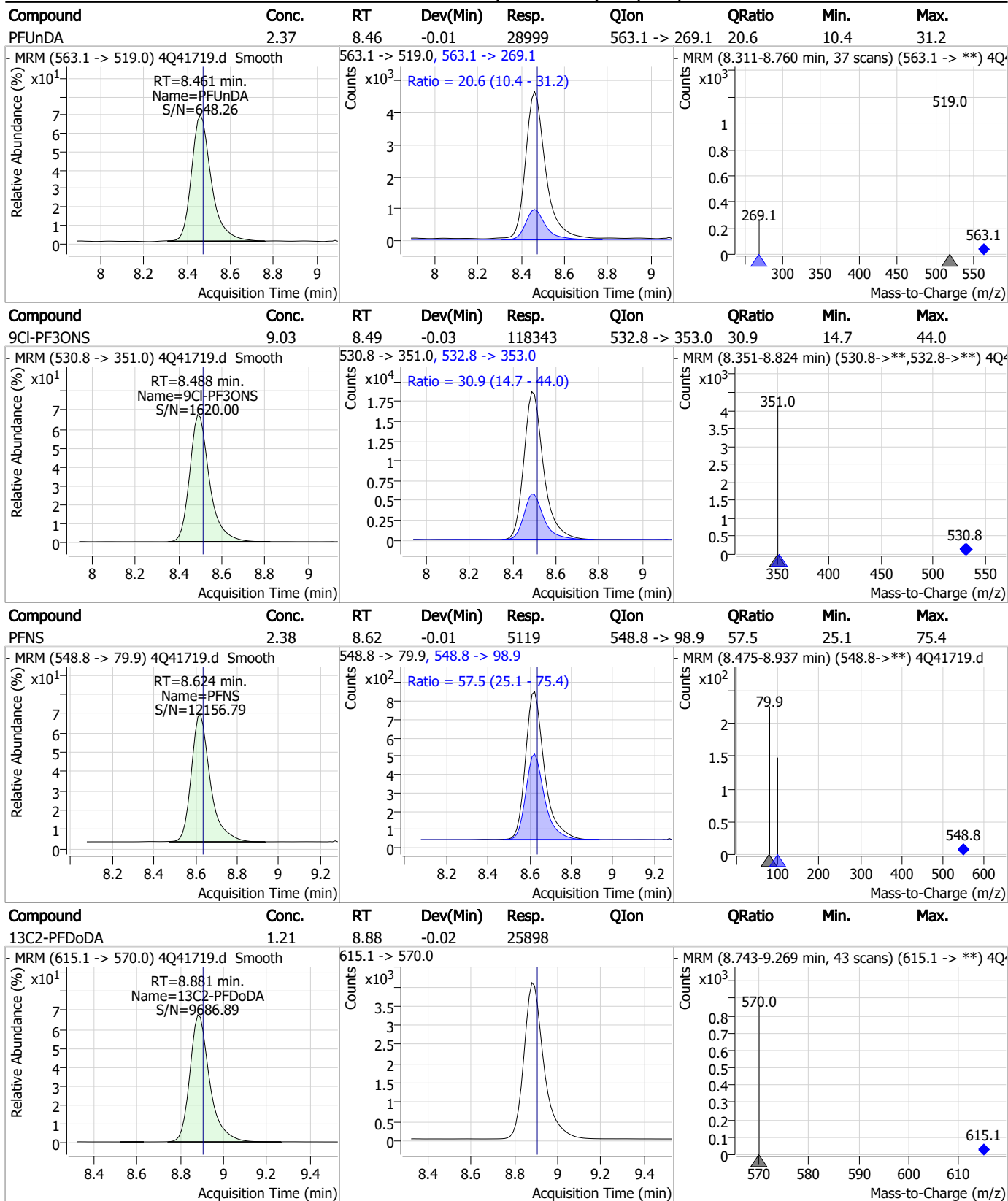


Perfluorinated Compounds by LC/MS/MS



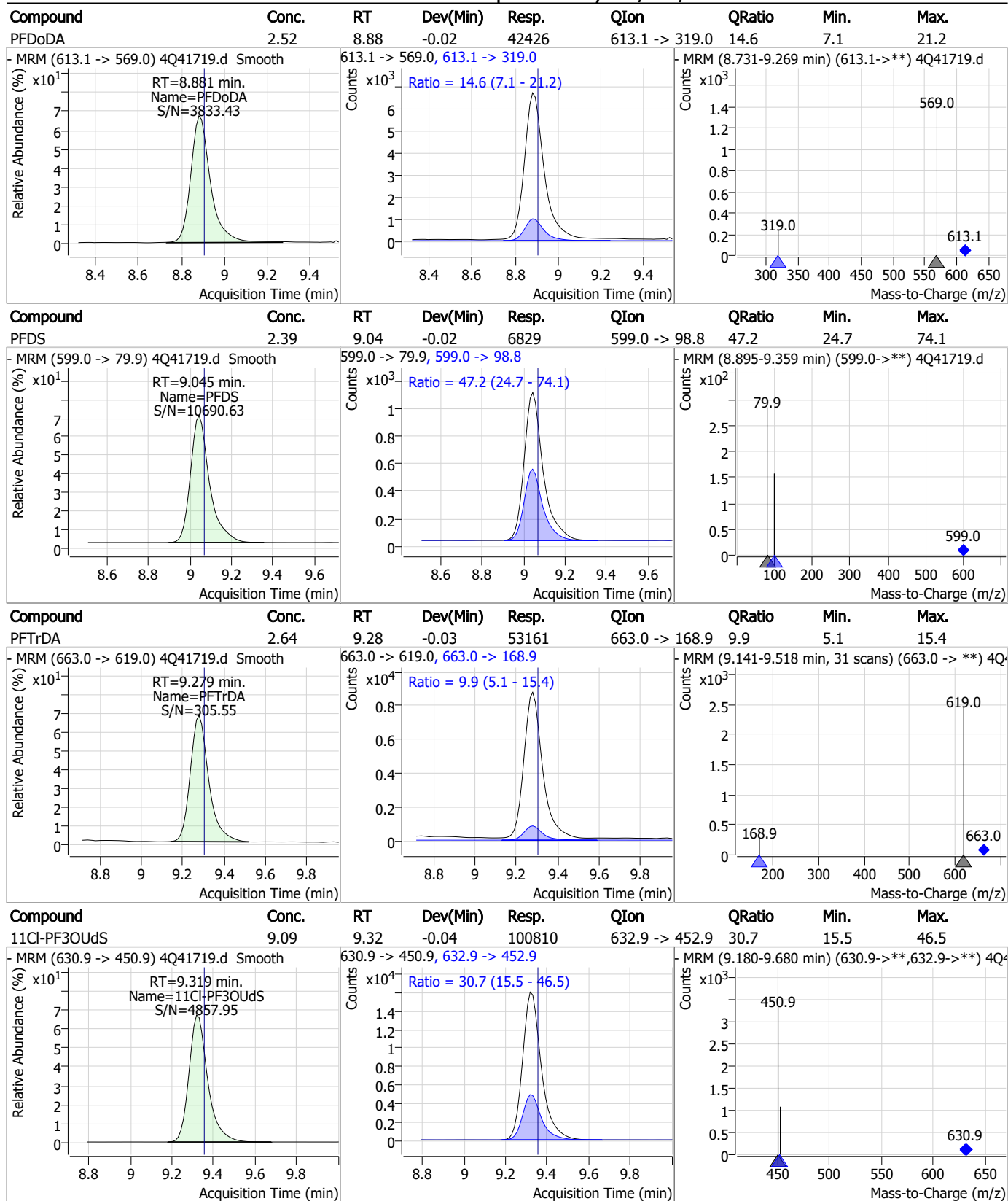
7.7.14

Perfluorinated Compounds by LC/MS/MS



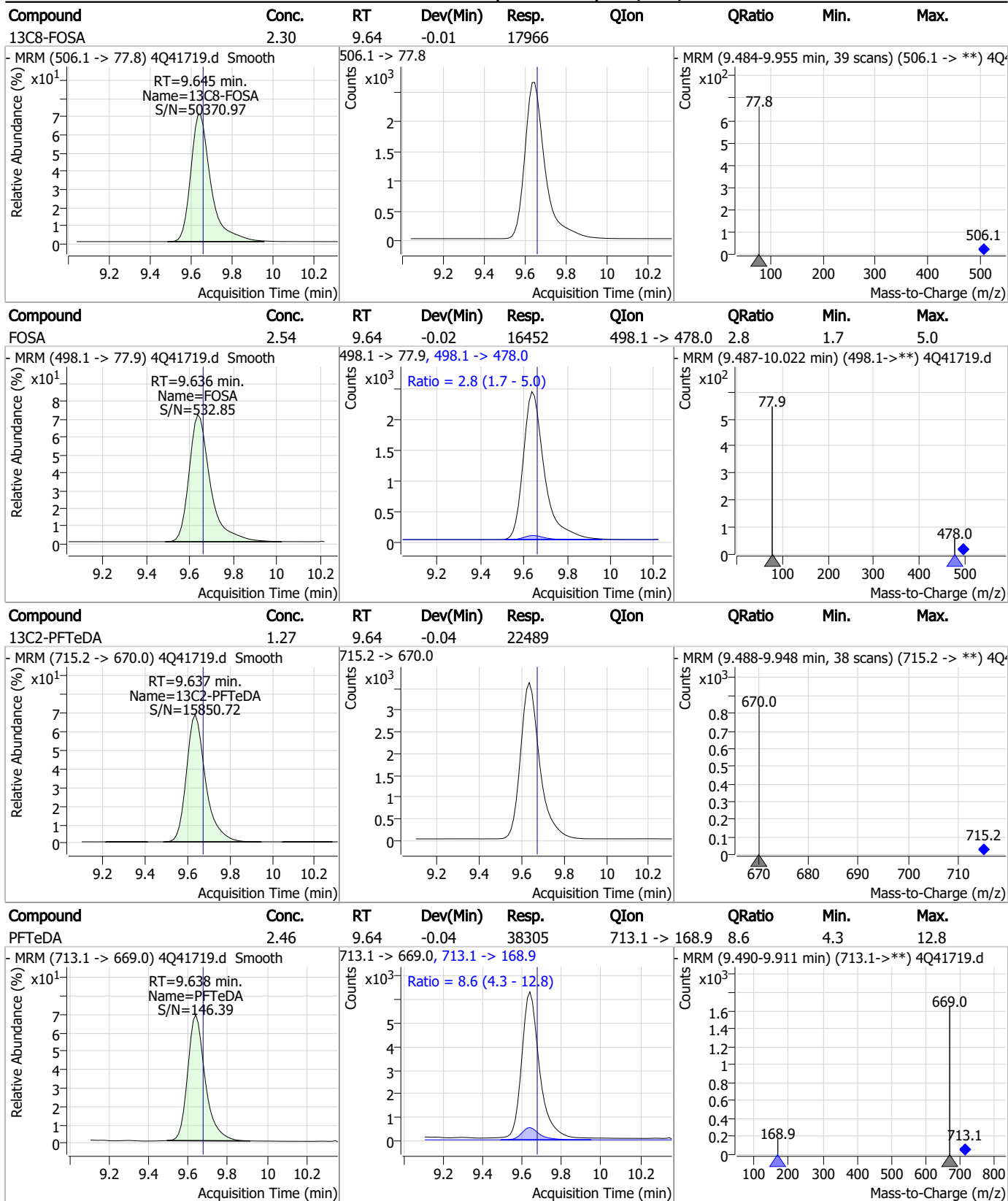
7.7.14
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Perfluorinated Compounds by LC/MS/MS



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Perfluorinated Compounds by LC/MS/MS

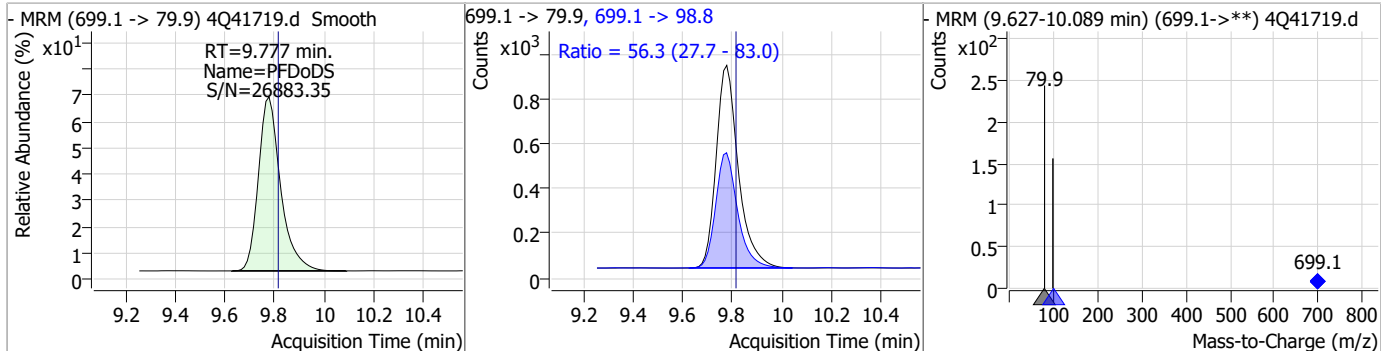


7.7.14
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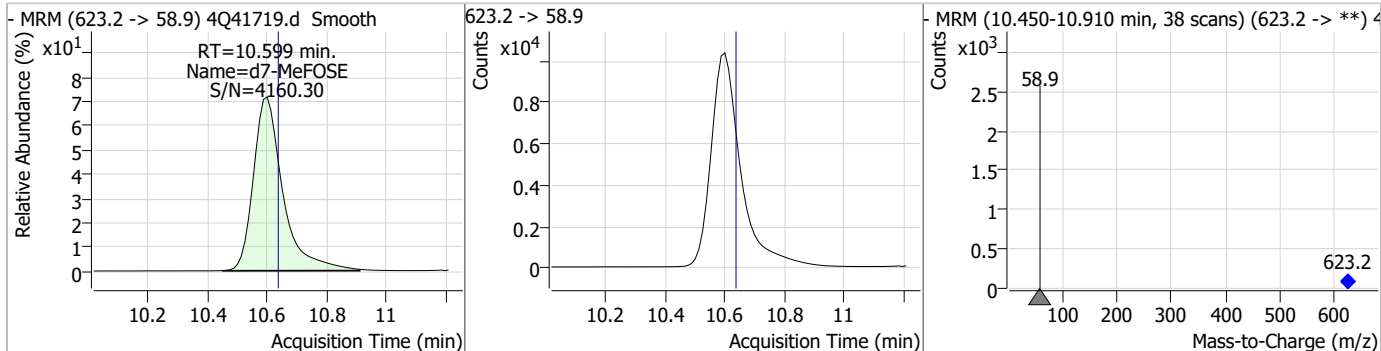


Perfluorinated Compounds by LC/MS/MS

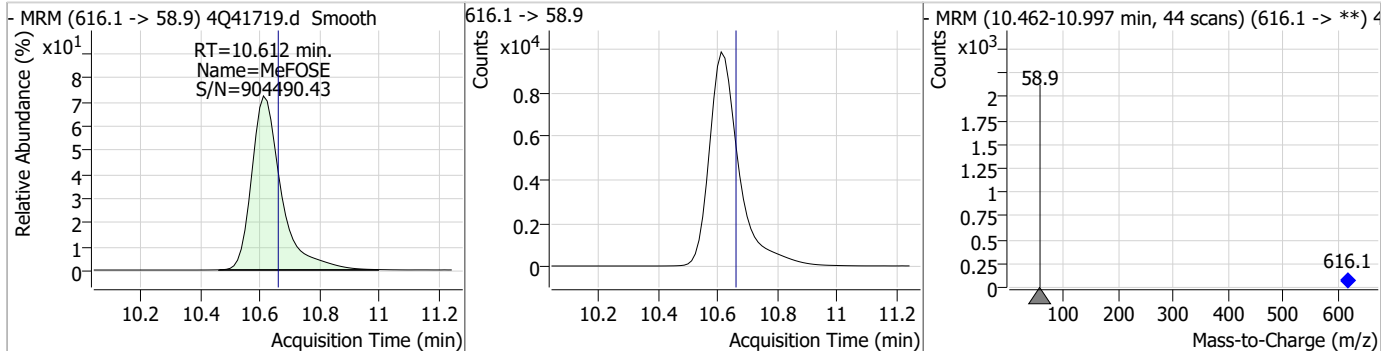
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFD _o DS	2.32	9.78	-0.04	5631	699.1 -> 98.8	56.3	27.7	83.0



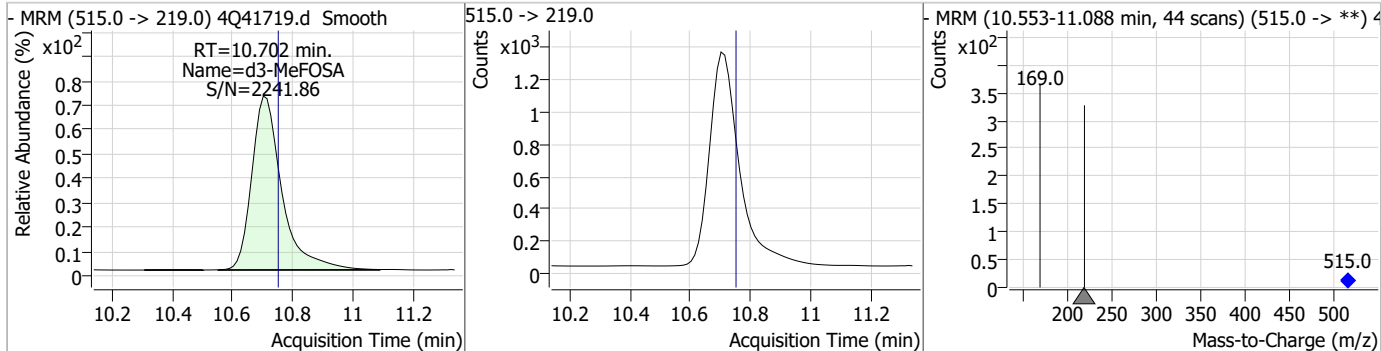
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	23.82	10.60	-0.04	71187				



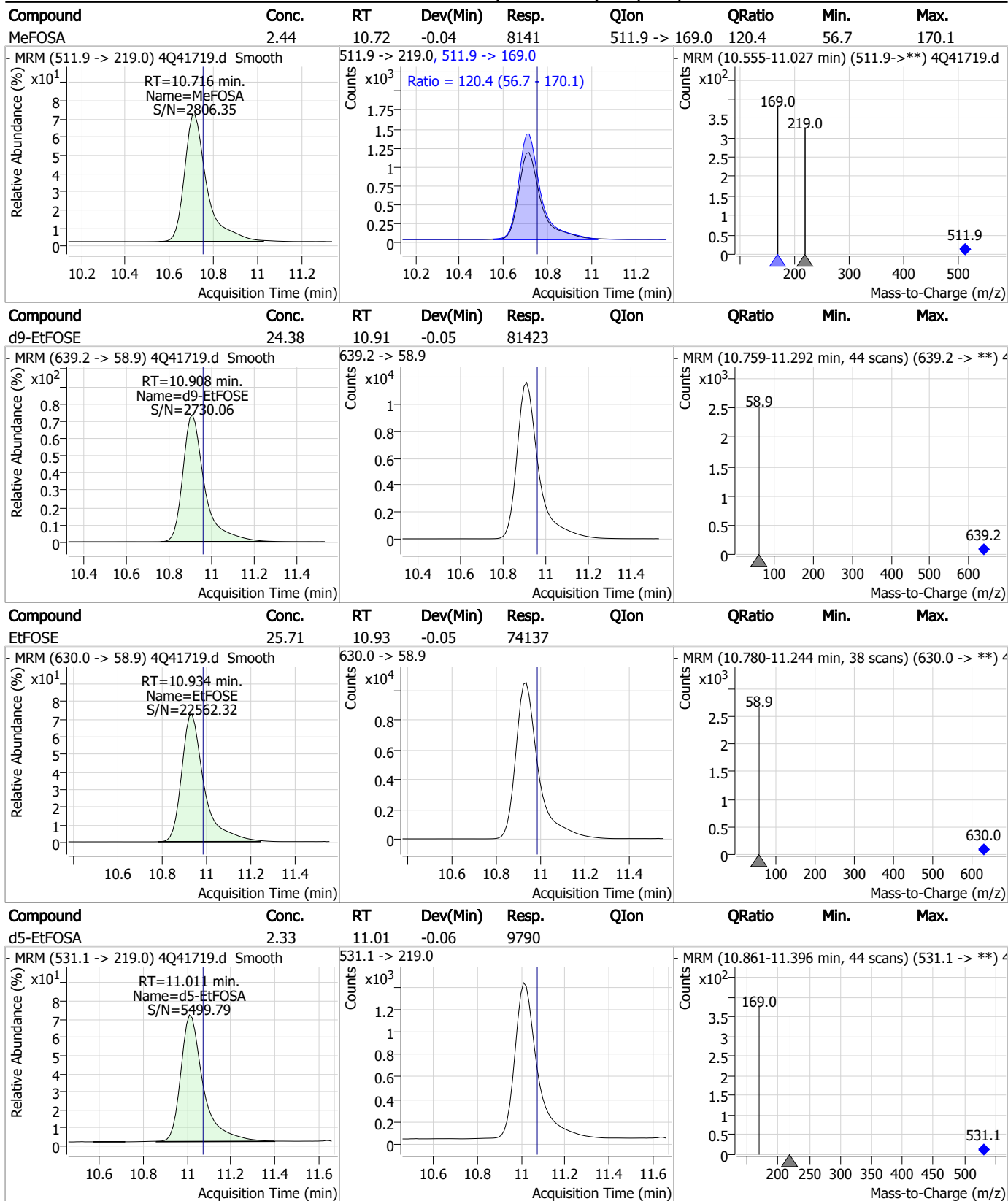
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	25.11	10.61	-0.05	68250				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.32	10.70	-0.05	9236				



Perfluorinated Compounds by LC/MS/MS

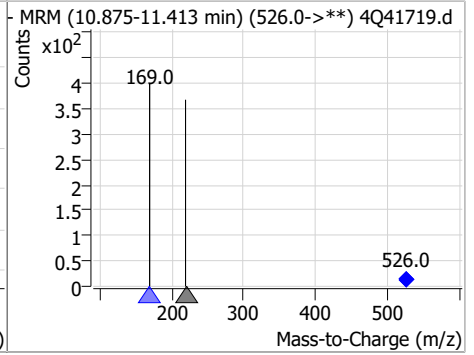
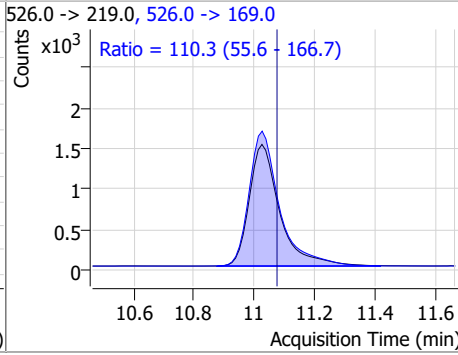
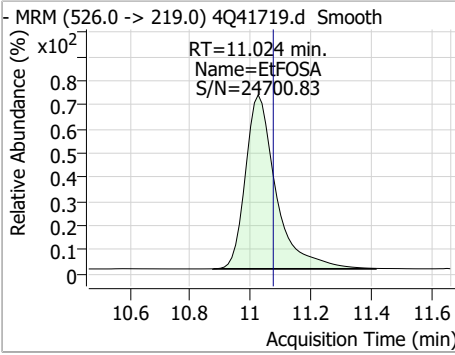


7.7.14



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	2.64	11.02	-0.05	10564	526.0 -> 169.0	110.3	55.6	166.7



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Manual Integration Approval Summary

Sample Number: S4Q597-CC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41719.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 20:33 Supervisor approved: 03/08/23 10:59 Natasha Guntie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.13	Split peak
MeFOSAA	2355-31-9		8.09	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.17	Split peak
EtFOSAA	2991-50-6		8.30	Split peak

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Perfluorinated Compounds by LC/MS/MS

Data File : 4Q41731.d
 Operator : marthav
 Acq. Method : 1633ful2l.m
 Acq. Date-Time : 3/6/2023 11:22:39 PM
 Sample Name : cc596-4
 Vial : P1-A5
 DA Method File : 1633_030323_S4Q596.quantmethod.xml
 Batch Name : s4q597.batch.bin
 Sample Information : op95719,S4Q597,500,,,5.0,1,water

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Internal Standards					
M4-PFBA	3.124	216.8 -> 171.9	165671	10.00 µg/L	0.013
M5-PFPeA	4.475	268.3 -> 223.0	89208	5.00 µg/L	0.012
M5-PFHxA	5.509	318.0 -> 273.0	76493	2.50 µg/L	0.000
M4-PFHpA	6.380	367.1 -> 322.0	41184	2.50 µg/L	0.012
M8-PFOA	7.025	421.1 -> 376.0	45741	2.50 µg/L	0.000
M9-PFNA	7.546	472.1 -> 427.0	24410	1.25 µg/L	0.000
M6-PFDA	8.029	519.1 -> 474.1	21765	1.25 µg/L	0.000
M7-PFUnDA	8.485	570.0 -> 525.1	24461	1.25 µg/L	0.012
M2-PFDoDA	8.906	615.1 -> 570.0	27791	1.25 µg/L	0.000
M2-PFTeDA	9.674	715.2 -> 670.0	22394	1.25 µg/L	0.000
M8-FOSA	9.670	506.1 -> 77.8	18133	2.50 µg/L	0.012
M3-PFBS	5.451	302.1 -> 79.9	15721	2.50 µg/L	0.000
M3-PFHxS	7.129	402.1 -> 79.9	9677	2.50 µg/L	0.000
M8-PFOS	8.180	507.1 -> 79.9	13717	2.50 µg/L	0.000
M2-4:2FTS	5.223	329.1 -> 80.9	1849	5.00 µg/L	0.000
M2-6:2FTS	6.798	429.1 -> 80.9	2386	5.00 µg/L	0.012
M2-8:2FTS	7.828	529.1 -> 80.9	4428	5.00 µg/L	0.000
M3-MeFOSAA	8.099	573.2 -> 419.0	18434	5.00 µg/L	0.000
M3-HFPO-DA	5.839	286.9 -> 168.9	39824	10.00 µg/L	0.000
M5-EtFOSAA	8.308	589.2 -> 419.0	14946	5.00 µg/L	0.012
M7-MeFOSE	10.636	623.2 -> 58.9	70083	25.00 µg/L	0.000
M9-EtFOSE	10.945	639.2 -> 58.9	79398	25.00 µg/L	-0.012
M5-EtFOSA	11.060	531.1 -> 219.0	10122	2.50 µg/L	-0.012
M3-MeFOSA	10.752	515.0 -> 219.0	9013	2.50 µg/L	0.000
13C4-PFOS	8.181	502.8 -> 79.9	14315	2.50 µg/L	0.000
13C3-PFBA	3.128	216.0 -> 172.0	96186	5.00 µg/L	0.012
18O2-PFHxS	7.128	403.0 -> 83.9	7303	2.50 µg/L	0.000
13C4-PFOA	7.025	417.1 -> 372.0	54437	2.50 µg/L	0.000
13C2-PFDA	8.029	515.1 -> 470.1	21345	1.25 µg/L	0.000
13C5-PFNA	7.547	468.0 -> 423.0	28054	1.25 µg/L	0.000
13C2-PFHxA	5.510	315.1 -> 270.0	70555	2.50 µg/L	0.000
System Monitoring Compounds					
13C2-4:2FTS	5.223	329.1 -> 80.9	1849	4.67 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 93.3%		
13C2-6:2FTS	6.798	429.1 -> 80.9	2386	4.25 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 85.0%		
13C2-8:2FTS	7.828	529.1 -> 80.9	4428	5.07 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%		Recovery = 101.4%		
13C2-PFDoDA	8.906	615.1 -> 570.0	27791	1.23 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 98.5%		
13C2-PFTeDA	9.674	715.2 -> 670.0	22394	1.20 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%		Recovery = 96.2%		
13C3-PFBS	5.451	302.1 -> 79.9	15721	2.31 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%		Recovery = 92.5%		
13C3-PFHxS	7.129	402.1 -> 79.9	9677	2.44 µg/L	0.000

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.4%	
13C4-PFBA	3.124	216.8 -> 171.9	165671	10.02 µg/L	0.013
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 100.2%	
13C4-PFHpA	6.380	367.1 -> 322.0	41184	2.46 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 98.4%	
13C5-PFHxA	5.509	318.0 -> 273.0	76493	2.50 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 99.9%	
13C5-PFPeA	4.475	268.3 -> 223.0	89208	4.63 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 92.6%	
13C6-PFDA	8.029	519.1 -> 474.1	21765	1.19 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 95.2%	
13C7-PFUnDA	8.485	570.0 -> 525.1	24461	1.29 µg/L	0.012
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 103.3%	
13C8-FOSA	9.670	506.1 -> 77.8	18133	2.28 µg/L	0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 91.1%	
13C8-PFOA	7.025	421.1 -> 376.0	45741	2.54 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 101.6%	
13C8-PFOS	8.180	507.1 -> 79.9	13717	2.43 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 97.3%	
13C9-PFNA	7.546	472.1 -> 427.0	24410	1.24 µg/L	0.000
Spiked Amount: 1.25	Range: 50.0 - 150.0%			Recovery = 99.5%	
d3-MeFOSAA	8.099	573.2 -> 419.0	18434	4.61 µg/L	0.000
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 92.2%	
13C3-HFPO-DA	5.839	286.9 -> 168.9	39824	11.15 µg/L	0.000
Spiked Amount: 10.00	Range: 50.0 - 150.0%			Recovery = 111.5%	
d3-MeFOSA	10.752	515.0 -> 219.0	9013	2.22 µg/L	0.000
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 88.9%	
d5-EtFOSAA	8.308	589.2 -> 419.0	14946	4.58 µg/L	0.012
Spiked Amount: 5.00	Range: 50.0 - 150.0%			Recovery = 91.6%	
d7-MeFOSE	10.636	623.2 -> 58.9	70083	22.99 µg/L	0.000
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 92.0%	
d9-EtFOSE	10.945	639.2 -> 58.9	79398	23.31 µg/L	-0.012
Spiked Amount: 25.00	Range: 50.0 - 150.0%			Recovery = 93.2%	
d5-EtFOSA	11.060	531.1 -> 219.0	10122	2.37 µg/L	-0.012
Spiked Amount: 2.50	Range: 50.0 - 150.0%			Recovery = 94.6%	
Target Compounds					QValue
4:2FTS	5.223	327.1 -> 307.0	23682	9.41 µg/L	98
		327.1 -> 80.9	10344		
6:2FTS	6.799	427.1 -> 407.0	18064	10.46 µg/L	98
		427.1 -> 80.9	7678		
8:2FTS	7.816	527.1 -> 507.0	18379	9.22 µg/L	99
		527.1 -> 80.8	7942		
EtFOSAA	8.309	584.2 -> 419.1	5902	2.46 µg/L	m 89
		584.2 -> 526.0	2931		
FOSA	9.661	498.1 -> 77.9	16405	2.51 µg/L	98
		498.1 -> 478.0	410		
MeFOSAA	8.099	570.1 -> 419.0	6374	2.52 µg/L	m 99
		570.1 -> 483.0	1197		
PFBA	3.132	212.8 -> 168.9	35310	9.90 µg/L	100
PFBS	5.452	298.7 -> 79.9	13218	2.35 µg/L	96
		298.7 -> 98.8	5285		
PFDA	8.029	512.9 -> 469.0	33499	2.69 µg/L	98
		512.9 -> 219.0	7075		
PFDODA	8.906	613.1 -> 569.0	43821	2.43 µg/L	100
		613.1 -> 319.0	6285		
PFDS	9.069	599.0 -> 79.9	6630	2.29 µg/L	98

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Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc.	Units	Dev(Min)
PFHpA	6.380	599.0 -> 98.8	3166	2.52	µg/L	98
		363.1 -> 319.0	52255			
PFHpS	7.686	363.1 -> 169.0	8827	2.23	µg/L	99
		449.0 -> 79.9	8350			
PFHxA	5.512	449.0 -> 98.9	4525	2.36	µg/L	100
		313.0 -> 269.0	55264			
PFHxS	7.130	313.0 -> 118.9	1691	2.31	µg/L	98
		398.7 -> 79.9	8164			
PFNA	7.547	398.7 -> 98.9	4075	2.47	µg/L	99
		463.0 -> 419.0	31843			
PFNS	8.649	463.0 -> 219.0	7863	2.52	µg/L	98
		548.8 -> 79.9	5489			
PFOA	7.026	548.8 -> 98.9	2828	2.35	µg/L	99
		413.0 -> 369.0	48780			
PFOS	8.182	413.0 -> 169.0	10293	2.10	µg/L	83
		498.9 -> 79.9	12209			
PFPeA	4.477	498.9 -> 98.8	5957	5.32	µg/L	100
		263.0 -> 219.0	90923			
PFPeS	6.432	349.1 -> 79.9	7423	2.28	µg/L	98
		349.1 -> 98.9	3098			
PFTeDA	9.675	713.1 -> 669.0	38017	2.45	µg/L	99
		713.1 -> 168.9	3345			
PFTrDA	9.304	663.0 -> 619.0	54097	2.50	µg/L	99
		663.0 -> 168.9	5348			
PFUnDA	8.486	563.1 -> 519.0	29503	2.35	µg/L	100
		563.1 -> 269.1	6160			
11CI-PF3OUdS	9.356	630.9 -> 450.9	101800	8.97	µg/L	98
		632.9 -> 452.9	30427			
9CI-PF3ONS	8.513	530.8 -> 351.0	120207	8.95	µg/L	97
		532.8 -> 353.0	37340			
ADONA	6.631	376.9 -> 250.9	239585	9.16	µg/L	99
		376.9 -> 84.8	62873			
HFPO-DA	5.840	284.9 -> 168.9	32742	10.45	µg/L	98
		284.9 -> 184.9	3896			
3:3FTCA	4.154	241.0 -> 177.0	12478	13.52	µg/L	99
		241.0 -> 117.0	1129			
5:3FTCA	6.333	341.0 -> 237.1	243953	62.97	µg/L	99
		341.0 -> 217.0	172188			
7:3FTCA	7.723	441.0 -> 316.9	92397	64.05	µg/L	98
		441.0 -> 336.9	209352			
EtFOSA	11.062	526.0 -> 219.0	10458	2.53	µg/L	98
		526.0 -> 169.0	11425			
EtFOSE	10.971	630.0 -> 58.9	73747	26.22	µg/L	100
		511.9 -> 219.0	8420			
MeFOSA	10.754	511.9 -> 169.0	9764	2.59	µg/L	98
		616.1 -> 58.9	67551			
MeFOSE	10.649	699.1 -> 79.9	5996	25.24	µg/L	100
		699.1 -> 98.8	3334			
PFDoDS	9.814	295.0 -> 201.0	4856	2.45	µg/L	100
		295.0 -> 84.9	1242			
NFDHA	5.415	279.0 -> 85.1	51596	6.11	µg/L	97
		229.0 -> 84.9	45764			
PFMBA	4.842	314.8 -> 134.9	78632	5.55	µg/L	100
		314.8 -> 82.9	2788			
PFMPA	3.702			4.45	µg/L	99
PFEESA	5.934					

= Qualifier out of range, m = manually integrated, + = Area summed

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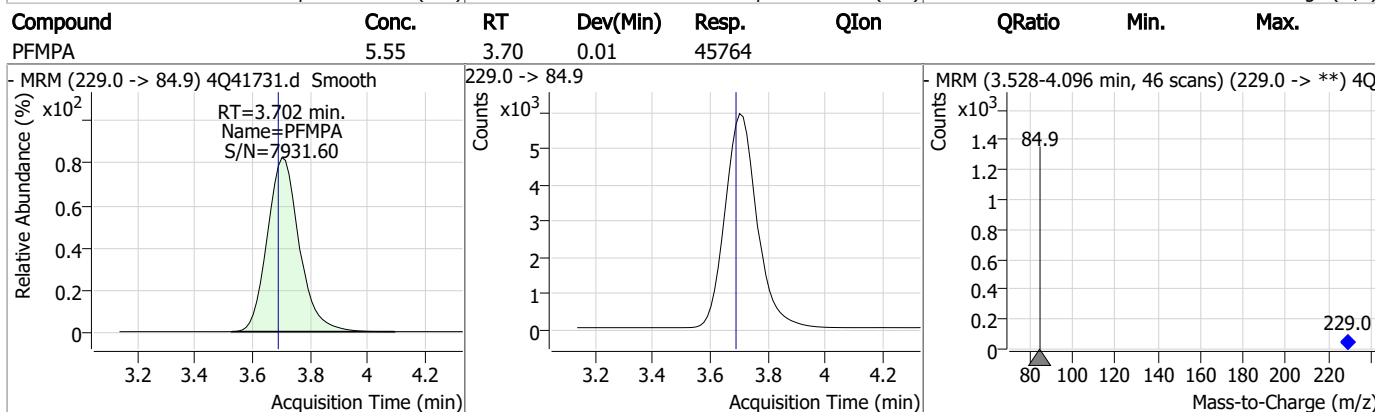
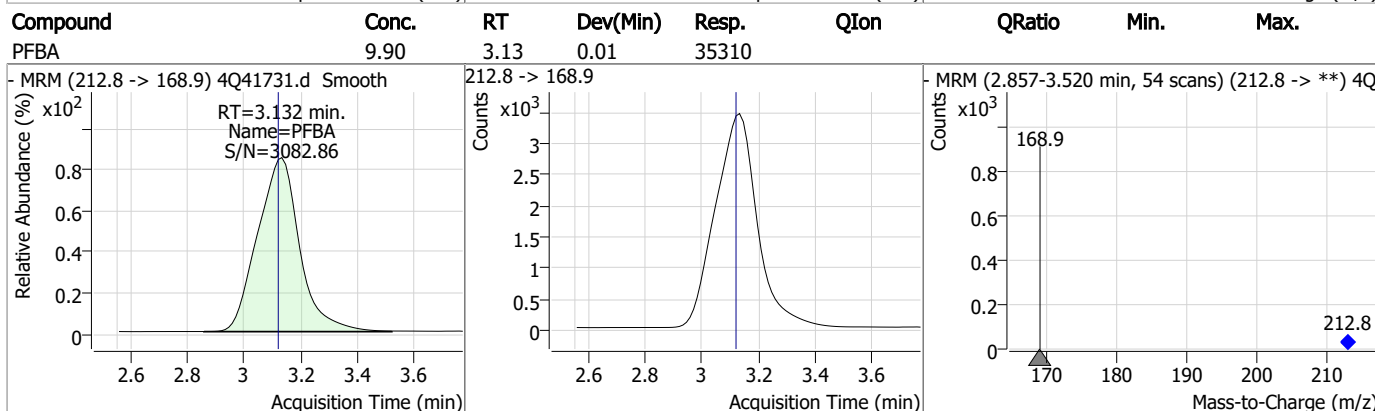
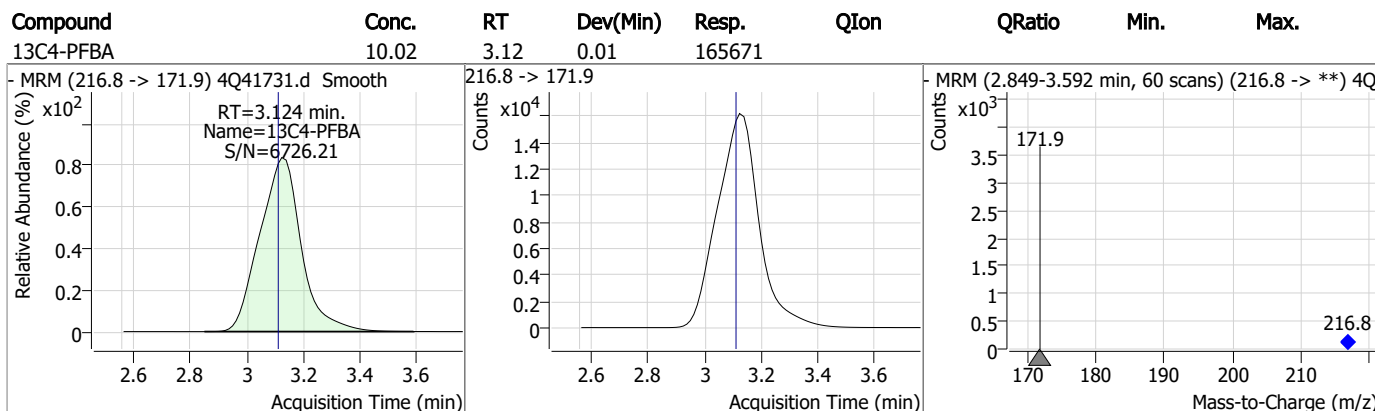
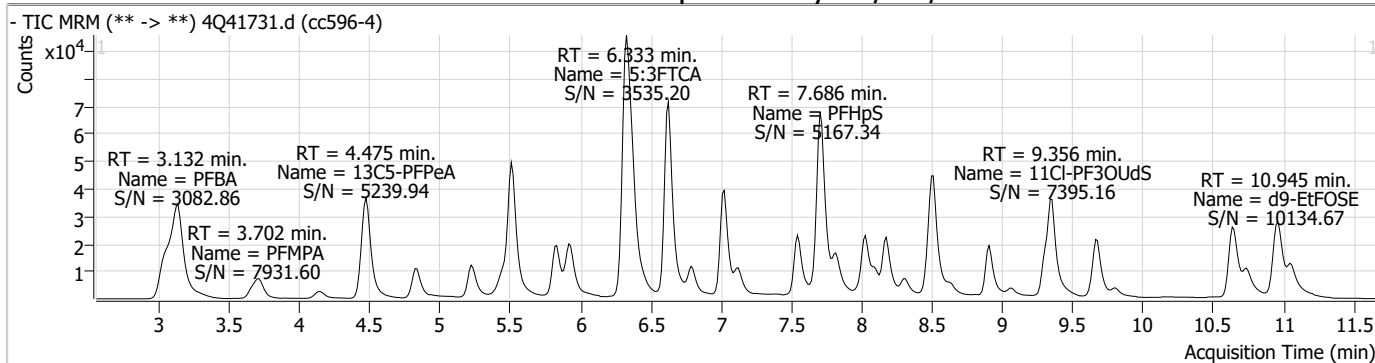
Perfluorinated Compounds by LC/MS/MS

Compound	RT	Transition	Response	Conc. Units	Dev(Min)
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7.7.15

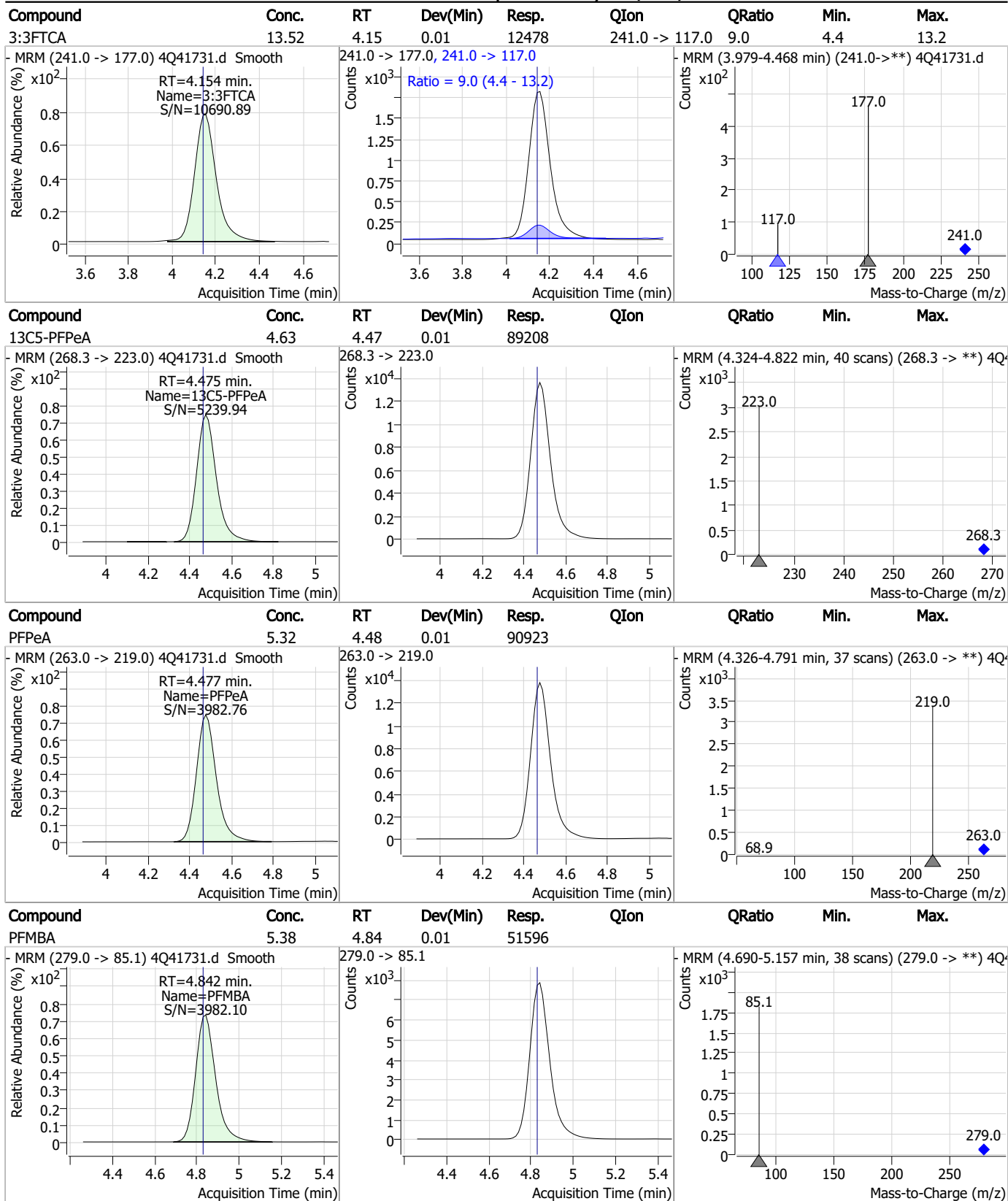
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Perfluorinated Compounds by LC/MS/MS



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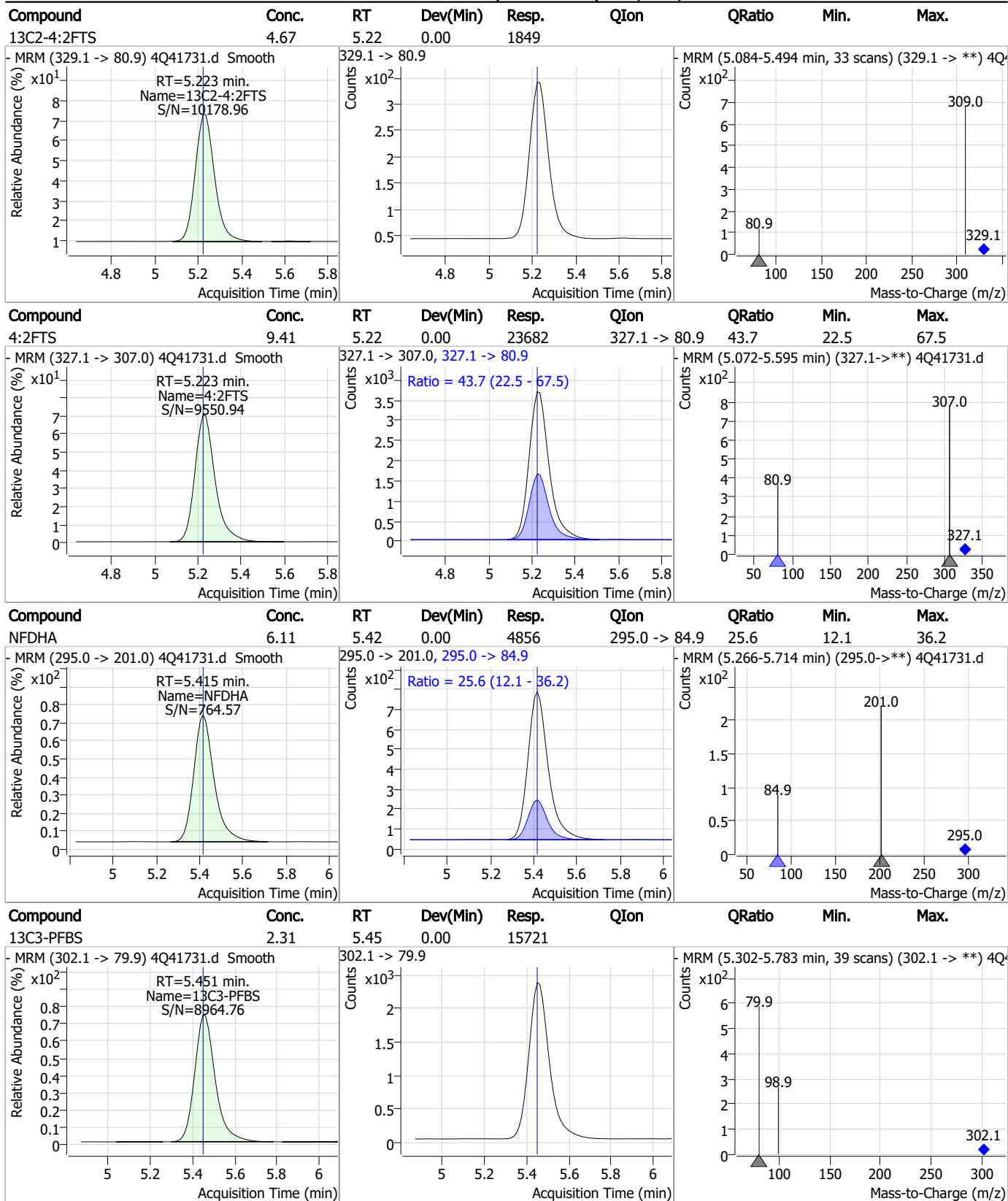
Perfluorinated Compounds by LC/MS/MS



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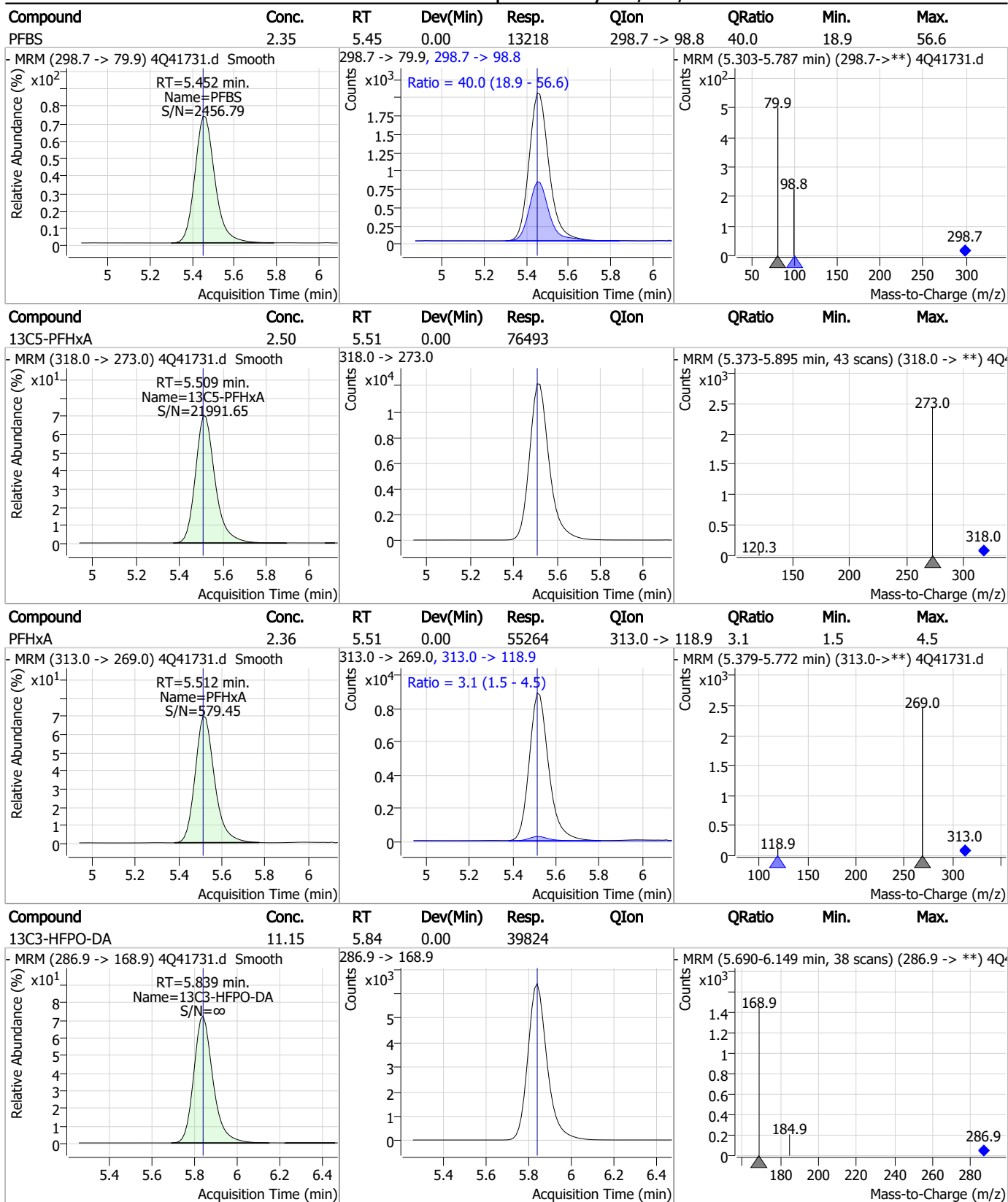
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Perfluorinated Compounds by LC/MS/MS



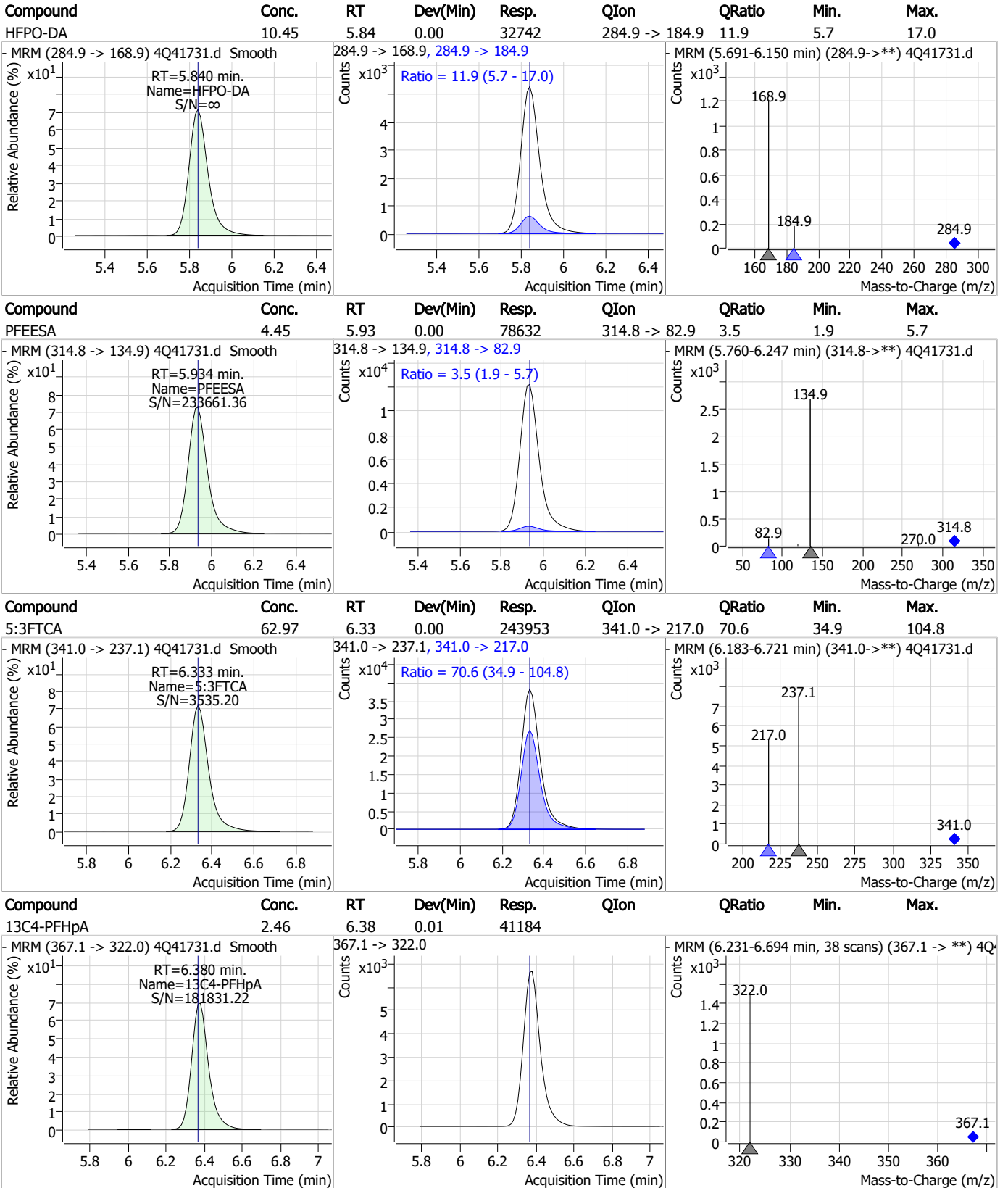
7.7.15
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Perfluorinated Compounds by LC/MS/MS



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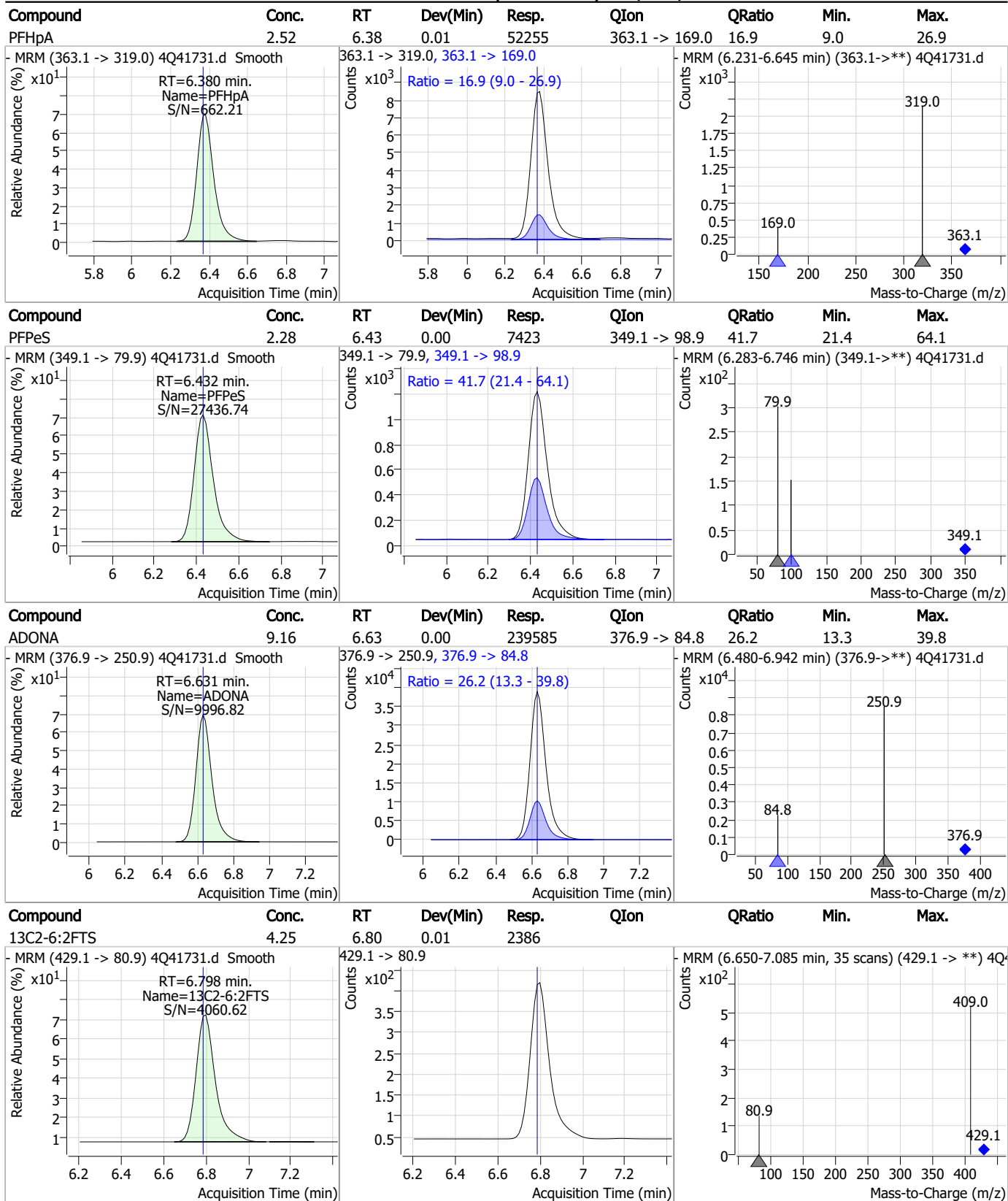
Perfluorinated Compounds by LC/MS/MS



7.7.15 7

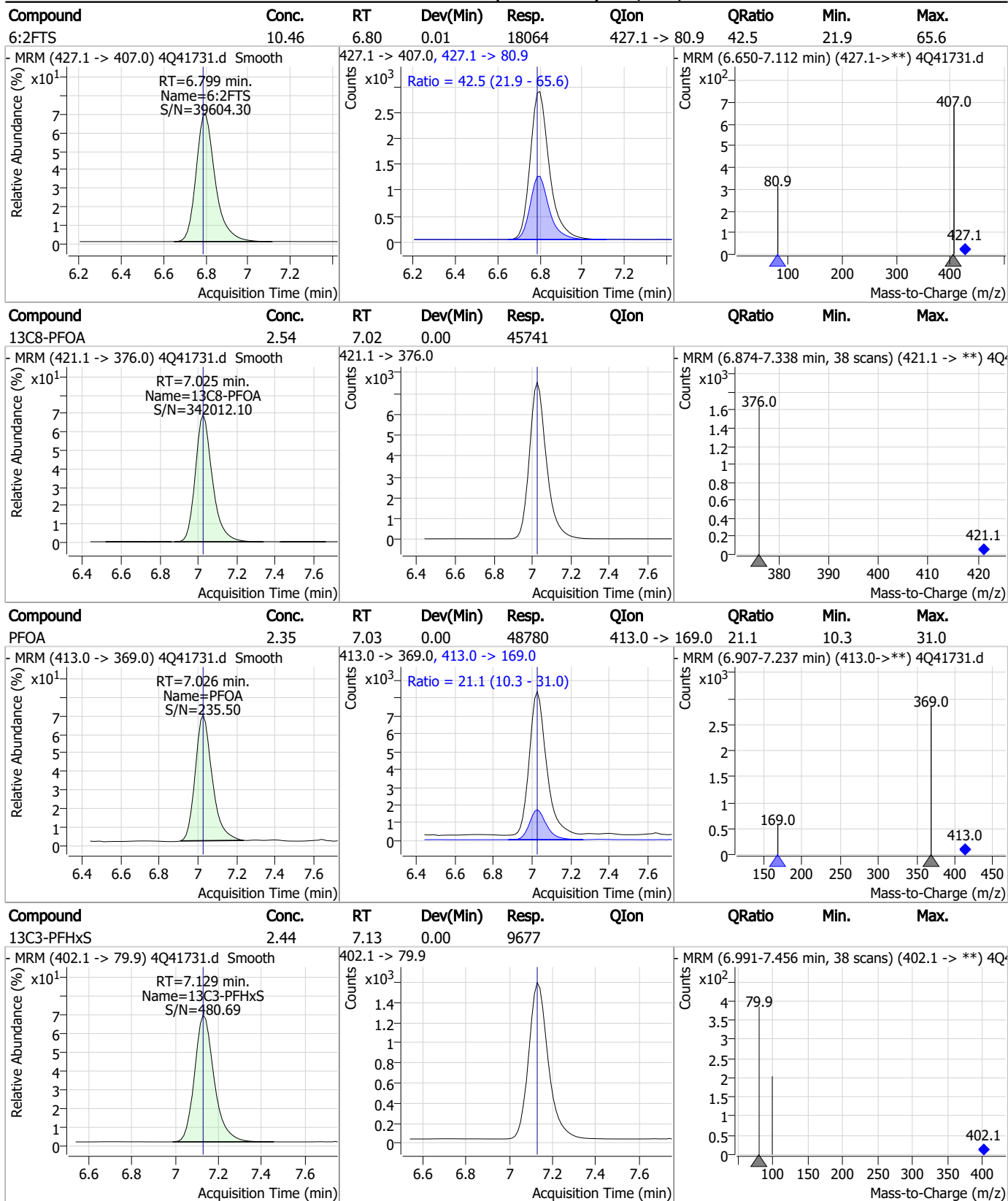


Perfluorinated Compounds by LC/MS/MS



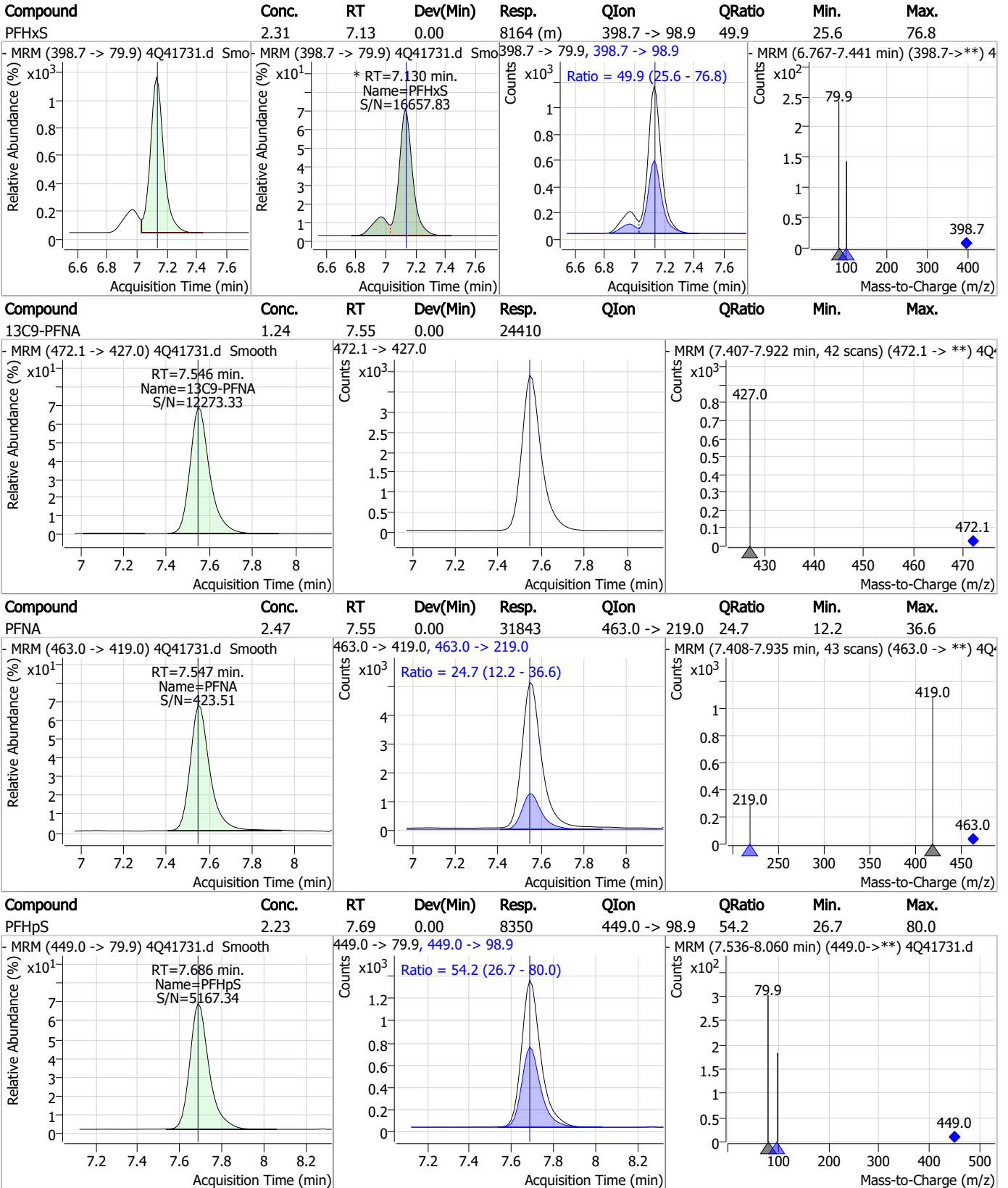
7.7.15 7

Perfluorinated Compounds by LC/MS/MS



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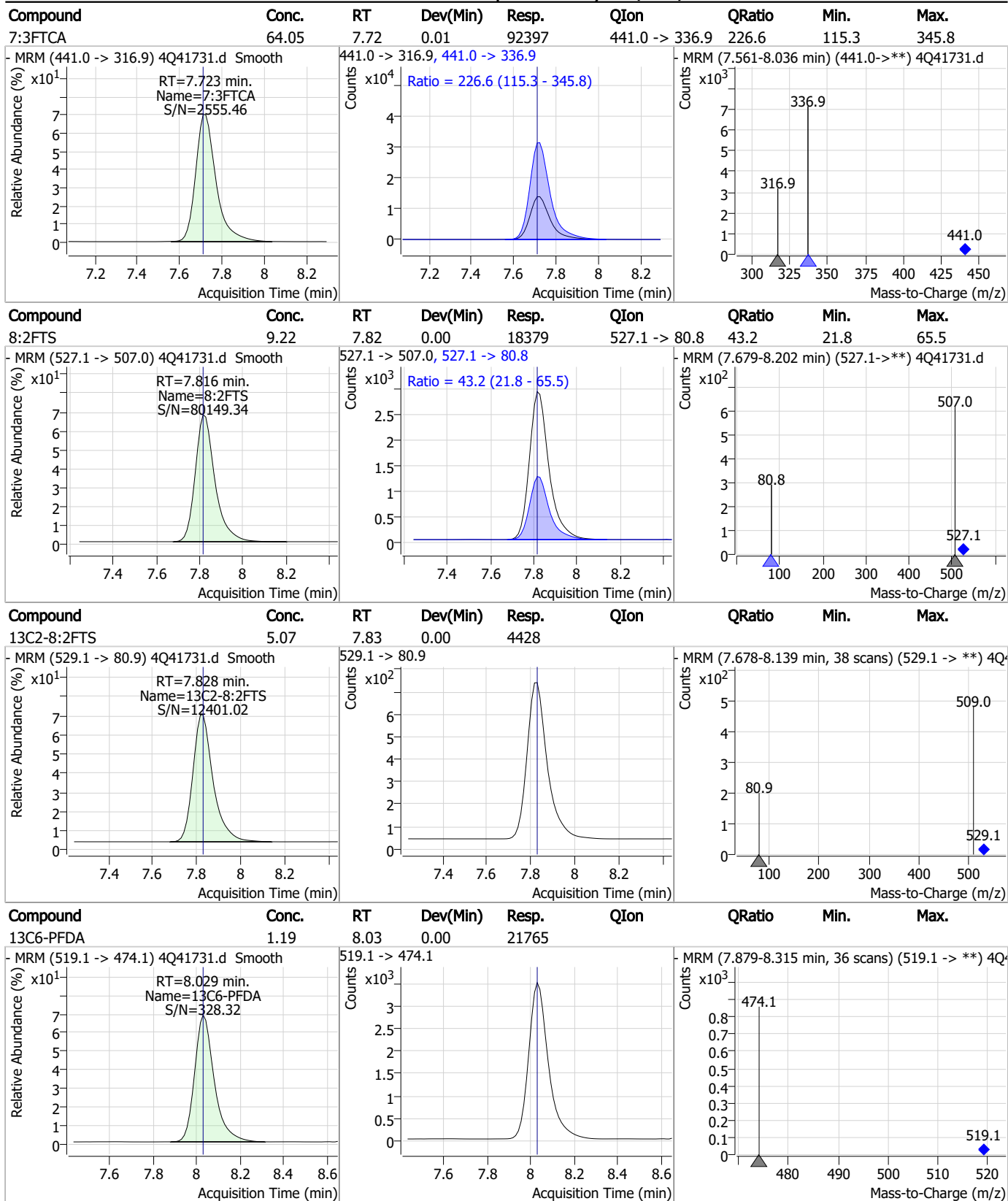
Perfluorinated Compounds by LC/MS/MS



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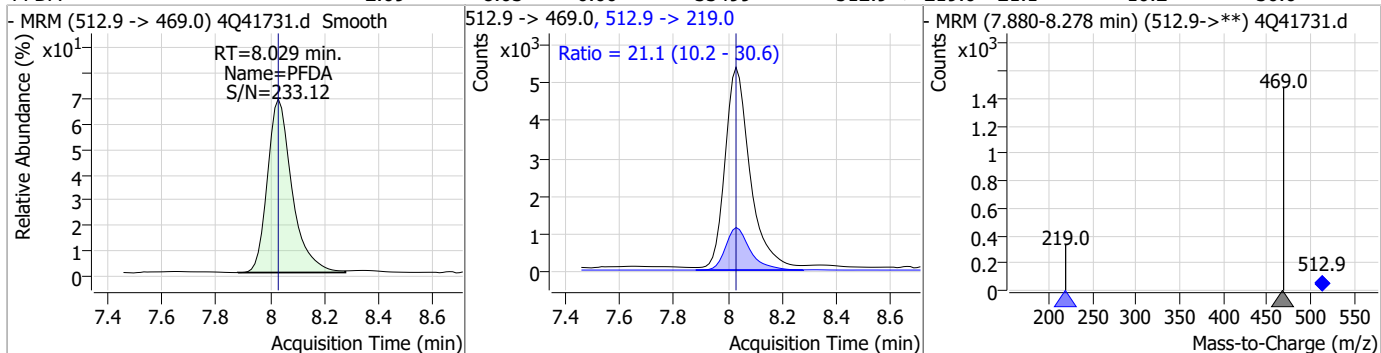
Perfluorinated Compounds by LC/MS/MS



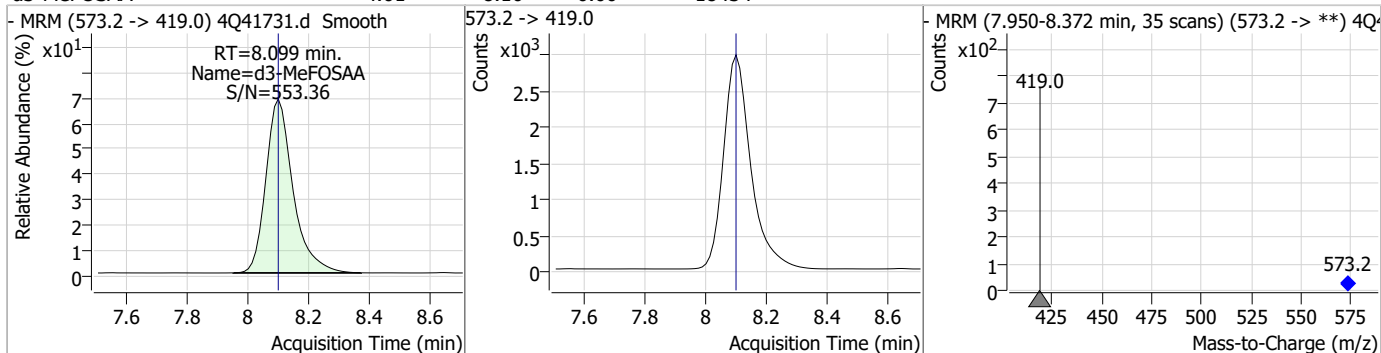
7.7.15

Perfluorinated Compounds by LC/MS/MS

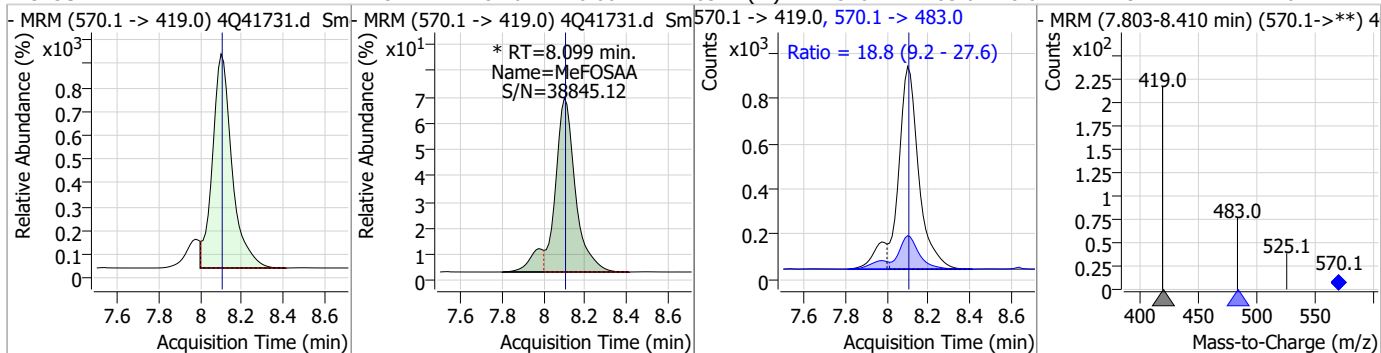
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	2.69	8.03	0.00	33499	512.9 -> 219.0	21.1	10.2	30.6



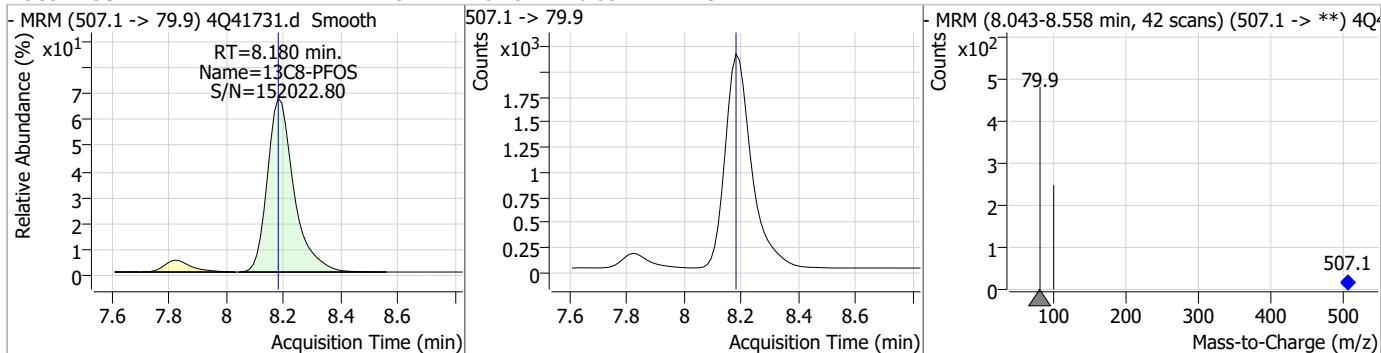
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSAA	4.61	8.10	0.00	18434				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	2.52	8.10	0.00	6374 (m)	570.1 -> 483.0	18.8	9.2	27.6



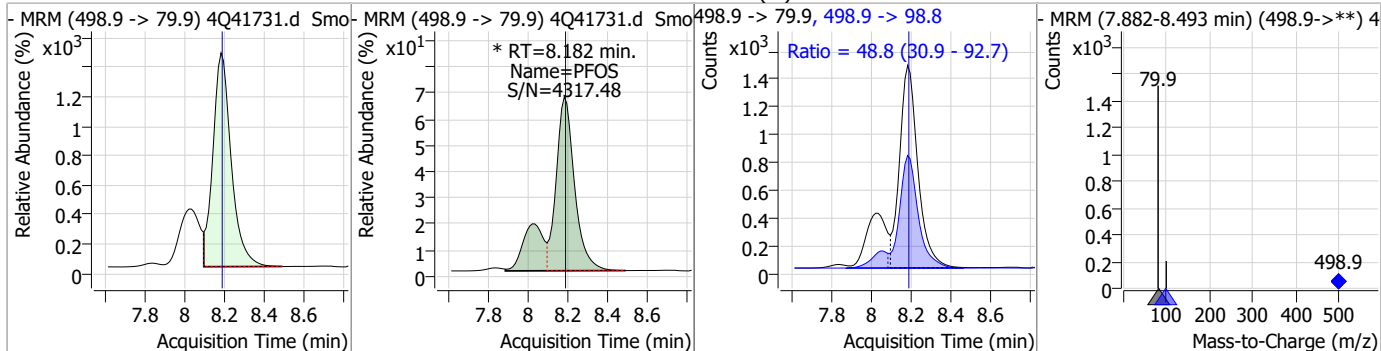
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C8-PFOS	2.43	8.18	0.00	13717				



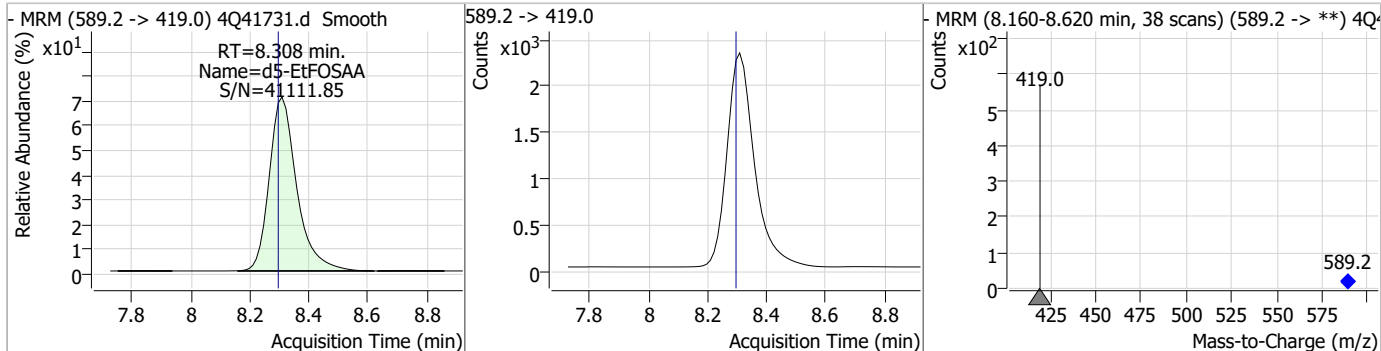
7.7.15
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Perfluorinated Compounds by LC/MS/MS

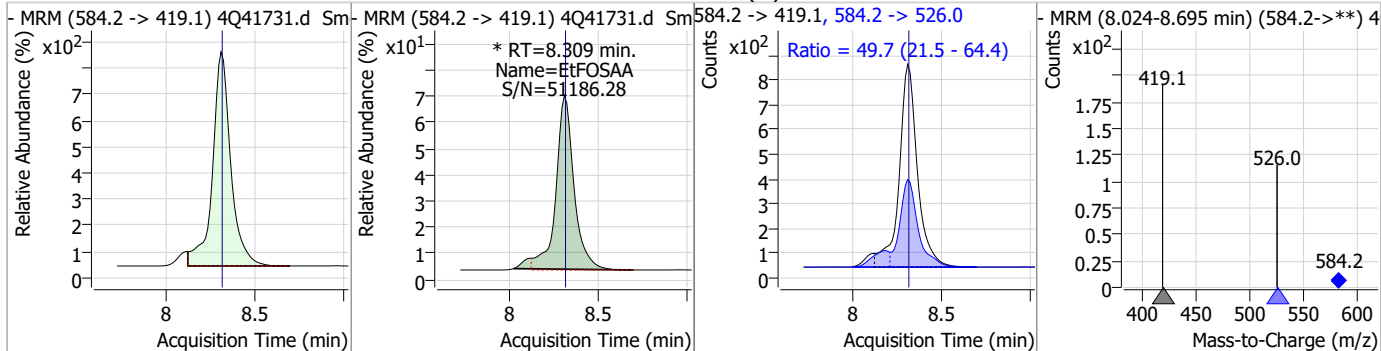
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	2.10	8.18	0.00	12209 (m)	498.9 -> 98.8	48.8	30.9	92.7



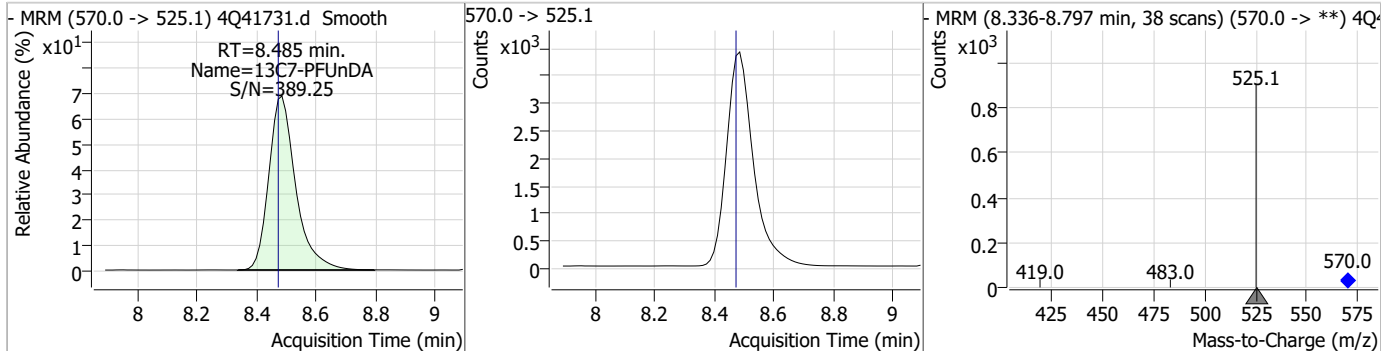
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	4.58	8.31	0.01	14946				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	2.46	8.31	0.00	5902 (m)	584.2 -> 526.0	49.7	21.5	64.4



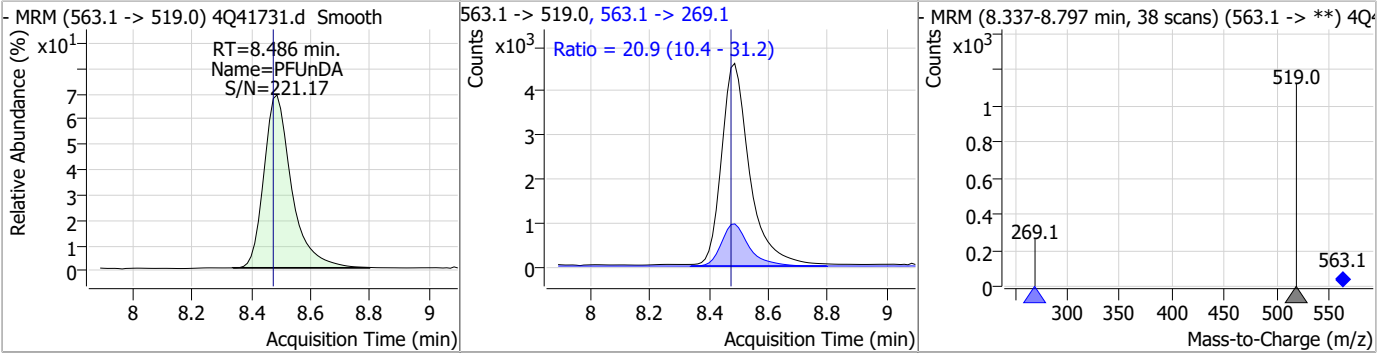
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C7-PFUnDA	1.29	8.49	0.01	24461				



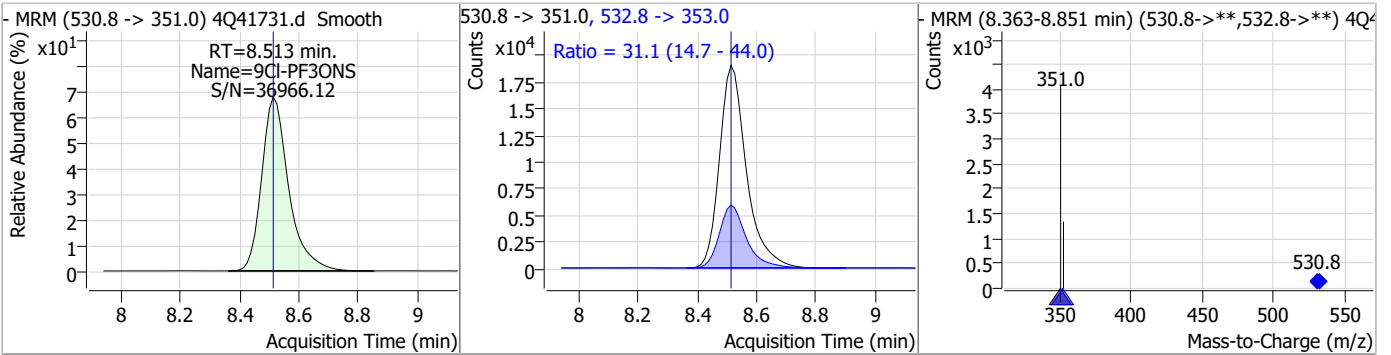
7.7.15
7

Perfluorinated Compounds by LC/MS/MS

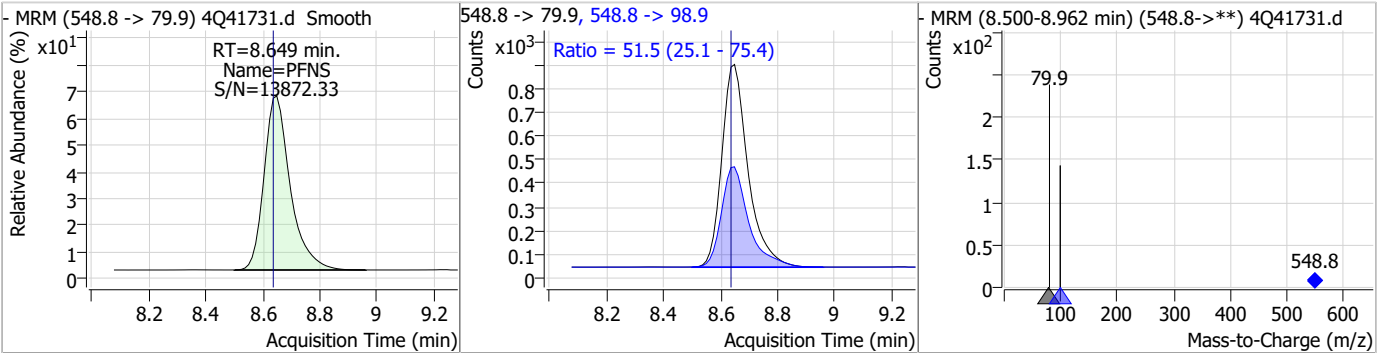
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	2.35	8.49	0.01	29503	563.1 -> 269.1	20.9	10.4	31.2



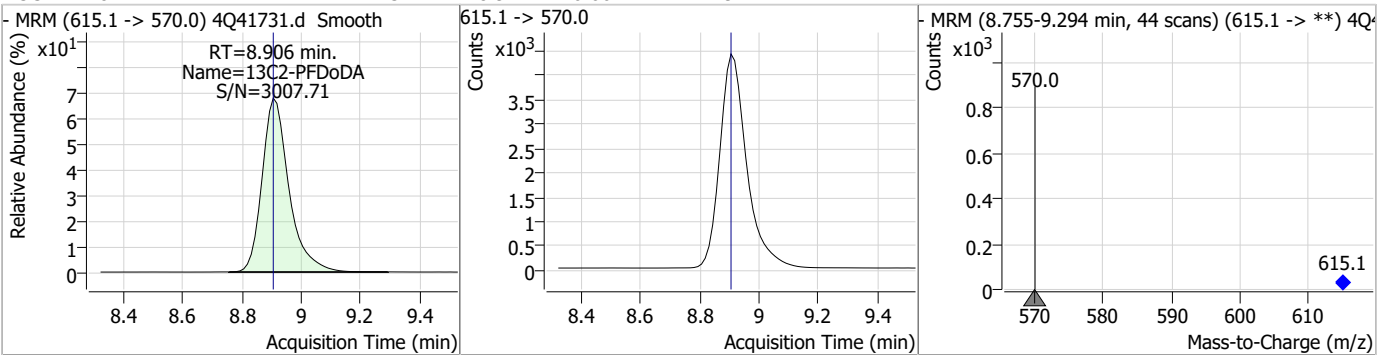
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	8.95	8.51	0.00	120207	532.8 -> 353.0	31.1	14.7	44.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	2.52	8.65	0.01	5489	548.8 -> 98.9	51.5	25.1	75.4

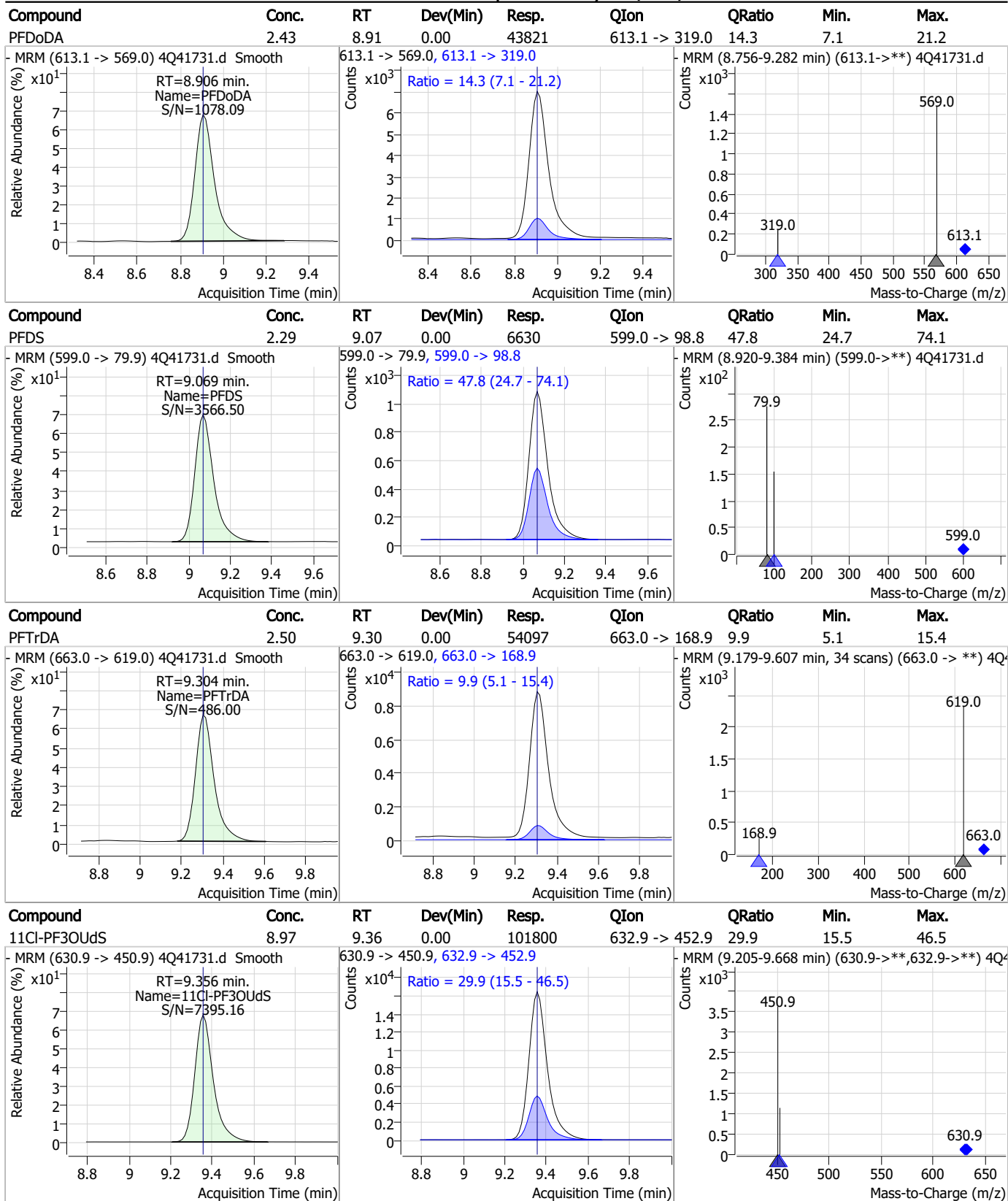


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA	1.23	8.91	0.00	27791	615.1 -> 570.0			



7.7.15
7

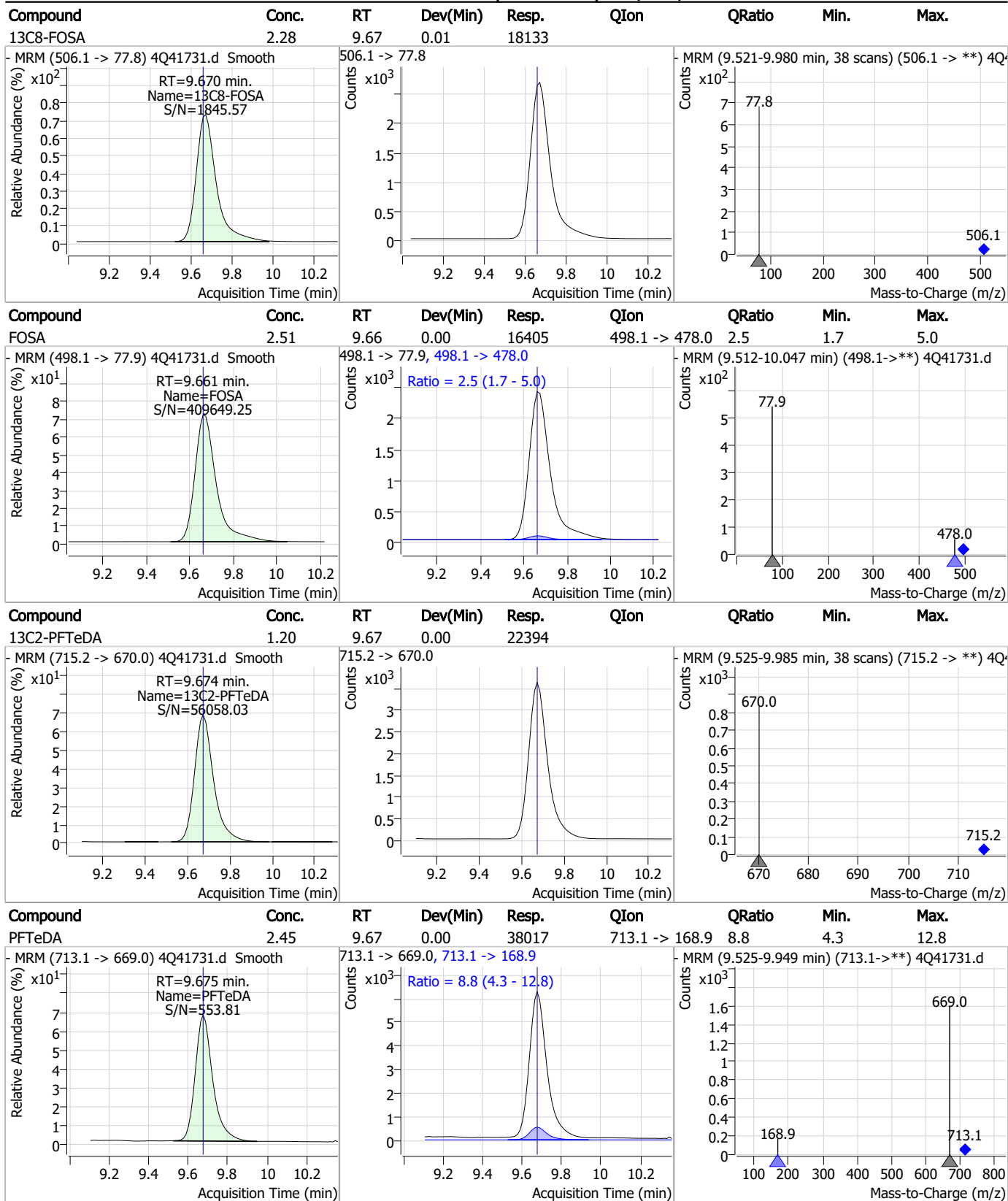
Perfluorinated Compounds by LC/MS/MS



7.7.15
7



Perfluorinated Compounds by LC/MS/MS

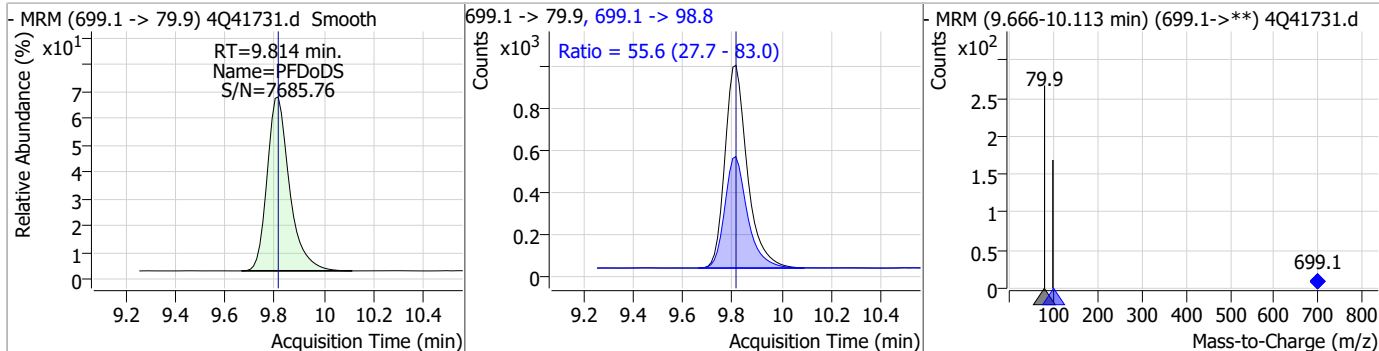


7.7.15

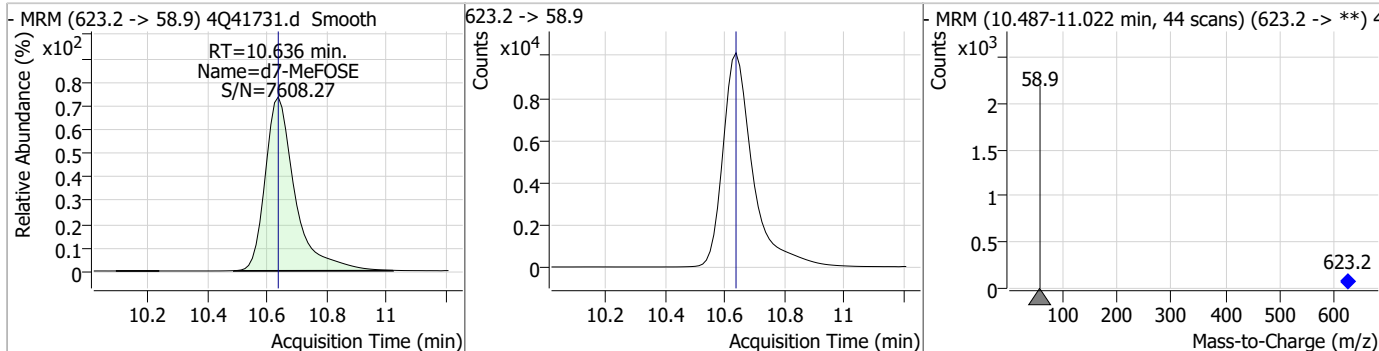
7

Perfluorinated Compounds by LC/MS/MS

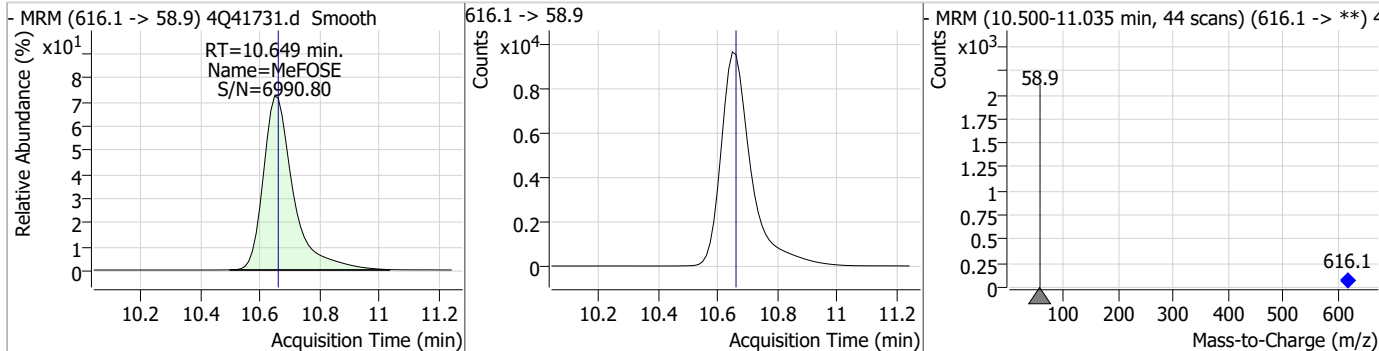
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFD _o DS	2.45	9.81	0.00	5996	699.1 -> 98.8	55.6	27.7	83.0



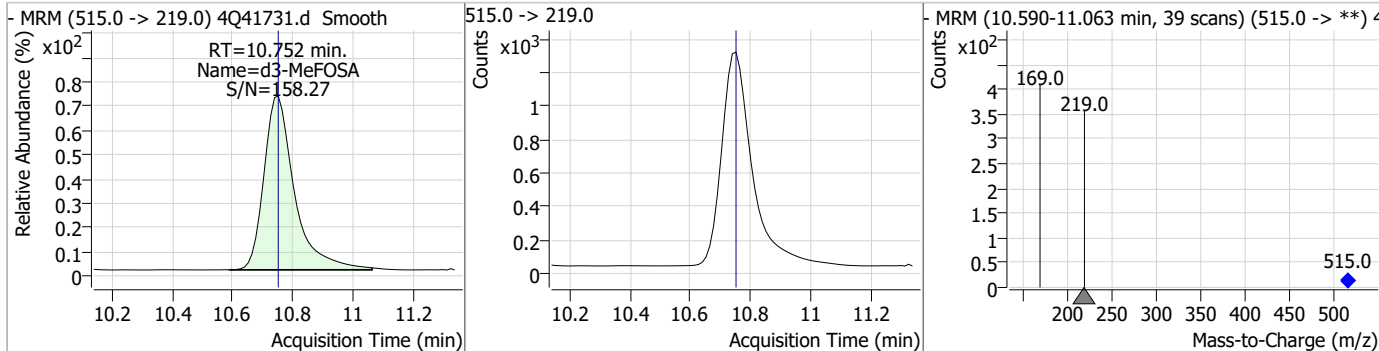
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d7-MeFOSE	22.99	10.64	0.00	70083				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSE	25.24	10.65	-0.01	67551				

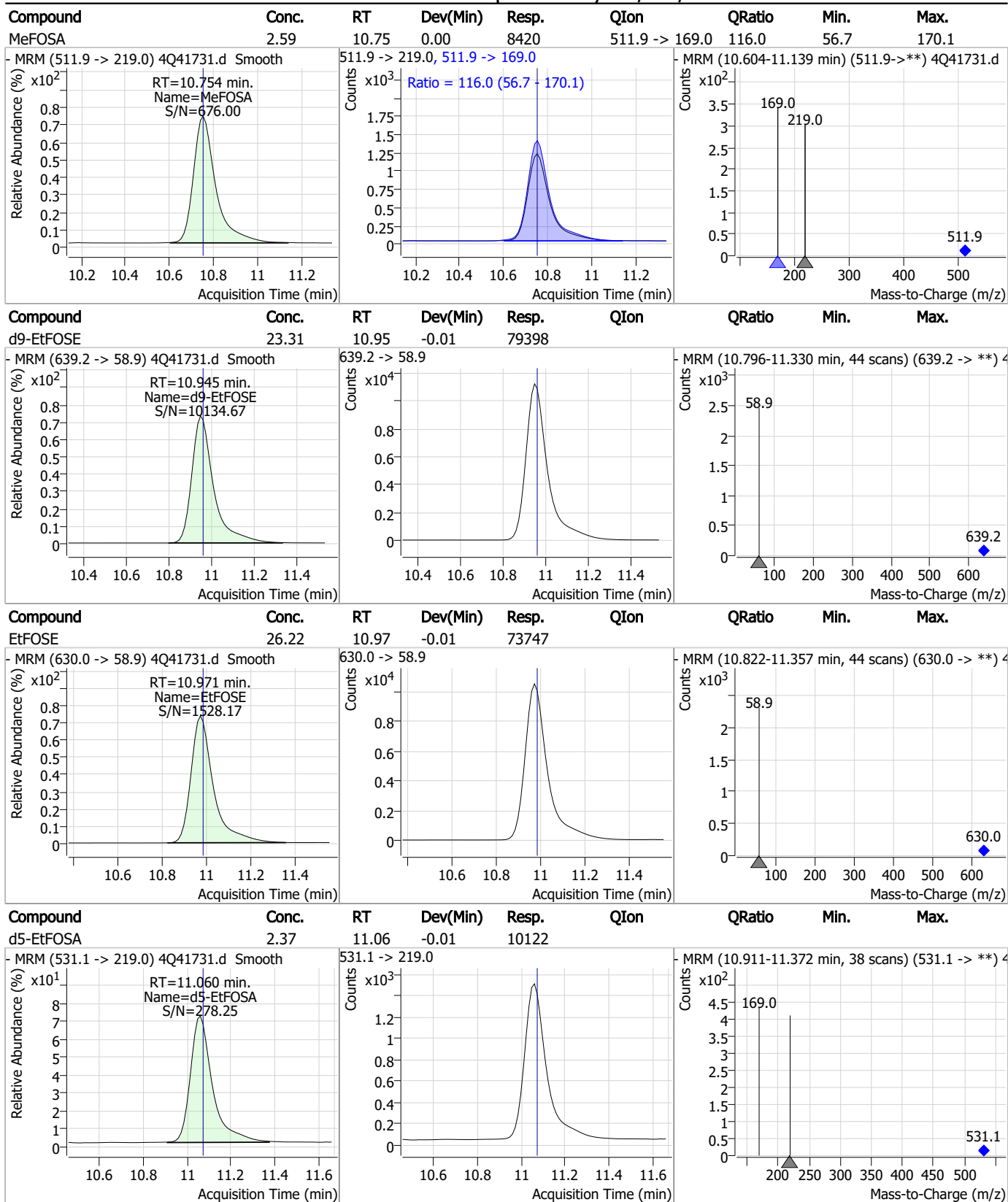


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSA	2.22	10.75	0.00	9013				



7.7.15
7

Perfluorinated Compounds by LC/MS/MS

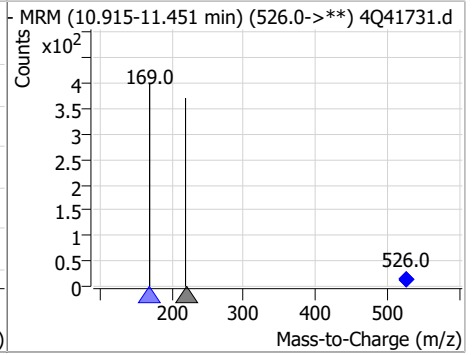
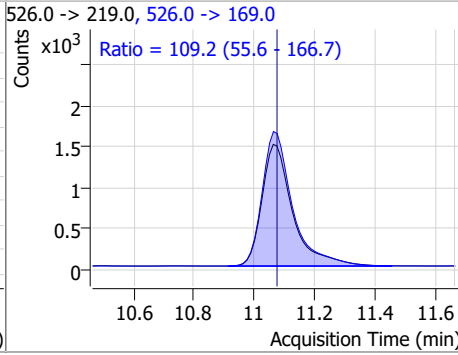
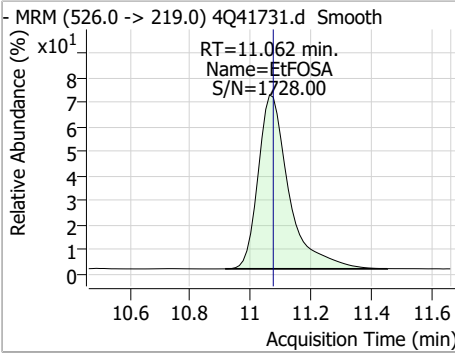


7.7.15
7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSA	2.53	11.06	-0.01	10458	526.0 -> 169.0	109.2	55.6	166.7



7.7.15
7

Manual Integration Approval Summary

Sample Number: S4Q597-CC596 Method: EPA DRAFT 1633
Lab FileID: 4Q41731.D Analyst approved: 03/07/23 15:27 Anna Ludwig
Injection Time: 03/06/23 23:22 Supervisor approved: 03/08/23 10:59 Natasha Guntie

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		7.13	Split peak
MeFOSAA	2355-31-9		8.10	Split peak
Perfluorooctanesulfonic acid	1763-23-1		8.18	Split peak
EtFOSAA	2991-50-6		8.31	Split peak

7.7.15.1

7

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DATE:	03/03/23
COLUMN TYPE:	Poroshell EC18
AMOUNT INJ:	6 ul
INSTRUMENT:	LCMS4-4Q

LCMS4-4Q ANALYSIS LOG

METHODS:	1633
PROC. METH:	ID_030323_S4Q596
CAL DATE:	03/03/23
ANALYST:	M. Valls AL
RUN BATCH:	S4Q596

ELUENT A LOT #:	224863 W5%ACN 214785 2mmMAMAC.11387
ELUENT B LOT #:	ACN 214785
IC/CC STD LOT #:	LCMS 2073
ICV STD LOT #:	LCMS 2055/2026
ISTD/ID STD LOT #:	11384/11383

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	4Q41635.d	P1-A1	ccb	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd
2	4Q41636.d	P1-A1	ccb	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd
3	4Q41637.d	P1-B3	RT TDCA	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	pass
4	4Q41638.d	P1-B4	RT BR_LN	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	pass
5	4Q41639.d	P1-A9	high std	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	recal
6	4Q41640.d	P1-A1	iblk	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	recal
7	4Q41641.d	P1-A5	cc589-4	1633f ul2 im	QC	20/500	op95682,S4Q596,500,,5.0.1,water	recal
8	4Q41642.d	P1-A2	cc589-1.0LL	1633f ul2 im	QC	1.6/500	op95682,S4Q596,500,,5.0.1,water	recal
9	4Q41643.d	P1-A1	ccb	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd
10	4Q41644.d	P1-A1	ccb	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd
11	4Q41645.d	P1-B3	RT TDCA	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	pass
12	4Q41646.d	P1-B4	RT BR_LN	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	pass
13	4Q41647.d	P1-A1	ic596-0	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	check tune file
14	4Q41648.d	P1-A2	ic596-1	1633f ul2 im	Calibration	1.6/500	op95682,S4Q596,500,,5.0.1,water	pass
15	4Q41649.d	P1-A3	ic596-2	1633f ul2 im	Calibration	4/500	op95682,S4Q596,500,,5.0.1,water	pass
16	4Q41650.d	P1-A4	ic596-3	1633f ul2 im	Calibration	10/500	op95682,S4Q596,500,,5.0.1,water	pass
17	4Q41651.d	P1-A5	icc596-4	1633f ul2 im	Calibration	20/500	op95682,S4Q596,500,,5.0.1,water	pass
18	4Q41652.d	P1-A6	ic596-5	1633f ul2 im	Calibration	40/500	op95682,S4Q596,500,,5.0.1,water	pass
19	4Q41653.d	P1-A7	ic596-6	1633f ul2 im	Calibration	100/500	op95682,S4Q596,500,,5.0.1,water	pass
20	4Q41654.d	P1-A8	ic596-7	1633f ul2 im	Calibration	200/500	op95682,S4Q596,500,,5.0.1,water	pass
21	4Q41655.d	P1-A9	ic596-8	1633f ul2 im	Calibration	1x	op95682,S4Q596,500,,5.0.1,water	pass
22	4Q41656.d	P1-A1	iblk	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd
23	4Q41657.d	P1-B1	icv596-4	1633f ul2 im	QC	20/500	op95682,S4Q596,500,,5.0.1,water	pass
24	4Q41658.d	P1-B2	icv596-20	1633f ul2 im	QC	100/500	op95682,S4Q596,500,,5.0.1,water	pass
25	4Q41659.d	P1-A5	cc596-4	1633f ul2 im	QC	20/500	op95682,S4Q596,500,,5.0.1,water	pass
26	4Q41660.d	P1-A2	cc596-1.0LL	1633f ul2 im	QC	1.6/500	op95682,S4Q596,500,,5.0.1,water	pass
27	4Q41661.d	P1-C1	op95702-bs	1633f ul2 im	Sample		op95702,S4Q596,500,,5.0.1,water	✓
28	4Q41662.d	P1-C2	op95702-llbs:2	1633f ul2 im	Sample		op95702,S4Q596,500,,5.0.1,water	✓
29	4Q41663.d	P1-C3	op95702-mb	1633f ul2 im	Sample		op95702,S4Q596,500,,5.0.1,water	✓
30	4Q41664.d	P1-C4	jd60940-16	1633f ul2 im	Sample		op95702,S4Q596,560,,5.0.1,water	✓
31	4Q41665.d	P1-C5	op95702-ms	1633f ul2 im	Sample		op95702,S4Q596,560,,5.0.1,water	✓
32	4Q41666.d	P1-C6	jd60940-17	1633f ul2 im	Sample		op95702,S4Q596,530,,5.0.1,water	✓
33	4Q41667.d	P1-C7	op95702-dup	1633f ul2 im	Sample		op95702,S4Q596,530,,5.0.1,water	✓
34	4Q41668.d	P1-A5	cc589-4	1633f ul2 im	QC	20/500	op95682,S4Q596,500,,5.0.1,water	pass
35	4Q41669.d	P1-A1	iccb	1633f ul2 im	Sample		op95682,S4Q596,500,,5.0.1,water	nd

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LCMS4-4Q ANALYSIS LOG

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36	4Q41670.d	P1-C8	op95676-bs	1633ful21.m	Sample	op95676,S4Q596,5.00,,,5.0,1,soil	✓
37	4Q41671.d	P1-C9	op95676-llbs:2	1633ful21.m	Sample	op95676,S4Q596,5.00,,,5.0,1,soil	✓
38	4Q41672.d	P1-D1	op95676-mb	1633ful21.m	Sample	op95676,S4Q596,5.00,,,5.0,1,soil	✓
39	4Q41673.d	P1-D2	jd60842-1	1633ful21.m	Sample	op95676,S4Q596,5.03,,,5.0,1,soil	rr for pfos hit
40	4Q41674.d	P1-D3	jd60842-2	1633ful21.m	Sample	op95676,S4Q596,5.04,,,5.0,1,soil	✓
41	4Q41675.d	P1-D4	op95676-ms	1633ful21.m	Sample	op95676,S4Q596,5.02,,,5.0,1,soil	✓
42	4Q41676.d	P1-D5	op95676-mnsd	1633ful21.m	Sample	op95676,S4Q596,4.95,,,5.0,1,soil	✓
43	4Q41677.d	P1-D6	jd60842-3	1633ful21.m	Sample	op95676,S4Q596,4.99,,,5.0,1,soil	✓
44	4Q41678.d	P1-D7	jd60842-4	1633ful21.m	Sample	op95676,S4Q596,5.02,,,5.0,1,soil	✓
45	4Q41679.d	P1-D8	jd60842-5	1633ful21.m	Sample	op95676,S4Q596,5.02,,,5.0,1,soil	✓
46	4Q41680.d	P1-A5	cc589-4	1633ful21.m	QC	20/500	pass
47	4Q41681.d	P1-A1	iccb	1633ful21.m	Sample	op95682,S4Q596,500,,,5.0,1,water	nd
48	4Q41682.d	P1-D9	jd60842-6	1633ful21.m	Sample	op95676,S4Q596,5.04,,,5.0,1,soil	✓
49	4Q41683.d	P1-E1	jd60842-7	1633ful21.m	Sample	op95676,S4Q596,4.99,,,5.0,1,soil	✓
50	4Q41684.d	P1-E2	jd60842-8	1633ful21.m	Sample	op95676,S4Q596,4.95,,,5.0,1,soil	✓
51	4Q41685.d	P1-E3	jd60842-9	1633ful21.m	Sample	op95676,S4Q596,5.02,,,5.0,1,soil	✓
52	4Q41686.d	P1-E4	jd60842-10	1633ful21.m	Sample	op95676,S4Q596,4.99,,,5.0,1,soil	rr for pfos hit
53	4Q41687.d	P1-E5	jd60842-11	1633ful21.m	Sample	op95676,S4Q596,4.96,,,5.0,1,soil	✓
54	4Q41688.d	P1-E6	jd60842-12	1633ful21.m	Sample	op95676,S4Q596,5.05,,,5.0,1,soil	✓
55	4Q41689.d	P1-E7	jd60842-13	1633ful21.m	Sample	op95676,S4Q596,4.99,,,5.0,1,soil	✓
56	4Q41690.d	P1-E8	jd60843-2	1633ful21.m	Sample	op95676,S4Q596,5.03,,,5.0,1,soil	rr for pfos hit
57	4Q41691.d	P1-E9	jd60843-3	1633ful21.m	Sample	op95676,S4Q596,4.96,,,5.0,1,soil	rr for pfos hit
58	4Q41692.d	P1-A5	cc589-4	1633ful21.m	QC	20/500	pass
59	4Q41693.d	P1-A1	iccb	1633ful21.m	Sample	op95682,S4Q596,500,,,5.0,1,water	nd
60	4Q41694.d	P1-F1	jd60843-4	1633ful21.m	Sample	op95676,S4Q596,5.05,,,5.0,1,soil	rr for pfos hit
61	4Q41695.d	P1-F8	fc3034-4	1633ful21.m	Sample	250/500	✓
62	4Q41696.d	P1-F9	fc3034-5	1633ful21.m	Sample	250/500	✓
63	4Q41697.d	P1-A5	cc589-4	1633ful21.m	QC	20/500	pass
64	4Q41698.d	P1-A1	iccb	1633ful21.m	Sample	op95682,S4Q596,500,,,5.0,1,water	nd

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DATE:	03/06/23
COLUMN TYPE:	Poroshell EC18
AMOUNT INJ:	6 ul
INSTRUMENT:	LCMS4-4Q

LCMS4-4Q ANALYSIS LOG

METHODS:	1633
PROC. METH:	ID_030323_S4Q596
CAL DATE:	03/03/23
ANALYST:	M. Valls AL
RUN BATCH:	S4Q597

ELUENT A LOT #:	224863 W5%A/CN 214785 2mmMMA/C. 11387
ELUENT B LOT #:	ACN 214785
IC/CC STD LOT #:	LCMS 2073
ICV STD LOT #:	LCMS 2055/2026
ISTD/ID STD LOT #:	11384/11383

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	4Q41699.d	P1-A1	ccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
2	4Q41700.d	P1-A1	ccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
3	4Q41701.d	P1-A1	ccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
4	4Q41702.d	P1-A1	ccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
5	4Q41703.d	P1-B3	RT TDCA	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	pass
6	4Q41704.d	P1-B4	RT BR_LN	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	pass
7	4Q41705.d	P1-A9	high std	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	pass
8	4Q41706.d	P1-A1	iblk	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
9	4Q41707.d	P1-A5	cc596-4	1633fult2.im	QC	20/500	op95719,S4Q597,500,,5.0.1,water	pass
10	4Q41708.d	P1-A2	cc596-1,0LL	1633fult2.im	QC	1.6/500	op95719,S4Q597,500,,5.0.1,water	pass
11	4Q41709.d	P6-A1	op95719-bs	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	✓
12	4Q41710.d	P6-A2	op95719-llbs:3	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	✓
13	4Q41711.d	P6-A3	op95719-mb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	✓
14	4Q41712.d	P6-A4	FC3096-1	1633fult2.im	Sample		op95719,S4Q597,560,,5.0.1,water	✓
15	4Q41713.d	P6-A5	op95719-ms	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	✓
16	4Q41714.d	P6-A6	FC3096-2	1633fult2.im	Sample		op95719,S4Q597,560,,5.0.1,water	✓
17	4Q41715.d	P6-A7	op95719-dup	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	✓
18	4Q41716.d	P6-A8	FC3096-3	1633fult2.im	Sample		op95719,S4Q597,525,,5.0.1,water	✓
19	4Q41717.d	P6-A9	FC3110-1	1633fult2.im	Sample		op95719,S4Q597,525,,5.0.1,water	✓
20	4Q41718.d	P6-B1	FC3110-2	1633fult2.im	Sample		op95719,S4Q597,525,,5.0.1,water	✓
21	4Q41719.d	P1-A5	cc596-4	1633fult2.im	QC	20/500	op95719,S4Q597,500,,5.0.1,water	pass
22	4Q41720.d	P1-A1	iccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
23	4Q41721.d	P6-B2	FC3110-3	1633fult2.im	Sample		op95719,S4Q597,525,,5.0.1,water	✓
24	4Q41722.d	P6-B3	op95718-llbs	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	✓
25	4Q41723.d	P6-B4	op95718-llbs:2	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	✓
26	4Q41724.d	P6-B5	op95718-lb	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
27	4Q41725.d	P6-B6	JD60059-1A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
28	4Q41726.d	P6-B7	JD60059-2A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
29	4Q41727.d	P6-B8	JD60059-3A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
30	4Q41728.d	P6-B9	JD60059-4A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
31	4Q41729.d	P6-C1	JD60059-6A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
32	4Q41730.d	P6-C2	JD60059-7A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH
33	4Q41731.d	P1-A5	cc596-4	1633fult2.im	QC	20/500	op95719,S4Q597,500,,5.0.1,water	pass
34	4Q41732.d	P1-A1	iccb	1633fult2.im	Sample		op95719,S4Q597,500,,5.0.1,water	nd
35	4Q41733.d	P6-C3	JD60059-8A	1633fult2.im	Sample		op95718,S4Q597,60,,5.0.1,water	XH

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LCMS4-4Q ANALYSIS LOG

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36	4Q41734.d	P6-C4	op95718.ms	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
37	4Q41735.d	P6-C5	JD60059-9A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
38	4Q41736.d	P6-C6	JD60059-10A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
39	4Q41737.d	P6-C7	op95718-dup	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
40	4Q41738.d	P6-C8	JD60059-11A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
41	4Q41739.d	P6-C9	JD60059-12A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	XH
42	4Q41740.d	P6-D1	JD60059-13A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	RR 10X GEN X SUR HI
43	4Q41741.d	P6-D2	JD60059-14A	1633ful21.m	Sample	op95718,S4Q597,60,,5.0.1,water	✓
44	4Q41742.d	P1-A5	cc596-4	1633ful21.m	QC	20/500	pass
45	4Q41743.d	P1-A1	iccb	1633ful21.m	Sample	op95719,S4Q597,500,,5.0.1,water	nd
46	4Q41744.d	P6-D3	op95720-bs	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	nfdha hi - pass
47	4Q41745.d	P6-D4	op95720-llbs-2	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	nfdha hi - pass
48	4Q41746.d	P6-D5	op95720-mb	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	✓
49	4Q41747.d	P6-D6	fc3074-1	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	rr 10x
50	4Q41748.d	P6-D7	op95720-ms	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	rr 10x
51	4Q41749.d	P6-D8	fc3074-2	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	✓
52	4Q41750.d	P6-D9	op95720-dup	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	✓
53	4Q41751.d	P6-E1	fc3074-3	1633ful21.m	Sample	op95720,S4Q597,500,,5.0.1,water	✓
54	4Q41752.d	P6-E2	fc3074-4	1633ful21.m	Sample	op95720,S4Q597,560,,5.0.1,water	✓
55	4Q41753.d	P6-E3	fc3074-5	1633ful21.m	Sample	op95720,S4Q597,525,,5.0.1,water	✓
56	4Q41754.d	P1-A5	cc596-4	1633ful21.m	QC	20/500	pass
57	4Q41755.d	P1-A1	iccb	1633ful21.m	Sample	op95719,S4Q597,500,,5.0.1,water	nd
58	4Q41756.d	P6-E4	fc3074-6	1633ful21.m	Sample	op95720,S4Q597,520,,5.0.1,water	✓
59	4Q41757.d	P6-E5	fc3074-9	1633ful21.m	Sample	op95720,S4Q597,560,,5.0.1,water	✓
60	4Q41758.d	P6-E6	fc3074-10	1633ful21.m	Sample	op95720,S4Q597,560,,5.0.1,water	✓
61	4Q41759.d	P6-E7	fc3083-1	1633ful21.m	Sample	op95720,S4Q597,120,,5.0.1,water	rr 10x 6:2 high
62	4Q41760.d	P1-A5	ecc596-4	1633ful21.m	QC	20/500	pass
63	4Q41761.d	P1-A1	iccb	1633ful21.m	Sample	op95719,S4Q597,500,,5.0.1,water	nd

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Organic Standards Preparation Log

SGS - Orlando Std. #	Name Description	Parent Std. #	Parent Name	Parent Vendor	Vendor Exp. Date	Lab* Exp. Date	Parent Conc.	Vol. Used	Final Vol.	Final Conc.	Diluent Lot	Prep. Date	Exp. Date	Initials
LCMS 2052	1633 prep mix	Lot: 221044	MeOH	Fisher	—	1/4/24	99.9%	92mL	100mL	92%	N/A	1/19/23	2/19/23	MV
↓	↓	Lot: 219481	NH4OH	↓	—	9/19/23	100%	3.3mL	↓	1%	↓	↓	↓	↓
↓	↓	Lot: 224863	H2O	↓	—	1/17/24	100%	1.7mL	↓	4%	↓	↓	↓	↓
↓	↓	Lot: 224297	Acetic ACID	↓	—	6/24	99.7%	0.625mL	↓	.625%	↓	↓	↓	↓
LCMS 2053	(spike) Full 1st std	11568	PFOA DOD 28 cap.	SGS	11/9/27	1/10/24	1.0ppm	400uL	4.0mL	100ppb	95% MeOH 5% H2O	12/4/23	3/21/23	MV
↓	↓	LCMS 1987	40 1st ADDOR#1	↓	—	3/21/23	1.0ppm	400uL	↓	↓	↓	↓	↓	↓
↓	↓	LCMS 1986	40 1st Add on #2	↓	—	4/18/23	1.0ppm	400uL	↓	↓	↓	↓	↓	↓
↓	↓	LCMS 2054	FOSE 2054	↓	—	7/27/23	5.0ppm	400uL	↓	500ppb	↓	↓	↓	↓
LCMS 2054	FOSE std.	11336	N-Et-FOSE	Wellington	5/13/27	9/19/23	50ppm	200uL	2.0mL	5ppm	95% MeOH 5% H2O	1/24/23	7/24/23	MV
↓	↓	11338	N-Me FOSE	↓	5/13/27	9/19/23	50ppm	200uL	↓	↓	↓	↓	↓	↓
LCMS 2055	1633 Cal std.	10855	PFAC-MxH	Wellington	9/14/26	1/17/24	1-4 ppm	2.50uL	4mL	62.5 125 250ppb	1033 MIX	1/24/23	7/24/23	MV
↓	↓	10853I	PFAC-	↓	9/14/26	1/11/24	1-10 ppm	2.50uL	↓	62.5 125 250ppb	↓	↓	↓	↓
↓	↓	10853J	MxI	↓	9/14/26	1/24/24	1-10 ppm	2.50uL	↓	↓	↓	↓	↓	↓
↓	↓	11579B	PFAC-	↓	1/11/25	1/11/24	2ppm	500uL	↓	250ppb	↓	↓	↓	↓
↓	↓	1167A	Mx F	↓	1/11/25	1/24/24	2ppm	500uL	↓	125ppb	↓	↓	↓	↓
↓	↓	10854I	PFAC-	↓	3/4/25	1/11/24	2ppm	250uL	↓	312/100 ppb	↓	↓	↓	↓
↓	↓	10854J	Mx G	↓	9/14/26	1/24/24	4-20 ppm	312uL	↓	↓	↓	↓	↓	↓
↓	↓	11492	PFAC-	↓	9/14/26	1/24/24	4-20 ppm	312uL	↓	↓	↓	↓	↓	↓
↓	↓	11603	Mx J	↓	9/14/26	1/24/24	4-20 ppm	312uL	↓	↓	↓	↓	↓	↓
				SGS			N/A	N/A						

* based on date opened as specified in each SGS - Orlando SOP.

ORLD-QAC-0017-6-03-FORM-icms std prep log.xls 030819

Organic Standards Preparation Log

SGS - Orlando Std. #	Name Description	Parent Std. #	Parent Name	Parent Vendor	Vendor Exp. Date	Lab* Exp. Date	Parent Conc.	Vol. Used	Final Vol.	Final Conc.	Diluent Lot	Prep. Date	Exp. Date	Initials
LCMS 2025	List 40 (Sur) ADD-ON Isotope Mix	11333	d7-N- MeFose	Wellington Labs	01/27/27	10/12/23	50ppm	200uL	2.0 mL	1/5ppm	95% MeOH 5% H2O	12/17/22	6/7/23	MW
		11460 11339	D9-N- EtFose		01/27/27 01/27/27	10/12/23		200uL						
		11115	M2- PFHQDA		11/23/28	08/23/23		40uL						
		10836	D-N EtFosa		12/30/25	08/23/23		40uL						
LCMS 2026	(Spike) FULL List Std.	11447	PROA- NONL28	Absolute	08/10/27	11/29/23	1.0ppm	400uL	4.0mL	100ppb	95% MeOH 5% H2O	12/10/22	05/14/23	NG
		1987	HOUS1 ADON#1			02/21/23	1.0ppm	400uL		100ppb				NG
		1986	HOUS1 ADON#2			04/18/23	1.0ppm	400uL		100ppb				NG
		2012	FOSF Std.			05/11/23	5.0ppm	400uL		500ppb				NG
LCMS 2027	(Spike) 1633 CAL Std.	10855F	PFAC- MXH	Wellington Labs	09/14/26	11/04/23	1-4 ppm	250uL	4mL	62.5/16350 ppb	1633 Mix	12/12/22	05/14/23	NG
		10853F	PFAC- MIXE		09/14/26	11/22/23	1-10 ppm	250uL		62.5/1635 ppb				NG
		11493A	PFAC- MIXE		05/04/23	11/29/23	2 ppm	500uL		250ppb				NG
		10854F	PFAC- MXG		03/04/25	11/22/23	2 ppm	250uL		125ppb				NG
		10855E	PFAC- MXS		10/10/23	11/22/23	4-20 ppm	312uL		312/1160 ppb				NG
LCMS 2028	5371 DW Std.	11447	PROA-DUB CARCENES	Absolute	05/10/27	11/29/23	1.0ppm	400uL	4mL	100ppb	96% MeOH 4% H2O	12/15/22	02/24/23	NG
		1950	S37.1 DW SMC			02/24/23	10/2.0 ppm	400uL		100/1000 ppb				NG

* based on date opened as specified in each SGS - Orlando SOP.

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MW Continued next page MW 12/13/22



10853



WELLINGTON
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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXI

**Native Perfluorooctanesulfonamide
and Perfluorooctanesulfonamidoethanol
Solution/Mixture**

PRODUCT CODE: PFAC-MXI
LOT NUMBER: PFACMXI0921
SOLVENT(S): Methanol
DATE PREPARED: (mm/dd/yyyy) 09/08/2021
LAST TESTED: (mm/dd/yyyy) 09/14/2021
EXPIRY DATE: (mm/dd/yyyy) 09/14/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXI is a solution/mixture of two native perfluorooctanesulfonamides (FOSAs) and two native perfluorooctanesulfonamidoethanols (FOSEs). The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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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

Form#: 13, Issued 2004-11-10
Revision#: 3, Revised 2020-12-23


PFACMXI0921 (1 of 5)
rev0

7.9.1

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Table A: PFAC-MXI; Components and Concentrations (µg/mL; ± 5% in methanol)

Compound	Acronym	Concentration (µg/mL)	Peak Assignment in Figure 1
N-methylperfluoro-1-octanesulfonamide	N-MeFOSA	1.00	B
N-ethylperfluoro-1-octanesulfonamide	N-EtFOSA	1.00	D
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	N-MeFOSE	10.0	A
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	N-EtFOSE	10.0	C

Certified By: 
 B.G. Chittim, General Manager

Date: 09/23/2021
(mm/dd/yyyy)

Form#: 13, Issued 2004-11-10
 Revision#: 9, Revised 2020-12-23

PFACMXI0921 (3 of 5)
 rev0

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG

Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXG
<u>LOT NUMBER:</u>	PFACMXG1219
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	12/03/2019
<u>LAST TESTED:</u> (mm/dd/yyyy)	05/04/2020
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	05/04/2025
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 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 acids to their respective methyl esters.

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Revision#:9, Revised 2020-12-23

PFACMXG1219 (1 of 5)
rev2

7.9.1

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INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) is 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, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(x_i)^2}$$

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 $\pm 5\%$ (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; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).




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

Table A: PFAC-MXG; Components and Concentrations (ng/mL; ± 5% in methanol/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 07/30/2021
(mm/dd/yyyy)

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXH

Native Per- and Poly-fluoroalkyl Substance
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXH
<u>LOT NUMBER:</u>	PFACMXH0921
<u>SOLVENT(S):</u>	Methanol / Isopropanol (2%) / Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/09/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXH is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), eight native perfluoroalkanesulfonates (C₄, C₅, C₇, C₉, C₁₀ and C₁₂ linear; C₈ and C₈ linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Table B: Isomeric Components and Percent Composition of br-NMeFOSAA
- Table C: Isomeric Components and Percent Composition of br-NEtFOSAA
- Table D: Isomeric Components and Percent Composition of PFHxSK
- Table E: Isomeric Components and Percent Composition of PFOSK
- Figure 1: LC/MS Data (SIR)
- 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 acids to their respective methyl esters.

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Form#:13, Issued 2004-11-10
Revision#:9, Revised 2020-12-23

PFACMXH0921 (1 of 11)
rev0

7.9.1

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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 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, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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 $\pm 5\%$ (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; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



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

Table A: PFAC-MXH; Components and Concentrations (µg/mL, ± 5% in methanol / isopropanol (2%) / water (<1%))

Compound	Acronym	Concentration* (µg/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-butanoic acid	PFBA	4.00		1
Perfluoro-n-pentanoic acid	PFPeA	2.00		2
Perfluoro-n-hexanoic acid	PFHxA	1.00		5
Perfluoro-n-heptanoic acid	PFHpA	1.00		7
Perfluoro-n-octanoic acid	PFOA	1.00		11
Perfluoro-n-nonanoic acid	PFNA	1.00		14
Perfluoro-n-decanoic acid	PFDA	1.00		18
Perfluoro-n-undecanoic acid	PFUdA	1.00		23
Perfluoro-n-dodecanoic acid	PFDoA	1.00		26
Perfluoro-n-tridecanoic acid	PFTrDA	1.00		27
Perfluoro-n-tetradecanoic acid	PFTeDA	1.00		29
Perfluoro-1-octanesulfonamide	FOSA	1.00		25
N-methylperfluorooctanesulfonamidoacetic acid ^a	N-MeFOSAA: linear isomer	0.760		20
	N-MeFOSAA: ∑ branched isomers	0.240		17
N-ethylperfluorooctanesulfonamidoacetic acid ^b	N-EtFOSAA: linear isomer	0.775		22
	N-EtFOSAA: ∑ branched isomers	0.225		21
Compound	Acronym	Concentration* (µg/mL)		Peak Assignment in Figure 1
Potassium perfluoro-1-butanedisulfonate	L-PFBS	1.00	0.887	
Sodium perfluoro-1-pentadisulfonate	L-PFPeS	1.00	0.941	6
Potassium perfluorohexanedisulfonate ^c	PFHxSK: linear isomer	0.811	0.741	9
	PFHxSK: ∑ branched isomers	0.189	0.173	8
Sodium perfluoro-1-heptadisulfonate	L-PFHpS	1.00	0.953	12
Potassium perfluorooctanedisulfonate ^d	PFOSK: linear isomer	0.788	0.732	15
	PFOSK: ∑ branched isomers	0.211	0.196	13
Sodium perfluoro-1-nonadisulfonate	L-PFNS	1.00	0.962	19
Sodium perfluoro-1-decanedisulfonate	L-PFDS	1.00	0.965	24
Sodium perfluoro-1-dodecanedisulfonate	L-PFDoS	1.00	0.970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	4.00	3.75	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	4.00	3.80	10
Sodium 1H,1H,2H,2H-perfluorodecanedisulfonate	8:2FTS	4.00	3.84	16

^a See Table B for percent composition of linear and branched N-MeFOSAA isomers.
^b See Table C for percent composition of linear and branched N-EtFOSAA isomers.
^c See Table D for percent composition of linear and branched PFHxSK isomers.
^d See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: 
 B.G. Chittim, General Manager

Date: 09/23/2021
(mm/dd/yyyy)

rec'd 10/31/22 11492



**WELLINGTON
LABORATORIES**

**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

PFAC-MXJ

**Native X:3 Fluorotelomer Carboxylic
Acid Solution/Mixture**

<u>PRODUCT CODE:</u>	PFAC-MXJ
<u>LOT NUMBER:</u>	PFACMXJ0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXJ is a solution/mixture of three native X:3 fluorotelomer carboxylic acids. The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Form#:13, Issued 2004-11-10
Revision#:9, Revised 2020-12-23

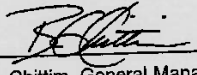
PFACMXJ0921 (1 of 5)
rev1

7.9.1

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Table A: PFAC-MXJ; Components and Concentrations ($\mu\text{g}/\text{mL}$; $\pm 5\%$ in methanol)

Compound	Acronym	Concentration ($\mu\text{g}/\text{mL}$)
3-Perfluoropropyl propanoic acid	FPrPA	4.00
3-Perfluoropentyl propanoic acid	FPePA	20.0
3-Perfluoroheptyl propanoic acid	FHpPA	20.0

Certified By: 
 B.G. Chittim, General Manager

Date: 10/02/2021
(mm/dd/yyyy)

11579 A-B
rec'd 12/27/22



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF

Native Replacement PFAS
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXF
<u>LOT NUMBER:</u>	PFACMXF0122
<u>SOLVENT(S):</u>	Methanol / Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	01/10/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	01/11/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	01/11/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonoate (NaDONA), the major and minor components of F-53B (9Cl-PF3ONS and 11Cl-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Figure 1: LC/MS Data (SIR)
- 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.

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PFACMXF0122 (1 of 5)
rev0

7.9.1

7

Table A: PFAC-MXF; Components and Concentrations (ng/mL; \pm 5% in Methanol/Water (<1%))

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

11599
rec'd 01/10/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXH

Native PFAS
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXH
<u>LOT NUMBER:</u>	PFACMXH0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (2%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	08/05/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/08/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/08/2027
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXH is a solution/mixture of 11 native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), eight native perfluoroalkanesulfonates (C₄, C₆, C₇, C₉, C₁₀ and C₁₂ linear; C₆ and C₈ linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of N-MeFOSAA
Table C: Isomeric Components and Percent Composition of N-EtFOSAA
Table D: Isomeric Components and Percent Composition of PFHxSK
Table E: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
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 acids to their respective methyl esters.

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PFACMXH0822 (1 of 11)
rev0

7.9.1

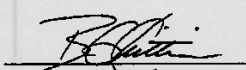
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Table A: PFAC-MXH; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (2%)/water (<1%))

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-butanoic acid	PFBA	4000		1
Perfluoro-n-pentanoic acid	PFPeA	2000		2
Perfluoro-n-hexanoic acid	PFHxA	1000		5
Perfluoro-n-heptanoic acid	PFHpA	1000		7
Perfluoro-n-octanoic acid	PFOA	1000		11
Perfluoro-n-nonanoic acid	PFNA	1000		14
Perfluoro-n-decanoic acid	PFDA	1000		18
Perfluoro-n-undecanoic acid	PFUDA	1000		24
Perfluoro-n-dodecanoic acid	PFDoA	1000		26
Perfluoro-n-tridecanoic acid	PFTrDA	1000		27
Perfluoro-n-tetradecanoic acid	PFTeDA	1000		29
Perfluoro-1-octanesulfonamide	FOSA	1000		23
N-methylperfluorooctanesulfonamidoacetic acid ^a	N-MeFOSAA: linear isomer	760		20
	N-MeFOSAA: ∑ branched isomers	240		17
N-ethylperfluorooctanesulfonamidoacetic acid ^b	N-EtFOSAA: linear isomer	775		22
	N-EtFOSAA: ∑ branched isomers	225		21
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro-1-butanesulfonate	L-PFBS	1000	887	3
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	1000	941	6
Potassium perfluorohexanesulfonate ^c	PFHxSK: linear isomer	811	741	9
	PFHxSK: ∑ branched isomers	189	173	8
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	1000	953	12
Potassium perfluorooctanesulfonate ^d	PFOSK: linear isomer	788	732	15
	PFOSK: ∑ branched isomers	211	196	13
Sodium perfluoro-1-nonanesulfonate	L-PFNS	1000	962	19
Sodium perfluoro-1-decanesulfonate	L-PFDS	1000	965	25
Sodium perfluoro-1-dodecanesulfonate	L-PFDoS	1000	970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	4000	3750	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	4000	3800	10
Sodium 1H,1H,2H,2H-perfluorodecanesulfonate	8:2FTS	4000	3840	16

^a See Table B for percent composition of linear and branched N-MeFOSAA isomers.
^b See Table C for percent composition of linear and branched N-EtFOSAA isomers.
^c See Table D for percent composition of linear and branched PFHxSK isomers.
^d See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: 
 B.G. Chittim, General Manager

Date: 08/09/2022
(mm/dd/yyyy)

11600
rec'd 01/10/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXI

Native Perfluorooctanesulfonamide and Perfluorooctanesulfonamidoethanol Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXI
<u>LOT NUMBER:</u>	PFACMXI0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXI is a solution/mixture of two native perfluorooctanesulfonamides (FOSAs) and two native perfluorooctanesulfonamidoethanols (FOSEs). The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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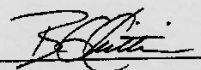
PFACMXI0921 (1 of 5)
rev0

7.9.1

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Table A: PFAC-MXI; Components and Concentrations (µg/mL; ± 5% in methanol)

Compound	Acronym	Concentration (µg/mL)	Peak Assignment in Figure 1
N-methylperfluoro-1-octanesulfonamide	N-MeFOSA	1.00	B
N-ethylperfluoro-1-octanesulfonamide	N-EtFOSA	1.00	D
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	N-MeFOSE	10.0	A
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	N-EtFOSE	10.0	C

Certified By: 
 B.G. Chittim, General Manager

Date: 09/23/2021
(mm/dd/yyyy)

Form# 13, Issued 2004-11-10
 Revision# 9, Revised 2020-12-23

11602
rec'd 01/10/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG

**Native Perfluoroalkyl Ether Carboxylic
Acids and Sulfonate Solution/Mixture**

<u>PRODUCT CODE:</u>	PFAC-MXG
<u>LOT NUMBER:</u>	PFACMXG1122
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	11/30/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	12/01/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	12/01/2027
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 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 acids to their respective methyl esters.

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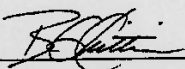
PFACMXG1122 (1 of 5)
revD

7.9.1
7

Table A: PFAC-MXG; Components and Concentrations (ng/mL; ± 5% in methanol/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 12/09/2022
(mm/dd/yyyy)

11603
rec'd: 01/10/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXJ

Native X:3 Fluorotelomer Carboxylic
Acid Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXJ
<u>LOT NUMBER:</u>	PFACMXJ0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXJ is a solution/mixture of three native X:3 fluorotelomer carboxylic acids. The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.


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7.9.1
7

Table A: PFAC-MXJ; Components and Concentrations (µg/mL; ± 5% in methanol)

Compound	Acronym	Concentration (µg/mL)
3-Perfluoropropyl propanoic acid	FPrPA	4.00
3-Perfluoropentyl propanoic acid	FPePA	20.0
3-Perfluoroheptyl propanoic acid	FHpPA	20.0

Certified By: 
B.G. Chittim, General Manager

Date: 10/02/2021
(mm/dd/yyyy)

11617 A-B rec'd 01/19/23



WELLINGTON
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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXF

**Native Replacement PFAS
Solution/Mixture**

PRODUCT CODE: PFAC-MXF
LOT NUMBER: PFACMXF0122
SOLVENT(S): Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 01/10/2022
LAST TESTED: (mm/dd/yyyy) 01/11/2022
EXPIRY DATE: (mm/dd/yyyy) 01/11/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9CI-PF3ONS and 11CI-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
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.

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Form# 13, Issued 2004-11-10
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PFACMXF0122 (1 of 5)
revD

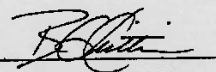
7.9.1

7

Table A: PFAC-MXF; Components and Concentrations (ng/mL; ± 5% in Methanol/Water (<1%))

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: 
 B.G. Chittim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

11618 A-B rec'd 01/19/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXJ

Native X:3 Fluorotelomer Carboxylic
Acid Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXJ
<u>LOT NUMBER:</u>	PFACMXJ0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXJ is a solution/mixture of three native X:3 fluorotelomer carboxylic acids. The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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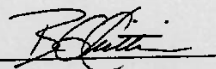
PFACMXJ0921 (1 of 5)
rev1

7.9.1
7

Table A: PFAC-MXJ; Components and Concentrations ($\mu\text{g/mL}$; $\pm 5\%$ in methanol)

Compound	Acronym	Concentration ($\mu\text{g/mL}$)
3-Perfluoropropyl propanoic acid	FPrPA	4.00
3-Perfluoropentyl propanoic acid	FPePA	20.0
3-Perfluoroheptyl propanoic acid	FHpPA	20.0

Certified By:



B.G. Chittim, General Manager

Date: 10/02/2021
(mm/dd/yyyy)

11627 A-B
rec'd 01/26/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF

Native Replacement PFAS
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXF
<u>LOT NUMBER:</u>	PFACMXF0122
<u>SOLVENT(S):</u>	Methanol / Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	01/10/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	01/11/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	01/11/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9Cl-PF3ONS and 11Cl-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Figure 1: LC/MS Data (SIR)
- 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.

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Revision#:9, Revised 2020-12-23


PFACMXF0122 (1 of 5)
rev0

7.9.1
7

Table A: PFAC-MXF; Components and Concentrations (ng/mL; ± 5% in Methanol/Water (<1%))

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

11628 A-B
rec'd 01/26/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXJ

Native X:3 Fluorotelomer Carboxylic
Acid Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXJ
<u>LOT NUMBER:</u>	PFACMXJ0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXJ is a solution/mixture of three native X:3 fluorotelomer carboxylic acids. The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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PFACMXJ0921 (1 of 5)
rev1

7.9.1

7

Table A: PFAC-MXJ; Components and Concentrations ($\mu\text{g}/\text{mL}$; $\pm 5\%$ in methanol)

Compound	Acronym	Concentration ($\mu\text{g}/\text{mL}$)
3-Perfluoropropyl propanoic acid	FPrPA	4.00
3-Perfluoropentyl propanoic acid	FPePA	20.0
3-Perfluoroheptyl propanoic acid	FHpPA	20.0

Certified By: 
B.G. Chittim, General Manager

Date: 10/02/2021
(m/m/dd/yyyy)

11638
rec'd 02/06/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXH

Native PFAS
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXH
<u>LOT NUMBER:</u>	PFACMXH0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (2%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	08/05/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/08/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/08/2027
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoules

DESCRIPTION:

PFAC-MXH is a solution/mixture of 11 native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), eight native perfluoroalkanesulfonates (C₄, C₅, C₇, C₈, C₁₀ and C₁₂ linear; C₆ and C₈ linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Table B: Isomeric Components and Percent Composition of N-MeFOSAA
- Table C: Isomeric Components and Percent Composition of N-EtFOSAA
- Table D: Isomeric Components and Percent Composition of PFHxSK
- Table E: Isomeric Components and Percent Composition of PFOSK
- Figure 1: LC/MS Data (SIR)
- 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 acids to their respective methyl esters.

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PFACMXH0822 (1 of 11)
rev0

7.9.1
7

Table A: PFAC-MXH; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (2%)/water (<1%))

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-butanoic acid	PFBA	4000		1
Perfluoro-n-pentanoic acid	PFPeA	2000		2
Perfluoro-n-hexanoic acid	PFHxA	1000		5
Perfluoro-n-heptanoic acid	PFHpA	1000		7
Perfluoro-n-octanoic acid	PFOA	1000		11
Perfluoro-n-nonanoic acid	PFNA	1000		14
Perfluoro-n-decanoic acid	PFDA	1000		18
Perfluoro-n-undecanoic acid	PFUdA	1000		24
Perfluoro-n-dodecanoic acid	PFDoA	1000		26
Perfluoro-n-tridecanoic acid	PFTrDA	1000		27
Perfluoro-n-tetradecanoic acid	PFTeDA	1000		29
Perfluoro-1-octanesulfonamide	FOSA	1000		23
N-methylperfluorooctanesulfonamidoacetic acid *	N-MeFOSAA: linear isomer	760		20
	N-MeFOSAA: ∑ branched isomers	240		17
N-ethylperfluorooctanesulfonamidoacetic acid *	N-EtFOSAA: linear isomer	775		22
	N-EtFOSAA: ∑ branched isomers	225		21
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro-1-butanedisulfonate	L-PFBS	1000	887	3
Sodium perfluoro-1-pentadisulfonate	L-PFPeS	1000	941	6
Potassium perfluorohexadisulfonate *	PFHxSK: linear isomer	811	741	9
	PFHxSK: ∑ branched isomers	189	173	8
Sodium perfluoro-1-heptadisulfonate	L-PFHpS	1000	953	12
Potassium perfluorooctadisulfonate *	PFOSK: linear isomer	788	732	15
	PFOSK: ∑ branched isomers	211	196	13
Sodium perfluoro-1-nonadisulfonate	L-PFNs	1000	962	19
Sodium perfluoro-1-decadisulfonate	L-PFDs	1000	965	25
Sodium perfluoro-1-dodecadisulfonate	L-PFDcS	1000	970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	4000	3750	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	4000	3800	10
Sodium 1H,1H,2H,2H-perfluorodecane sulfonate	8:2FTS	4000	3840	16

* See Table B for percent composition of linear and branched N-MeFOSAA isomers.

* See Table C for percent composition of linear and branched N-EtFOSAA isomers.

* See Table D for percent composition of linear and branched PFHxSK isomers.

* See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/09/2022
(mm/dd/yyyy)

11639
rec'd: 02/06/23



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXI

**Native Perfluorooctanesulfonamide
and Perfluorooctanesulfonamidoethanol
Solution/Mixture**

<u>PRODUCT CODE:</u>	PFAC-MXI
<u>LOT NUMBER:</u>	PFACMXI0921
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/08/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/14/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/14/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXI is a solution/mixture of two native perfluorooctanesulfonamides (FOSAs) and two native perfluorooctanesulfonamidoethanols (FOSEs). The components and their concentrations are given in Table A.

The individual components have a chemical purity of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Figure 1: LC/MS Data (SIR)
- Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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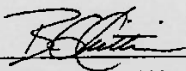
PFACMXI0921 (1 of 5)
rev0

7.9.1
7

Table A: PFAC-MXI; Components and Concentrations ($\mu\text{g/mL}$; $\pm 5\%$ in methanol)

Compound	Acronym	Concentration ($\mu\text{g/mL}$)	Peak Assignment in Figure 1
N-methylperfluoro-1-octanesulfonamide	N-MeFOSA	1.00	B
N-ethylperfluoro-1-octanesulfonamide	N-EtFOSA	1.00	D
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	N-MeFOSE	10.0	A
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	N-EtFOSE	10.0	C

Certified By:


 B.G. Chittim, General Manager

Date: 09/23/2021
(mm/dd/yyyy)

11640 A-B
rec'd: 02/06/23



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF

Native Replacement PFAS
Solution/Mixture

PRODUCT CODE: PFAC-MXF
LOT NUMBER: PFACMXF0122
SOLVENT(S): Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 01/10/2022
LAST TESTED: (mm/dd/yyyy) 01/11/2022
EXPIRY DATE: (mm/dd/yyyy) 01/11/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9CI-PF3ONS and 11CI-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
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.

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PFACMXF0122 (1 of 5)
rev0

7.9.1

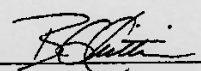
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Table A: PFAC-MXF; Components and Concentrations (ng/mL; ± 5% in Methanol/Water (<1%))

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By:


B.G. Chitrim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

11641
rec'd: 02/06/23



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG

**Native Perfluoroalkyl Ether Carboxylic
Acids and Sulfonate Solution/Mixture**

7.9.1
7

<u>PRODUCT CODE:</u>	PFAC-MXG
<u>LOT NUMBER:</u>	PFACMXG1122
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	11/30/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	12/01/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	12/01/2027
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Figure 1: LC/MS Data (SIR)
- 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 acids to their respective methyl esters.

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Revision#: 9, Revised 2020-12-23

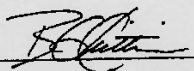
PFACMXG1122 (1 of 5)
rev0

Table A: PFAC-MXG; Components and Concentrations (ng/mL; ± 5% in methanol/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By:


 B.G. Chittim, General Manager

Date: 12/09/2022
(mm/dd/yyyy)

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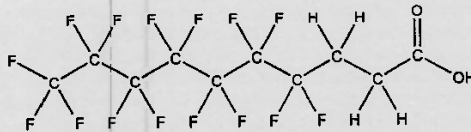
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FHpPA
COMPOUND: 3-Perfluoroheptyl propanoic acid

LOT NUMBER: FHpPA1020

STRUCTURE:

CAS #: 812-70-4



MOLECULAR FORMULA: C₁₀H₉F₁₅O₂
CONCENTRATION: 50.0 ± 2.5 µg/mL
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/12/2020
EXPIRY DATE: (mm/dd/yyyy) 11/12/2025
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 442.12
SOLVENT(S): Methanol

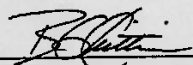
DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: 
B.G. Chittim, General Manager

Date: 11/27/2020
(mm/dd/yyyy)

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FHpPA1020 (1 of 4)
rev0

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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FPrPA

LOT NUMBER:

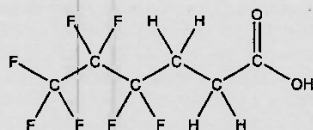
FPrPA1020

COMPOUND:

3-Perfluoropropyl propanoic acid

STRUCTURE:**CAS #:**

356-02-5

**MOLECULAR FORMULA:** $C_6H_5F_7O_2$ **MOLECULAR WEIGHT:**

242.09

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/12/2020

EXPIRY DATE: (mm/dd/yyyy)

11/12/2025

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% of the unsaturated 3:3 telomer acid ($C_8H_5F_7O_2$) as an impurity determined by ^{19}F NMR.

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Certified By:

B.G. Chittim, General Manager

Date: 11/27/2020

(mm/dd/yyyy)

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10685A



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FPePA

LOT NUMBER:

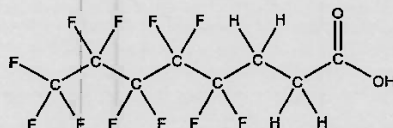
FPePA1120

COMPOUND:

3-Perfluoropentyl propanoic acid

STRUCTURE:**CAS #:**

914637-49-3

**MOLECULAR FORMULA:** $C_8H_5F_{11}O_2$ **MOLECULAR WEIGHT:**

342.11

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/11/2020

EXPIRY DATE: (mm/dd/yyyy)

11/11/2025

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% of the unsaturated 5:3 telomer acid ($C_8H_3F_{11}O_2$) as an impurity determined by ^{19}F NMR.

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Certified By:

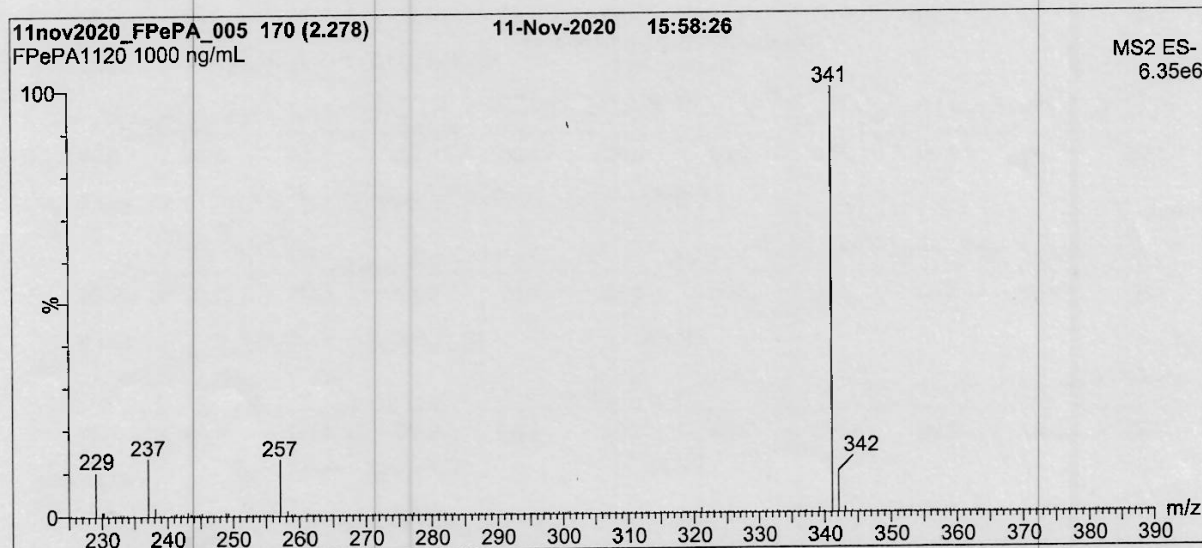
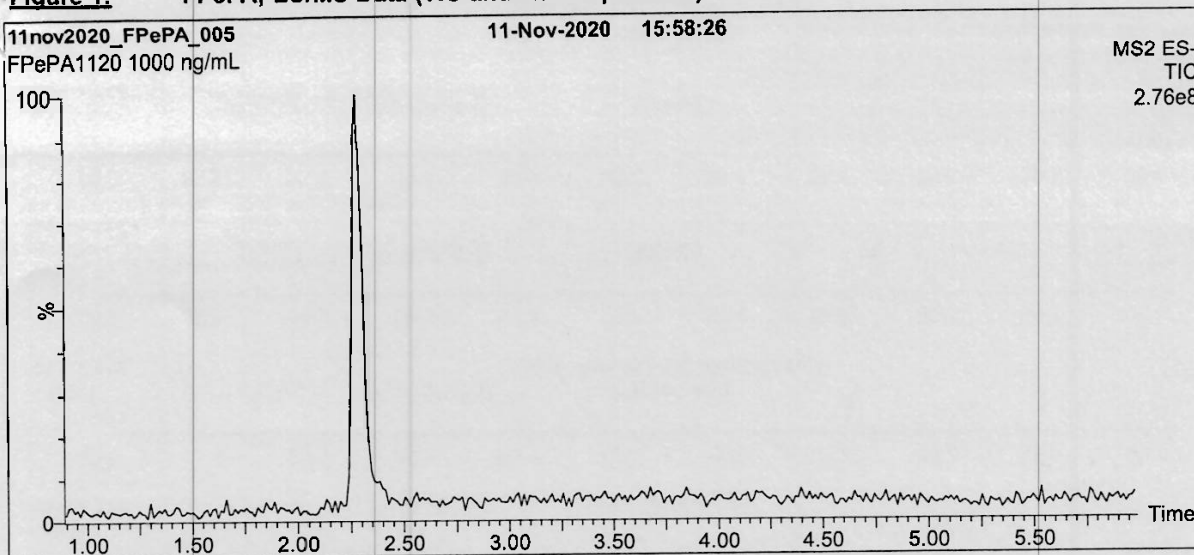
B.G. Chittim, General Manager

Date: 11/27/2020

(mm/dd/yyyy)

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Figure 1: FPePA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{1a}
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% H₂O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc 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) = 18.50
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

10726 A

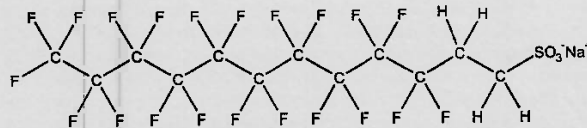


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS0221
COMPOUND: Sodium 1H,1H,2H,2H-perfluorododecanesulfonate

STRUCTURE: **CAS #:** 108026-35-3



MOLECULAR FORMULA: C₁₂H₄F₂₁SO₃Na **MOLECULAR WEIGHT:** 650.18
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt) **SOLVENT(S):** Methanol
48.3 ± 2.4 µg/mL (10:2FTS acid)
48.2 ± 2.4 µg/mL (10:2FTS anion)
CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 03/03/2021
EXPIRY DATE: (mm/dd/yyyy) 03/03/2026
RECOMMENDED STORAGE: Refrigerate ampoule

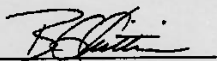
DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan 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:** 03/05/2021
(mm/dd/yyyy)
B.G. Chittim, General Manager

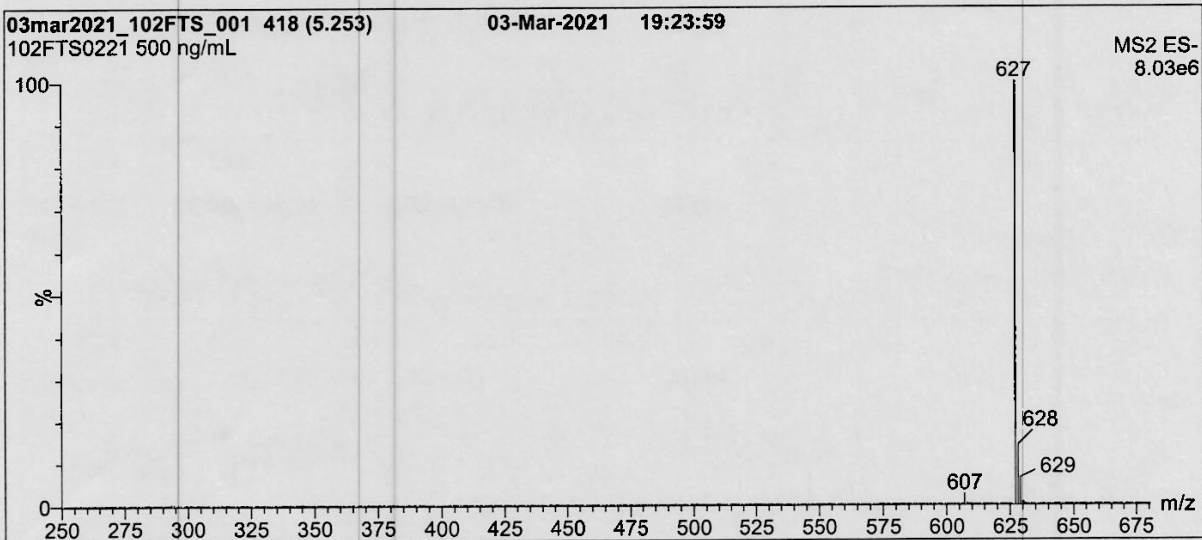
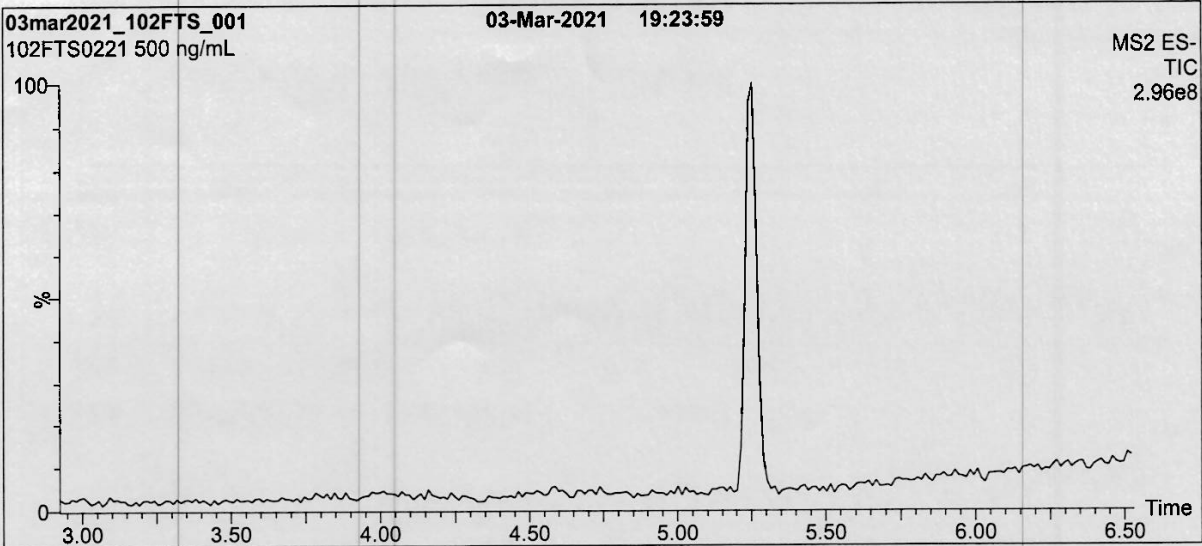
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Revision#: 9, Revised 2020-12-23

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7

Figure 1: 10:2FTS; LC/MS Data (Full Scan and Mass Spectrum)



Conditions for Figure 1:

Waters Acquity Ultra Performance LC
 Waters Xevo TQ-S micro MS

Chromatographic Conditions:
 Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 40% H₂O / 60% (80:20 MeOH:ACN)
 (both with 10 mM NH₄OAc 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 μ L/min

MS Parameters:
 Experiment: Full Scan (250 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 25.00
 Desolvation Temperature ($^{\circ}$ C) = 500
 Desolvation Gas Flow (L/hr) = 1000

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 Revision#: 9, Revised 2020-12-23

10762 A-B



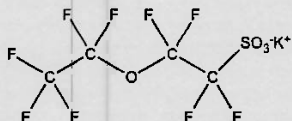
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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFEESA *rec'd
8/20/21
WPH* **LOT NUMBER:** PFEESA0520

COMPOUND: Potassium perfluoro(2-ethoxyethane)sulfonate

STRUCTURE: **CAS #:** 117205-07-9



MOLECULAR FORMULA: C₄F₈SO₄K **MOLECULAR WEIGHT:** 354.19

CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt) **SOLVENT(S):** Methanol

44.6 ± 2.2 µg/ml (PFEESA acid)

44.5 ± 2.2 µg/ml (PFEESA anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 05/13/2020

EXPIRY DATE: (mm/dd/yyyy) 05/13/2025

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

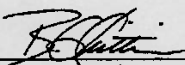
Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of perfluoro-n-octanoic acid (PFOA).

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Certified By:  **Date:** 05/29/2020
(mm/dd/yyyy)
 B.G. Chittim, General Manager

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 Revision#:7, Revised 2020-01-09

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10763 A-B



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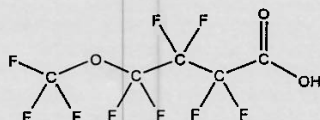
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PF5OHxA *res'd with 8/20/21* **LOT NUMBER:** PF5OHxA0320

COMPOUND: Perfluoro-5-oxahexanoic acid

SYNONYM: Perfluoro-4-methoxybutanoic acid (PFMBA)

STRUCTURE: **CAS #:** 863090-89-5



MOLECULAR FORMULA: C₅HF₉O₃ **MOLECULAR WEIGHT:** 280.05

CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 03/31/2020

EXPIRY DATE: (mm/dd/yyyy) 03/31/2025

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

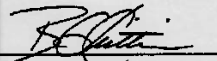
DOCUMENTATION/ DATA ATTACHED:

- 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: 
B.G. Chittim, General Manager

Date: 12/21/2020
(mm/dd/yyyy)

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Form#: 27, Issued 2004-11-10
Revision#: 8, Revised 2020-09-10

PF5OHxA0320 (1 of 4)
rev1

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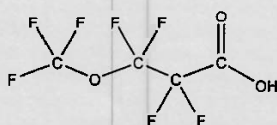
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PF4OPeA *rec'd
WPH
8/20/21* **LOT NUMBER:** PF4OPeA0320

COMPOUND: Perfluoro-4-oxapentanoic acid

SYNONYM: Perfluoro-3-methoxypropanoic acid (PFMPA)

STRUCTURE: **CAS #:** 377-73-1



MOLECULAR FORMULA: C₄HF₇O₃ **MOLECULAR WEIGHT:** 230.04

CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 03/31/2020

EXPIRY DATE: (mm/dd/yyyy) 03/31/2025

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

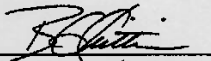
DOCUMENTATION/ DATA ATTACHED:

- 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: 
B.G. Chittim, General Manager

Date: 12/21/2020
(mm/dd/yyyy)

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PF4OPeA0320 (1 of 4)
rev1

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7

10765 A-13



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

3,6-OPFHpA

*rec'd
WPH
8/20/21*

LOT NUMBER:

36OPFHpA0320

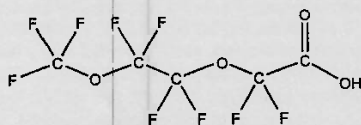
COMPOUND:

Perfluoro-3,6-dioxaheptanoic acid

STRUCTURE:

CAS #:

151772-58-6



MOLECULAR FORMULA:

C₆HF₉O₄

MOLECULAR WEIGHT:

296.04

CONCENTRATION:

50.0 ± 2.5 µg/ml

SOLVENT(S):

Methanol
Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/31/2020

EXPIRY DATE: (mm/dd/yyyy)

03/31/2025

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.

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Certified By:

B.G. Chittim, General Manager

Date: 05/27/2020
(mm/dd/yyyy)

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10829



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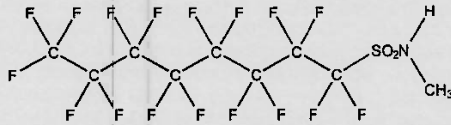
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0721M

STRUCTURE:

CAS #: 31506-32-8



rec'd
WPA
10/5/21

MOLECULAR FORMULA: C₈H₄F₁₇NO₂S
CONCENTRATION: 50.0 ± 2.5 µg/mL
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/03/2021
EXPIRY DATE: (mm/dd/yyyy) 08/03/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 513.17
SOLVENT(S): Methanol

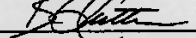
DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
- Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: 
B.G. Chittim, General Manager

Date: 08/04/2021
(mm/dd/yyyy)

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Revision#:9, Revised 2020-12-23

NMeFOSA0721M (1 of 4)
rev0

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PRODUCT CODE:

N-EtFOSA-M

10837

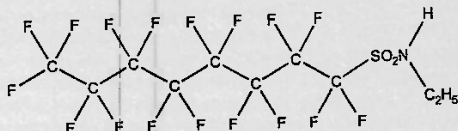
LOT NUMBER: NEtFOSA0821M

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA:

C₁₀H₉F₁₇NO₂S

MOLECULAR WEIGHT:

527.20

CONCENTRATION:

50.0 ± 2.5 µg/mL

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/12/2021

EXPIRY DATE: (mm/dd/yyyy)

08/12/2026

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By:

B.G. Chittim, General Manager

Date: 08/16/2021

(mm/dd/yyyy)

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10

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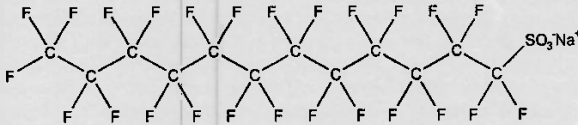
10840

PRODUCT CODE: L-PFDoS
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

LOT NUMBER: LPFDoS0721

STRUCTURE:

CAS #: 1260224-54-1



MOLECULAR FORMULA: C₁₂F₂₅SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt)
48.5 ± 2.4 µg/mL (PFDoS acid)
48.4 ± 2.4 µg/mL (PFDoS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/09/2021
EXPIRY DATE: (mm/dd/yyyy) 07/09/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 722.14
SOLVENT(S): Methanol


DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
- Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.2% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager
Date: 07/16/2021
(mm/dd/yyyy)

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PRODUCT CODE:

PFODA

10847 NS 01/18/23

LOT NUMBER:

PFODA0821

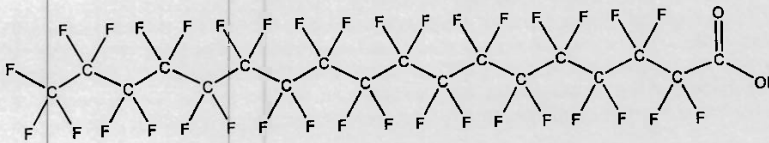
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C₁₈H₃₅O₂

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

50.0 ± 2.5 µg/mL

SOLVENT(S):

Methanol
Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/03/2021

EXPIRY DATE: (mm/dd/yyyy)

09/03/2026

RECOMMENDED STORAGE:

Store ampoule at ambient temperature in a dark place

DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan 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.
- The solubility of this product in methanol is very sensitive to storage conditions and solvent composition. The stated validity period applies to the sealed ampoules stored at ambient temperature.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/28/2021

(mm/dd/yyyy)

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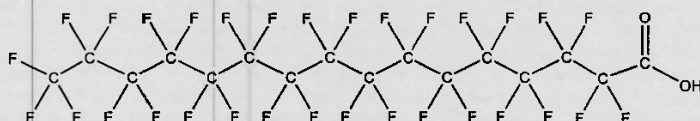
CERTIFICATE OF ANALYSIS DOCUMENTATION

10842 * NG 01/18/23

PRODUCT CODE: PFHxDA **LOT NUMBER:** PFHxDA0421

COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE: **CAS #:** 67905-19-5



MOLECULAR FORMULA: C₁₆HF₃₁O₂ **MOLECULAR WEIGHT:** 814.13
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/07/2021
EXPIRY DATE: (mm/dd/yyyy) 05/07/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

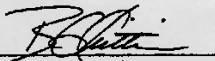
DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
- Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 05/25/2021
 B.G. Chittim, General Manager (mm/dd/yyyy)

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PFHxDA0421 (1 of 4)
 rev0

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7

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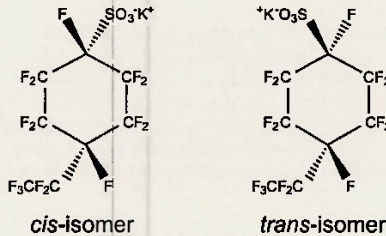


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFECHS **LOT NUMBER:** PFECHS1021
COMPOUND: Potassium perfluoro-4-ethylcyclohexanesulfonate (isomeric mixture)

STRUCTURE: **CAS #:** 335-24-0



MOLECULAR FORMULA: C₈F₁₆SO₃K **MOLECULAR WEIGHT:** 500.22
CONCENTRATION: 50.0 ± 2.5 µg/mL (K salt) **SOLVENT(S):** Methanol
 46.2 ± 2.3 µg/mL (PFECHS acid)
 46.1 ± 2.3 µg/mL (PFECHS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/14/2021
EXPIRY DATE: (mm/dd/yyyy) 10/14/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

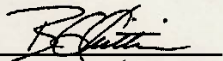
DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan 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 1:1.27 (*cis:trans*).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 10/15/2021
(mm/dd/yyyy)

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 Revision#:9, Revised 2020-12-23

PFECHS1021 (1 of 4)
 rev0

7.9.1

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11140



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFPrS

LOT NUMBER:

LPFPrS0721

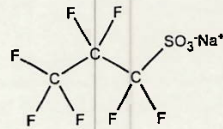
COMPOUND:

Sodium perfluoro-1-propanesulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₃F₇SO₃Na

MOLECULAR WEIGHT:

272.07

CONCENTRATION:

50.0 ± 2.5 µg/mL (Na salt)

46.0 ± 2.3 µg/mL (PFPrS acid)

45.8 ± 2.3 µg/mL (PFPrS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/12/2021

EXPIRY DATE: (mm/dd/yyyy)

07/12/2026

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan 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:

B.G. Chittim, General Manager

Date: 08/04/2021

(mm/dd/yyyy)

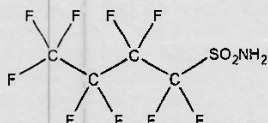
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11224


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CERTIFICATE OF ANALYSIS
 DOCUMENTATION

PRODUCT CODE: FBSA-I **LOT NUMBER:** FBSA11211
COMPOUND: Perfluoro-1-butananesulfonamide **CAS #:** 30334-69-1
STRUCTURE:



MOLECULAR FORMULA: C₄H₂F₉NO₂S **MOLECULAR WEIGHT:** 299.11
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Isopropanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/10/2021
EXPIRY DATE: (mm/dd/yyyy) 11/10/2026
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan 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:

 B.G. Chittim, General Manager

Date: 11/10/2021

(mm/dd/yyyy)

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11225



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FHxSA-I

LOT NUMBER:

FHxSA12211

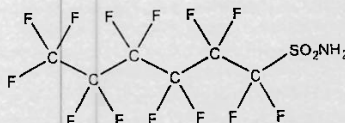
COMPOUND:

Perfluoro-1-hexanesulfonamide

CAS #:

41997-13-1

STRUCTURE:



MOLECULAR FORMULA:

C₆H₂F₁₃NO₂S

MOLECULAR WEIGHT:

399.13

CONCENTRATION:

50.0 ± 2.5 µg/mL

SOLVENT(S):

Isopropanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/29/2021

EXPIRY DATE: (mm/dd/yyyy)

12/29/2026

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan 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:

B.G. Chittim, General Manager

Date: 01/10/2022
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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11338



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSE-M

LOT NUMBER:

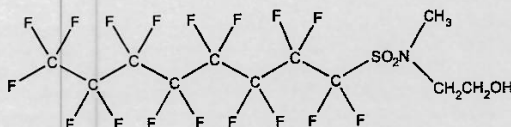
NMeFOSE0522M

COMPOUND:

2-(N-methylperfluoro-1-octanesulfonamido)ethanol

STRUCTURE:**CAS #:**

24448-09-7

**MOLECULAR FORMULA:**C₁₁H₈F₁₇NO₃S**MOLECULAR WEIGHT:**

557.22

CONCENTRATION:

50.0 ± 2.5 µg/mL

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/13/2022 (HRGC/LRMS)

05/13/2022 (LC/MS)

EXPIRY DATE: (mm/dd/yyyy)

05/13/2027

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)

Figure 2: LC/MS Data (Full Scan 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:

B.G. Chittim, General Manager
Date: 06/14/2022
(mm/dd/yyyy)

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11383 A-J



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CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

**Mass-Labelled PFAS Extraction
Standard Solution/Mixture**

PRODUCT CODE: MPFAC-HIF-ES
LOT NUMBER: MPFACHIFES0822
SOLVENT(S): Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 07/20/2022
LAST TESTED: (mm/dd/yyyy) 08/02/2022
EXPIRY DATE: (mm/dd/yyyy) 08/02/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4 - C_{12} , C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4 , C_6 , and C_8), three mass-labelled (one ^{13}C and two ^2H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^2H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^2H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C -labelled components all have chemical purities >98% and isotopic purities of $\geq 99\%$. The individual ^2H -labelled components all have chemical purities >98% and isotopic purities of $\geq 98\%$.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 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 acids to their respective methyl esters.

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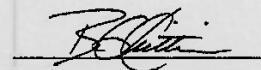
Form# 13, Issued 2004-11-10
 Revision#9, Revised 2020-12-23

MPFACHIFES0822 (1 of 7)
 rev0

Table A: MPFAC-HIF-ES; Components and Concentrations
(ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))

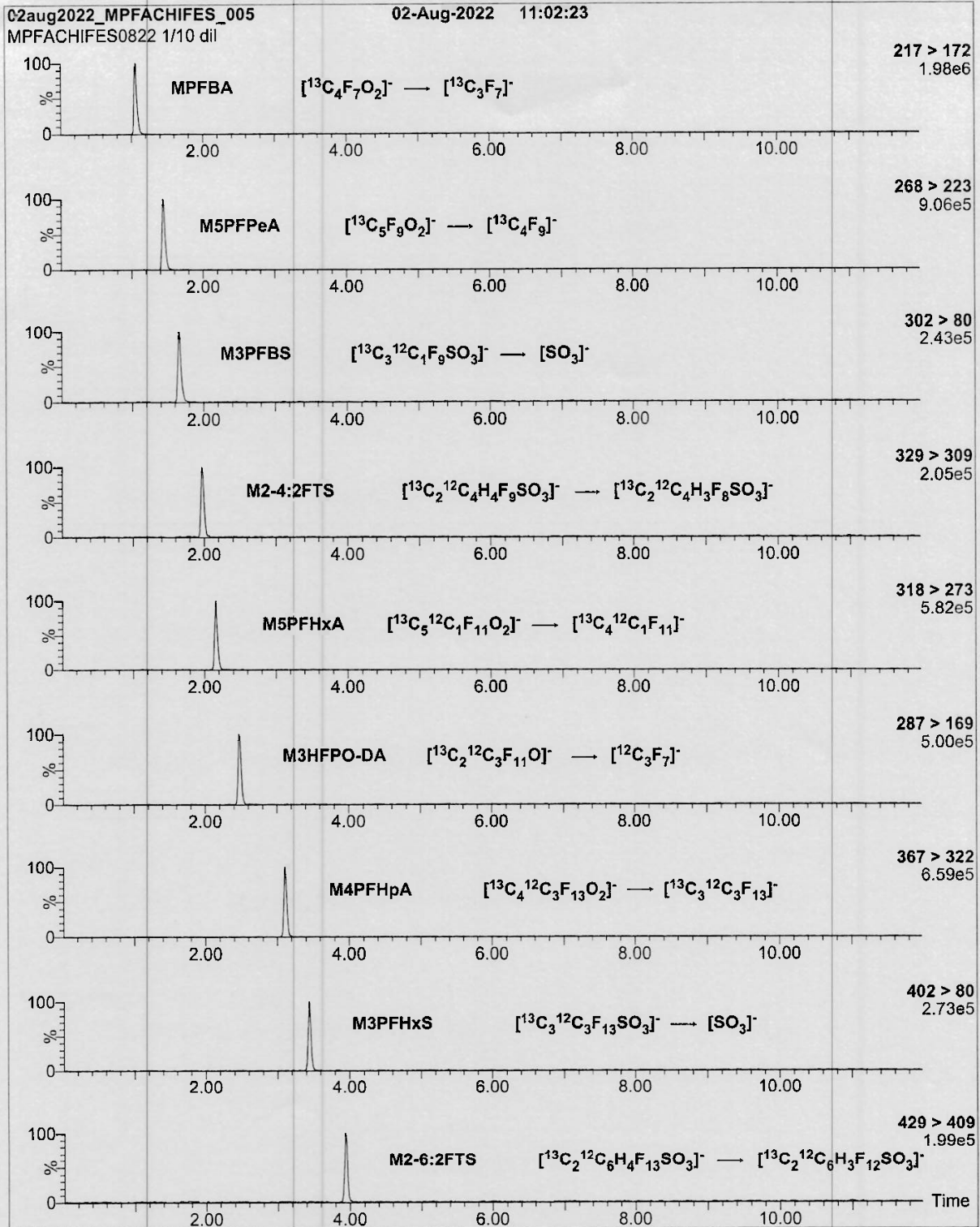
Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(¹³ C ₄)butanoic acid	MPFBA	2000		1
Perfluoro-n-(¹³ C ₅)pentanoic acid	M5PFPeA	1000		2
Perfluoro-n-(1,2,3,4,6- ¹³ C ₅)hexanoic acid	M5PFHxA	500		5
Perfluoro-n-(1,2,3,4- ¹³ C ₆)heptanoic acid	M4PFHpA	500		7
Perfluoro-n-(¹³ C ₈)octanoic acid	M8PFOA	500		10
Perfluoro-n-(¹³ C ₉)nonanoic acid	M9PFNA	250		11
Perfluoro-n-(1,2,3,4,5,6- ¹³ C ₁₀)decanoic acid	M6PFDA	250		14
Perfluoro-n-(1,2,3,4,5,6,7- ¹³ C ₁₁)undecanoic acid	M7PFUdA	250		17
Perfluoro-n-(1,2- ¹³ C ₁₂)dodecanoic acid	MPFDoA	250		19
Perfluoro-n-(1,2- ¹³ C ₁₄)tetradecanoic acid	M2PFTeDA	250		23
Perfluoro-1-(¹³ C ₈)octanesulfonamide	M8FOSA	500		18
N-methyl-d ₃ -perfluoro-1-octanesulfonamide	d-N-MeFOSA	500		21
N-ethyl-d ₅ -perfluoro-1-octanesulfonamide	d-N-EtFOSA	500		24
N-methyl-d ₃ -perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000		15
N-ethyl-d ₅ -perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000		16
2-(N-methyl-d ₃ -perfluoro-1-octanesulfonamido)ethan-d ₃ -ol	d7-N-MeFOSE	5000		20
2-(N-ethyl-d ₅ -perfluoro-1-octanesulfonamido)ethan-d ₅ -ol	d9-N-EtFOSE	5000		22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(¹³ C ₃)propanoic acid	M3HFPO-DA	2000		6
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4- ¹³ C ₃)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3- ¹³ C ₃)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-(¹³ C ₈)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/02/2022
(mm/dd/yyyy)

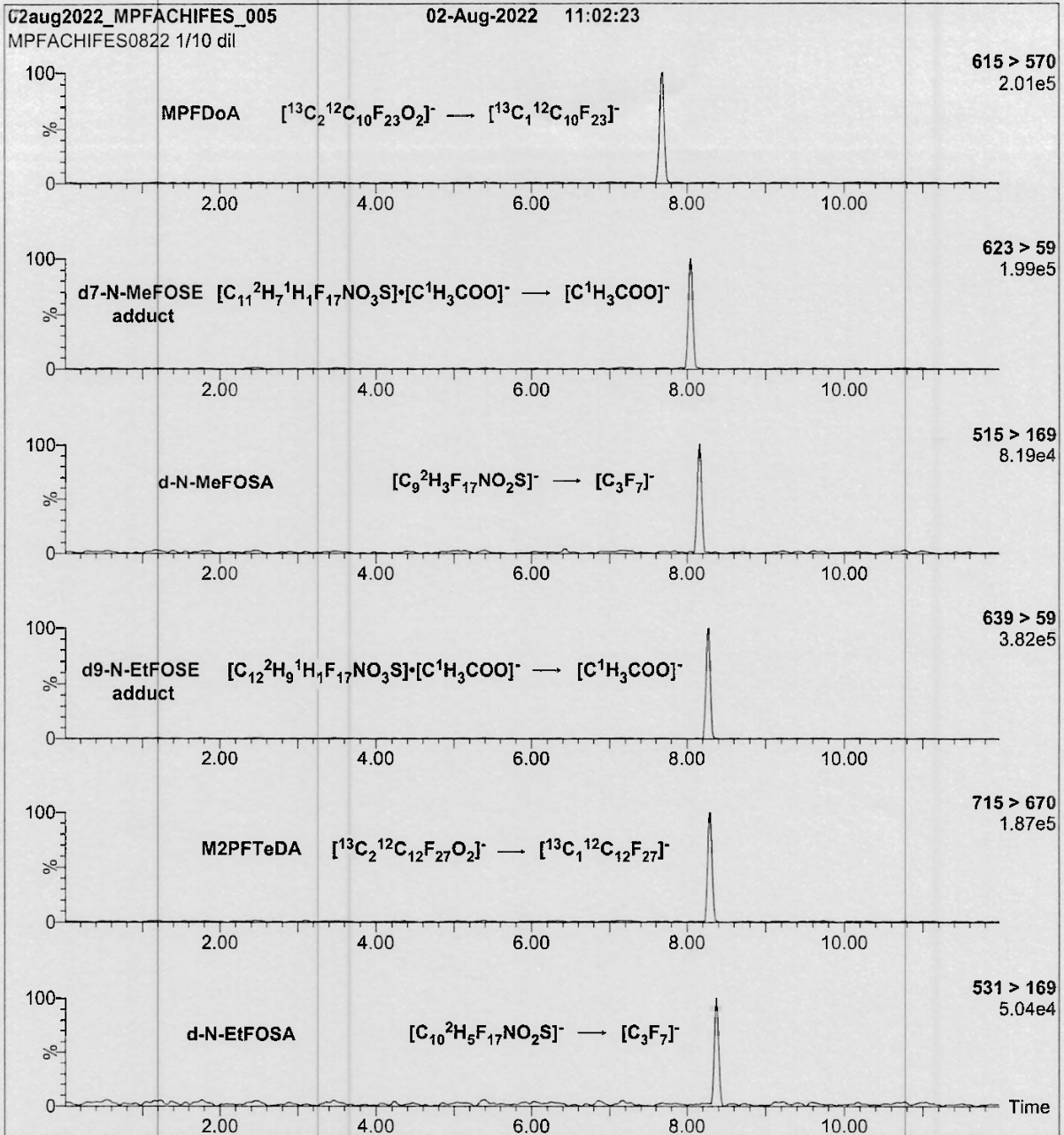
Figure 2: MPFAC-HIF-ES; LC/MS/MS Data (Selected MRM Transitions)



Form# 13, Issued 2004-11-10
Revision#: 9, Revised 2020-12-23

MPFACHIFES0822 (5 of 7)
rev0

Figure 2: MPFAC-HIF-ES; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: On-column (MPFAC-HIF-ES)
 Mobile phase: Same as Figure 1
 Flow: 300 $\mu\text{L}/\text{min}$

MS Parameters:

Collision Gas (mbar) = 3.24e-3
 Collision Energy (eV) = 4-64 (variable)

11384 A-J



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CERTIFICATE OF ANALYSIS DOCUMENTATION

MPFAC-HIF-IS

Mass-Labelled Perfluoroalkyl Substance
Injection Standard Solution/Mixture

<u>PRODUCT CODE:</u>	MPFAC-HIF-IS
<u>LOT NUMBER:</u>	MPFACHIFIS0921
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	09/07/2021
<u>LAST TESTED:</u> (mm/dd/yyyy)	09/07/2021
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	09/07/2026
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

MPFAC-HIF-IS is a solution/mixture of five mass-labelled (¹³C) perfluoroalkylcarboxylic acids (C₄, C₆, C₈-C₁₀) and two mass-labelled (¹⁸O and ¹³C) perfluoroalkanesulfonates (C₈ and C₉). The components and their concentrations are given in Table A.

The individual mass-labelled perfluoroalkylcarboxylic acids and mass-labelled perfluoroalkanesulfonates all have chemical purities of >98% and isotopic purities of ≥99% per ¹³C or >94% per ¹⁸O.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Components and Concentrations of the Solution/Mixture
- Figure 1: LC/MS Data (SIR)
- 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 acids to their respective methyl esters.

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Form#: 13, Issued 2004-11-10
Revision#: 9, Revised 2020-12-23

MPFACHIFIS0921 (1 of 5)
rev1

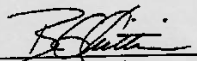
7.9.1

7

Table A: MPFAC-HIF-IS; Components and Concentrations (ng/mL, ± 5% in methanol/water (<1%))

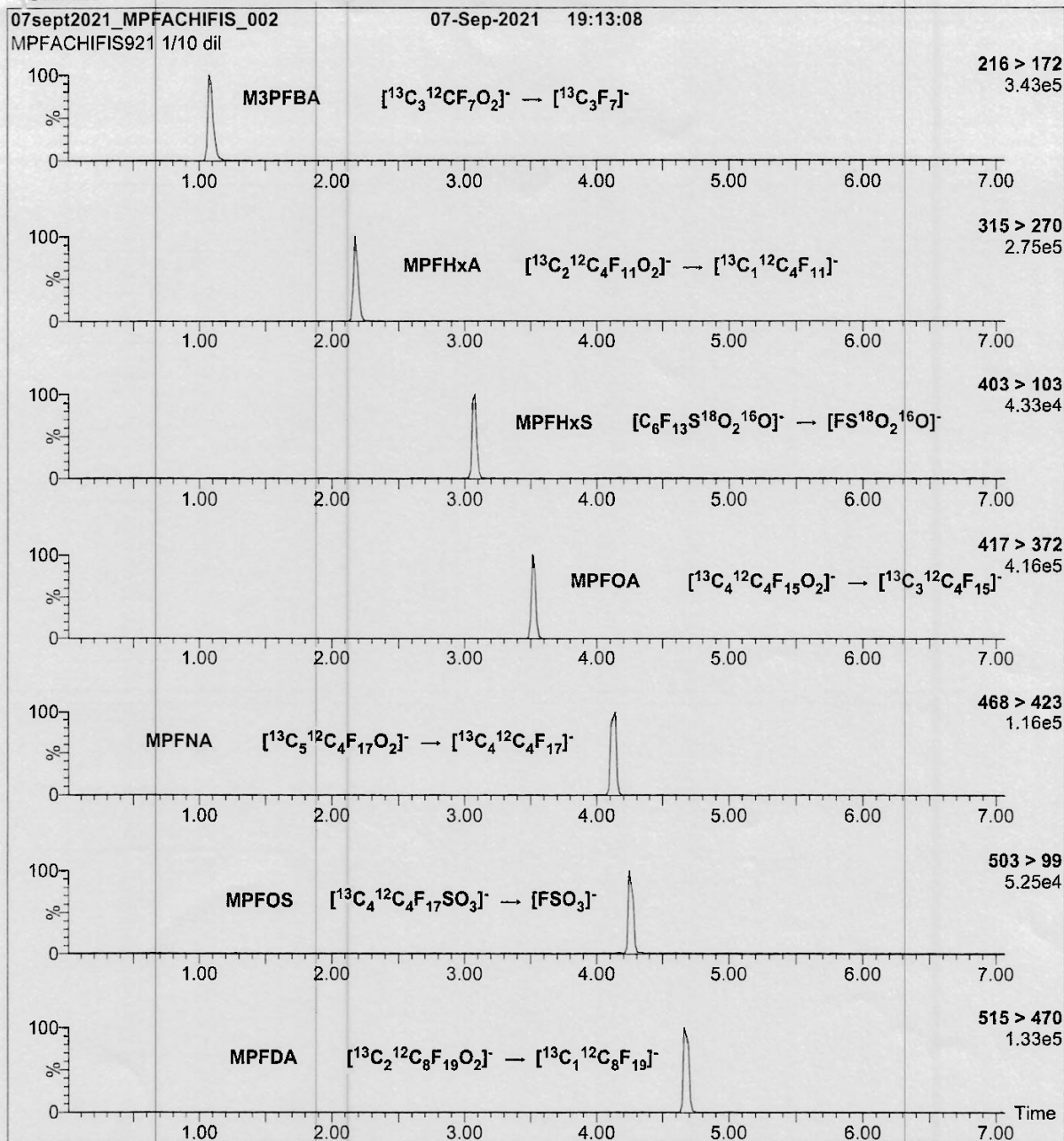
Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(2,3,4- ¹³ C ₃)butanoic acid	M3PFBA	1000		1
Perfluoro-n-(1,2- ¹³ C ₂)hexanoic acid	MPFHxA	500		2
Perfluoro-n-(1,2,3,4- ¹³ C ₄)octanoic acid	MPFOA	500		4
Perfluoro-n-(1,2,3,4,5- ¹³ C ₅)nonanoic acid	MPFNA	250		5
Perfluoro-n-(1,2- ¹³ C ₂)decanoic acid	MPFDA	250		7
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-hexane(¹⁸ O ₂)sulfonate	MPFHxS	500	474	3
Sodium perfluoro-1-(1,2,3,4- ¹³ C ₄)octanesulfonate	MPFOS	500	479	6

* Concentrations have been rounded to three significant figures.

Certified By: 
 B.G. Chittim, General Manager

Date: 10/13/2021
(mm/dd/yyyy)

Figure 2: MPFAC-HIF-IS; LC/MS/MS Data (Selected MRM Transitions)

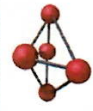


Conditions for Figure 2:

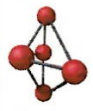
Injection: On-column (MPFAC-HIF-IS)
 Mobile phase: Same as Figure 1
 Flow: 300 $\mu\text{L}/\text{min}$

MS Parameters:

Collision Gas (mbar) = 3.18e-3
 Collision Energy (eV) = 4-64 (variable)



Certified Reference Material CRM
11447



SEMIQUANTITATIVE REPORT

Part Number: 080522
Lot Number: 042722
Description: 28 components
Expiration Date: 06/03/27
Recommender Storage: 1.0
Nominal Concentration (µg/mL): 100.0
NIST Test ID: 907B

Solvent(s): Methanol (1 ml KOH) 2-Propanol (96%)
Low: 042722 (96%)
Date: 23/14 (2%)
SE-05 Balances Uncertainty: 100.0
Flask Uncertainty: 0.012

Formulated By: Prashant Chaturan
Reviewed By: Pedro L. Ramos
DATE: 080522
DATE: 080522

Volume(s) shown below were combined and diluted to (mL).
Notes: All assigned values are zircon concentrations.

Compound	Part Number	Lot Number	Duration Factor	Initial Conc. (µg/mL)	Uncertainty (±) µg/mL	Final Conc. (µg/mL)	Uncertainty (±) µg/mL	80% Information (Spkwt Safety Inc. On Attached pp.)
1. Perfluoro-n-butanoic acid (PFBA)	99182	021022	0.02	2.00	0.017	50.1	1.00	375-22-4 N/A N/A
2. Perfluoro-n-pentanoic acid (PFPA)	99183	060522	0.02	2.00	0.017	50.3	1.01	0.02 2706-80-3 N/A N/A
3. Perfluoroheptanoic acid (PFHFA)	99189	071122	0.02	2.00	0.017	50.2	1.00	0.02 307-24-4 N/A N/A
4. Perfluorooctanoic acid (PFHFA)	99197	040522	0.02	2.00	0.017	50.1	1.00	0.02 375-85-9 N/A N/A
5. Perfluorodecanoic acid (PFDA)	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02 335-67-1 (L) N/A ip-m 18mg/kg
6. Perfluorododecanoic acid (PFDDA)	99200	080522	0.02	2.00	0.017	50.1	1.00	0.02 375-95-1 N/A N/A
7. Perfluorotetradecanoic acid (PFTEA)	99185	041822	0.02	2.00	0.017	50.2	1.00	0.02 332-76-2 N/A N/A
8. Perfluorohexadecanoic acid (PFHEA)	99205	071522	0.02	2.00	0.017	50.1	1.00	0.02 2059-84-8 N/A N/A
9. Perfluorooctadecanoic acid (PFODA)	99196	071522	0.02	2.00	0.017	50.2	1.00	0.02 307-55-1 N/A N/A
10. Perfluorotriacontanoic acid (PFTA)	99204	021022	0.02	2.00	0.017	50.1	1.00	0.02 72639-94-6 N/A N/A
11. Perfluorotriacontanoic acid (PFTA)	99203	030222	0.02	2.00	0.017	50.1	1.00	0.02 376-06-7 N/A N/A
12. Perfluoro-1-octadecanethioic acid (PFODA)	3677	F03A0321	0.02	2.00	0.017	50.0	1.00	0.05 754-91-6 N/A N/A
13. Methylperfluorooctadecanethioic acid (M-PFOA)	4182	M4MFOA0421	0.02	2.00	0.017	50.0	1.00	0.05 2355-31-9 (L) N/A N/A
14. Methylperfluorododecanethioic acid (M-PFOA)	4183	M4MFOA0421	0.02	2.00	0.017	50.0	1.00	0.05 2991-50-6 (L) N/A N/A
15. Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02 375-73-6 N/A N/A
16. Perfluoro-1-pentanesulfonic acid (PFPS)	99184	032422	0.02	2.00	0.017	50.1	1.00	0.02 2706-91-4 N/A N/A
17. Perfluoro-1-heptanesulfonic acid (PFHS)	99188	071522	0.02	2.00	0.017	50.2	1.00	0.02 355-48-4 (L) N/A N/A
18. Perfluoro-1-nonylsulfonic acid (PFNS)	3672	LPHF050122	0.02	2.00	0.017	47.6	1.00	0.05 375-92-8 N/A N/A
19. Perfluoro-1-undecylsulfonic acid (PFUS)	99201	030222	0.02	2.00	0.017	50.1	1.00	0.02 1783-23-1 (L) N/A N/A
20. Perfluoro-1-tridecylsulfonic acid (PFTS)	3657	LPHNS0422	0.02	2.00	0.017	48.0	1.01	0.05 62599-12-1 N/A N/A
21. Perfluoro-1-pentadecylsulfonic acid (PFPS)	3671	LPTDS0222	0.02	2.00	0.017	48.2	1.01	0.05 335-77-3 N/A N/A
22. 1H,1H,2H,2H-Perfluorooctanesulfonic acid (PFOS)	66272	071522	0.02	2.00	0.017	50.2	1.00	0.05 757184-72-4 N/A N/A
23. 1H,1H,2H,2H-Perfluorodecane sulfonic acid (PFDS)	66273	071522	0.02	2.00	0.017	50.2	1.00	0.05 27619-97-2 N/A N/A
24. 1H,1H,2H,2H-Perfluorododecane sulfonic acid (PFDDA)	66274	071522	0.02	2.00	0.017	47.9	1.01	0.05 39108-34-4 N/A N/A
25. 1H,1H,2H,2H-Perfluorotetradecane sulfonic acid (PFTEA)	66265	080522	0.02	2.00	0.017	50.1	1.00	0.02 13282-13-6 N/A N/A
26. 1H,1H,2H,2H-Perfluorohexadecane sulfonic acid (PFHEA)	4185	M4MFOA0422	0.02	2.00	0.017	47.8	1.00	0.05 756426-26-1 N/A N/A
27. 1H,1H,2H,2H-Perfluorooctadecane sulfonic acid (PFODA)	4184	M4MFOA0422	0.02	2.00	0.017	47.1	1.00	0.05 810005-14-4 N/A N/A
28. Dodecafluoro-3H,4,5,6-tetrafluorophosphoric acid (ADONA)	4183	M4DONA0422	0.02	2.00	0.017	47.1	1.00	0.05 810005-14-4 N/A N/A
Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010 335-67-1 (L) N/A ip-m 18mg/kg
Perfluorodecanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001 335-67-1 (L) N/A ip-m 18mg/kg
Perfluorooctanoic acid (linear)*	99186	071522	0.02	2.00	0.017	44.2	0.88	0.02 355-48-4 (L) N/A N/A
Perfluorodecanoic acid (branched isomer)*	99186	071522	0.02	2.00	0.017	6.0	0.12	0.021 355-48-4 (L) N/A N/A
Hepafluorooctanoic acid (linear)*	99201	030222	0.02	2.00	0.017	38.1	0.76	0.02 1783-23-1 (L) N/A N/A
Hepafluorodecanoic acid (branched isomer)*	99201	030222	0.02	2.00	0.017	7.5	0.15	0.003 1783-23-1 (L) N/A N/A
Hepafluorodecanoic acid (branched isomer)*	99201	030222	0.02	2.00	0.017	4.0	0.08	0.002 1783-23-1 (L) N/A N/A
Hepafluorodecanoic acid (branched isomer)*	99201	030222	0.02	2.00	0.017	0.5	0.010	0.002 1783-23-1 (L) N/A N/A
Methylperfluoro-1-octadecanethioic acid (linear)*	4182	M4MFOA0421	0.02	2.00	0.017	36.0	0.72	0.04 2355-31-9 (L) N/A N/A
Methylperfluoro-1-dodecanethioic acid (branched)*	4182	M4MFOA0421	0.02	2.00	0.017	6.0	0.13	0.011 2355-31-9 (L) N/A N/A
Methylperfluoro-1-tetradecanethioic acid (branched)*	4182	M4MFOA0421	0.02	2.00	0.017	5.0	0.10	0.009 2355-31-9 (L) N/A N/A
Methylperfluoro-1-hexadecanethioic acid (branched)*	4182	M4MFOA0421	0.02	2.00	0.017	2.5	0.05	0.009 2355-31-9 (L) N/A N/A
Methylperfluoro-1-octadecanethioic acid (linear)*	4183	M4MFOA0421	0.02	2.00	0.017	36.6	0.73	0.04 2355-31-9 (L) N/A N/A
Methylperfluoro-1-dodecanethioic acid (branched)*	4183	M4MFOA0421	0.02	2.00	0.017	7.7	0.15	0.009 2355-31-9 (L) N/A N/A
Methylperfluoro-1-tetradecanethioic acid (branched)*	4183	M4MFOA0421	0.02	2.00	0.017	6.3	0.11	0.009 2355-31-9 (L) N/A N/A
Methylperfluoro-1-hexadecanethioic acid (branched)*	4183	M4MFOA0421	0.02	2.00	0.017	5.4	0.07	0.006 2355-31-9 (L) N/A N/A

*Concentrations for branched and linear isomers are based on LIMS chromatographic analysis only.
A quantitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wilmington Labs, Cat. No. T-PFOA or equivalent). This standard is used to determine the relative amounts of the linear and branched isomers; the linear only PFOA standard must be used for quantitation (Sect. 7.2.2) and a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.

The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
*Standard uncertainty is given in parentheses immediately following the certified value.
*All standards, after opening ampals, should be stored with care (light and under appropriate laboratory conditions).
*Values are given in mg/L, µg/L, or ng/L. Expressing the Uncertainty as NIST Measurement Result.

SGS - ORLANDO

SPE LIQUID SAMPLE PREP REPORT

Date/Time: 03-03-23 15:45
Started (mm/dd/yy 24:00)

Method: EPA 1633 Draft QSM

Date/Time: 3/6/23 14:00
Finished (mm/dd/yy 24:00)

Balance ID: _____

Batch#: OP95719

Ext. By: DBL

Conc. By: _____

Vialed By: _____

Sample ID	Bottle Number	Amount Extracted (ml)	Initial pH	Adjusted pH	Surrogate Amount (ul)	Spike Amount (ul)	Final Volume (ml)	Manifold ID	Comments
OP95719 MB	n/a	500	7.0	n/a	25		5	A1	
OP95719 BS	↓	500				200			
OP95719 LLBS	↓	500				80			
FC3096-1	2	500							
↓ -2	2	500							
↓ -3	2	525							
FC3110-1	2	525							
↓ -2	2	535							
↓ -3	2	565							
DBL 03-03-23									
OP95719 MS	3	560			25	200	5	A1	FC3096-1
OP MSD									
OP95719 DUP	3	500			25		5	A1	FC3096-2

Comments:

EIS (SURR) ID: 11650 A-C Conc: 250-5000 ng/ml Exp. Date: 02-23-24 Inj. By: DBL Ver. By: BO
 SPIKE.1 ID: LCMS 2073-B Conc: Varied Exp. Date: 08-22-23 Inj. By: DBL Ver. By: BO
 SPIKE.2 ID: _____ Conc: _____ Exp. Date: _____ Inj. By: _____ Ver. By: _____
 NIS (ISTD) ID: 11637 A-C Conc: 250-1000 ng/ml Exp. Date: 2/20/24 Inj. By: MW Ver. By: MW

TurboVap Temp (Therm ID): _____ N-Evap Temp (Therm ID): _____
 Observed Temp °C: _____ Corr. Temp °C: _____ Observed Temp °C: _____ Corr. Temp °C: _____

Methanol Lot # 224267 1% NH4OH MeOH PF300 SPE Lot # S23-000772
 Water Lot# OP95448 0.3M Formic Acid PF301 Syringe filter Lot # _____
 Acetic Acid# 194003 3% NH4OH Sol _____ pH paper Lot# 215322
 0.1M Formic PF296 5% Formic Acid _____ Carbon Lot# 160898

Relinquished By: [Signature]

Accepted By: MW

Date: 03-03-23

Date: 3/6/23