

# PERFLUORINATED COMPOUNDS (PFOS/PFOA)

## Emerging Contaminant of Concern

Recent research has provided evidence that perfluorinated compounds (PFCs), such as perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), are persistent organic pollutants and are ubiquitous in the environment. Because PFCs may be toxic and have bioaccumulative properties, there is growing interest in the development of analytical methods for PFCs in the environment.

### UPLC CONDITIONS

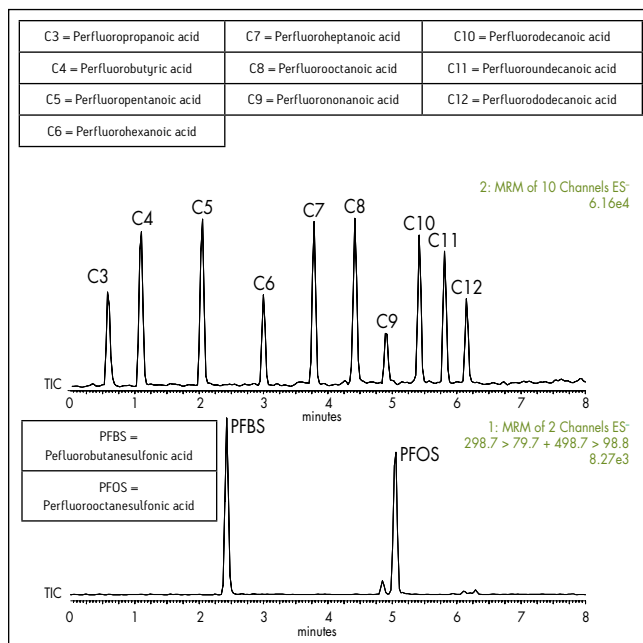
Instrument: ACQUITY UPLC® System  
 Column: ACQUITY UPLC BEH C<sub>18</sub>, 1.7 µm, 2.1 x 50 mm,  
 Flow Rate: 0.40 mL/min  
 Injection Volume: 10 µL [full loop injection mode]  
 Column Temp: 40 °C  
 Mobile Phase: A: 20 mM ammonium acetate in water/acetonitrile [90:10]  
 B: Methanol/acetonitrile [60:40]  
 Gradient: 15% – 95% B over 8 minutes  
 Curve: Linear

### MS CONDITIONS

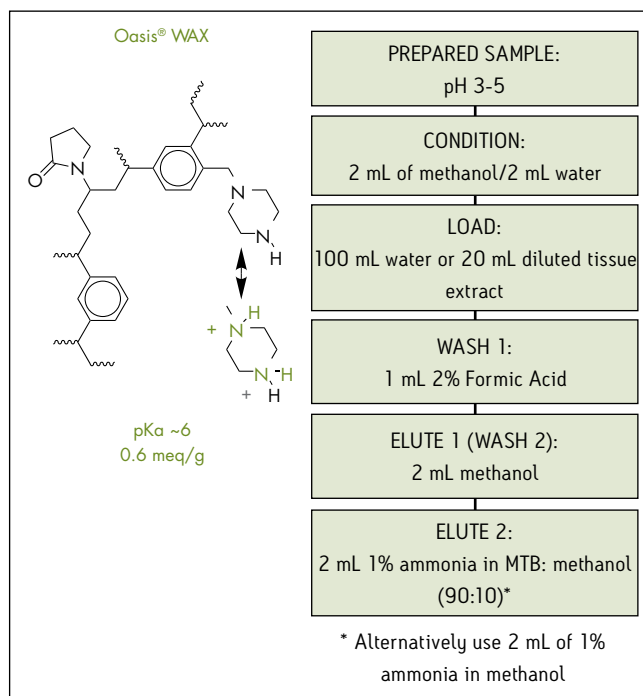
Instrument: Quattro Premier™ XE  
 Ionization Mode: ESI -  
 Capillary Voltage: 3 kV  
 MS Mode: MRM  
 Desolvation Temp: 350 °C  
 Source Temp: 150 °C

PFC	MRM Transition	Cone (V)	Collision (eV)
PFBS	299>80	40	30
PFOS	499>80	50	40
C3	163>119	20	13
C4	213>169	15	10
C5	263>219	15	9
C6	313>269	15	12
C7	363>319	15	10
C8	413>369	15	10
C9	463>419	15	10
C10	513>469	15	10
C11	563>519	15	10
C12	613>569	15	10

Optimized MRM transition parameters.



UPLC®/MS/MS of 12 PFCs spiked at 10 µg/kg in chicken liver.



Oasis® WAX Sorbent and SPE protocol for water and tissue.

### SAMPLE PREPARATION

#### Method 1: Water

Water samples [100 mL] were spiked with the appropriate compounds, adjusted to pH 3 with formic acid, and then processed by SPE. The SPE eluate [Elute 2] was collected in polypropylene test tubes, diluted with 2 mL of 2% aqueous formic acid and brought to 5 mL with water. Alternatively, the eluate may be evaporated and reconstituted in mobile phase prior to analysis, but polypropylene labware should be used exclusively.

#### Method 2: Tissues

A 1 mL aliquot of supernatant was diluted to 20 mL with water and the pH was adjusted to 4–5 using 2% formic acid. This solution was then loaded on an Oasis® WAX cartridge. SPE eluates were evaporated and reconstituted in 1 mL of mobile phase [polypropylene labware].

### ORDERING INFORMATION

Description	Part Number
ACQUITY® BEH C <sub>18</sub> , 1.7 µm, 2.1 x 50 mm	186002350
Oasis WAX, 3 cc, 60 mg	186002492
LC/MS Certified Vials	see catalog

Description	Literature Code
Environmental System Solutions	720001601EN
Analysis of Perfluorinated Compounds (PFCs) on the ACQUITY UPLC System and the Quattro Premier XE in ES-MS/MS	720001761EN
Separation of Branched PFOS Isomers by UPLC with MS/MS Detection	720001694EN
Oasis WAX Sorbent for UPLC/MS Determination of PFOS and Related Compounds in Water and Tissue	720001817EN
Analysis of Perfluorinated Compounds using UPLC and MS/MS Detection	720001848EN

[www.waters.com/library](http://www.waters.com/library)

Recovery from Drinking Water [%]											
Spike Level µg/L	PFBS	PFOS	C3	C4	C5	C6	C7	C8	C9	C10	C11
0.10	122	109	108	119	97	184	107	83	121	101	101
0.30	110	117	95	132	105	110	119	126	137	118	94
0.70	102	98	91	107	93	118	100	78	103	126	119
1.0	113	94	128	106	98	130	100	88	100	110	117
4.0	104	86	101	99	99	102	102	92	115	99	84
10	104	100	98	101	100	87	89	82	103	99	101

*Recovery of PFCs from drinking water.*