

Per- & Polyfluoroalkyl Substances (PFAS)



AccuStandard®



Per- and Polyfluoroalkyl Substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) belong to a continuously expanding family of over 4000 man-made chemical pollutants. The amphiphilic ability of PFAS has led to the manufacturing of PFAS in oils and water-resistant industrial and consumer products such as firefighting foams, cleaners, cosmetics, paints, adhesives and insecticides. However, environmental chemists and biologists have uncovered that PFAS have harmful toxicological effects and pose a significant risk to the public. The high thermal and chemical stability of PFAS make them persistent in the environment and nearly non-biodegradable, necessitating chemical reference standards to test the concentration of PFAS in drinking water, burn sites and teflon products.

PFOA / PFOS Compounds

Perfluoroalkylsulfonates $CF_3-(CF_2)_n-SO_3^-NA^+$	CAS No.	Conc.	Matrix	Cat. No.	Unit
Potassium perfluoro-1-octanesulfonate	2795-39-3	100 µg/mL	MeOH	PFOS-002S	1 mL
Potassium perfluoro-1-butanesulfonate	29420-49-3	50 µg/mL	MeOH	PFOS-005S	1 mL
Sodium perfluoro-1-pentanesulfonate	630402-22-1	50 µg/mL	MeOH	PFOS-006S	1 mL
Potassium perfluoro-1-hexanesulfonate	3871-99-6	50 µg/mL	MeOH	PFOS-007S	1 mL
Perfluoroalkylsulfonic acid $CF_3-(CF_2)_n-SO_2H$					
Perfluoro-n-octane sulfonic acid	1763-23-1	100 µg/mL	MeOH	PFOS-001S	1 mL
Perfluoroalkylcarboxylic acids $CF_3-(CF_2)_n-CO_2H$ UPDATED					
Perfluoro-n-octanoic acid	335-67-1		NEAT	PFOA-001N	100 mg
		100 µg/mL	MeOH	PFOA-001S	1 mL
Perfluoro-n-butanoic acid	375-22-4	100 µg/mL	MeOH	PFOA-002S	1 mL
Perfluoro-n-decanoic acid	335-76-2	100 µg/mL	MeOH	PFOA-003S	1 mL
Perfluoro-n-dodecanoic acid	307-55-1	100 µg/mL	MeOH	PFOA-004S	1 mL
Perfluoro-n-heptanoic acid	375-85-9	100 µg/mL	MeOH	PFOA-005S	1 mL
Perfluoro-n-hexanoic acid	307-24-4	100 µg/mL	MeOH	PFOA-006S	1 mL
Perfluoro-n-nonanoic acid	375-95-1	100 µg/mL	MeOH	PFOA-007S	1 mL
Perfluoro-n-pentanoic acid	2706-90-3	100 µg/mL	MeOH	PFOA-008S	1 mL
Perfluoro-n-undecanoic acid	2058-94-8	100 µg/mL	MeOH	PFOA-009S	1 mL
2,2,3,3,3-Pentafluoropropionic acid	422-64-0	2 µg/mL	MeOH	PFOA-015S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-015S	1 mL
Perfluoro-n-tridecanoic acid	72629-94-8	50 µg/mL	MeOH:Water (50:50)	PFOA-016S-M-W	1 mL
Perfluoro-n-tetradecanoic acid	376-06-7	50 µg/mL	MeOH:Water (50:50)	PFOA-017S-M-W	1 mL
Nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	2 µg/mL	MeOH	PFOA-018S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-018S	1 mL
Perfluoro(2-ethoxyethane)sulphonic acid	113507-82-7	2 µg/mL	MeOH	PFOA-019S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-019S	1 mL
Perfluoro-3-methoxypropanoic acid	377-73-1	2 µg/mL	MeOH	PFOA-020S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-020S	1 mL
Perfluoro(4-methoxybutanoic) acid	863090-89-5	2 µg/mL	MeOH	PFOA-021S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-021S	1 mL
2H-Perfluoro-2-octenoic acid	70887-88-6	2 µg/mL	MeOH	PFOA-024S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-024S	1 mL
Perfluorooctylsulfonamidoacetic acids $CF_3-(CF_2)_7-SO_2N^{\text{Alk}}-CH_2-CO_2H$					
N-ethyl perfluorooctanesulfonamidoacetic acid		100 µg/mL	MeOH	PFOS-003S	1 mL
N-methyl perfluorooctanesulfonamidoacetic acid		100 µg/mL	MeOH	PFOS-004S	1 mL
Telomer sulfonates $CF_3-(CF_2)_n-CH_2-CH_2-SO_3^-NA^+$					
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	27619-93-8	100 µg/mL	MeOH	PFOS-011S	1 mL
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	27619-94-9	100 µg/mL	MeOH	PFOS-012S	1 mL
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	27619-96-1	100 µg/mL	MeOH	PFOS-013S	1 mL
Polyfluoroalkyls UPDATED					
2H,2H,3H,3H-Perfluoroundecanoic acid	34598-33-9	100 µg/mL	MeOH	PFOA-010S	1 mL
2H,2H,3H,3H-Perfluorooctanoic acid	914637-49-3	2 µg/mL	MeOH	PFOA-022S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-022S	1 mL
2H,2H,3H,3H-Perfluorodecanoic acid	812-70-4	2 µg/mL	MeOH	PFOA-023S-0.02X	1 mL
		100 µg/mL	MeOH	PFOA-023S	1 mL
Commercial / Technical grades					
Ammonium perfluoro(2-methyl-3-oxahexanoate) (GenX)	62037-80-3	100 µg/mL	MeOH	PFOS-019S	1 mL
Scotchgard™ Pre-2002 Formulation (Tech mix)		100 µg/mL	MeOH	PFOS-SCG-001S	1 mL
Scotchgard™ Post-2002 Formulation (Tech mix)		100 µg/mL	MeOH	PFOS-SCG-002S	1 mL

This updated version of Method 537 can be used for the quantitative analysis of 18 analytes by Solid Phase Extraction (SPE) and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).

PFAS compounds exist in both linear and branched forms in nature. Each lot manufactured may carry a different ratio than previous lots. A ratio of linear and branched isomers will be provided on each standard's Certificate of Analysis if both linear and branched isomers are present. If no ratio appears, then the standard contains only the linear isomer. Please contact our Technical Department if the ratio of our current lots must be known prior to placing an order.

EPA 537.1 Method Standard

M-537.1

2 µg/mL each in MeOH

1 mL

18 comps.

Perfluoro(2-methyl-3-oxahexanoic) acid
 N-ethylperfluoro-1-octanesulfonamidoacetic acid (linear)
 N-methylperfluoro-1-octanesulfonamidoacetic acid (linear)
 Perfluorobutane-1-sulfonic acid
 Perfluoro-n-decanoic acid
 Perfluoro-n-dodecanoic acid
 Perfluoro-n-heptanoic acid
 Perfluorohexane-1-sulfonic acid (Linear and Branched)
 Perfluoro-n-hexanoic acid
 Perfluoro-n-nonanoic acid
 Perfluorooctane-1-sulfonic acid (Linear and branched)
 Perfluoro-n-octanoic acid
 Perfluoro-n-tetradecanoic acid
 Perfluoro-n-tridecanoic acid
 Perfluoro-n-undecanoic acid
 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
 9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid
 4,8-Dioxa-3H-perfluorononanoic acid

Technical Notes

LC/MS is an excellent screening tool to determine all of the components in a sample.

LC/MS/MS is preferable for low detection limit analysis, and for regulatory compliance for EPA, ASTM D7979 or other methods.

Elution Order

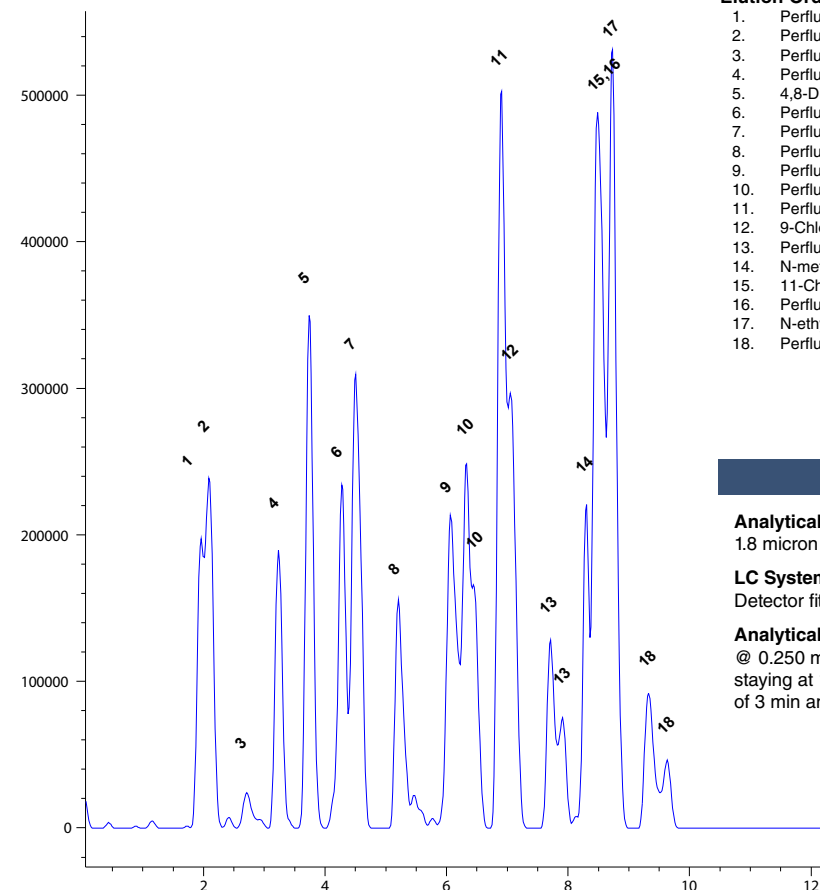
1. Perfluoro-n-hexanoic acid (307-24-4)
2. Perfluorobutane-1-sulfonic acid (375-73-5)
3. Perfluoro(2-methyl-3-oxahexanoic) acid (13252-13-6)
4. Perfluoro-n-heptanoic acid (375-85-9)
5. 4,8-Dioxa-3H-perfluorononanoic acid (919005-14-4)
6. Perfluorohexane-1-sulfonic acid (Linear and Branched) (355-46-4)
7. Perfluoro-n-octanoic acid (335-67-1)
8. Perfluoro-n-nonanoic acid (375-95-1)
9. Perfluorooctane-1-sulfonic acid (Linear and branched) (1763-23-1)
10. Perfluoro-n-decanoic acid (335-76-2)
11. Perfluoro-n-undecanoic acid (2058-94-8)
12. 9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (756426-58-1)
13. Perfluoro-n-dodecanoic acid (307-55-1)
14. N-methylperfluoro-1-octanesulfonamidoacetic acid (linear) (2355-31-9)
15. 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (763051-92-9)
16. Perfluoro-n-tridecanoic acid (72629-94-8)
17. N-ethylperfluoro-1-octanesulfonamidoacetic acid (linear) (2991-50-6)
18. Perfluoro-n-tetradecanoic acid (376-06-7)

Analytical Conditions:

Analytical column: Zorbax Eclipse plus C18 RRHD 23.1 x 50 mm, 1.8 micron particle size.

LC System: Agilent 1290 infinity II, HP Infinity Lab G6152B MS Detector fitted with multimode (ESI+APCI) source.

Analytical conditions: Gradient start @ 35% H₂O, 65% acetonitrile @ 0.250 ml/min for 1 min, then 0% H₂O, 100% acetonitrile in 10 min, staying at 100% acetonitrile until 13 min, followed by a post-run time of 3 min analysis time = 13 min.



EPA Method 537 Native Compound Standard and 24 PFAS for Ground, Surface, and Wastewater on next pages.

EPA Method 537 - Native Compound Standard

EPA Method 537 (Determination of selected perfluorinated alkyl acids in drinking water analyzed by LC/MS/MS)

This 14 component standard mixture is associated with this method.

Method 537 Native Compound Standard

M-537 **1 mL**

50 µg/mL each in AcCN:Water (95:5) 14 comps.

Perfluoro-n-hexanoic acid
Perfluoro-n-heptanoic acid
Perfluoro-n-octanoic acid
Perfluoro-n-nonanoic acid
Perfluoro-n-decanoic acid
Perfluoro-n-undecanoic acid
Perfluoro-n-dodecanoic acid
Perfluoro-n-tridecanoic acid
Perfluoro-n-tetradecanoic acid
N-Methylperfluorooctanesulfonamidoacetic acid
N-Ethylperfluorooctanesulfonamidoacetic acid
Perfluoro-n-butane sulfonic acid
Perfluoro-n-hexane sulfonic acid
Perfluoro-n-octane sulfonic acid

Technical Note

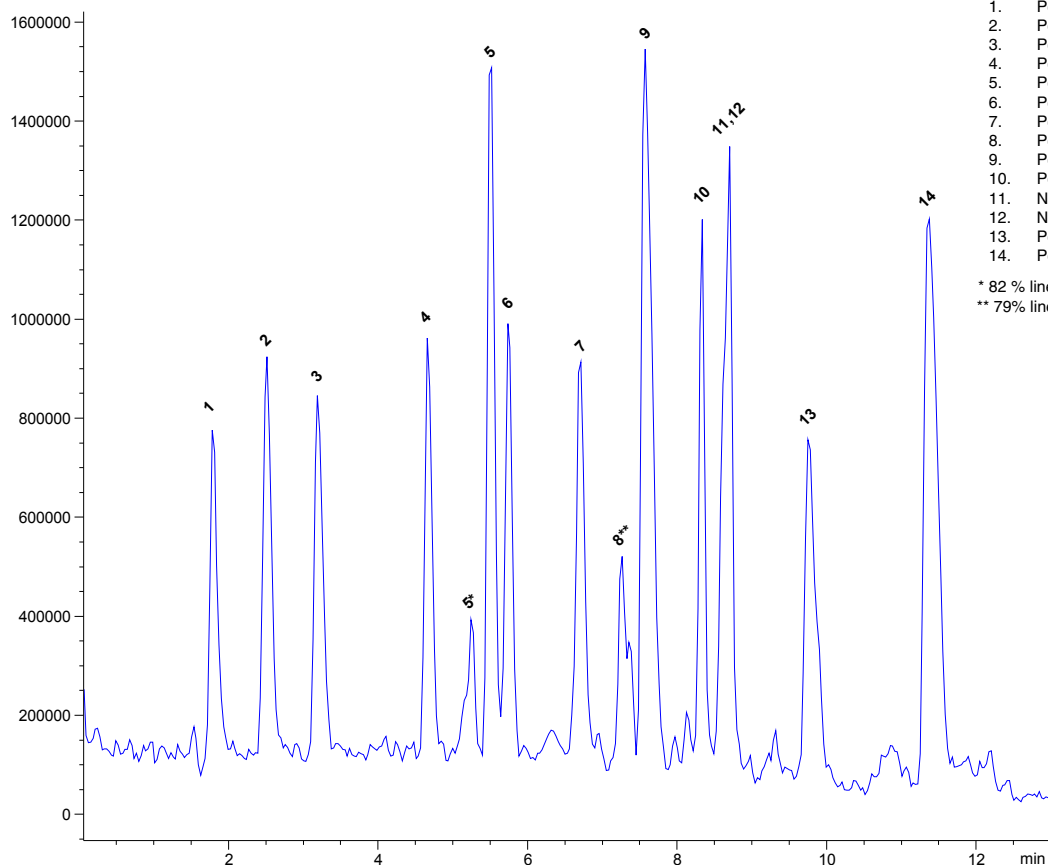
This was the first method introduced for the determination of 14 PFAS in drinking water. It includes 14 PFAS for determination using Solid Phase Extraction (SPE) and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). This method was updated in 2018 to 537.1 which adds additional analytes.

Analytical Conditions:

Analytical column: Zorbax Eclipse plus C18 RRHD 23.1 x 50 mm, 1.8 micron particle size.

LC System: Agilent 1290 infinity II, HP Infinity Lab G6152B MS Detector fitted with multimode (ESI+APCI) source.

Analytical conditions: Gradient start @ 35% H₂O, 65% acetonitrile @ 0.250 ml/min for 1 min, then 0% H₂O, 100% acetonitrile in 10 min, staying at 100% acetonitrile until 13 min, followed by a post-run time of 3 min analysis time = 13 min.



Elution Order

1. Perfluoro-n-hexanoic acid
2. Perfluoro-n-butane sulfonic acid
3. Perfluoro-n-heptanoic acid
4. Perfluoro-n-octanoic acid
5. Perfluoro-n-hexane sulfonic acid *
6. Perfluoro-n-nonanoic acid
7. Perfluoro-n-decanoic acid
8. Perfluoro-n-octane sulfonic acid **
9. Perfluoro-n-undecanoic acid
10. Perfluoro-n-dodecanoic acid
11. N-Ethylperfluorooctanesulfonamidoacetic acid
12. N-Methylperfluorooctanesulfonamidoacetic acid
13. Perfluoro-n-tridecanoic acid
14. Perfluoro-n-tetradecanoic acid

* 82 % linear, 18 % branched

** 79% linear, 21% branched

PFAS compounds exist in both linear and branched forms in nature. Each lot manufactured may carry a different ratio than previous lots. A ratio of linear and branched isomers will be provided on each standard's Certificate of Analysis if both linear and branched isomers are present. If no ratio appears, then the standard contains only the linear isomer. Please contact our Technical Department if the ratio of our current lots must be known prior to placing an order.

EPA Method 8327 - 24 PFCs for Ground, Surface, and Wastewater

This standard contains the 24 PFAS described in USEPA Method 8327. It is suitable for testing many different water samples. For your convenience, we offer this product at a high and low concentration.

Method 8327 Standard - 24 PFCs

PFC-24 1 mL

2 µg/mL each in MeOH:Water (80:20) 24 comps.

PFC-24-10X 1 mL

20 µg/mL each in MeOH:Water (80:20) 24 comps.

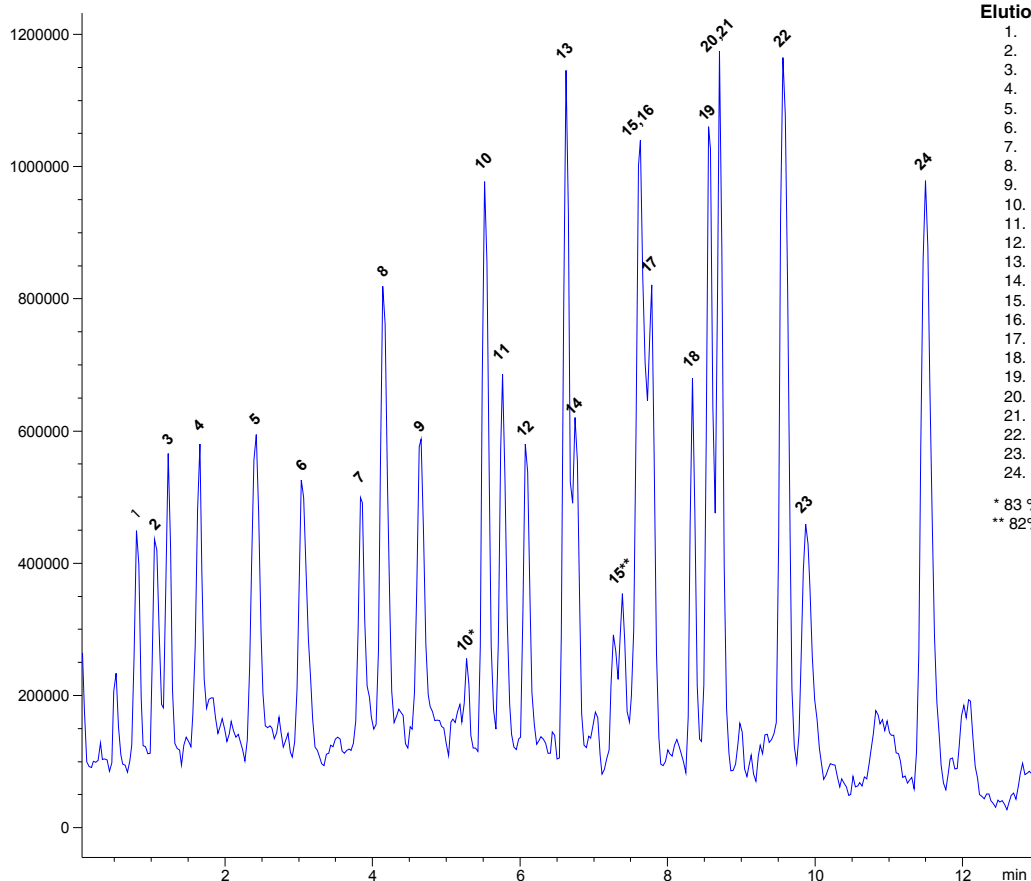
Perfluoro-n-butanoic acid
 Perfluoro-n-pentanoic acid
 Perfluoro-n-hexanoic acid
 Perfluoro-n-heptanoic acid
 Perfluoro-n-octanoic acid
 Perfluoro-n-nonanoic acid
 Perfluoro-n-decanoic acid
 Perfluoro-n-undecanoic acid
 Perfluoro-n-dodecanoic acid
 Perfluoro-n-tridecanoic acid
 Perfluoro-n-tetradecanoic acid
 N-Methylperfluorooctanesulfonamidoacetic acid
 N-Ethylperfluorooctanesulfonamidoacetic acid
 Potassium perfluoro-1-butanedisulfonate
 Sodium perfluoro-1-pentanesulfonate
 Potassium perfluoro-1-hexanesulfonate
 Sodium perfluoro-1-heptanesulfonate
 Potassium perfluoro-1-octanesulfonate
 Sodium perfluoro-1-nonanesulfonate
 Sodium perfluoro-1-decanesulfonate
 Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate
 Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate
 Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate
 Perfluorooctane sulfonamide

Analytical Conditions:

Analytical column: Zorbax Eclipse plus C18 RRHD 23.1 x 50 mm, 1.8 micron particle size.

LC System: Agilent 1290 infinity II, HP Infinity Lab G6152B MS Detector fitted with multimode (ESI+APCI) source.

Analytical conditions: Gradient start @ 35% H₂O, 65% acetonitrile @ 0.250 ml/min for 1 min, then 0% H₂O, 100% acetonitrile in 10 min, staying at 100% acetonitrile until 13 min, followed by a post-run time of 3 min analysis time = 13 min.

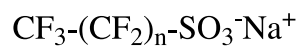


Elution Order

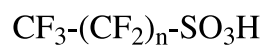
1. Perfluoro-n-butanoic acid
2. Perfluoro-n-pentanoic acid
3. Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate
4. Perfluoro-n-hexanoic acid
5. Potassium perfluoro-1-butanedisulfonate
6. Perfluoro-n-heptanoic acid
7. Sodium perfluoro-1-pentanesulfonate
8. Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate
9. Perfluoro-n-octanoic acid
10. Potassium perfluoro-1-hexanesulfonate *
11. Perfluoro-n-nonanoic acid
12. Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate
13. Sodium perfluoro-1-heptanesulfonate
14. Perfluoro-n-decanoic acid
15. Potassium perfluoro-1-octanesulfonate **
16. Perfluorooctane sulfonamide
17. Perfluoro-n-undecanoic acid
18. N-Methylperfluorooctanesulfonamidoacetic acid
19. Sodium perfluoro-1-nonanesulfonate
20. N-Ethylperfluorooctanesulfonamidoacetic acid
21. Perfluoro-n-dodecanoic acid
22. Sodium perfluoro-1-decanesulfonate
23. Perfluoro-n-tridecanoic acid
24. Perfluoro-n-tetradecanoic acid

* 83 % linear, 17 % branched

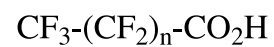
** 82 % linear, 18 % branched



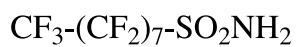
Perfluoroalkylsulfonates



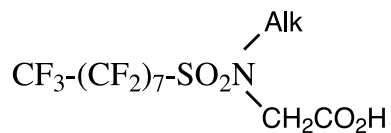
Perfluoroalkylsulfonic acids



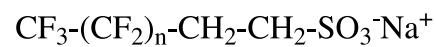
Perfluoroalkylcarboxylic acids



Perfluorooctylsulfonamides



Perfluorooctylsulfonamidoacetic acids



Telomer sulfonates



AccuStandard®