PFAS Analysis in Water Samples using LC/MS/MS Large-Volume Direct Injection

Eric Redman[1], Simon Roberts[2], KC Hyland[2], Christopher Borton[2] Craig Butt[3], and Scott Krepich[4]
[1]Test America, Laboratories Sacramento, CA
[2]SCIEX, Redwood City, CA
[3]SCIEX, Framingham, MA
[4]Phenomenex, Inc., 411 Madrid Ave., Torrance, CA 90501 USA

Overview[1]

Human exposure to PFAS residues has been implicated in the incidence of cancer, obesity, endocrine system disruption, and other adverse health effects. In recognition of these potential risks, sources of human exposure to these chemicals (e.g., via drinking water) are receiving public and scientific attention.

This application note presents a method for the quantitation of per- and polyfluorinated alkyl substances (PFASs) in water samples. Presented here utilizes dilution of a water sample in methanol and direct injection of 950 µL of the diluted sample using a 17.5 minute HPLC gradient. The method achieved accurate quantitation at levels of approximately 1-10 ng/L for more than 17 PFASs. Water samples were obtained anonymously from various sources in the United States. Samples were stored in the dark at 4 °C in 250 mL high density polyethlyene bottles until analysis. A Phenomenex Luna® 5 µm C18(2) 30 x 2 mm column (00A-4252-B0) was installed between the pump mixing chamber and the column, outside of a column oven. This column served as a delay or hold-up column to isolate PFAS contamination originating from the pumps and eluents.

Acknowledgement

Phenomenex acknowledges Test America (Sacramento, CA) for collaborating with SCIEX and Phenomenex to contribute this application.

Reference

1. For complete application including Mass Spec parameters and sample prep steps, please refer to: “Quantitation of PFASs in Water Samples using LC/MS/MS: Large-Volume Direct Injection and Solid Phase Extraction” at www.Sciex.com

LC/MS/MS Conditions

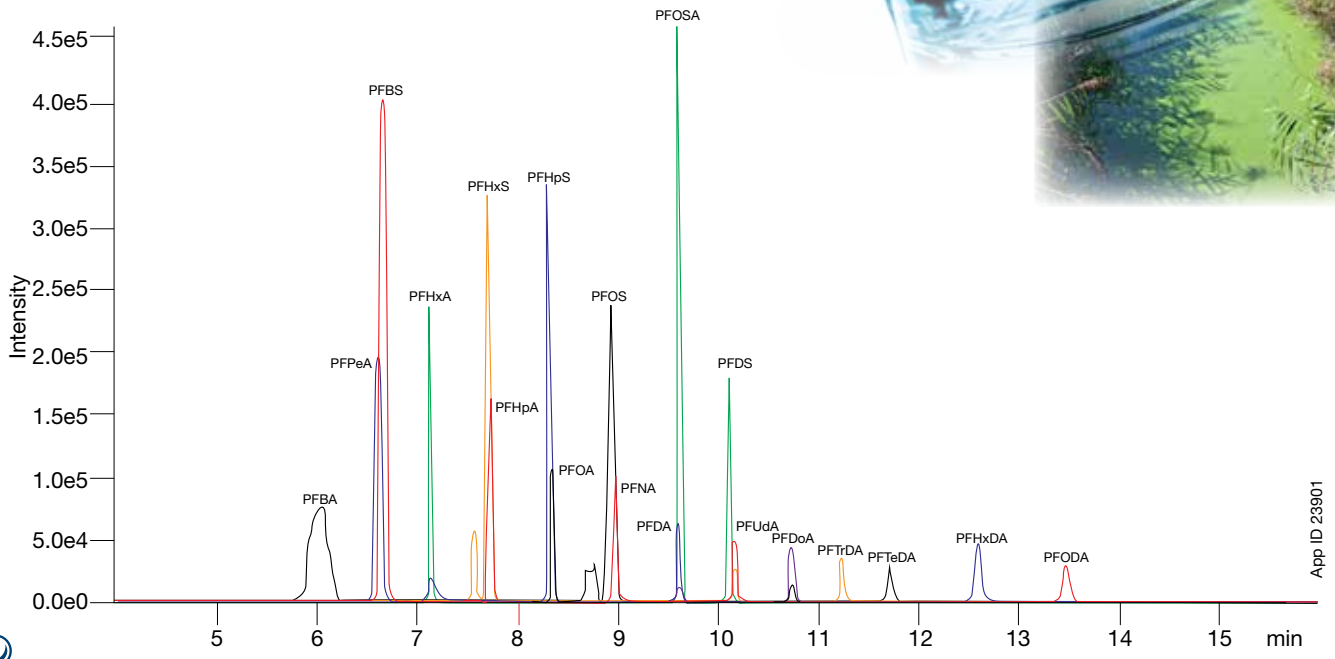
Column: Gemini® 3 µm C18
Dimensions: 100 x 3.0 mm
Part No.: 00D-4439-Y0
Mobile Phase: A: 20 mM Ammonium Acetate in Water
B: Methanol

Gradient:

Time (min)	% B
0	10
1.5	65
8	95
8.1	99
12	99
12.5	10

Injection: 0.950 µL
Flow Rate: 0.6 mL/min
Temperature: 40 °C
Detection: SCIEX Triple Quad™ 5500 with a Turbo V™ source

10 ng/L spike into groundwater matrix diluted with methanol



Ordering Information

3 µm Microbore, Minibore and MidBore™ Columns (mm)										SecurityGuard™ Cartridges (mm)
Phases	**50 x 1.0**	**20 x 2.0**	**30 x 2.0**	**50 x 2.0**	**100 x 2.0**	**150 x 2.0**	**50 x 3.0**	**100 x 3.0**	**150 x 3.0**	**4 x 2.0***
Gemini® C18	00B-4439-A0	00M-4439-B0	00A-4439-B0	00B-4439-B0	00D-4439-B0	00F-4439-B0	00B-4439-Y0	00D-4439-Y0	00F-4439-Y0	AJ0-7596
										for ID: 2.0-3.0 mm

5 µm Microbore and Minibore Columns (mm)								SecurityGuard™ Cartridges (mm)
Phases	**50 x 1.0**	**150 x 1.0**	**250 x 1.0**	**30 x 2.0**	**50 x 2.0**	**150 x 2.0**	**250 x 2.0**	**4 x 2.0***
Luna® C18(2)	00B-4252-A0	00F-4252-A0	00G-4252-A0	00A-4252-B0	00B-4252-B0	00F-4252-B0	00G-4252-B0	AJ0-4286
								for ID: 2.0-3.0 mm

Australia
t: +61 (0)2-9428-6444
f: +61 (0)2-9428-6445
auinfo@phenomenex.com

Austria
t: +43 (0)1-319-1301
f: +43 (0)1-319-1300
anfrage@phenomenex.com

Belgium
t: +32 (0)2 503 4015 (French)
t: +32 (0)2 511 8666 (Dutch)
f: +31 (0)30-2383749
beinfo@phenomenex.com

Canada
t: +1 (800) 543-3681
f: +1 (310) 328-7768
info@phenomenex.com

China
t: +86 (0)20 2282-6668
f: +86 (0)20 2809-8130
chinainfo@phenomenex.com

Denmark
t: +45 4824 8048
f: +45 4810 6265
nordicinfo@phenomenex.com

Finland
t: +358 (0)9 4789 0063
f: +45 4810 6265
nordicinfo@phenomenex.com

France
t: +33 (0)1 30 09 21 10
f: +33 (0)1 30 09 21 11
franceinfo@phenomenex.com

Germany
t: +49 (0)6021-58830-0
f: +49 (0)6021-58830-11
anfrage@phenomenex.com

India
t: +91 (0)40-3012 2400
f: +91 (0)40-3012 2411
indiainfo@phenomenex.com

Ireland
t: +353 (0)1 247 5405
f: +44 1625-501796
eireinfo@phenomenex.com

Italy
t: +39 051 6327511
f: +39 051 6327555
italiainfo@phenomenex.com

Luxembourg
t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

Mexico
t: 01-800-844-5226
f: 001-310-328-7768
tecnicomx@phenomenex.com

The Netherlands
t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

New Zealand
t: +64 (0)9-4780951
f: +64 (0)9-4780952
nzinfo@phenomenex.com

Norway
t: +47 810 02 005
f: +45 4810 6265
nordicinfo@phenomenex.com

Puerto Rico
t: +1 (800) 541-HPLC
f: +1 (310) 328-7768
info@phenomenex.com

Spain
t: +34 91-413-8613
f: +34 91-413-2290
espinfo@phenomenex.com

Sweden
t: +46 (0)8 611 6950
f: +45 4810 6265
nordicinfo@phenomenex.com

United Kingdom
t: +44 (0)1625-501367
f: +44 (0)1625-501796
ukinfo@phenomenex.com

USA
t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com

All other countries
Corporate Office USA
t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com

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guarantee

If Luna analytical columns do not provide at least an equivalent separation as compared to a competing column of the same particle size, similar phase and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

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