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PFOA ANALYSIS WITH ASTRA® DELAY COLUMN

ABSTRACT

This application describes a quick and robust LC-MS/MS method for analysis of residual concentrations of PFOA. The delay column ASTRA® is used to trap system-derived contaminants.

INTRODUCTION

Perfluorooctanoic acid (PFOA) belongs to a class of perfluorinated contaminants (PFCs), a class of organic contaminants, which are widely used in everyday products, such as paints, adhesives, textiles, waxes, and in non-stick coatings in kitchen utensils. Because of its chemical properties, PFOA is very stable, does not degrade naturally and bioaccumulates in the food chain. It has been classified as a highly persistent pollutant. Analysis of PFOA in environmental matrices is challenging because the trace detection is required in conditions of possible instrumental contamination. The parts of standard HPLC systems contain fluoropolymers that may pose the leach of PFOA into the mobile phase, creating false positives and high blank levels.

NOTE: The presented analytical method is designed to resolve background contamination of long chain PFAS. The separation efficiency was tested only with the presented combination of analytical and delay HPLC columns.

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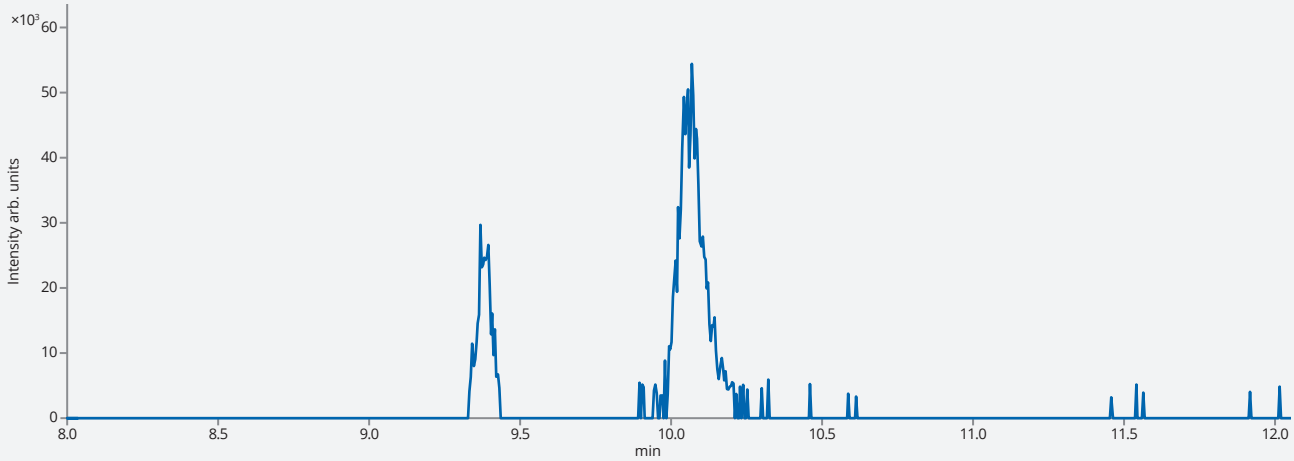
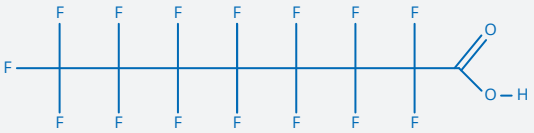
PFOA analysis with ASTRA® Delay Column



Chromatogram of test solution (1- injected sample 0.1 ng/mL, 2- delayed contamination from HPLC system)



Perfluorooctanoic acid (PFOA)

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PFOA analysis with ASTRA® Delay Column

LC-MS Method

Mass spectrometer	Exploris 240 Thermo Scientific			
Analytical Column	ARION® Polar C18, 5 µm			
Dimensions	50 mm × 2.1 mm			
Part number	ARI-5721-LG21			
Delay Column	ASTRA® C18-HE, 5 µm			
Dimensions	20 mm × 2.1 mm			
Part number	AST-5732-LC21			
Mobile phase	A: UPW + 10 mM NH_4COOH B: MeOH + 10 mM NH_4COOH			
Gradient elution	Time (min)	A (%)	B (%)	Flow (µL/min)
	0	95	5	350
	4	75	25	350
	6	40	60	350
	11	0	100	400
	14	0	100	400
	14.1	95	5	350
	17	95	5	350
Temperature	23 °C			
Injection volume	5 µL			
Detection	HESI, negative ionization full scan mode			
Analytes	**1. Perfluorooctanoic acid (PFOA), CAS: 335-67-1**			

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