

**Accessory publication****Field intercomparison on the determination of volatile and semi-volatile polyfluorinated compounds in Air**

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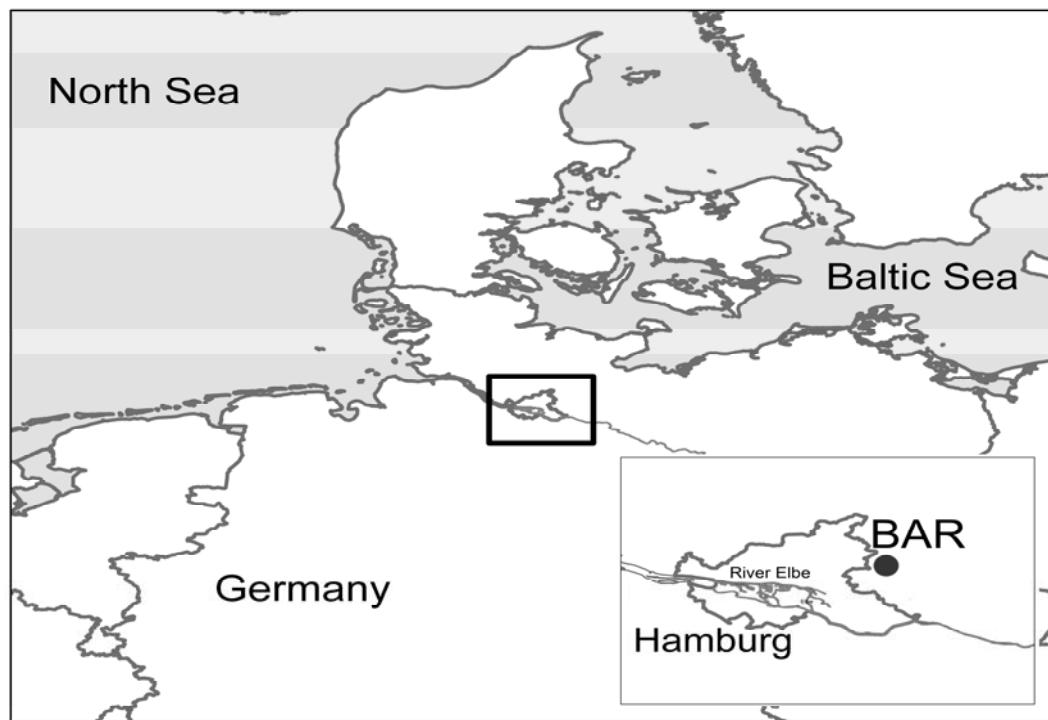
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**Sampling site**

**Fig. A1.** Location and setup of the sampling site at Barsbüttel (BAR).

### Sampling schedule

**Fig. A2.** Sampling schedule and Lab colour codes.  $n$ (High Vol) = 114;  $n$ (SIP disk, sorbent-impregnated polyurethane foam disk), 2 per period = 12 (Lab A, C), 2 per period = 4 (Lab B, D);  $n$ (SPMD, semipermeable membrane device), 6 per period = 36. I–VI: period numbers. I, 2 April 2007–4 June 2007; II, 4 June 2007–30 July 2007; III, 30 July 2007–1 October 2007; IV, 1 October 2007–3 December 2007; V, 3 December 2007–4 February 2008; VI, 4 February 2008–31 March 2008. Field blanks were taken once per month  $n$  = 12 (high-volume samples) or at the end of each period  $n$  = 6 (passive samples).

Lab	Device	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
A	SIP disk	I		II		III		IV		V		VI	
B	SPMD	I		II		III		IV		V		VI	
B	SIP disk	–		II		–		–		V		–	
C	SIP disk	I		II		III		IV		V		VI	
D	High Vol	taken continuously for 3 and 4 days											
D	SIP disk	–		II		–		–		V		–	

**Analytes****Table A1.** Analytical standards, their acronym, structure, and CAS number

n.a., not available

Analytes	Acronym	Structure	CAS
<b>fluorotelomer alcohols (FTOHs)</b>			
4:2 fluorotelomer alcohol	4:2 FTOH		2043-47-2
6:2 fluorotelomer alcohol	6:2 FTOH		647-42-7
8:2 fluorotelomer alcohol	8:2 FTOH		678-39-7
10:2 fluorotelomer alcohol	10:2 FTOH		865-86-1
12:2 fluorotelomer alcohol	12:2 FTOH		39239-77-5
<b>fluorotelomer acrylates (FTAs)</b>			
6:2 fluorotelomer acrylate	6:2 FTA		17527-29-6
8:2 fluorotelomer acrylate	8:2 FTA		27905-45-9
10:2 fluorotelomer acrylate	10:2 FTA		17741-60-5
<b>perfluoroalkyl sulfonamids (FASAs)</b>			
N-Methyl-perfluorobutane sulfonamide	MeFBSA		n.a.
N-Methyl-perfluorooctane sulfonamide	MeFOSA		31506-32-8
N-Ethyl perfluorooctane sulfonamide	EtFOSA		4151-50-2
N,N-dimethylperfluorooctane sulfonamide	Me2FOSA		213181-78-3

**Table A1. (Continued)**

perfluoroalkyl sulfonamide ethanol (FASEs)			
N-Methyl-perflurobutane sulfonamido ethanol	MeFBSE		n.a.
N-Methyl-perfluorooctane sulfonamido ethanol	MeFOSE		24448-09-7
N-Ethyl-perfluorooctane sulfonamido ethanol	EtFOSE		1691-99-2

**Sampling rates and effective volumes****Table A2. Linear SIP disk and SPMD sampling rates ( $R_s$ ,  $\text{m}^3 \text{ day}^{-1}$ ) reported in literature**

Note that linear sampling rates were not applicable to calculate SIP-based FTOH concentrations in this study since SIP disks already reached the equilibrium uptake phase. n.a., not analysed

Compound	$R_s$ (SIP disk) (Shoeib et al. <sup>[25]</sup> )	$R_s$ (SPMD) (Fiedler et al. <sup>[30]</sup> )
6:2 FTOH	4.6	n.a.
8:2 FTOH	4.6	1.4
10:2 FTOH	4.6	2.6
12:2 FTOH	n.a.	n.a.
MeFOSA	2.6	n.a.
EtFOSA	2.6	n.a.
MeFBSE	n.a.	n.a.
MeFOSE	1.5	n.a.
EtFOSE	1.4	n.a.

**Table A3. Effective volumes ( $\text{m}^3$ ) used in this study to calculate FTOH air concentrations from SIP sampling**

	Period I	Period II	Period III	Period IV	Period V	Period VI
Deployment time (in days)	63	56	61	64	64	56
Average air temperature ( $^\circ\text{C}$ )	12.2	17.1	15.3	6.9	4.4	4.7
Effective air volumes ( $\text{m}^3$ )						
6:2 FTOH	160	121	137	198	210	190
8:2 FTOH	155	118	133	193	206	186
10:2 FTOH	158	121	136	194	207	188
12:2 FTOH	132	102	114	162	176	162

**Polyfluorinated compound (PFC) concentrations in the intercomparison standard solution****Table A4.** PFC concentrations ( $\text{pg } \mu\text{L}^{-1}$ ) in a circulated intercomparison standard solution

Nominal concentration, 50  $\text{pg } \mu\text{L}^{-1}$ ; s.d., standard deviation; r.s.d., relative standard deviation; n.a., not analysed

Compound	Intercomparison standard solution ( $\text{pg } \mu\text{L}^{-1}$ )			
	A $c \pm \text{s.d. (r.s.d., %)}$	B $c \pm \text{s.d. (r.s.d., %)}$	C $c \pm \text{s.d. (r.s.d., %)}$	D $c \pm \text{s.d. (r.s.d., %)}$
4:2 FTOH	n.a.	38 ± 16 (43)	68 ± 3.8 (5.6)	44 ± 0.3 (0.7)
6:2 FTOH	49 ± 1.5 (3.0)	65 ± 12 (18)	60 ± 2.8 (4.6)	45 ± 0.3 (0.8)
8:2 FTOH	31 ± 1.2 (3.8)	37 ± 13 (36)	45 ± 3.8 (8.5)	41 ± 0.5 (1.1)
10:2 FTOH	27 ± 0.5 (1.9)	54 ± 11 (20)	45 ± 4.4 (9.9)	40 ± 0.4 (0.9)
12:2 FTOH	n.a.	n.a.	54 ± 7.7 (14.4)	39 ± 0.8 (1.9)
6:2 FTA	n.a.	n.a.	57 ± 2.0 (3.6)	40 ± 0.2 (0.5)
8:2 FTA	n.a.	n.a.	58 ± 3.7 (6.3)	42 ± 0.4 (0.9)
10:2 FTA	n.a.	n.a.	n.a.	39 ± 0.5 (1.2)
MeFBSA	n.a.	n.a.	21 ± 2.8 (13.3)	35 ± 0.3 (0.8)
MeFOSA	22 ± 0.9 (4.2)	n.a.	42 ± 0.8 (1.8)	39 ± 0.2 (0.5)
EtFOSA	27 ± 0.4 (1.4)	n.a.	41 ± 2.6 (6.3)	37 ± 0.3 (0.8)
MeFBSE	n.a.	n.a.	45 ± 3.1 (6.8)	34 ± 0.4 (1.0)
MeFOSE	21 ± 1.6 (7.7)	n.a.	73 ± 2.2 (3.1)	37 ± 2.4 (6.5)
EtFOSE	21 ± 2.7 (13)	n.a.	43 ± 4.6 (10.7)	36 ± 1.7 (4.8)

## PFC concentrations during the sampling periods

**Table A5.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period I

n.a., not analysed; n.d., not detected

Compound	Period I ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.4
6:2 FTOH	11	n.d.	12	25
8:2 FTOH	54	55	52	97
10:2 FTOH	19	12	20	34
12:2 FTOH	n.a.	n.a.	8.5	8.9
6:2 FTA	n.a.	n.a.	n.d.	2.0
8:2 FTA	n.a.	n.a.	n.d.	4.0
10:2 FTA	n.a.	n.a.	n.a.	1.2
MeFBSA	n.a.	n.a.	n.d.	2.3
MeFOSA	2.5	n.a.	5.6	1.7
EtFOSA	1.6	n.a.	0.7	1.3
MeFBSE	n.a.	n.a.	7.0	1.9
MeFOSE	7	n.a.	n.d.	2.2
EtFOSE	n.d.	n.a.	n.d.	0.9

**Table A6.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period II

n.a., not analysed; n.d., not detected

Compound	Period II ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.0
6:2 FTOH	14	n.d.	13	34
8:2 FTOH	74	38	63	108
10:2 FTOH	31	5.4	24	32
12:2 FTOH	n.a.	n.a.	10	9.2
6:2 FTA	n.a.	n.a.	n.d.	3.7
8:2 FTA	n.a.	n.a.	n.d.	6.4
10:2 FTA	n.a.	n.a.	n.a.	1.6
MeFBSA	n.a.	n.a.	n.d.	6.9
MeFOSA	3.9	n.a.	5.1	6.3
EtFOSA	1.6	n.a.	n.d.	2.4
MeFBSE	n.a.	n.a.	4.2	6.2
MeFOSE	13	n.a.	n.d.	4.5
EtFOSE	5.4	n.a.	n.d.	1.3

**Table A7.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period III

n.a., not analysed; n.d., not detected

Compound	Period III ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.2
6:2 FTOH	35	n.d.	12	37
8:2 FTOH	62	59	74	69
10:2 FTOH	33	13	17	33
12:2 FTOH	n.a.	n.a.	8.4	9.6
6:2 FTA	n.a.	n.a.	n.d.	1.9
8:2 FTA	n.a.	n.a.	n.d.	6.1
10:2 FTA	n.a.	n.a.	n.a.	1.6
MeFBSA	n.a.	n.a.	n.d.	1.2
MeFOSA	3.7	n.a.	3.7	2.8
EtFOSA	1.4	n.a.	2.8	1.3
MeFBSE	n.a.	n.a.	11.3	3.5
MeFOSE	16	n.a.	12.1	3.4
EtFOSE	5.4	n.a.	n.d.	1.7

**Table A8.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period IV

n.a., not analysed; n.d., not detected

Compound	Period IV ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.4
6:2 FTOH	24	n.d.	11	22
8:2 FTOH	61	n.d.	63	54
10:2 FTOH	27	n.d.	18	18
12:2 FTOH	n.a.	n.a.	2.0	3.8
6:2 FTA	n.a.	n.a.	n.d.	1.1
8:2 FTA	n.a.	n.a.	n.d.	5.0
10:2 FTA	n.a.	n.a.	n.a.	1.6
MeFBSA	n.a.	n.a.	n.d.	1.6
MeFOSA	3.9	n.a.	2.9	1.7
EtFOSA	1.0	n.a.	1.5	2.0
MeFBSE	n.a.	n.a.	7.7	3.0
MeFOSE	14	n.a.	9.0	2.2
EtFOSE	4.7	n.a.	n.d.	1.1

**Table A9.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period V

n.a., not analysed; n.d., not detected

Compound	Period V ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.5
6:2 FTOH	24	n.d.	17	15
8:2 FTOH	58	n.d.	61	38
10:2 FTOH	36	n.d.	17	8.6
12:2 FTOH	n.a.	n.a.	3.9	15
6:2 FTA	n.a.	n.a.	n.d.	1.4
8:2 FTA	n.a.	n.a.	n.d.	3.6
10:2 FTA	n.a.	n.a.	n.a.	4.0
MeFBSA	n.a.	n.a.	n.d.	3.6
MeFOSA	6.2	n.a.	2.5	1.5
EtFOSA	1.1	n.a.	1.8	0.8
MeFBSE	n.a.	n.a.	6.1	1.4
MeFOSE	15	n.a.	5.4	1.1
EtFOSE	3.1	n.a.	n.d.	0.5

**Table A10.** Concentrations ( $\text{pg m}^{-3}$ ) of volatile PFCs determined by passive sampling and concentrations averages of high-volume samples for period VI

n.a., not analysed; n.d., not detected

Compound	Period VI ( $\text{pg m}^{-3}$ )			
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)	Lab D (High Vol)
4:2 FTOH	n.a.	n.d.	n.d.	0.8
6:2 FTOH	29	n.d.	22	12
8:2 FTOH	64	n.d.	72	48
10:2 FTOH	32	n.d.	19	15
12:2 FTOH	n.a.	n.a.	3.0	14
6:2 FTA	n.a.	n.a.	n.d.	1.2
8:2 FTA	n.a.	n.a.	n.d.	3.2
10:2 FTA	n.a.	n.a.	n.a.	3.9
MeFBSA	n.a.	n.a.	n.d.	2.4
MeFOSA	5.4	n.a.	2.7	1.2
EtFOSA	1.5	n.a.	2.4	0.7
MeFBSE	n.a.	n.a.	7.7	1.7
MeFOSE	14	n.a.	4.7	1.2
EtFOSE	3.5	n.a.	n.d.	0.6

**Variation in derived air concentrations expressed as the ratio of active/passive****Table A11. Ratios for active : SIP-derived air concentrations for 6:2 FTOH**

n.d., not detected

c(active)/c(passive) 6:2 FTOH			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	2.2	n.d.	2.2
II	2.4	n.d.	2.6
III	1.0	n.d.	3.0
IV	0.9	n.d.	1.9
V	0.6	n.d.	0.9
VI	0.4	n.d.	0.6
mean	1.3	n.d.	1.9
s.d.	0.8	n.d.	1.0

**Table A12. Ratios for active : SIP-derived air concentrations for 8:2 FTOH**

n.d., not detected

c(active)/c(passive) 8:2 FTOH			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	1.8	1.8	1.9
II	1.5	2.8	1.7
III	1.1	1.2	0.9
IV	0.9	n.d.	0.9
V	0.7	n.d.	0.6
VI	0.8	n.d.	0.7
mean	1.1	1.9	1.1
s.d.	0.4	0.8	0.5

**Table A13. Ratios for active : SIP-derived air concentrations for 10:2 FTOH**

n.d.: not detected

c(active)/c(passive) 10:2 FTOH			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	1.8	2.8	1.7
II	1.1	6.0	1.3
III	1.0	2.5	1.9
IV	0.7	n.d.	1.0
V	0.2	n.d.	0.5
VI	0.5	n.d.	0.8
mean	0.9	3.8	1.2
s.d.	0.6	1.9	0.5

**Table A14. Ratios for active:SIP-derived air concentrations for 12:2 FTOH**

n.a., not analysed

c(active)/c(passive) 12:2 FTOH			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	n.a.	n.a.	1.0
II	n.a.	n.a.	0.9
III	n.a.	n.a.	1.1
IV	n.a.	n.a.	1.9
V	n.a.	n.a.	3.8
VI	n.a.	n.a.	4.6
mean	n.a.	n.a.	2.2
s.d.	n.a.	n.a.	1.6

**Table A15. Ratios for active:SIP-derived air concentrations for MeFOSA**

n.a., not analysed

c(active)/c(passive) MeFOSA			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	0.7	n.a.	0.3
II	1.6	n.a.	1.2
III	0.8	n.a.	0.7
IV	0.4	n.a.	0.6
V	0.2	n.a.	0.6
VI	0.2	n.a.	0.4
mean	0.7	n.a.	0.7
s.d.	0.5	n.a.	0.3

**Table A16. Ratios for active:SIP-derived air concentrations for EtFOSA**

n.a., not analysed

c(active)/c(passive) EtFOSA			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	0.8	n.a.	1.9
II	1.5	n.a.	n.d.
III	0.9	n.a.	0.5
IV	2.0	n.a.	1.3
V	0.7	n.a.	0.4
VI	0.5	n.a.	0.3
mean	1.1	n.a.	0.9
s.d.	0.6	n.a.	0.7

**Table A17. Ratios for active:SIP-derived air concentrations for MeFBSE**

n.a., not analysed

c(active)/c(passive) MeFBSE			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	n.a.	n.a.	0.3
II	n.a.	n.a.	1.5
III	n.a.	n.a.	0.3
IV	n.a.	n.a.	0.4
V	n.a.	n.a.	0.2
VI	n.a.	n.a.	0.2
mean	n.a.	n.a.	0.5
s.d.	n.a.	n.a.	0.5

**Table A18. Ratios for active:SIP-derived air concentrations for MeFOSE**

n.a., not analysed

c(active)/c(passive) MeFOSE			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	0.3	n.a.	n.d.
II	0.3	n.a.	n.d.
III	0.2	n.a.	0.3
IV	0.2	n.a.	0.2
V	0.1	n.a.	0.2
VI	0.1	n.a.	0.2
mean	0.2	n.a.	0.2
s.d.	0.1	n.a.	0.0

**Table A19. Ratios for active:SIP-derived air concentrations for EtFOSE**

n.a., not analysed; n.d., not detected

c(active)/c(passive) EtFOSE			
Period	A (SIP disk)	B (SPMD)	C (SIP disk)
I	n.d.	n.a.	n.d.
II	0.2	n.a.	n.d.
III	0.3	n.a.	n.d.
IV	0.2	n.a.	n.d.
V	0.1	n.a.	n.d.
VI	0.2	n.a.	n.d.
mean	0.2	n.a.	n.d.
s.d.	0.1	n.a.	n.d.

**Passive air sampling (PAS) field sampling rates calibrated by high-volume samples****Table A20.** Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period I using high-volume data

$T$ , annual temperature average ( $^\circ\text{C}$ ),  $12.2^\circ\text{C}$ ;  $U$ , annual wind speed average ( $\text{m s}^{-1}$ ),  $2.3 \text{ m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) period I		
	Lab A (SIP disk)	Lab B (SPMD)	Lab C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	0.8	n.c.
10:2 FTOH	n.c.	0.9	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFOSA	6.6	n.a.	7.4
EtFOSA	4.2	n.a.	1.2
MeFBSE	n.a.	n.a.	3.8
MeFOSE	8.6	n.a.	n.d.
EtFOSE	n.d.	n.a.	n.d.

**Table A21.** Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period II using high-volume data

$T$ ,  $17.1^\circ\text{C}$ ;  $U$ ,  $2.1 \text{ m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) period II		
	A (SIP disk)	B (SPMD)	C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	0.5	n.c.
10:2 FTOH	n.c.	0.4	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFBSA	n.a.	n.a.	1.9
MeFOSA	2.3	n.a.	n.d.
EtFOSA	n.a.	n.a.	0.7
MeFBSE	8.0	n.a.	n.d.
MeFOSE	9.7	n.a.	n.d.
EtFOSE	0.8	n.a.	0.6

**Table A22:** Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period III using high-volume data

$T$ ,  $15.3^\circ\text{C}$ ;  $U$ ,  $2.1 \text{ m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) period III		
	A (SIP disk)	B (SPMD)	C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	2.5	n.c.
10:2 FTOH	n.c.	3.5	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFOSA	6.0	n.a.	3.1
EtFOSA	4.0	n.a.	5.1
MeFBSE	n.a.	n.a.	3.4
MeFOSE	12.4	n.a.	2.4
EtFOSE	7.5	n.a.	n.d.

**Table A23. Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period IV using high-volume data**

$T$ , 6.9°C;  $U$ , 2.0  $\text{m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) Period IV		
	A (SIP disk)	B (SPMD)	C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	n.d.	n.c.
10:2 FTOH	n.c.	n.d.	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFOSA	10.3	n.a.	3.9
EtFOSA	1.7	n.a.	1.7
MeFBSE	n.a.	n.a.	2.7
MeFOSE	16.7	n.a.	2.7
EtFOSE	9.8	n.a.	n.d.

**Table A24. Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period V using high-volume data**

$T$ , 4.4°C;  $U$ , 3.7  $\text{m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) Period V		
	A (SIP disk)	B (SPMD)	C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	n.d.	n.c.
10:2 FTOH	n.c.	n.d.	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFOSA	19.0	n.a.	4.0
EtFOSA	4.6	n.a.	5.4
MeFBSE	n.a.	n.a.	4.4
MeFOSE	37.1	n.a.	3.4
EtFOSE	16.0	n.a.	n.d.

**Table A25. Sampling rates ( $\text{m}^3 \text{ day}^{-1}$ ) calculated for period VI using high-volume data**

$T$ , 4.7°C;  $U$ , 3.9  $\text{m s}^{-1}$ ; n.a., not analysed; n.c., not calculated; n.d., not detected

Compound	Sampling rate ( $\text{m}^3 \text{ day}^{-1}$ ) Period VI		
	A (SIP disk)	B (SPMD)	C (SIP disk)
6:2 FTOH	n.c.	n.a.	n.c.
8:2 FTOH	n.c.	n.d.	n.c.
10:2 FTOH	n.c.	n.d.	n.c.
12:2 FTOH	n.c.	n.a.	n.c.
MeFOSA	20.0	n.a.	5.2
EtFOSA	7.4	n.a.	8.1
MeFBSE	n.a.	n.a.	4.7
MeFOSE	33.2	n.a.	2.7
EtFOSE	13.6	n.a.	n.d.

**MDLs and IDLs****Table A26. Instrumental detection limits (IDL, pg  $\mu\text{L}^{-1}$ )**

Compound	IDL (pg $\mu\text{L}^{-1}$ )			
	A	B	C	D
4:2 FTOH	n.a.	10	11	0.8
6:2 FTOH	0.9	5	2.1	0.9
8:2 FTOH	1.1	5	1.0	0.8
10:2 FTOH	0.6	5	1.0	0.8
12:2 FTOH	n.a.	n.a.	5.9	0.8
6:2 FTA	n.a.	n.a.	1.9	0.1
8:2 FTA	n.a.	n.a.	1.0	0.1
10:2 FTA	n.a.	n.a.	n.a.	0.1
MeFBSA	n.a.	n.a.	1.0	0.1
MeFOSA	0.1	n.a.	1.1	0.1
EtFOSA	0.1	n.a.	1.0	0.1
MeFBSE	n.a.	n.a.	1.9	0.1
MeFOSE	1.0	n.a.	3.6	0.1
EtFOSE	0.6	n.a.	3.6	0.2

**Table A27. Method detection limits (MDL)**

MDLs ( $\text{pg m}^{-3}$ ) for lab A, B, C were estimated from MDLs ( $\text{pg mL}^{-1}$ ). For FTOHs, MDLs ( $\text{pg m}^{-3}$ ) = MDLs ( $\text{pg mL}^{-1}$ ) average effective volume (sampling duration of 60 days). For FASAs and FASEs, MDLs ( $\text{pg m}^{-3}$ ) = MDLs ( $\text{pg mL}^{-1}$ ) (60 days) sampling rate calculated in this study (Table 3). n.a., not analysed; n.d., not detected

Compound	MDL (pg $\mu\text{L}^{-1}$ )				MDL (pg $\text{m}^{-3}$ )			
	A	B	C	D	A	B	C	D
4:2 FTOH	n.a.	20	37	3.0	n.a.	n.d.	22	<0.1
6:2 FTOH	0.6	15	10	2.3	1.8	n.d.	5.9	<0.9
8:2 FTOH	0.7	15	2.9	4.5	2.1	36	1.8	<0.7
10:2 FTOH	0.4	10	3.1	1.8	1.2	13	1.9	<0.1
12:2 FTOH	n.a.	n.a.	14	1.1	n.a.	n.a.	9.9	<0.4
6:2 FTA	n.a.	n.a.	8.9	1.2	n.a.	n.a.	n.d.	<0.2
8:2 FTA	n.a.	n.a.	1.1	0.3	n.a.	n.a.	n.d.	<0.1
10:2 FTA	n.a.	n.a.	n.a.	0.1	n.a.	n.a.	n.a.	<0.1
MeFBSA	n.a.	n.a.	1.0	0.7	n.a.	n.a.	0.9	<0.3
MeFOSA	0.1	n.a.	3.8	0.9	0.1	n.a.	1.3	<0.4
EtFOSA	0.1	n.a.	1.0	0.3	0.3	n.a.	0.3	<0.1
MeFBSE	n.a.	n.a.	2.1	0.2	n.a.	n.a.	0.7	<0.1
MeFOSE	0.6	n.a.	13	1.0	0.5	n.a.	3.4	<0.2
EtFOSE	0.4	n.a.	4.3	0.2	0.5	n.a.	n.d.	<0.4

## Recovery rates

**Table A28. Average recovery rates (R, %) of PFCs determined by different sampling techniques**

Note: signal enhancement was involved at lab A and C. s.d., standard deviation (%); r.s.d., relative standard deviation (%); n.a., not analysed

Compound	Average recovery rates (%)			
	A (SIP disk) R ± s.d. (r.s.d.)	B (SPMD) R ± s.d. (r.s.d.)	C (SIP disk) R ± s.d. (r.s.d.)	D (High Vol) R ± s.d. (r.s.d.)
13C 4:2 FTOH	n.a.	n.a.	n.a.	21 ± 13 (1.1)
13C 6:2 FTOH	90 ± 22 (24)	n.a.	85 ± 26 (31)	39 ± 20 (1.1)
13C 8:2 FTOH	70 ± 19 (26)	54 ± 8.6 (16)	129 ± 43 (34)	49 ± 23 (1.3)
13C 10:2 FTOH	117 ± 13 (11)	63 ± 14 (22)	108 ± 45 (41)	45 ± 32 (1.2)
D3 MeFOSA	n.a.	n.a.	76 ± 19 (24)	41 ± 19 (0.7)
D5 EtFOSA	n.a.	n.a.	85 ± 9 (11)	45 ± 19 (1.2)
D7 MeFOSE	n.a.	n.a.	101 ± 14 (14)	60 ± 27 (1.5)
D9 EtFOSE	n.a.	n.a.	103 ± 16 (15)	59 ± 21 (1.0)
5:1 FA	n.a.	n.a.	75 ± 12 (6)	n.a.
7:1 FA	n.a.	n.a.	75 ± 33 (44)	n.a.
9:1 FA	n.a.	n.a.	105 ± 31 (30)	n.a.
11:1 FA	n.a.	n.a.	136 ± 34 (25)	n.a.

**Blanks****Table A29. Average laboratory and field blanks (pg m<sup>-3</sup>)**

n.a., not analysed; n.d., not detected

	lab blanks				field blanks			
	lab A (SIP disk)	lab B (SPMD)	lab C (SIP disk)	lab D (High Vol)	lab A (SIP disk)	lab B (SPMD)	lab C (SIP disk)	lab D (High Vol)
4:2 FTOH	n.d.	n.d.	n.d.	0.2	n.d.	n.d.	20	1.4
6:2 FTOH	n.d.	n.d.	n.d.	0.2	n.d.	n.d.	3.3	1.3
8:2 FTOH	n.d.	n.d.	0.4	0.2	n.d.	6.3	25	0.8
10:2 FTOH	n.d.	n.d.	0.3	0.1	3.4	1.5	2.0	1.0
12:2 FTOH	n.a.	n.a.	0.1	0.1	n.a.	n.a.	0.6	1.0
6:2 FTA	n.a.	n.a.	2.6	0.3	n.a.	n.a.	2.6	1.0
8:2 FTA	n.a.	n.a.	0.02	0.2	n.a.	n.a.	n.d.	0.7
10:2 FTA	n.a.	n.a.	n.a.	0.2	n.a.	n.a.	n.a.	0.9
MeFBSA	n.a.	n.a.	n.d.	n.d.	n.a.	n.a.	0.001	0.7
MeFOSA	n.d.	n.a.	1.7	0.2	2.2	n.a.	1.4	0.6
EtFOSA	n.d.	n.a.	n.d.	0.1	n.d.	n.a.	0.9	0.2
MeFBSE	n.a.	n.a.	1.2	0.2	n.a.	n.a.	n.d.	0.9
MeFOSE	n.d.	n.a.	0.8	0.1	n.d.	n.a.	5.6	0.7
EtFOSE	n.d.	n.a.	0.6	0.1	n.d.	n.a.	n.d.	0.8