

Supplementary data

Table S1. Operational instrumental parameters for HPLC-HRqToF-MS.

Parameter		Detail
Columns	Guard:	Agilent Zorbex SIL (4.6 x 12.5 mm, 5 µm) and DIOL (4.6 x 12.5 mm, 5 µm)
	Main:	Agilent Zorbex Eclipse Plus C18 (4.6 x 12.5 mm, 5 µm)
Injection volume		20 µL
Mobile phase	Solution A:	Water with 10 mM ammonium acetate
	Solution B:	Methanol with 10 mM ammonium acetate
Elution times	0–10 min:	Solution A at 95 % : Solution B at 5 %
	10–17 min:	Solution A at 5 % : Solution B at 95 %
	17–25 min:	Solution A at 95 % : Solution B at 5 %
Column temperature		30 °C
Instrument mode		Both positive and negative runs performed
Needle wash		30 seconds in acetone, directed to waste
Flow rate		0.35 mL min ⁻¹
Sheath gas temperature		350 °C
Fragmentor voltage		80 V
VCAP		4000 V
MS-scanning		100 – 1000 m/z

Table S2. TOP-Assay concentrations for drainage solution samples collected following 0 and 60 minutes drainage time for both the control and the fire exposed samples, an additional sample of fresh foam solution was also analysed (n=3). Analysis conducted by Envirolab, Services Pty Ltd., NSW, AU.

PFAS compounds	Drainage time after extinction	Concentration, ng mL ⁻¹		
		Control	Fire-exposed	Foam solution
6-2 FTS,	0	360	540	20
6-2 Fluorotelomer sulfonate	60	830	1900	
PFBA,	0	500	500	2700
Perfluorobutanoic acid	60	1700	7300	
PFPeA,	0	100	920	5200
Perfluoropentanoic acid	60	3300	15000	
PFHxA,	0	77	350	1500
Perfluorohexanoic acid	60	110	4200	
PFHpA,	0	10	29	190
Perfluoroheptanoic acid	60	120	520	
Total	0	1047	2339	9610
	60	6060	28920	

Table S3. Calculation of total interfacial surface area required for complete adsorption of the 6:2 FTSaB contained in 1 L of model foam solution.

Parameter	Value	Equation	Calculation
Estimated bubble radius, m	1.5×10^{-4}	Estimated from Figure S1	
Expansion ratio	8	Estimated from Figure S1	
Volume of bubble, m ³	1.4×10^{-11}	$\frac{4}{3}\pi r^3$	$\frac{4}{3}\pi(1.5 e^{-4})^3$
Number of bubbles in 8 L foam (7 L air, 1 L foam solution)	5.0×10^8	$\frac{\text{Volume of air}}{\text{Volume of bubbles}}$	$\frac{7e^{-3}}{1.4 e^{-11}}$
Surface area of average bubble, m ²	2.8×10^{-7}	$4\pi r^2$	$4 \pi (1.5e^{-4})^2$
Total surface area of interface, m ²	140	$\text{Number of bubbles} \times \text{Bubble surface area}$	$5.0e^8 \times 2.8e^{-7}$
6:2 FTSaB per L foam, mM	0.36		
Number of 6:2 FTSaB molecules per L foam solution	2.2×10^{20}	$6:2\text{FTSaB molecules } L^{-1} \times \text{Avogadro constant}$	$0.36 e^{-3} \times 6.02 e^{23}$
Molecules per nm ² at full surface saturation	2.07	Estimated from plot of foam concentration against surface tension	
Total interfacial area, m ²	110	$\frac{\text{Molecules per L}}{\text{Molecules per nm}}$	$\frac{2.2e^{20}}{2.07}$

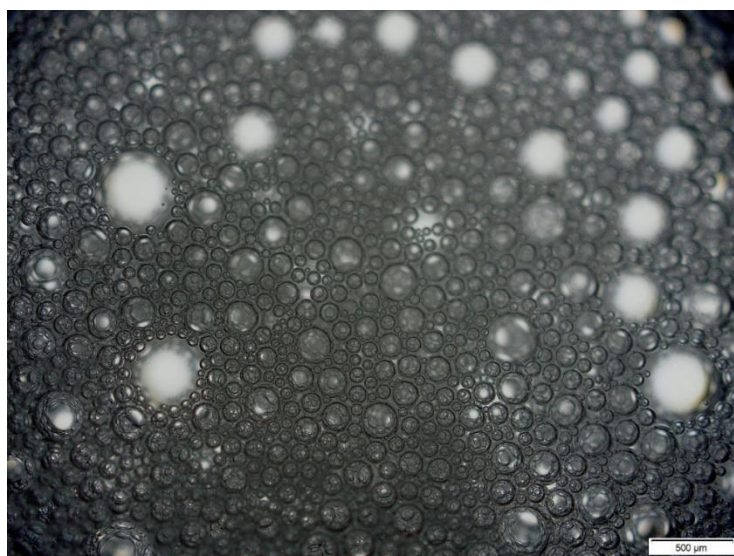


Figure S1. Optical microscope image of model foam formed using a laboratory branch pipe (DEF 41).