

Figure S1. Calibration curves* for a range LD - 1 mg L⁻¹. (a) 1-Propanol (b) 2-Butanone (c) 1-Butanol (d) Ethyl propionate (e) Dimethyl disulfide (f) Ethyl butyrate (g) Dimethyl trisulfide (h) Benzaldehyde (i) Limonene (j) *p*-Cresol (k) Indole (l) Skatole. *Calibration curves based on area ratio (AREA_{VOC}/AREA_{IS}) vs concentration ratio (CONCENTRATION_{VOC}/CONCENTRATION_{IS}).

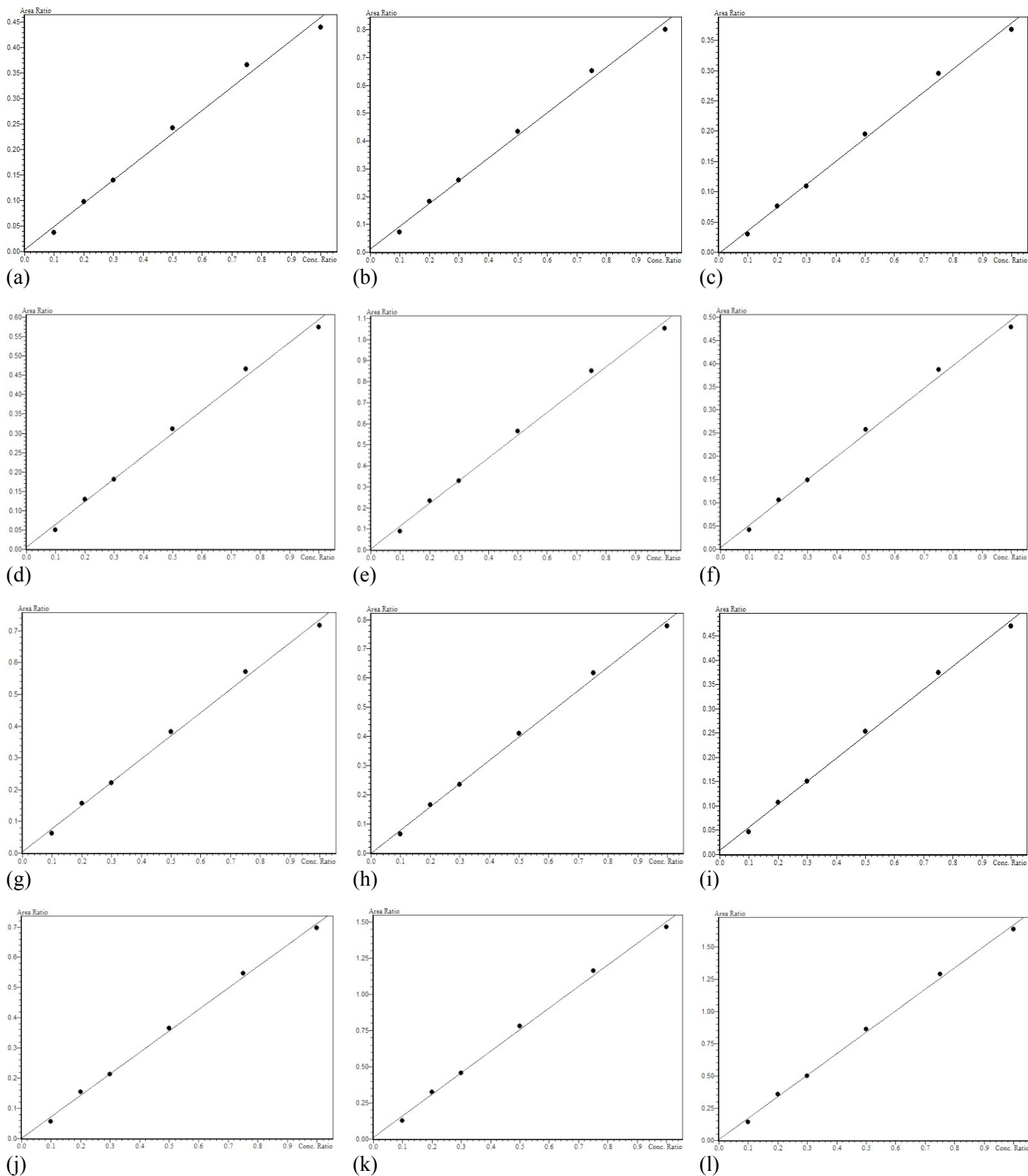


Figure S2. Calibration curves* for a range 1-10 mg L⁻¹. (a) 1-Propanol (b) 2-Butanone (c) 1-Butanol (d) Ethyl propionate (e) Dimethyl disulfide (f) Ethyl butyrate (g) Dimethyl trisulfide (h) Benzaldehyde (i) Limonene (j) *p*-Cresol (k) Indole (l) Skatole. *Calibration curves based on area ratio (AREA_{VOC}/AREA_{IS}) vs concentration ratio (CONCENTRATION_{VOC}/CONCENTRATION_{IS}).

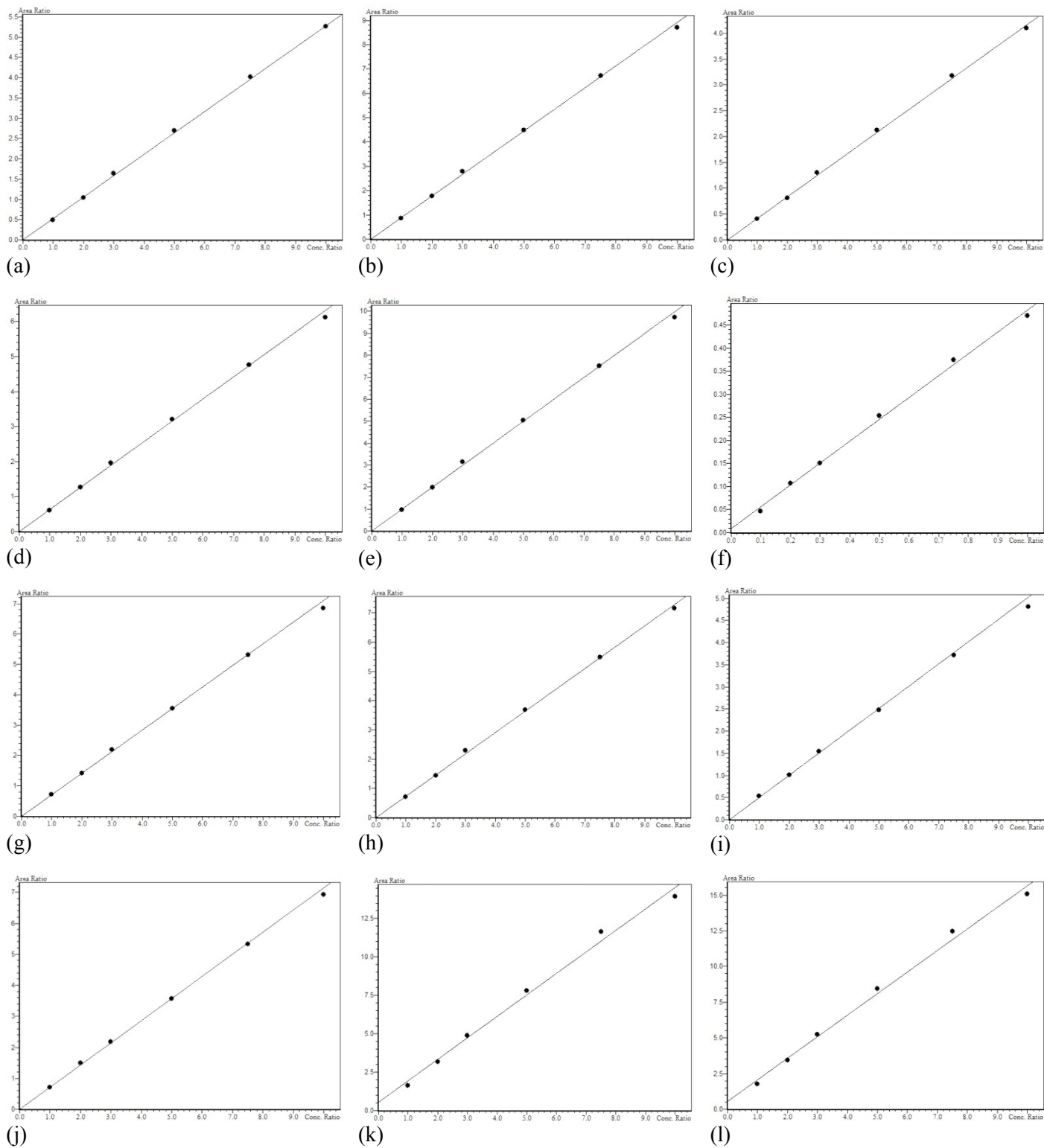


Figure S3. Calibration curves* for a range 10-100 mg L⁻¹. (a) 1-Propanol (b) 2-Butanone (c) 1-Butanol (d) Ethyl propionate (e) Dimethyl disulfide (f) Ethyl butyrate (g) Dimethyl trisulfide (h) Benzaldehyde (i) Limonene (j) *p*-Cresol (k) Indole (l) Skatole. *Calibration curves based on area ratio (AREA_{VOC}/AREA_{IS}) vs concentration ratio (CONCENTRATION_{VOC}/CONCENTRATION_{IS}).

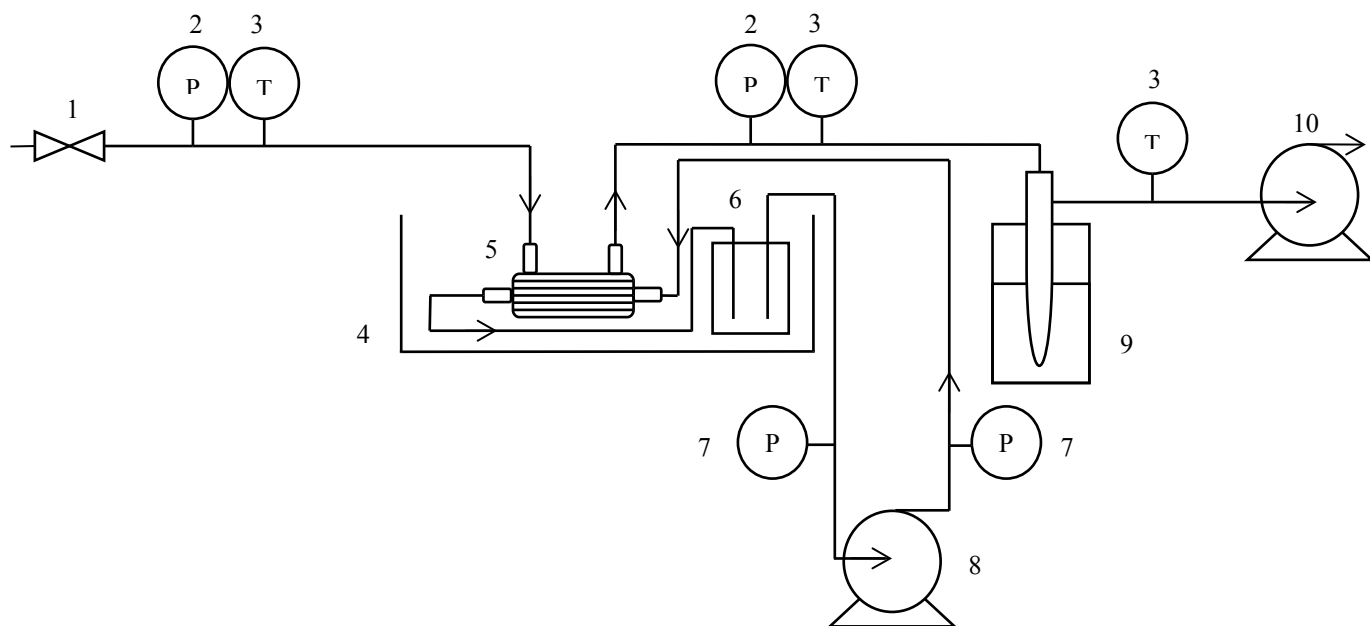


Figure S4. Pervaporation membrane rig schematic. 1: Needle valve; 2: Absolute pressure transducer (PXM 319-002A, Omega, Manchester, UK); 3: Temperature probe (HMT337, Vaisala, Suffolk, UK); 4: Thermostatic bath at 50°C (Grant TC120, Cambridge, UK); 5: Membrane module (see table 1); 6: Feed solution in Duran bottle with GL 45 screw cap and 2 hose connections (Fisher scientific, Loughborough, UK) ; 7: Pressure gauge (DPG 1001, Omega, Manchester, UK); 8: Peristaltic pump (520s, Watson Marlow, Falmouth, UK); 9: Liquid nitrogen cold trap (-196°C) or condenser (2°C); 10: Diaphragm vacuum pump (MD 4C NT, Vacuubrand, Brackley).

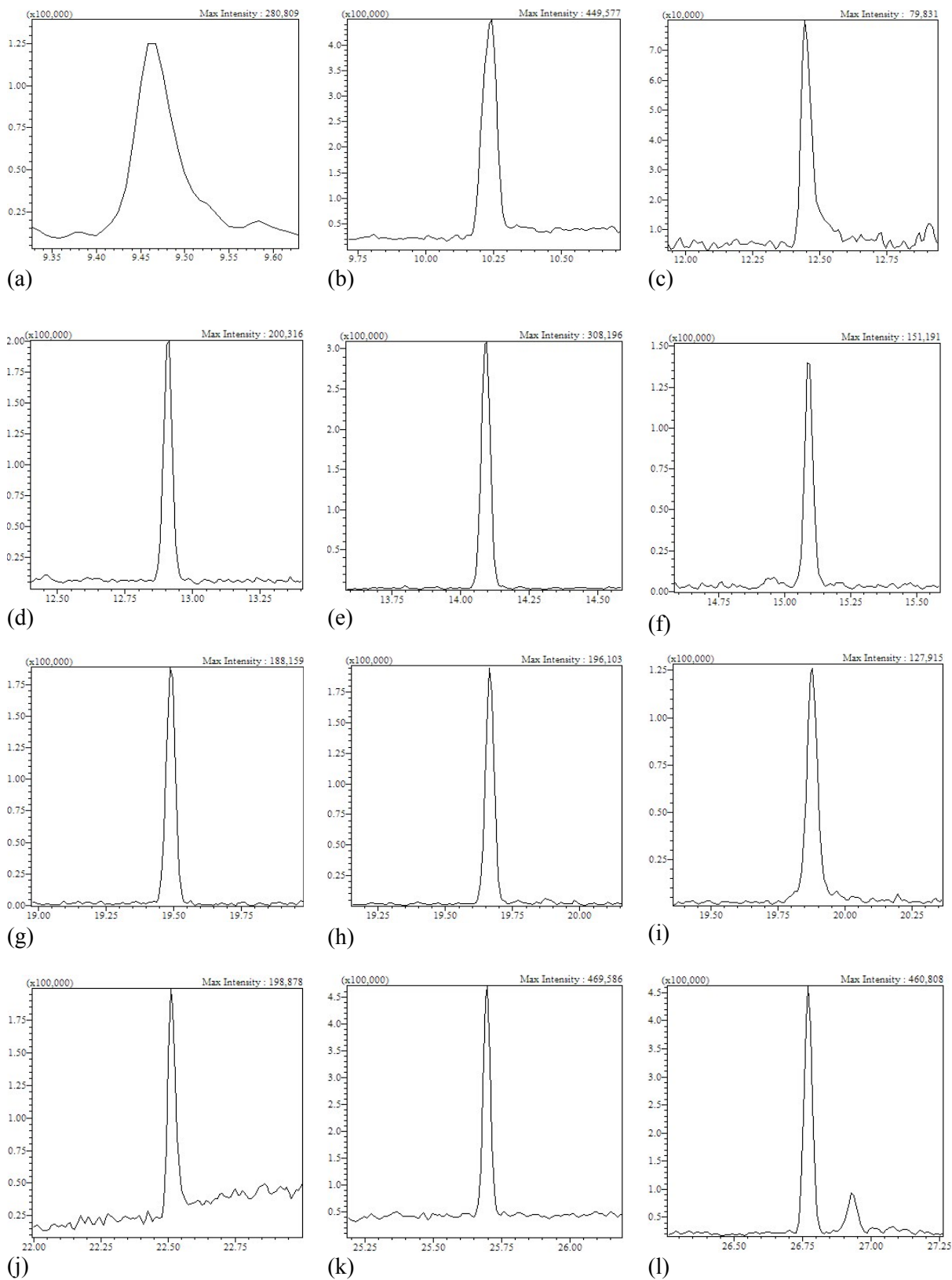


Figure S5. Intensity vs. retention time of individual peaks at 0.1 mg L^{-1} in single ion monitoring mode. (a) 1-Propanol (b) 2-Butanone (c) 1-Butanol (d) Ethyl propionate (e) Dimethyl disulfide (f) Ethyl butyrate (g) Dimethyl trisulfide (h) Benzaldehyde (i) Limonene (j) *p*-Cresol (k) Indole (l) Skatole.

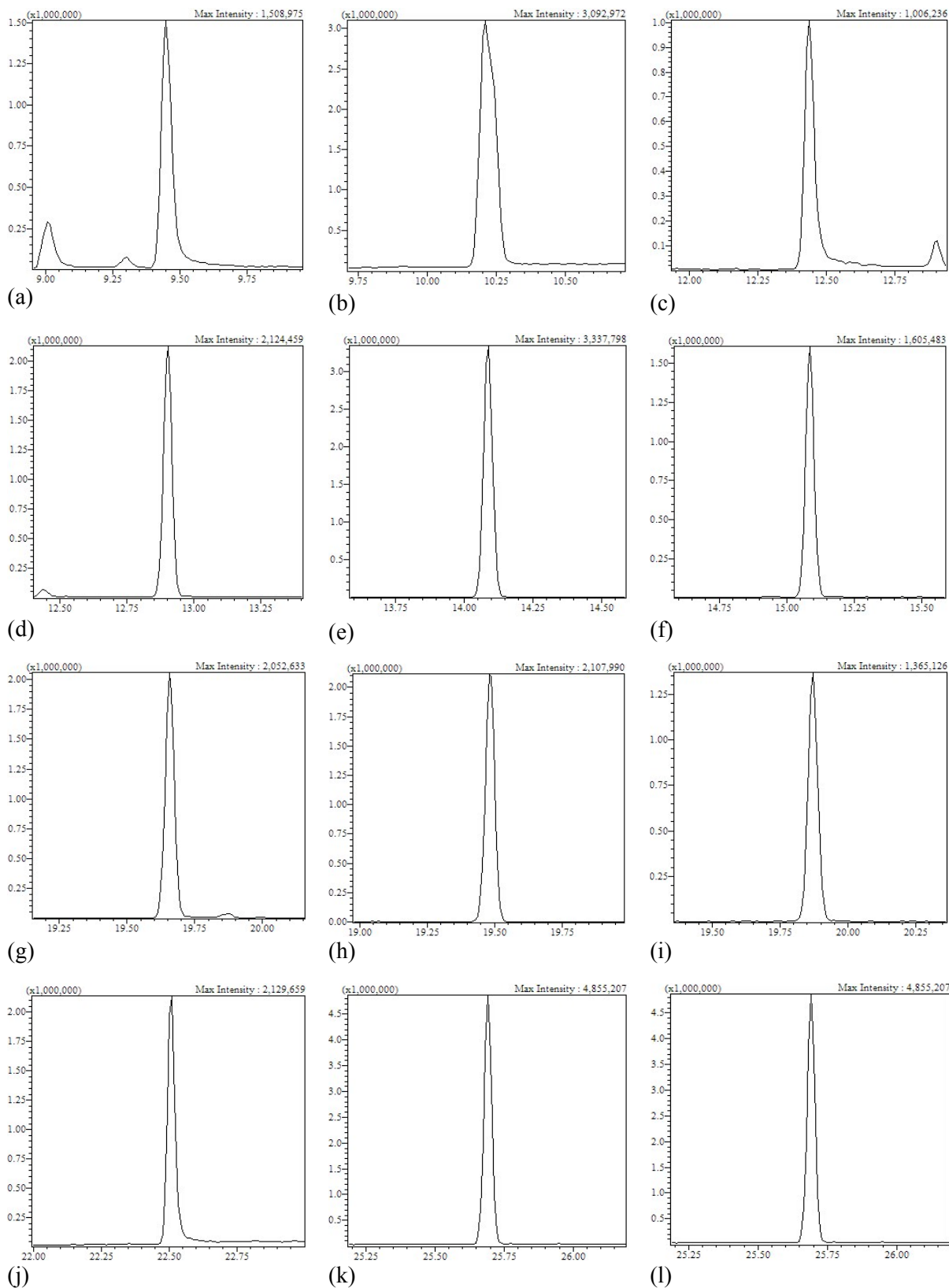


Figure S6. Intensity vs. retention time of individual peaks at 1 mg L⁻¹ in single ion monitoring mode. (a) 1-Propanol (b) 2-Butanone (c) 1-Butanol (d) Ethyl propionate (e) Dimethyl disulfide (f) Ethyl butyrate (g) Dimethyl trisulfide (h) Benzaldehyde (i) Limonene (j) *p*-Cresol (k) Indole (l) Skatole.

Table S1. Membrane characteristics and operating conditions.

	Pervaporation	
Manufacturer (model)	DeltaMem (Pervap™ 4101)	Permselect (PDMSXA-2500)
Material	Polyvinyl alcohol (PVA)	Polydimethylsiloxane (PDMS)
Membrane area (m ²)	0.0153	0.25
Membrane thickness (μm)	5	55
Membrane structure	Crosslinked support layer	Symmetric
Contact angle (°)	43 (±1.1)	116 (±1.4)
Geometry	Flat sheet	Hollow fibre
Operating pressure (bar)	0.05	0.05
Operating membrane temperature (°C)	50	50

Note: >90° indicates hydrophobic polymer and <90° indicates hydrophilic polymer

Table S2. USP coefficient tailing factors for 0.1 mg L⁻¹ and 1 mg L⁻¹ peaks.

	0.1 mg L ⁻¹	1 mg L ⁻¹
1-Propanol	1.40	1.39
2-Butanone	0.86	1.57
1-Butanol	2.04	1.34
Ethyl propionate	1.00	1.02
Dimethyl disulfide	1.08	1.03
Ethyl butyrate	0.96	1.00
Dimethyl trisulfide	0.96	0.90
Benzaldehyde	0.96	0.93
Limonene	1.10	1.06
<i>p</i> -Cresol	1.24	1.25
Indole	1.00	0.98
Skatole	0.95	0.92

USP tailing factor calculated as $W_{0.05}/2f_{0.05}$, where $W_{0.05}$ is the peak width and f is the peak front width at 5% height.

Note: 1. Good chromatographic peak shape defined as symmetrical, narrow and tailing factor of 1(Agilent, ND).

2. U.S. Food and Drug Administration (FDA). The FDA recommends a tailing factor of ≤ 2

Table S3. VOC microbial sources of selected compounds in this study.

Volatile organic compound	Microbial source
1-Propanol	<i>Escherichia coli</i> ^a
2-Butanone	<i>Pseudomonas aeruginosa</i> ^a
1-Butanol	<i>Staphylococcus aureus</i> , <i>Escherichia coli</i> ^a
Ethyl propionate	-
Dimethyl disulfide	<i>Klebsiella pneumoniae</i> ^a , <i>Pseudomonas aeruginosa</i> ^a , <i>Escherichia coli</i> ^a
Ethyl butyrate	<i>Enterococcus faecalis</i> ^a , <i>Escherichia coli</i> ^a
Dimethyl trisulfide	<i>Pseudomonas aeruginosa</i> ^a
Benzaldehyde	<i>Staphylococcus aureus</i> ^a , <i>Escherichia coli</i> ^a
Limonene	<i>Pseudomonas aeruginosa</i> ^a
<i>p</i> -Cresol	Most aerobic enterobacteria and anaerobic <i>Clostridium perfringens</i> ^b
Indole	<i>Escherichia coli</i> ^a
Skatole	<i>Escherichia coli</i> ^a

^aB.Bos et al. 2013

^bVanholder et al., 1999