

Supplement to “Emissions of I/SVOCs from domestic fuels used in Delhi, India”

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S1 - Combustion of samples and filter collection

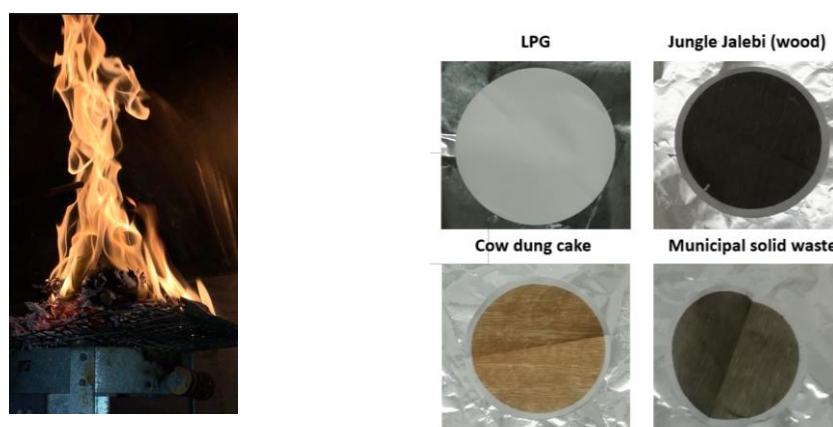


Figure S1. Left: Combustion of wood sample. Right: example PTFE filters from different fuel types.

S2 - SPE and PTFE blanks

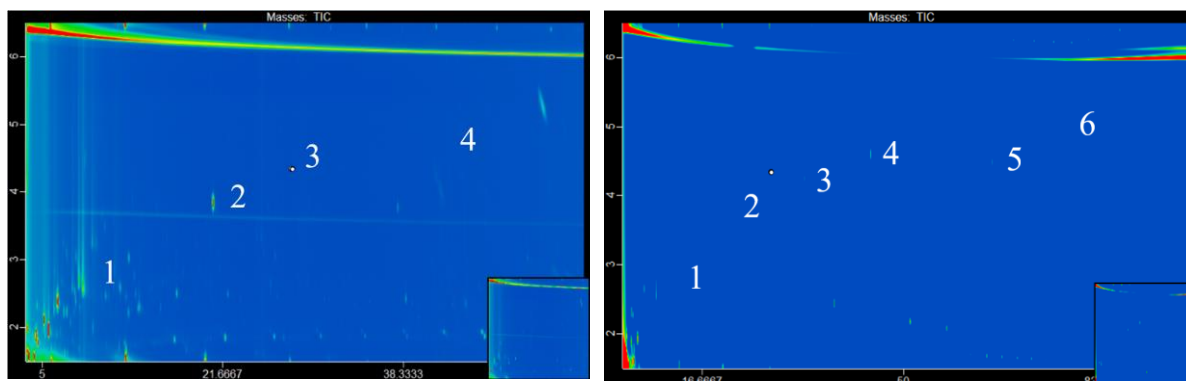


Figure S2. Left: penultimate SPE blank. Right: penultimate PTFE blank where peaks from the internal standard are 1 = 1,4-Dichlorobenzene-d₄, 2 = naphthalene-d₈, 3 = acenaphthene-d₁₀, 4 = phenanthrene-d₁₀, 5 = chrysene-d₁₂ and 6 = perylene-d₁₂.

Figure S2 shows an SPE blank taken from the chamber after 21 burning samples had been collected (6 L min⁻¹ for 30 mins, after chamber had been pumped for 20 mins post sample). The chromatogram is quite blank, with one of the most prominent peaks (around 1° 20 mins, 2° 4s) from naphthalene-d₈ from the internal standard. There are very faint peaks from *n*-alkanes from *n*-nonane to *n*-eicosane, but there are also peaks from the 1-alkene which indicates that there is some carryover/background from the burning chamber. This alkane/1-alkene effect is also seen in online GCxGC-FID burning chromatograms. There are also a few aromatic peaks early in the chromatogram such as toluene, ethylbenzene, *m/p/o*-xylenes, trimethylbenzenes and 1,4,-dichlorobenzene which are likely to be from ambient air. There are a few peaks from 4 to 10 mins that are from contaminants in the EtOAc solvent such as Bicyclo[3.1.0]hexan-3-one, butyl acetate, 2-pentanone, 4-hydroxy-4-methyl and 3-penten-2-one, 4-methyl.

The PTFE blank shows minimum signal except for a few peaks from 4 to 10 mins that are solvent contaminants, such as 1,nitro-2-propanone, N,N,O-triacetylhydroxylamine, butyl acetate and pentatonic acid. There are the peaks from the internal standard and a few *n*-alkanes (*n*-docosane to *n*-tetracontane) which are either contaminants or from ambient aerosol. This method was prone to a small interference in the region of these alkanes, with the rubber septum on the sample vial caps identified as one source. This interference was still observed in some samples and it is suggested that this is not suitable for trace level analyses of these components. Issues with quantification of *n*-alkanes have been previously highlighted in samples with low emission factors, but high levels in the blank (Jayarathne et al., 2018).

S3 – Recovery testing

Figure S3 shows a chromatogram of the standard mixture used to test recoveries. Table S1 shows the names of species tested as well as the split methods used for quantification on SPE disks (Q_{ms}) and PTFE filters (Q_{mp}). It also shows percentage recoveries measured from SPE disks (S_{rec}) and PTFE filters (P_{rec}).

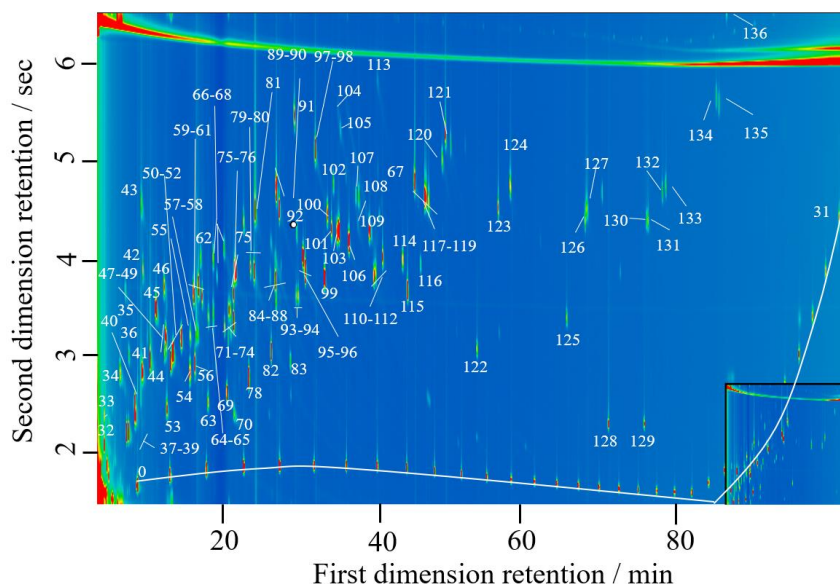


Figure S3. GCxGC-ToF-MS chromatogram of a mixed standard, numbered according to species listed in Table S1.

Table S1. Species used in calibration where Comp No. refers to the peak number in Figure S3, Q_{ms} = split method used for SPE quantitation, Q_{mp} = split method used for PTFE quantitation, S = splitless method, S_{rec} = % recovery SPE, P_{rec} = % recovery PTFE, ^a = Sigma-Aldrich *n*-alkanes standard, ^b = Sigma-Aldrich semivolatiles standard, ^c = Sigma-Aldrich deuterated internal standard, ^d = in-house solution and - = not measured either due to being outside of SPE method range or due to volatilisation from PTFE filters. Slight over-recoveries of > 100 % are reported as 100 % and accounted for in blank subtractions.

Comp No.	Species	Q_{ms}	Q_{mp}	S_{rec}	P_{rec}	Comp No.	Species	Q_{ms}	Q_{mp}	S_{rec}	P_{rec}
Alkane						NVOC					
0	<i>n</i> -Nonane ^a	10:1	S	60.0	-	32	Pyridine ^d	10:1	S	75.1	-
1	<i>n</i> -Decane ^a	10:1	S	77.6	19.5	33	<i>n</i> -Nitrosodimethylamine ^b	10:1	S	-	-
2	<i>n</i> -Undecane ^a	10:1	S	100	57.2	44	2,3-lutidine ^d	10:1	S	99.4	-
3	<i>n</i> -Dodecane ^a	10:1	S	85.7	22.0	46	Benzonitrile ^d	75:1	S	86.9	-
4	<i>n</i> -Tridecane ^a	10:1	S	91.4	75.0	57	<i>n</i> -Nitrosodipropylamine ^b	10:1	S	100	-
5	<i>n</i> -Tetradecane ^a	10:1	S	97.8	97.8	62	Nitrobenzene ^b	10:1	S	88.5	-
6	<i>n</i> -Pentadecane ^a	10:1	S	99.7	92.3	67	2-Nitrophenol ^b	10:1	S	100	-
7	<i>n</i> -Hexadecane ^a	10:1	S	100	100	68	Pyrrole 2-carbonitrile ^d	10:1	S	-	-
8	<i>n</i> -Heptadecane ^a	10:1	S	100	98.0	77	4-chloroaniline ^b	10:1	S	7.78	-
9	<i>n</i> -Octadecane ^a	10:1	S	100	99.9	98	2-Nitroaniline ^b	10:1	S	100	-
10	<i>n</i> -Nonadecane ^a	10:1	S	100	98.9	102	2,6-dinitrotoluene ^b	10:1	S	99.9	-
11	<i>n</i> -Eicosane ^a	10:1	S	100	96.8	105	3-Nitroaniline ^b	10:1	S	34.2	-
12	<i>n</i> -Heneicosane ^a	10:1	S	-	100	107	2,4-Dinitrotoluene ^b	10:1	S	100	-

13-23	<i>n</i> -Docosane ^a – <i>n</i> -Dotriacontane ^a	10:1	S	-	100	108	4-Nitrophenol ^b	10:1	S	-	-
24	<i>n</i> -Tritriacontane	-	-	-	96.5	112	Azobenzene ^b	10:1		100	100
25	<i>n</i> -Tetraatriacontane	-	-	-	78.9	113	<i>p</i> - Nitroaniline ^b	10:1	S	64.5	-
26	<i>n</i> -Pentatriacontane	-	-	-	58.3	121	Caffeine ^d	10:1	S	-	-
27	<i>n</i> -Hexatriacontane	-	-	-	49.9	Aromatics					
28	<i>n</i> -Heptatriacontane	-	-	-	35.4	37	Ethylbenzene ^d	10:1	S	44.6	-
29	<i>n</i> -Octatriacontane	-	-	-	32.1	38	<i>m</i> -Xylene ^d	10:1	S	34.5	-
30	<i>n</i> -Nonatriacontane	-	-	-	29.1	39	<i>o</i> -Xylene ^d	10:1	S	32.4	-
31	<i>n</i> -Tetracontane	-	-	-	27.9	40	Styrene ^d	10:1	S	58.4	-
PAH						69	Pentylbenzene ^d	10:1	S	99.0	24.4
76	Naphthalene ^{b/c}	75:1	S	93.9	37.1	82	Pentamethylbenzene ^d	10:1	S	68.6	39.5
81	Quinoline ^d	10:1	S	28.6	-	Halogenated					
87	2-Methylnaphthalene ^b	75:1	S	90.8	72.4	48	2-Chlorophenol ^b	10:1	S	100	-
89	Indole ^d	10:1	S	81.6	-	50	1,3-Dichlorobenzene ^b	10:1	S	85.5	-
90	Azulene ^d	10:1	S	38.5	-	51	1,4-Dichlorobenzene ^{b,c}	10:1	S	87.2	-
91	1(3H)- Isobenzofuranone ^d	10:1	S	100	-	52	1,2-Dichlorobenzene ^b	10:1	S	70.3	-
96	Biphenyl ^d	10:1	S	99.5	75.0	56	Hexachloroethane ^b	10:1	S	83.7	-
97	1,4-Naphthoquinone ^d	10:1	S	100	-	74	2,4-Dichlorophenol ^b	10:1	S	100	83.9
99	2,3- Dimethylnaphthalene ^d	10:1	S	100	-	75	1,2,4-trichlorobenzene ^b	10:1	S	85.6	-
100	Acenaphthylene ^b	10:1	S	98.5	84.1	78	Hexachlorobutadiene ^b	10:1	S	61.6	-
103	Acenaphthene ^{b/c}	10:1	S	100	88.2	83	Hexachlorocyclopentadiene ^b	10:1	S	100	-
106	Dibenzofuran ^b	10:1	S	100	86.4	88	4-Chloro-3-methylphenol ^b		S	90.8	-
109	Fluorene ^b	10:1	S	100	86.0	93	2,4,6-Trichlorophenol ^b	10:1	S	95.8	-
117	9H-Fluoren-9-one ^d	10:1	S	100	100	94	2,4,5-Trichlorophenol ^b	10:1	S	100	-
118	Phenanthrene ^b	10:1	S	100	96.7	95	2-Chloronaphthalene ^b	10:1	S	99.6	-
119	Anthracene ^b	10:1	S	98.6	95.9	110	4-Chlorophenylphenylether ^b	10:1	S	100	-
120	Carbazole ^b	10:1	S	100	85.2	114	4-Bromophenylphenylether ^b	10:1	S	100	-
123	Fluoranthene ^b	10:1	S	100	97.2	115	Hexachlorobenzene ^b	10:1	S	100	-
124	Pyrene ^b	10:1	S	-	100	116	Pentachlorophenol ^b	10:1	S	100	-
126	Benzo(a)anthracene ^b	-	S	-	100	Furans					
127	Chrysene ^{b/c}	-	S	-	100	34	Furfural ^d	75:1	S	84.3	-
130	Benzo(b)fluoranthene ^b	-	S	-	100	35	Maleic anhydride ^d	10:1	S	54.9	-
131	Benzo(k)fluoranthene ^b	-	S	-	100	36	α-Angelica lactone ^d	10:1	S	52.1	-
132	Benzo(a)pyrene ^b	-	S	-	89.5	43	2-5(H)-furanone ^d	75:1	S	100	-
133	Perylene-D12 ^c	-	S	-	92.4	Phthalates					
134	Indeno(1,2,3- CD)pyrene ^b	-	S	-	94.0	101	Dimethyl phthalate ^b	10:1	S	100	-
135	Dibenz(A,H)anthracene ^b	-	S	-	92.9	111	Diethyl phthalate ^b	10:1	S	100	-
136	Benzo(G,H,I)perylene ^b	-	S	-	96.6	122	Di- <i>n</i> -butyl-phthalate ^b	10:1	S	-	-
Oxygenated aromatics						125	Benzyl butyl phthalate ^b	-	S	-	92.0
41	Anisole ^d	10:1	S	20.4	-	128	Bis(2-ethylhexyl)phthalate ^b	-	S	-	97.4
42	<i>p</i> -Benzoquinone ^d	10:1	S	94.8	-	129	Di- <i>n</i> -octyl phthalate ^b	-	S	-	90.6
45	Benzaldehyde ^d	10:1	S	82.8	-	Others					
47	Phenol ^b	75:1	S	100	-	49	Bis(2-chloroethyl)ether ^b	10:1	S	84.5	-
55	<i>o</i> -Cresol ^b	10:1	S	100	-	53	2-Octanone ^d	10:1	S	97.0	-
58	<i>p</i> -Cresol ^b	75:1	S	100	-	54	Bis(2-chloro-1-methylethyl)ether ^b	10:1	S	100	-
59	3-Methylbenzaldehyde ^d	10:1	S	99.9	-	63	Nonanal ^d	10:1	S	100	52.3
60	2-Methylbenzaldehyde ^d	75:1	S	100	-	65	Isophorone ^b	10:1	S	96.4	-
61	2-Methoxyphenol ^d	75:1	S	100	-	70	1-nonanol ^d	10:1	S	98.6	-
64	2,6-Dimethylphenol ^d	75:1	S	100	100	72	Bis(2-chloroethoxy)methane ^b	10:1	S	100	-

66	2,3-dimethyl-2,5-cyclohexadiene-1,4-dione ^d	10:1	S	100	-	84	Pinane diol ^d	10:1	S	-	-
71	2,4-dimethylphenol ^b	10:1	S	89.5	-	104	Levogluconan ^d	10:1	S	0	70.0
73	Benzoic acid ^d	10:1	S	-	-						
79	Mequinol ^d	10:1	S	60.4	-						
80	<i>m</i> -Guaiacol ^d	10:1	S	44.0	-						
85	Hydroquinone ^d	10:1	S	34.8	-						
86	Resorcinol ^d	10:1	S	76.0	-						
92	2,6-Dimethoxyphenol ^d	10:1	S	93.6	-						

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S4 - Breakthrough testing

Figure S4-Figure S10 show a comparison of the area from 6 spikes containing 136 compounds (50 μL at 20 $\mu\text{g mL}^{-1}$) directly into 0.95 mL of EtOAc to 6 separate PTFE filters (black) and SPE disks (red) spiked with the standard solution containing 136 compounds (50 μL at 20 $\mu\text{g mL}^{-1}$) extracted and analysed and SPE disks spiked with 96 compounds of interest (4 times, 50 μL at 20 $\mu\text{g mL}^{-1}$), subject to a purified air flow of 6 L min^{-1} for 30 mins then extracted and analysed (green).

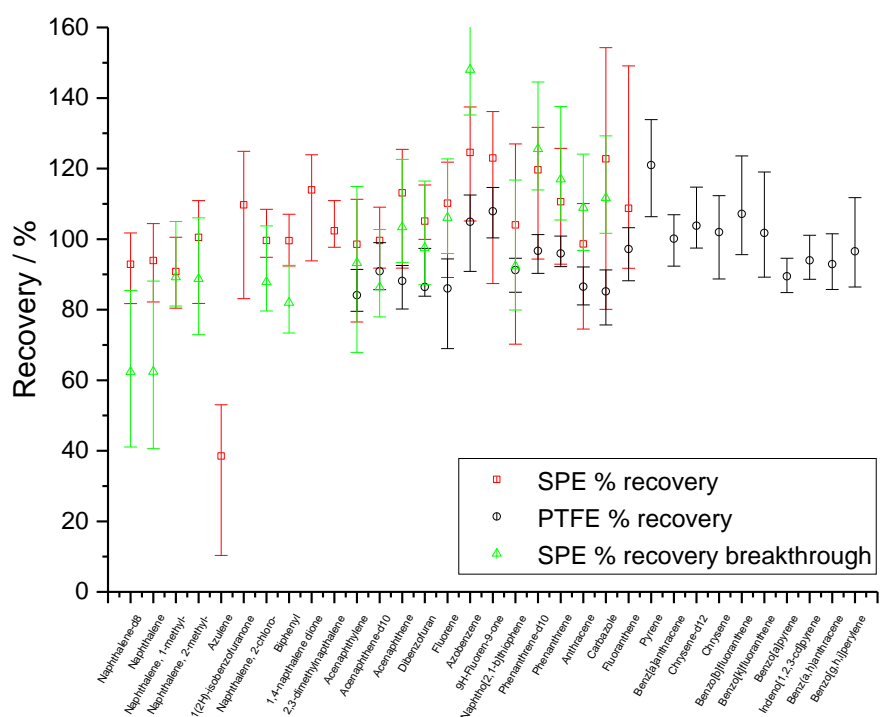
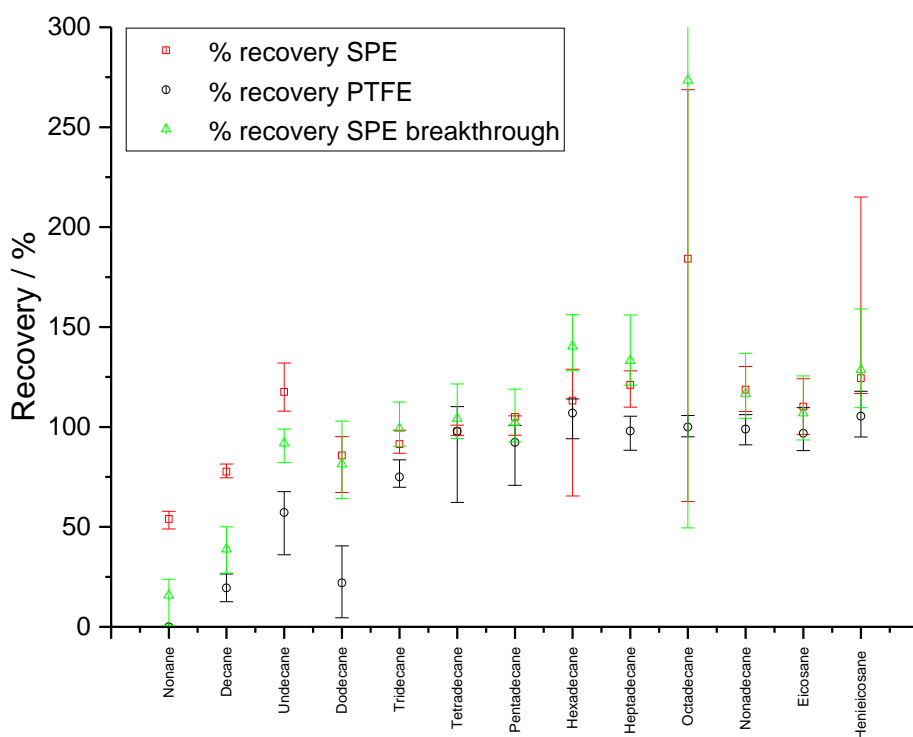
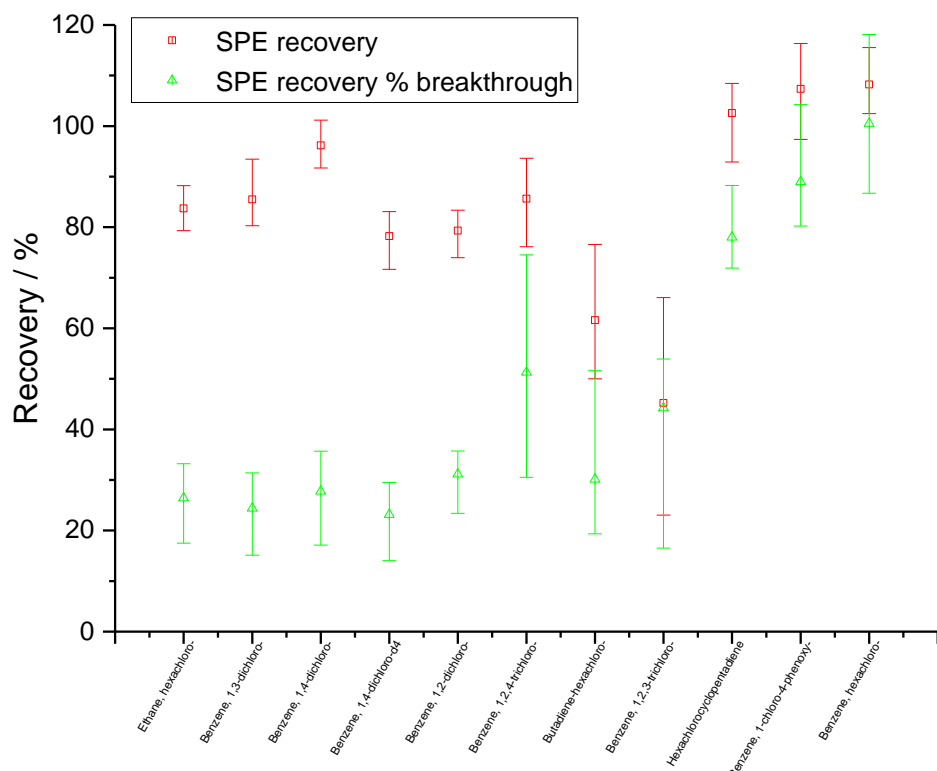


Figure S4. PAH breakthrough test.



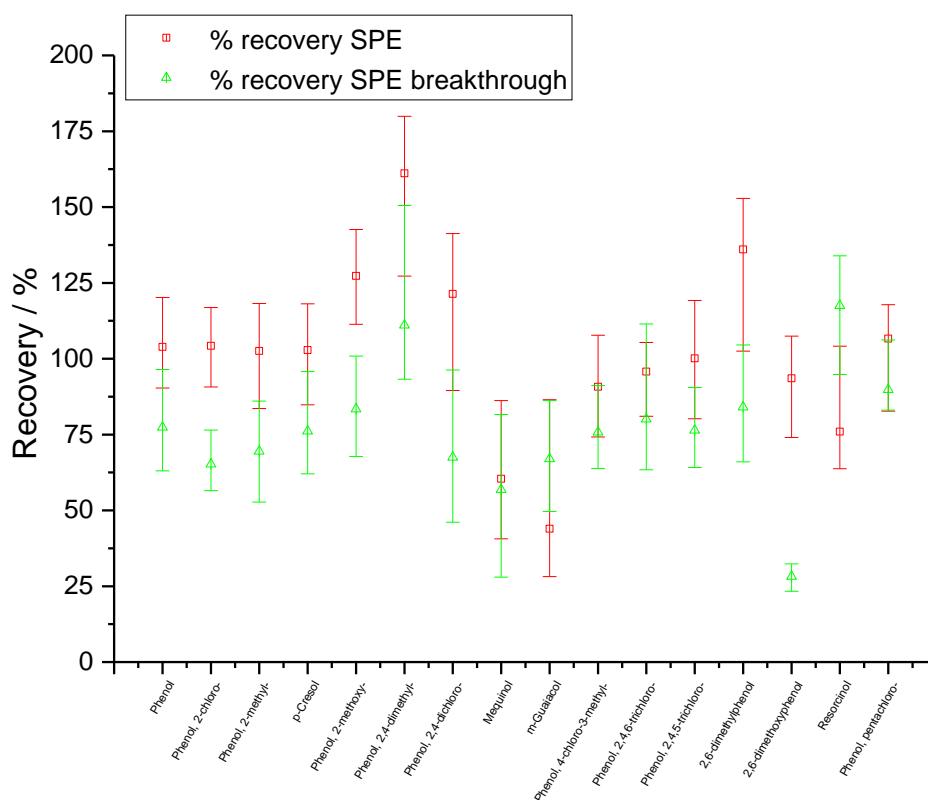
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77 Figure S5. Alkane breakthrough test. The large over recovery of *n*-octadecane is assumed to be from
 78 the C₁₈ coating on SPE disks.



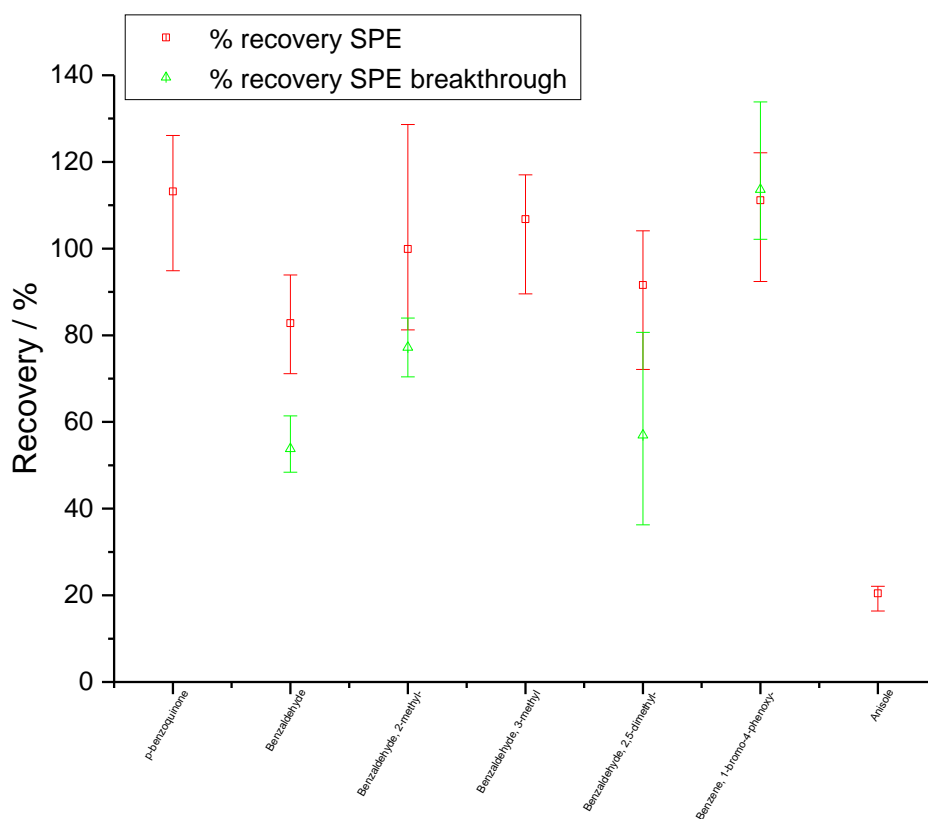
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80 Figure S6. Chlorine containing species breakthrough test.



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82 Figure S7. Phenols breakthrough test.



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84 Figure S8. Oxygenated aromatics breakthrough test.

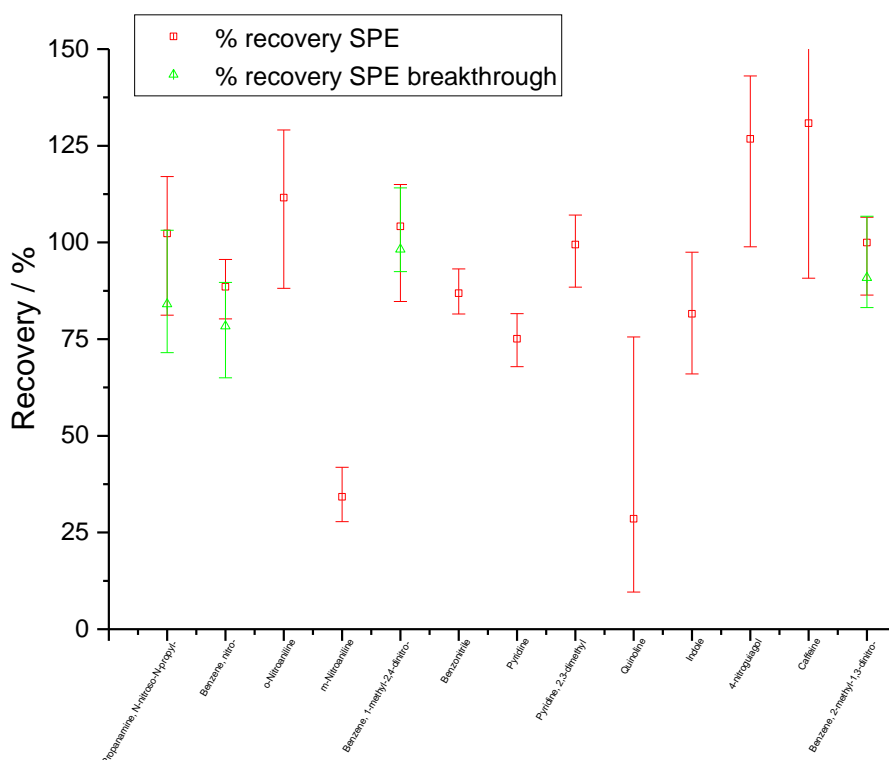


Figure S9. Nitrogen containing VOC breakthrough test.

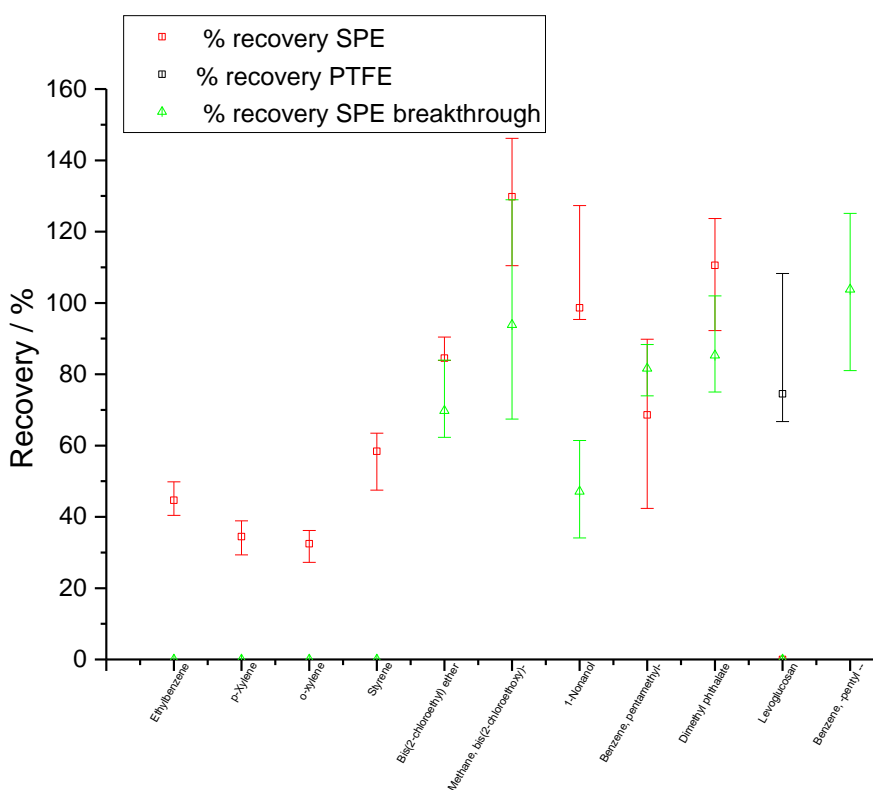


Figure S10. Aromatics and others breakthrough test. Levoglucosan PTFE recovery carried out from spiking stock solution in MeOH directly onto filter to give a final solution concentration of around 10 $\mu\text{g mL}^{-1}$ due to low instrument sensitivity.

S5 - *n*-Alkane comparison to GC×GC-FID

Comparison to PTR-ToF-MS was complicated by more than one species being present at a mass and aerosol samples passing through a chamber stage with either losses to walls or off gassing of the more volatile components from the aerosol sample post acquisition.

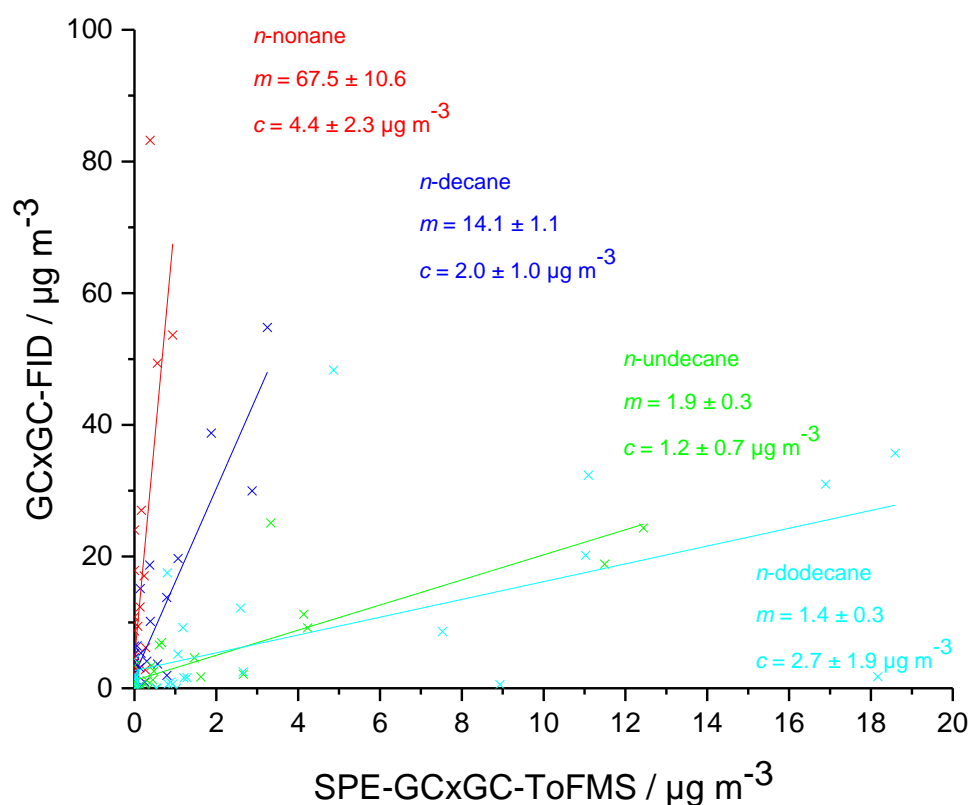


Figure S11. Comparison of GC×GC-FID to SPE-GC×GC-ToF-MS.

S6 - Gas and particle phase composition of I/SVOC emissions from combustion of cow dung cake

Figure S12 shows the functionality and phase of peaks observed from a sample collected from the combustion of cow dung cake.

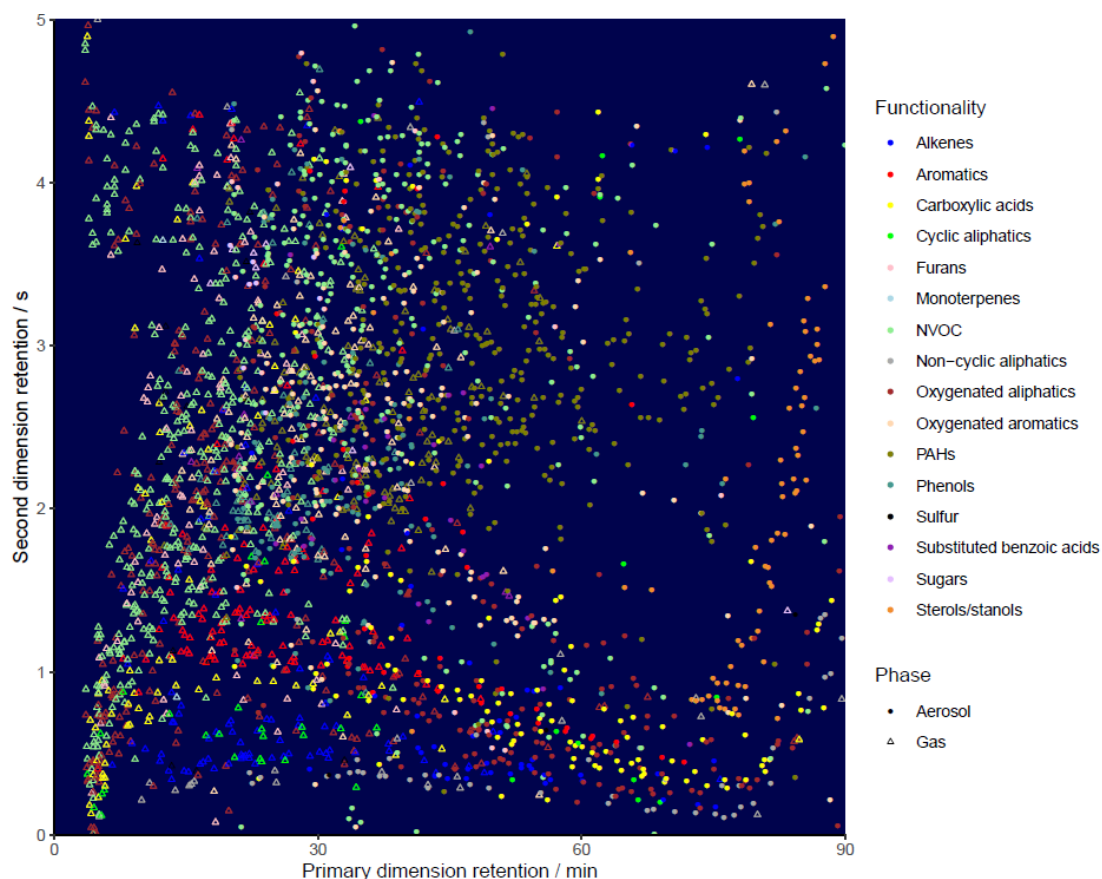


Figure S12. Gas and particle phase composition of I/SVOC emissions from burning cow dung cake collected onto SPE disks and PTFE filters, split by functionality where empty triangles indicate peaks in the gas phase and solid circles show peaks in the aerosol phase.

116 **S7 – SPE peak tables by sample type**

117 Please see attached table supplementary information S7.

118

119 **S8 – PTFE peak tables by sample type**
120 Please see attached table supplementary information S8.
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122 **S9 - PAH emission factors**

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124 The mean values and standard deviations of measured PAH emission factors for fuel types with
125 more than one sample were as follows: fuelwood ($247 \pm 214 \text{ mg kg}^{-1}$), crop residue (747 ± 518
126 mg kg^{-1}), MSW ($1022 \pm 340 \text{ mg kg}^{-1}$) and cow dung cake ($615 \pm 112 \text{ mg kg}^{-1}$).

127 Table 2. Emission factors of PAHs (g kg⁻¹) where (G) represents gas phase and (A) represents aerosol phase and Nn = naphthalene, MNn = methylnaphthalene,
128 DMNn = dimethylnaphthalenes, B = biphenyl, Fno = 9H-Fluoren-9-one, AE = Acenaphthylene, DF = Dibenzofuran, Fn = Fluorene, Pn = Phenanthrene, An =
129 Anthracene, Ca = carbazole, FLn = Fluoranthene, PYn = Pyrene, BaA = Benz[a]anthracene, Cn = Chrysene, BbF = Benzo[B]fluoranthene, BkF =
130 Benzo[K]fluoranthene, BaP = Benzo[A]pyrene, IP = Indeno[1,2,3-cd]pyrene, AH = Dibenz(A,H)Anthracene and ghi = Benzo[ghi]perylene.

Sample	Nn (G)	MNn (G)	DMNn (G)	B (G)	Fno (G)	AE (G)	DF (G)	DF (A)	Fn (G)	Fn (A)	Pn (G)	Pn (A)
<i>Brassica spp</i>	0.7911	0.2511	0.1327	0.0055	0.0006	0.0254	0.0068	0.0000	0.0044	0.0000	0.0099	0.0020
<i>Melia</i>	0.2800	0.1052	0.0596	0.0017	0.0000	0.0097	0.0027	0.0000	0.0019	0.0000	0.0050	0.0005
Plywood	0.1523	0.0473	0.0159	0.0004	0.0000	0.0035	0.0008	0.0000	0.0006	0.0000	0.0010	0.0010
<i>Prosopis spp</i>	0.0341	0.0110	0.0000	0.0005	0.0000	0.0026	0.0012	0.0000	0.0005	0.0000	0.0011	0.0000
<i>Eucalyptus spp</i>	0.0375	0.0099	0.0000	0.0003	0.0000	0.0018	0.0009	0.0000	0.0004	0.0000	0.0006	0.0001
<i>Azadirachta</i>	0.0519	0.0161	0.0000	0.0008	0.0000	0.0020	0.0017	0.0000	0.0009	0.0000	0.0016	0.0002
<i>Mangifera</i>	0.0896	0.0308	0.0128	0.0006	0.0000	0.0014	0.0012	0.0000	0.0007	0.0000	0.0012	0.0007
<i>Morus spp</i>	0.2381	0.1013	0.0450	0.0033	0.0003	0.0078	0.0063	0.0003	0.0040	0.0010	0.0041	0.0051
<i>Pithecellobium</i>	0.1405	0.0484	0.0201	0.0012	0.0003	0.0042	0.0028	0.0000	0.0016	0.0000	0.0029	0.0004
<i>Shorea spp</i>	0.0963	0.0283	0.0000	0.0014	0.0003	0.0054	0.0059	0.0001	0.0020	0.0000	0.0064	0.0006
<i>Solanum melongena</i>	0.1253	0.0425	0.0185	0.0013	0.0003	0.0060	0.0038	0.0000	0.0018	0.0001	0.0057	0.0012
<i>Ficus religiosa</i>	0.5633	0.2279	0.0962	0.0009	0.0003	0.0036	0.0014	0.0000	0.0009	0.0000	0.0027	0.0007
<i>Syzygium spp</i>	0.1155	0.0244	0.0159	0.0043	0.0005	0.0119	0.0057	0.0002	0.0038	0.0003	0.0057	0.0007
<i>Ficus spp</i>	0.0873	0.0269	0.0000	0.0009	0.0002	0.0035	0.0020	0.0002	0.0010	0.0003	0.0019	0.0000
<i>Vachellia spp</i>	0.0608	0.2784	0.0244	0.0033	0.0003	0.0087	0.0052	0.0001	0.0033	0.0001	0.0054	0.0016
<i>Dalbergia sis</i>	0.0912	0.0304	0.0142	0.0012	0.0003	0.0031	0.0025	0.0002	0.0012	0.0002	0.0027	0.0005
<i>Ricinus spp</i>	0.0797	0.0198	0.0000	0.0011	0.0002	0.0043	0.0021	0.0001	0.0012	0.0002	0.0027	0.0000
<i>Holoptelea spp</i>	0.0871	0.0253	0.0000	0.0010	0.0002	0.0050	0.0016	0.0001	0.0011	0.0002	0.0022	0.0000
<i>Saraca indica</i>	0.1587	0.0734	0.0287	0.0023	0.0004	0.0113	0.0041	0.0000	0.0032	0.0000	0.0053	0.0005
<i>Cocos nucifera</i>	0.4622	0.1533	0.0655	0.0040	0.0002	0.0114	0.0074	0.0006	0.0038	0.0000	0.0037	0.0059
Charcoal	0.0849	0.0332	0.0156	0.0014	0.0000	0.0051	0.0025	0.0000	0.0019	0.0000	0.0024	0.0001
Sawdust	0.8312	0.2007	0.0893	0.0075	0.0011	0.0171	0.0103	0.0002	0.0079	0.0004	0.0091	0.0087
Dung	0.9502	0.3785	0.1899	0.0077	0.0006	0.0147	0.0069	0.0003	0.0055	0.0012	0.0073	0.0056
Waste	0.5801	0.1783	0.0943	0.0211	0.0015	0.0185	0.0080	0.0000	0.0099	0.0008	0.0148	0.0083
LPG	0.0270	0.0072	0.0000	0.0020	0.0000	0.0029	0.0014	0.0000	0.0029	0.0000	0.0104	0.0001
Mean wood	0.1391	0.0650	0.0196	0.0015	0.0002	0.0053	0.0028	0.0001	0.0017	0.0001	0.0031	0.0007
Mean crop	0.4595	0.1490	0.0722	0.0036	0.0004	0.0143	0.0060	0.0002	0.0033	0.0000	0.0064	0.0030

Sample	An (G)	Ca (G)	Ca (A)	FLn (G)	FLn (A)	PYn (G)	PYn (A)	BaA (A)	Cn (A)	BbF (A)	BkF (A)	BaP (A)	IP (A)	AH (A)	ghi (A)
<i>Brassica spp</i>	0.0011	0.0000	0.0009	0.0008	0.0049	0.0008	0.0046	0.0021	0.0037	0.0012	0.0018	0.0014	0.0008	0.0000	0.0016
<i>Melia</i>	0.0000	0.0000	0.0002	0.0002	0.0010	0.0002	0.0009	0.0004	0.0004	0.0002	0.0004	0.0003	0.0000	0.0001	0.0003
Plywood	0.0000	0.0000	0.0007	0.0000	0.0022	0.0000	0.0020	0.0007	0.0010	0.0004	0.0007	0.0005	0.0016	0.0000	0.0006
<i>Prosopis spp</i>	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
<i>Eucalyptus spp</i>	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>Azadirachta</i>	0.0000	0.0000	0.0005	0.0000	0.0006	0.0000	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>Mangifera</i>	0.0000	0.0000	0.0009	0.0000	0.0010	0.0000	0.0008	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000
<i>Morus spp</i>	0.0005	0.0000	0.0052	0.0000	0.0052	0.0000	0.0049	0.0024	0.0030	0.0010	0.0017	0.0017	0.0007	0.0000	0.0013
<i>Pithecellobium</i>	0.0002	0.0001	0.0000	0.0001	0.0003	0.0002	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>Shorea spp</i>	0.0000	0.0000	0.0003	0.0000	0.0014	0.0005	0.0011	0.0013	0.0027	0.0009	0.0013	0.0007	0.0003	0.0000	0.0009
<i>Solanum melongena</i>	0.0000	0.0000	0.0008	0.0000	0.0028	0.0003	0.0023	0.0008	0.0017	0.0005	0.0009	0.0006	0.0004	0.0000	0.0010
<i>Ficus religiosa</i>	0.0000	0.0000	0.0010	0.0001	0.0024	0.0000	0.0019	0.0005	0.0011	0.0002	0.0005	0.0003	0.0003	0.0000	0.0006
<i>Syzygium spp</i>	0.0004	0.0000	0.0010	0.0003	0.0019	0.0003	0.0016	0.0007	0.0007	0.0006	0.0009	0.0006	0.0029	0.0002	0.0016
<i>Ficus spp</i>	0.0000	0.0000	0.0005	0.0001	0.0009	0.0000	0.0008	0.0005	0.0000	0.0006	0.0008	0.0006	0.0007	0.0003	0.0017
<i>Vachellia spp</i>	0.0005	0.0000	0.0032	0.0002	0.0028	0.0002	0.0024	0.0008	0.0011	0.0005	0.0009	0.0007	0.0010	0.0001	0.0011
<i>Dalbergia sis</i>	0.0000	0.0000	0.0012	0.0001	0.0018	0.0001	0.0015	0.0005	0.0003	0.0004	0.0007	0.0004	0.0004	0.0002	0.0008
<i>Ricinus spp</i>	0.0000	0.0000	0.0004	0.0001	0.0006	0.0002	0.0005	0.0003	0.0000	0.0004	0.0007	0.0004	0.0009	0.0002	0.0012
<i>Holoptelea spp</i>	0.0000	0.0000	0.0005	0.0001	0.0009	0.0002	0.0008	0.0005	0.0004	0.0006	0.0011	0.0006	0.0023	0.0002	0.0014
<i>Saraca indica</i>	0.0000	0.0000	0.0004	0.0002	0.0011	0.0000	0.0012	0.0004	0.0002	0.0002	0.0005	0.0004	0.0002	0.0000	0.0007
<i>Cocos nucifera</i>	0.0004	0.0000	0.0052	0.0000	0.0077	0.0002	0.0075	0.0049	0.0061	0.0023	0.0039	0.0038	0.0020	0.0002	0.0031
Charcoal	0.0001	0.0003	0.0008	0.0001	0.0005	0.0001	0.0005	0.0004	0.0005	0.0002	0.0004	0.0002	0.0000	0.0000	0.0001
Sawdust	0.0000	0.0000	0.0047	0.0003	0.0110	0.0000	0.0061	0.0056	0.0068	0.0047	0.0039	0.0035	0.0018	0.0003	0.0036
Dung	0.0000	0.0001	0.0097	0.0003	0.0087	0.0004	0.0079	0.0060	0.0080	0.0027	0.0044	0.0040	0.0024	0.0010	0.0031
Waste	0.0019	0.0000	0.0044	0.0007	0.0124	0.0005	0.0102	0.0103	0.0128	0.0075	0.0081	0.0058	0.0041	0.0020	0.0052
LPG	0.0012	0.0000	0.0000	0.0003	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mean wood	0.0001	0.0000	0.0010	0.0001	0.0014	0.0001	0.0013	0.0006	0.0006	0.0004	0.0006	0.0004	0.0007	0.0001	0.0007
Mean crop	0.0005	0.0000	0.0023	0.0003	0.0052	0.0004	0.0048	0.0026	0.0039	0.0013	0.0022	0.0020	0.0011	0.0000	0.0019

S10 - Emission factor calculation

The total volume of air convectively moving up the stack was determined from

$$V_d = \sqrt{\frac{2gP_s}{D_s}}$$

where V_d = vertical displacement up the flue (ms^{-1}), $g = 9.81 \text{ m}^{-2}$, P_s = average stack pressure (mmH_2O) and D_s is determined by:

$$D_s = \frac{TD_a}{T_s}$$

where T = ambient temperature (k), D_a = density of air (1.1455 kg m^{-3}), T_s = average stack temperature ($^{\circ}\text{K}$). The emission factor (EF) was calculated by:

$$\text{EF} = \frac{tCV_dA_d}{M}$$

where t = time burned (s), C = concentration (g m^{-3}), A_d = area of flue, M = mass of fuel burnt (kg).