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Supplement of

Meteorological-gaseous influences on seasonal $PM_{2.5}$ variability in the Klang Valley urban-industrial environment

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Experimental quality assurance and quality control (QA/QC)

For filter sampling, the elapsed time indicator (ETI) as well as the flow/pressure recorder chart was operated and checked daily to ensure the quality of sampling. Filter weighing was repeated three times and the average of those three were used for calculation. $PM_{2.5}$ mass were corrected by deducting the monthly filter blank (FB).

Anion and cation analysis: Using ion chromatography (IC), it was ensured that all ion regression coefficients were better than 0.999 before the sample analysis was begun and that every 15th sample, the QA/QC samples were run, i.e. the ultra-pure water (UPW) and 1 ppm standard prepared the same manner as the samples. These were used as validation tests for the method and the recovery purpose. All lab ware used in the ion analyses was Class A glassware.

Trace element analysis: Using inductively coupled plasma mass spectrometry (ICPMS), it was ensured that all element regression coefficients were better than 0.999 before the sample analysis was begun and that every 15th sample, the QA/QC were samples run, i.e. the UPW, 1 ppm multi-element standard and standard reference material (SRM1648a). The reference material was 10 mg of SRM1648a Urban Particulate Matter obtained from NIST (National Institute of Standards and Technology, MD, USA) while 1 ppm Multi-Element Calibration Standard 3 (Perkin Elmer Pure Plus, Perkin-Elmer; USA) both prepared the same manner as the samples to test the recovery and validation of the method. All lab ware used for trace element analyses was Teflon material, except for the syringes.

Table S1. Descriptive statistics of experimental data (meteorological, gaseous and ion parameters); unit: mean ± std (min - max). Remarks: ud = undetected (below detection limit); SIA = secondary inorganic aerosol; NR = neutralisation ratio = $[NH_4^+]$ / ($[SO_4^{2-}]$ + $[NO_3^-]$) (Squizzato et al., 2013); SO_2 gas was converted from ppm to µg m^{-3} assuming 1 ppm = 2619 µg m^{-3} (25 ^oC,1 atm).

Elements	Unit	ANNUAL 5 Aug 2011 - 18 July 2012 n = 81	SW 15 May - 14 Sept n = 29	INT.2 15 Sept - 30 Oct n = 7
API	-	50 ± 16 (29 - 127)	60 ± 21 (36 - 127)	49 ± 6 (40 - 59)
T	^oC	28.49 ± 1.19 (26.05 - 31.55)	28.88 ± 1.36 (26.4 - 31.55)	28.53 ± 1.2 (27.1 - 30.4)
RH	%	71.23 ± 7.91 (50.42 - 86.67)	68.23 ± 9.22 (50.42 - 86.67)	72.88 ± 8.5 (59.67 - 82.67)
WS	ms^{-1}	1.29 ± 0.19 (0.87 - 1.77)	1.39 ± 0.19 (0.97 - 1.77)	1.25 ± 0.2 (1.01 - 1.53)
WD	Degree	128.83 ± 31.64 (23.13 - 208.21)	123.32 ± 37.99 (23.13 - 205)	128.52 ± 22.02 (100 - 167.42)
Rainfall	mm	10.37 ± 17.51 (0 - 85.4)	6.27 ± 10.63 (0 - 34.2)	8.46 ± 16.88 (0 - 45.4)
CO	ppm	1.29 ± 0.31 (0.61 - 2.16)	1.26 ± 0.32 (0.61 - 1.99)	1.43 ± 0.32 (1.1 - 1.93)
O_3	ppm	0.01 ± 0.01 (ud - 0.03)	0.01 ± 0.01 (ud - 0.02)	0.02 ± 0.01 (0.01 - 0.03)
SO_2	ppm	0 ± 0 (ud - 0.01)	0 ± 0 (ud - 0.01)	0 ± 0 (ud - 0.01)
NO_X	ppm	0.06 ± 0.01 (0.03 - 0.11)	0.06 ± 0.01 (0.03 - 0.08)	0.07 ± 0.01 (0.06 - 0.09)
NO	ppm	0.03 ± 0.01 (0.01 - 0.07)	0.03 ± 0.01 (0.01 - 0.04)	0.03 ± 0.01 (0.02 - 0.05)
NO_2	ppm	0.03 ± 0.01 (0.02 - 0.05)	0.03 ± 0.01 (0.02 - 0.05)	0.04 ± 0.01 (0.03 - 0.05)
SO_4^{2-}	µg m^{-3}	1.33 ± 0.88	1.77 ± 1.16	1.62 ± 0.78
ss-SO_4^{2-}	µg m^{-3}	0.08 ± 0.09	0.06 ± 0.02	0.02 ± 0.01
nss-SO_4^{2-}	µg m^{-3}	1.29 ± 0.9	1.75 ± 1.18	1.61 ± 0.79
NO_3^-	µg m^{-3}	0.21 ± 0.13	0.19 ± 0.08	0.29 ± 0.22
NH_4^+	µg m^{-3}	0.99 ± 0.85	1.45 ± 1.18	1 ± 0.64
SIA	µg m^{-3}	2.4 ± 1.68	3.28 ± 2.25	2.78 ± 1.58
SIA/$PM_{2.5}$	%	8.54 ± 2.97	8.69 ± 3.43	9.62 ± 2.96
NR	-	0.65 ± 0.31	0.72 ± 0.19	0.55 ± 0.07
SO_4^2-SO_2	µg m^{-3}	1.33 - 8.19	1.77 - 9.5	1.62 - 10.84

Continuation of Table S1 (2)

Elements	Unit	NE 1 Nov - 14 Mar n = 35	INT.1 15 Mar - 14 May n = 10	HAZE n = 11
API	-	44 ± 8 (29 - 58)	45 ± 9 (33 - 58)	78 ± 22 (49 - 127)
T	^{o}C	28.07 ± 1.02 (26.05 - 30.37)	28.76 ± 0.78 (27.47 - 30.18)	29.5 ± 1.33 (26.66 - 31.55)
RH	%	73.58 ± 6.79 (56.54 - 85.54)	70.51 ± 4.01 (65.08 - 76.96)	63 ± 9.91 (50.42 - 81.63)
WS	ms^{-1}	1.2 ± 0.17 (0.87 - 1.46)	1.32 ± 0.18 (1.08 - 1.71)	1.49 ± 0.14 (1.27 - 1.7)
WD	Degree	132.47 ± 31.19 (83.17 - 208.21)	128.43 ± 25.06 (103.33 - 177.83)	102.84 ± 33.19 (23.13 - 136.88)
Rainfall	mm	15.13 ± 22.69 (0 - 85.4)	7.04 ± 9.69 (0 - 24)	2.28 ± 5.18 (0 - 15.8)
CO	ppm	1.29 ± 0.3 (0.92 - 2.16)	1.31 ± 0.28 (0.84 - 1.75)	1.45 ± 0.31 (0.89 - 1.99)
O_3	ppm	0.01 ± 0.01 (ud - 0.03)	0.01 ± 0 (ud - 0.02)	0.02 ± 0 (0.01 - 0.02)
SO_2	ppm	0 ± 0 (ud - 0)	0 ± 0 (ud - 0)	0 ± 0 (ud - 0.01)
NO_X	ppm	0.07 ± 0.01 (0.04 - 0.11)	0.06 ± 0.01 (0.04 - 0.07)	0.06 ± 0.01 (0.03 - 0.07)
NO	ppm	0.03 ± 0.01 (0.02 - 0.07)	0.03 ± 0.01 (0.01 - 0.04)	0.02 ± 0.01 (0.01 - 0.04)
NO_2	ppm	0.03 ± 0.01 (0.02 - 0.05)	0.03 ± 0.01 (0.02 - 0.04)	0.03 ± 0.01 (0.02 - 0.05)
SO_4^{2-}	$\mu g\ m^{-3}$	0.98 ± 0.41	1.06 ± 0.7	2.4 ± 1.24
ss-SO_4^{2-}	$\mu g\ m^{-3}$	0.05 ± 0.03	0.16 ± 0.15	0.06 ± 0
nss-SO_4^{2-}	$\mu g\ m^{-3}$	0.95 ± 0.42	0.9 ± 0.6	2.4 ± 1.24
NO_3^-	$\mu g\ m^{-3}$	0.19 ± 0.13	0.27 ± 0.13	0.22 ± 0.14
NH_4^+	$\mu g\ m^{-3}$	0.65 ± 0.34	0.82 ± 0.49	2.21 ± 1.47
SIA	$\mu g\ m^{-3}$	1.72 ± 0.81	1.98 ± 0.87	4.67 ± 2.59
SIA/$PM_{2.5}$	%	8.23 ± 2.77	8.44 ± 2.31	7.5 ± 2.66
NR	-	0.56 ± 0.11	0.83 ± 0.76	0.85 ± 0.22
SO_4^2-SO_2	$\mu g\ m^{-3}$	0.98 - 6.64	1.06 - 7.96	2.4 - 9.09

Table S2. Statistical compositions of $PM_{2.5}$ during the one-year period including % recovery for anions and cations using 1 ppm standard of single cation/anion standards; and for trace element using standard reference material (SRM1648a). Remarks: MDL = method detection limit

			ANNUAL					SW				
			n = 81					n = 29				
	Elements	Unit	min	max	med	avg	std	min	max	med	avg	std
1	$PM_{2.5}$	µg/m^3	6	118	23	28	17	14	118	29	38	24
2	F^-	µg/m^3	< MDL	0.018	0.002	0.003	0.004	< MDL	0.018	0.003	0.006	0.005
3	Cl^-	µg/m^3	< MDL	0.141	0.016	0.026	0.026	0.007	0.085	0.018	0.024	0.017
4	NO_2^-	µg/m^3	< MDL	0.009	0.004	0.004	0.002	< MDL	0.005	0.003	0.003	0.001
5	Br^-	µg/m^3	0.008	0.030	0.021	0.019	0.008	0.009	0.021	0.015	0.015	0.009
6	NO_3^-	µg/m^3	0.076	0.616	0.177	0.213	0.127	0.092	0.372	0.174	0.191	0.077
7	PO_4^{3-}	µg/m^3	< MDL	0.205	0.072	0.079	0.063	< MDL	0.074	0.048	0.054	0.017
8	SO_4^{2-}	µg/m^3	0.139	4.155	1.093	1.328	0.885	0.368	4.155	1.385	1.769	1.158
9	Na^+	µg/m^3	< MDL	2.113	0.218	0.300	0.357	0.113	0.385	0.201	0.236	0.093
10	NH_4^+	µg/m^3	0.085	5.440	0.691	0.987	0.852	0.193	5.440	1.054	1.453	1.180
11	K^+	µg/m^3	0.077	0.906	0.207	0.253	0.144	0.118	0.906	0.336	0.343	0.182
12	Ca^{2+}	µg/m^3	0.060	0.785	0.159	0.180	0.100	0.069	0.785	0.159	0.198	0.145
13	Mg^{2+}	µg/m^3	< MDL	0.391	0.024	0.033	0.044	0.015	0.115	0.029	0.035	0.021
14	Al	µg/m^3	< MDL	7.740	0.712	1.063	1.226	< MDL	7.740	0.974	1.723	1.973
15	Ba	µg/m^3	0.011	0.115	0.030	0.036	0.019	0.014	0.115	0.027	0.040	0.025
16	Fe	µg/m^3	< MDL	5.245	0.879	1.000	0.706	< MDL	5.245	0.940	1.236	1.108
17	Pb	µg/m^3	0.015	0.787	0.077	0.108	0.116	0.015	0.146	0.060	0.069	0.033
18	Zn	µg/m^3	< MDL	0.519	0.173	0.189	0.104	< MDL	0.328	0.139	0.148	0.075
19	Ag	ng/m^3	< MDL	0.360	0.112	0.145	0.104	< MDL	0.221	0.152	0.152	0.097
20	As	ng/m^3	< MDL	1.196	0.358	0.380	0.152	< MDL	0.552	0.328	0.320	0.112
21	Cd	ng/m^3	0.031	1.002	0.092	0.125	0.136	0.042	0.197	0.084	0.093	0.045
22	Cr	ng/m^3	< MDL	32.198	2.055	3.936	6.364	< MDL	32.198	1.386	6.227	10.279
23	Li	ng/m^3	< MDL	0.063	0.011	0.013	0.010	< MDL	0.063	0.010	0.014	0.015
24	Be	ng/m^3	< MDL	0.016	0.001	0.002	0.004	< MDL	0.007	0.001	0.002	0.002
25	Bi	ng/m^3	0.010	0.098	0.028	0.030	0.014	0.010	0.055	0.026	0.027	0.009
26	Cs	ng/m^3	0.009	0.124	0.030	0.035	0.021	0.012	0.096	0.035	0.039	0.022
27	Co	ng/m^3	0.004	0.117	0.012	0.015	0.014	0.004	0.117	0.011	0.018	0.022
28	Cu	ng/m^3	0.290	10.984	2.083	2.740	1.890	0.290	10.984	1.836	2.818	2.267
29	Ga	ng/m^3	0.020	0.135	0.042	0.048	0.024	0.021	0.135	0.054	0.057	0.031
30	Mn	ng/m^3	< MDL	3.841	0.822	0.934	0.643	< MDL	3.841	0.782	0.986	0.765
31	Ni	ng/m^3	< MDL	3.126	0.391	0.480	0.469	0.137	1.960	0.430	0.538	0.358
32	Rb	ng/m^3	0.349	3.185	0.865	1.008	0.501	0.443	3.185	1.188	1.251	0.653
33	Se	ng/m^3	< MDL	0.386	0.087	0.107	0.071	< MDL	0.386	0.126	0.132	0.096
34	Sr	ng/m^3	< MDL	1.192	0.201	0.265	0.223	< MDL	1.192	0.285	0.342	0.298
35	U	ng/m^3	< MDL	0.021	0.002	0.003	0.003	< MDL	0.010	0.002	0.003	0.002
36	V	ng/m^3	< MDL	2.743	0.790	0.915	0.556	< MDL	2.640	0.836	0.951	0.595
37	BC	µg/m^3	2.548	5.548	4.248	4.155	0.642	2.974	5.167	4.248	4.155	0.581

Continuation of Table S2 (2)

			INT.2					NE				
			n = 7					n = 35				
	Elements	Unit	min	max	med	avg	std	min	max	med	avg	std
1	$PM_{2.5}$	$\mu g/m^3$	10	50	27	29	12	6	35	20	21	6
2	F^-	$\mu g/m^3$	< MDL	0.015	0.002	0.005	0.006	< MDL	0.006	0.001	0.002	0.001
3	Cl^-	$\mu g/m^3$	< MDL	0.077	0.012	0.027	0.031	< MDL	0.141	0.014	0.027	0.032
4	NO_2^-	$\mu g/m^3$	< MDL	0.009	0.006	0.006	0.002	< MDL	0.007	0.004	0.004	0.001
5	Br^-	$\mu g/m^3$	n/d	n/d	n/d	n/d	n/d	0.008	0.028	0.016	0.017	0.008
6	NO_3^-	$\mu g/m^3$	0.114	0.608	0.219	0.290	0.218	0.076	0.616	0.141	0.188	0.126
7	PO_4^{3-}	$\mu g/m^3$	< MDL	0.020	0.014	0.013	0.007	0.010	0.205	0.165	0.113	0.082
8	SO_4^{2-}	$\mu g/m^3$	0.756	3.104	1.399	1.618	0.782	0.139	1.673	0.942	0.981	0.414
9	Na^+	$\mu g/m^3$	< MDL	0.108	0.085	0.085	0.031	< MDL	0.399	0.134	0.189	0.115
10	NH_4^+	$\mu g/m^3$	0.448	2.331	0.741	1.004	0.636	0.085	1.680	0.597	0.645	0.336
11	K^+	$\mu g/m^3$	0.104	0.482	0.240	0.258	0.124	0.077	0.357	0.194	0.195	0.076
12	Ca^{2+}	$\mu g/m^3$	0.110	0.227	0.164	0.171	0.044	0.061	0.340	0.151	0.161	0.064
13	Mg^{2+}	$\mu g/m^3$	0.019	0.027	0.024	0.024	0.002	< MDL	0.036	0.018	0.019	0.008
14	Al	$\mu g/m^3$	< MDL	2.263	1.268	1.121	0.897	< MDL	1.757	0.721	0.806	0.387
15	Ba	$\mu g/m^3$	0.011	0.080	0.037	0.042	0.021	0.017	0.093	0.029	0.032	0.014
16	Fe	$\mu g/m^3$	0.480	1.649	0.989	1.069	0.481	0.358	1.221	0.796	0.811	0.222
17	Pb	$\mu g/m^3$	0.041	0.787	0.126	0.220	0.265	0.032	0.661	0.084	0.118	0.114
18	Zn	$\mu g/m^3$	0.112	0.515	0.330	0.300	0.152	< MDL	0.519	0.187	0.212	0.099
19	Ag	ng/m^3	n/d	n/d	n/d	n/d	n/d	< MDL	0.360	0.095	0.139	0.116
20	As	ng/m^3	0.235	0.638	0.445	0.437	0.131	0.212	1.196	0.421	0.433	0.177
21	Cd	ng/m^3	0.031	1.002	0.144	0.238	0.340	0.041	0.630	0.099	0.141	0.127
22	Cr	ng/m^3	< MDL	4.081	2.392	2.500	1.295	< MDL	5.034	1.560	1.924	1.745
23	Li	ng/m^3	< MDL	0.023	0.011	0.012	0.009	< MDL	0.032	0.011	0.012	0.007
24	Be	ng/m^3	0.001	0.002	0.001	0.001	0.001	< MDL	0.016	0.000	0.004	0.008
25	Bi	ng/m^3	0.015	0.055	0.038	0.039	0.014	0.012	0.098	0.029	0.032	0.018
26	Cs	ng/m^3	0.015	0.059	0.041	0.037	0.017	0.009	0.124	0.030	0.035	0.024
27	Co	ng/m^3	0.006	0.024	0.017	0.017	0.007	0.005	0.044	0.011	0.012	0.007
28	Cu	ng/m^3	0.593	4.718	1.999	2.542	1.556	0.969	10.188	2.223	2.835	1.845
29	Ga	ng/m^3	0.020	0.104	0.057	0.059	0.027	0.022	0.106	0.041	0.042	0.016
30	Mn	ng/m^3	< MDL	2.436	1.409	1.339	0.793	< MDL	1.438	0.862	0.811	0.324
31	Ni	ng/m^3	0.358	0.747	0.544	0.550	0.147	< MDL	3.126	0.286	0.427	0.615
32	Rb	ng/m^3	0.575	1.756	1.180	1.149	0.467	0.349	1.427	0.827	0.849	0.305
33	Se	ng/m^3	0.049	0.192	0.112	0.115	0.052	< MDL	0.242	0.096	0.098	0.051
34	Sr	ng/m^3	< MDL	1.070	0.242	0.338	0.331	< MDL	0.542	0.199	0.227	0.111
35	U	ng/m^3	< MDL	0.007	0.004	0.003	0.002	< MDL	0.021	0.002	0.003	0.003
36	V	ng/m^3	0.790	2.024	1.314	1.299	0.421	0.157	1.470	0.654	0.731	0.366
37	BC	$\mu g/m^3$	2.548	5.548	4.480	4.333	0.952	3.056	5.524	4.213	4.201	0.615

Continuation of Table S2 (3)

			INT.1 n = 10					HAZE n = 11					
	Elements	Unit	min	max	med	avg	std	min	max	med	avg	std	% Recovery
1	$PM_{2.5}$	$\mu g/m^3$	14	39	22	23	8	40	118	54	61	24	
2	F^-	$\mu g/m^3$	< MDL	0.011	0.004	0.004	0.004	0.003	0.018	0.011	0.011	0.006	105
3	Cl^-	$\mu g/m^3$	0.007	0.072	0.018	0.027	0.021	0.007	0.085	0.021	0.030	0.022	112
4	NO_2^-	$\mu g/m^3$	< MDL	0.003	0.003	0.003	0.000	0.003	0.004	0.004	0.004	0.001	107
5	Br^-	$\mu g/m^3$	0.025	0.030	0.028	0.028	0.002	n/d	n/d	n/d	n/d	n/d	99
6	NO_3^-	$\mu g/m^3$	0.170	0.559	0.215	0.267	0.125	0.092	0.372	0.194	0.219	0.142	131
7	PO_4^{3-}	$\mu g/m^3$	< MDL	0.114	0.075	0.080	0.014	n/d	n/d	n/d	n/d	n/d	103
8	SO_4^{2-}	$\mu g/m^3$	0.269	2.631	0.949	1.057	0.698	0.719	4.155	2.276	2.403	1.235	106
9	Na^+	$\mu g/m^3$	0.343	2.113	0.367	0.637	0.611	0.233	0.233	0.233	0.233	0.000	110
10	NH_4^+	$\mu g/m^3$	0.245	1.591	0.769	0.821	0.485	0.541	5.440	1.999	2.211	1.468	86
11	K^+	$\mu g/m^3$	0.087	0.290	0.176	0.181	0.063	0.336	0.906	0.452	0.507	0.171	96
12	Ca^{2+}	$\mu g/m^3$	0.060	0.259	0.211	0.196	0.062	0.124	0.785	0.170	0.282	0.206	93
13	Mg^{2+}	$\mu g/m^3$	0.015	0.391	0.048	0.081	0.111	0.028	0.115	0.042	0.050	0.027	98
14	Al	$\mu g/m^3$	0.025	0.990	0.387	0.408	0.292	< MDL	7.740	2.050	2.788	2.564	36
15	Ba	$\mu g/m^3$	0.018	0.052	0.032	0.033	0.011	0.022	0.115	0.043	0.046	0.026	
16	Fe	$\mu g/m^3$	0.511	1.452	0.900	0.980	0.355	0.371	5.245	1.351	1.897	1.500	69
17	Pb	$\mu g/m^3$	0.045	0.293	0.090	0.108	0.069	0.059	0.146	0.095	0.094	0.030	101
18	Zn	$\mu g/m^3$	0.050	0.256	0.142	0.137	0.065	< MDL	0.328	0.185	0.175	0.088	69
19	Ag	ng/m^3	< MDL	0.249	0.176	0.161	0.096	n/d	n/d	n/d	n/d	n/d	74
20	As	ng/m^3	0.211	0.454	0.313	0.326	0.093	0.214	0.428	0.328	0.337	0.065	51
21	Cd	ng/m^3	0.034	0.135	0.075	0.080	0.033	0.051	0.197	0.139	0.130	0.047	47
22	Cr	ng/m^3	< MDL	10.545	2.865	3.370	3.063	< MDL	4.214	2.866	2.866	1.907	17
23	Li	ng/m^3	< MDL	0.030	0.014	0.015	0.006	0.002	0.063	0.010	0.021	0.021	
24	Be	ng/m^3	0.001	0.001	0.001	0.001	0.000	0.275	2.484	1.395	1.456	0.749	
25	Bi	ng/m^3	0.010	0.035	0.026	0.023	0.008	0.017	0.042	0.027	0.028	0.008	
26	Cs	ng/m^3	0.013	0.054	0.025	0.026	0.012	0.033	0.096	0.059	0.060	0.019	38
27	Co	ng/m^3	0.005	0.025	0.012	0.015	0.006	0.004	0.117	0.018	0.029	0.032	60
28	Cu	ng/m^3	1.468	4.383	2.040	2.323	1.002	1.517	6.840	3.264	3.491	1.962	65
29	Ga	ng/m^3	0.021	0.062	0.033	0.038	0.013	0.024	0.135	0.057	0.056	0.032	
30	Mn	ng/m^3	0.222	2.932	0.578	0.937	0.930	< MDL	3.841	1.113	1.388	1.064	72
31	Ni	ng/m^3	< MDL	0.928	0.402	0.456	0.283	0.196	1.960	0.425	0.588	0.496	65
32	Rb	ng/m^3	0.379	1.324	0.818	0.785	0.282	1.048	3.185	1.733	1.777	0.612	29
33	Se	ng/m^3	< MDL	0.087	0.058	0.055	0.026	0.066	0.386	0.203	0.207	0.085	42
34	Sr	ng/m^3	< MDL	0.228	0.133	0.132	0.058	< MDL	1.192	0.311	0.456	0.386	58
35	U	ng/m^3	0.001	0.004	0.002	0.002	0.001	0.515	9.890	2.730	3.820	2.829	
36	V	ng/m^3	0.240	2.743	1.035	1.186	0.832	0.612	2.640	0.841	1.024	0.574	64
37	BC	$\mu g/m^3$	3.091	4.799	3.591	3.865	0.676	4.202	5.167	4.529	4.611	0.332	

Table S3. Seasonal results of Pearson correlation matrices between $PM_{2.5}$ mass, chemical mass closure (CMC) components and positive matrix factorisation (PMF) factors identified towards: a) meteorological parameters, and b) gaseous parameters. Remarks: BC = black carbon while PMF factors were: factor 1= combustion of engine oil; factor 2= mineral dust; factor 3= mixed secondary inorganic aerosol (SIA) and biomass burning; factor 4= mixed traffic and industrial; and factor 5= sea salt. For meteorological parameters, API is air pollution index; T = temperature; RH = relative humidity; WS = wind speed; and WD = wind direction.

a)

	Variables	ANNUAL	SW	INT.2	NE	INT.1	HAZE
API	$PM_{2.5}$ mass	**0.763**	**0.748**	0.299	**0.473**	**0.705**	0.531
	CMC SO_4^{2-}	**0.629**	**0.565**	0.683	**0.469**	0.585	0.48
	CMC NO_3^-	-0.172	-0.35	0.37	0.079	0.623	-0.175
	CMC NH_4^+	**0.712**	**0.667**	0.75	**0.561**	0.46	**0.606**
	CMC Sea salt	-0.087	-0.294	0.214	-0.088	0.547	-0.102
	CMC Dust	**0.227**	0.22	-0.033	-0.101	0.302	-0.114
	CMC BC	**0.353**	**0.58**	0.046	0.234	**0.772**	0.274
	PMF Factor 1	0.133	-0.062	-0.084	**0.366**	-0.313	0.076
	PMF Factor 2	**0.354**	0.275	-0.041	-0.103	0.325	0.005
	PMF Factor 3	**0.725**	**0.716**	**0.767**	0.158	**0.817**	0.476
	PMF Factor 4	**-0.235**	0.081	-0.006	-0.169	0.416	0.014
	PMF Factor 5	0.011	-0.079	-0.279	-0.025	0.612	-0.124
T	$PM_{2.5}$ mass	**0.31**	0.236	0.572	0.201	0.03	-0.05
	CMC SO_4^{2-}	0.149	-0.063	0.089	**0.414**	0.112	-0.547
	CMC NO_3^-	0.052	0.194	0.521	-0.151	-0.097	0.384
	CMC NH_4^+	0.145	0.046	0.087	0.176	-0.542	-0.259
	CMC Sea salt	0.155	**0.407**	0.128	**0.379**	0.008	0.562
	CMC Dust	**0.576**	**0.641**	0.692	**0.581**	-0.216	**0.761**
	CMC BC	-0.023	0.188	0.689	**-0.421**	-0.079	0.489
	PMF Factor 1	0.063	0.022	-0.393	0.083	-0.11	0.086
	PMF Factor 2	**0.599**	**0.673**	0.703	**0.464**	0.734	**0.789**
	PMF Factor 3	**0.236**	0.229	0.342	0.177	-0.184	-0.094
	PMF Factor 4	-0.189	0.122	0.709	-0.28	0.403	0.089
	PMF Factor 5	0.213	0.313	0.14	0.163	-0.405	**0.687**
RH	$PM_{2.5}$ mass	**-0.314**	-0.252	-0.495	-0.174	0.152	0.108
	CMC SO_4^{2-}	-0.054	0.186	-0.007	**-0.352**	0.148	**0.646**
	CMC NO_3^-	-0.035	-0.358	-0.489	0.231	0.338	-0.534
	CMC NH_4^+	-0.112	0.011	-0.01	-0.113	0.504	0.332
	CMC Sea salt	-0.117	**-0.379**	-0.097	**-0.519**	0.227	-0.461
	CMC Dust	**-0.615**	**-0.716**	-0.697	**-0.543**	0.437	**-0.742**
	CMC BC	0.022	-0.189	-0.64	**0.396**	0.228	-0.472
	PMF Factor 1	0.056	0.186	0.439	-0.116	0.139	-0.039
	PMF Factor 2	**-0.652**	**-0.738**	-0.778	**-0.547**	-0.6	**-0.759**
	PMF Factor 3	-0.226	-0.192	-0.275	-0.111	0.053	0.229
	PMF Factor 4	0.212	-0.219	-0.655	0.334	-0.567	-0.205
	PMF Factor 5	-0.22	-0.353	-0.131	-0.219	0.6	-0.57

	Variables	ANNUAL	SW	INT.2	NE	INT.1	HAZE
WS	$PM_{2.5}$ mass	**0.274**	0.164	0.245	-0.03	0.192	-0.446
	CMC SO_4^{2-}	0.174	-0.047	-0.125	0.224	0.208	**-0.692**
	CMC NO_3^-	-0.113	0.161	0.378	**-0.429**	-0.055	**0.719**
	CMC NH_4^+	0.14	0.015	-0.103	-0.034	-0.421	-0.53
	CMC Sea salt	0.013	0.007	-0.035	0.241	-0.195	0.111
	CMC Dust	**0.385**	**0.421**	0.588	**0.408**	-0.154	0.43
	CMC BC	-0.07	0.162	0.445	**-0.403**	-0.034	-0.06
	PMF Factor 1	0.084	-0.066	-0.599	0.107	0.557	0.104
	PMF Factor 2	**0.429**	**0.456**	0.875	**0.401**	0.249	0.494
	PMF Factor 3	0.213	0.107	0.182	-0.186	0.228	**-0.678**
	PMF Factor 4	**-0.391**	0.155	0.378	**-0.507**	0.628	0.138
	PMF Factor 5	0.132	0.048	0.128	0.144	-0.267	0.306
WD	$PM_{2.5}$ mass	-0.131	-0.181	0.409	0.056	0.047	0.413
	CMC SO_4^{2-}	-0.054	-0.006	0.047	0.083	-0.029	0.162
	CMC NO_3^-	0.002	0.17	0.471	-0.226	-0.124	0.451
	CMC NH_4^+	-0.105	-0.012	0.034	-0.029	-0.524	0.319
	CMC Sea salt	0.096	0.064	-0.19	0.309	0.145	-0.039
	CMC Dust	0.014	-0.085	0.625	**0.406**	**-0.699**	0.197
	CMC BC	-0.063	-0.13	0.579	-0.113	-0.172	0.381
	PMF Factor 1	0.205	**0.581**	0.129	-0.147	-0.15	**0.677**
	PMF Factor 2	-0.016	-0.011	0.354	**0.373**	-0.195	0.319
	PMF Factor 3	-0.161	-0.257	-0.045	0.144	0.633	0.259
	PMF Factor 4	0.163	-0.185	0.638	0.048	0.464	0.161
	PMF Factor 5	-0.067	-0.152	0.339	0.121	-0.312	-0.011
Rainfall	$PM_{2.5}$ mass	-0.212	-0.246	-0.733	-0.052	-0.051	-0.178
	CMC SO_4^{2-}	-0.136	-0.133	-0.422	0.025	0.001	0.236
	CMC NO_3^-	-0.03	-0.03	-0.414	0.037	0.079	-0.257
	CMC NH_4^+	-0.092	-0.188	-0.335	0.207	0.618	0.012
	CMC Sea salt	-0.106	-0.274	0.109	-0.093	-0.251	-0.213
	CMC Dust	**-0.228**	-0.353	-0.296	-0.265	0.551	-0.391
	CMC BC	-0.116	-0.141	**-0.893**	-0.029	0.027	-0.591
	PMF Factor 1	-0.037	-0.084	-0.291	0.191	0.53	0.064
	PMF Factor 2	**-0.257**	-0.184	-0.156	**-0.513**	-0.581	-0.399
	PMF Factor 3	-0.207	-0.227	-0.227	-0.265	0.047	-0.097
	PMF Factor 4	-0.11	-0.102	-0.743	-0.296	-0.524	-0.343
	PMF Factor 5	-0.05	-0.128	**-0.816**	0.144	0.338	-0.101

Continuation of Table S3 (2)

b)	Variables	ANNUAL	SW	INT.2	NE	INT.1	HAZE
CO	$PM_{2.5}$ mass	**0.471**	**0.687**	0.713	**0.488**	**0.654**	**0.749**
	CMC SO_4^{2-}	**0.455**	**0.579**	**0.793**	**0.428**	0.582	0.412
	CMC NO_3^-	0.171	-0.292	0.334	0.296	**0.687**	0.014
	CMC NH_4^+	**0.462**	**0.664**	0.711	**0.576**	0.177	**0.674**
	CMC Sea salt	0.02	-0.273	-0.085	**-0.482**	0.626	0.107
	CMC Dust	0.06	0.232	0.001	-0.285	0.331	0.205
	CMC BC	**0.549**	**0.533**	0.554	**0.544**	**0.748**	**0.697**
	PMF Factor 1	0.206	0.134	0.722	**0.498**	-0.167	0.306
	PMF Factor 2	0.197	**0.455**	-0.637	-0.295	0.198	0.322
	PMF Factor 3	**0.302**	**0.612**	0.42	-0.083	0.072	0.6
	PMF Factor 4	0.199	0.157	0.577	0.04	-0.015	0.007
	PMF Factor 5	-0.025	-0.163	0.438	-0.167	**0.694**	0.01
O_3	$PM_{2.5}$ mass	**0.298**	**0.535**	0.427	**0.433**	0.378	0.449
	CMC SO_4^{2-}	0.198	0.191	0.674	**0.531**	0.239	**0.803**
	CMC NO_3^-	0.079	0.032	-0.055	-0.087	0.345	-0.413
	CMC NH_4^+	**0.241**	0.343	0.553	**0.521**	0.627	**0.685**
	CMC Sea salt	0.121	-0.014	-0.21	0.333	0.237	-0.332
	CMC Dust	0.115	0.193	-0.467	0.207	0.316	-0.532
	CMC BC	0.049	0.131	0.316	-0.263	0.454	-0.071
	PMF Factor 1	**-0.287**	**-0.605**	**0.796**	0.118	0.04	0.358
	PMF Factor 2	-0.009	0.105	-0.832	-0.007	-0.434	-0.427
	PMF Factor 3	**0.304**	**0.597**	0.204	**0.383**	0.703	0.538
	PMF Factor 4	0.035	0.024	0.188	**-0.351**	0.126	-0.122
	PMF Factor 5	0.147	0.113	0.638	0.305	0.509	-0.379
SO_2	$PM_{2.5}$ mass	**0.324**	0.141	-0.25	**0.654**	0.627	0.445
	CMC SO_4^{2-}	**0.345**	0.201	-0.559	**0.407**	**0.67**	-0.017
	CMC NO_3^-	0.03	0.009	0.041	0.061	0.523	0.193
	CMC NH_4^+	**0.31**	0.267	-0.442	**0.46**	-0.404	0.353
	CMC Sea salt	-0.028	-0.057	0.611	-0.191	0.261	0.279
	CMC Dust	0.189	0.207	0.331	-0.022	0.031	0.425
	CMC BC	0.167	0.01	-0.217	**0.461**	0.455	**0.709**
	PMF Factor 1	**0.38**	0.301	-0.349	**0.436**	0.395	0.276
	PMF Factor 2	**0.345**	0.319	0.224	0.06	0.583	0.471
	PMF Factor 3	0.181	0.108	-0.26	-0.008	-0.168	0.375
	PMF Factor 4	-0.008	0.2	-0.032	0.114	0.33	0.465
	PMF Factor 5	-0.026	-0.082	-0.581	-0.211	0.32	0.267

	Variables	ANNUAL	SW	INT.2	NE	INT.1	HAZE
NO_X	$PM_{2.5}$ mass	0.058	0.112	**0.8**	**0.38**	0.588	0.192
	CMC SO_4^{2-}	0.05	0.038	0.709	0.18	0.492	-0.333
	CMC NO_3^-	**0.284**	0.085	0.545	0.295	0.609	0.429
	CMC NH_4^+	0.05	0.127	0.663	**0.351**	0.226	0.03
	CMC Sea salt	-0.063	-0.04	0.005	**-0.527**	0.472	0.307
	CMC Dust	-0.019	0.244	0.364	**-0.419**	0.358	0.589
	CMC BC	**0.467**	0.122	0.642	**0.621**	**0.724**	0.588
	PMF Factor 1	0.17	0.218	0.482	**0.471**	-0.043	0.158
	PMF Factor 2	0.122	**0.504**	-0.449	-0.28	0.081	**0.65**
	PMF Factor 3	-0.139	0.014	0.504	-0.22	0	0.12
	PMF Factor 4	**0.459**	0.186	**0.774**	0.219	-0.007	0.239
	PMF Factor 5	-0.122	0.029	0.18	-0.288	**0.643**	0.362
NO	$PM_{2.5}$ mass	**-0.262**	-0.309	0.701	0.086	-0.126	-0.285
	CMC SO_4^{2-}	**-0.252**	-0.27	0.573	-0.088	-0.227	**-0.702**
	CMC NO_3^-	0.185	0.177	0.353	0.126	-0.006	0.432
	CMC NH_4^+	**-0.243**	-0.285	0.491	0.053	0.134	-0.475
	CMC Sea salt	-0.062	0.215	-0.073	**-0.475**	0.013	0.434
	CMC Dust	-0.124	0.159	0.225	**-0.469**	-0.013	**0.687**
	CMC BC	**0.237**	-0.207	0.583	**0.472**	0.142	0.274
	PMF Factor 1	0.083	0.247	0.651	0.326	-0.246	0.05
	PMF Factor 2	-0.034	0.369	-0.629	-0.247	-0.36	**0.698**
	PMF Factor 3	**-0.39**	-0.376	0.263	-0.343	-0.476	-0.282
	PMF Factor 4	**0.428**	0.028	0.719	0.195	-0.37	0.239
	PMF Factor 5	-0.118	0.181	0.327	-0.325	0.188	0.589
NO_2	$PM_{2.5}$ mass	**0.473**	**0.528**	**0.851**	**0.711**	**0.874**	0.599
	CMC SO_4^{2-}	**0.444**	0.359	**0.819**	**0.545**	**0.846**	0.155
	CMC NO_3^-	**0.287**	-0.052	0.751	**0.454**	**0.778**	0.269
	CMC NH_4^+	**0.433**	**0.528**	**0.828**	**0.7**	0.173	0.526
	CMC Sea salt	-0.041	-0.309	0.112	**-0.408**	0.583	0.069
	CMC Dust	0.137	0.234	0.515	-0.173	0.482	0.276
	CMC BC	**0.579**	**0.435**	0.661	**0.633**	**0.785**	**0.689**
	PMF Factor 1	0.213	0.098	0.192	**0.529**	0.175	0.202
	PMF Factor 2	**0.26**	0.422	-0.145	-0.201	0.388	0.345
	PMF Factor 3	**0.291**	**0.422**	**0.783**	0.057	0.736	0.34
	PMF Factor 4	**0.311**	0.29	**0.766**	0.172	0.337	0.239
	PMF Factor 5	-0.073	-0.152	-0.017	-0.118	**0.641**	0.007

Remarks: Values in bold are different from 0 with a significance level alpha=0.05

Table S4. Relative contribution from five identified sources for each HAZE episode.

Source contribution, μg m^{-3} (%)	HAZE 2011 n = 3	HAZE 2012 n = 8
Factor 1: Combustion of engine oil	5.66 (10%)	3.71 (6%)
Factor 2: Mineral dust	1.17 (2%)	15.07 (25%)
Factor 3: Mixed SIA and biomass burning	46.97 (81%)	33.15 (56%)
Factor 4: Mixed traffic and industrial	1.12 (2%)	2.12 (4%)
Factor 5: Sea salt	2.87 (5%)	5.28 (9%)

Table S5. Pearson correlation matrix results between chemical mass closure (CMC) components and positive matrix factorisation (PMF) factor for: a) HAZE 2011, and b) HAZE 2012 episodes. Remarks: SIA = secondary inorganic aerosol.

a) HAZE 2011

Variables	PMF Factor 3	CMC SO_4^{2-}	CMC NH_4^+	CMC K^+	CMC nss-SO_4^{2-}	CMC SIA
PMF Factor 3	**1**	0.899	0.873	0.915	0.899	0.888
CMC SO_4^{2-}		**1**	**0.998**	0.647	**1.000**	**1.000**
CMC NH_4^+			**1**	0.603	**0.998**	**1.000**
CMC K^+				**1**	0.647	0.627
CMC nss- SO_4^{2-}					**1**	**1.000**
CMC SIA						**1**

b) HAZE 2012

Variables	PMF Factor 3	CMC SO_4^{2-}	CMC NH_4^+	CMC K^+	CMC nss-SO_4^{2-}	CMC SIA
PMF Factor 3	**1**	**0.963**	**0.944**	0.695	**0.965**	**0.952**
CMC SO_4^{2-}		**1**	**0.989**	**0.781**	**1.000**	**0.995**
CMC NH_4^+			**1**	**0.849**	**0.988**	**0.997**
CMC K^+				**1**	**0.777**	**0.829**
CMC nss- SO_4^{2-}					**1**	**0.995**
CMC SIA						**1**

Values in bold are different from 0 with a significance level alpha=0.05.

Table S6. HAZE episodes results for Pearson correlation matrices between PM2.5 mass, chemical mass closure (CMC) components and positive matrix factorisation (PMF) factors identified towards: a) meteorological parameters, and b) gaseous parameters. Remarks: BC = black carbon while PMF factor details are as follows: factor 1= combustion of engine oil; factor 2= mineral dust; factor 3= mixed secondary inorganic aerosol (SIA) and biomass burning; factor 4= mixed traffic and industrial; and factor 5= sea salt. For meteorological parameters, API is air pollution index; T = temperature; RH = relative humidity; WS = wind speed; and WD = wind direction.

a)	Variables	HAZE 2011	HAZE 2012
API	$PM_{2.5}$ mass	0.082	0.613
	SO_4^{2-}	0.491	**0.736**
	NO_3^-		-0.313
	NH_4^+	0.539	0.67
	Sea salt	0.386	-0.204
	Dust	0.145	-0.298
	BC	0.027	0.245
	Factor 1	0.99	0.093
	Factor 2	**1**	-0.231
	Factor 3	0.061	0.611
	Factor 4	-0.53	-0.075
	Factor 5	**1**	-0.37
T	$PM_{2.5}$ mass	0.387	-0.188
	SO_4^{2-}	0.737	-0.612
	NO_3^-		0.287
	NH_4^+	0.774	-0.517
	Sea salt	0.653	0.693
	Dust	0.445	**0.863**
	BC	0.336	0.371
	Factor 1	0.985	0.288
	Factor 2	**1**	**0.864**
	Factor 3	0.367	-0.304
	Factor 4	-0.241	-0.563
	Factor 5	0.952	0.751
RH	$PM_{2.5}$ mass	-0.715	0.317
	SO_4^{2-}	-0.942	**0.733**
	NO_3^-		-0.54
	NH_4^+	-0.959	0.637
	Sea salt	-0.896	-0.49
	Dust	-0.758	**-0.779**
	BC	-0.675	-0.248
	Factor 1	-0.841	-0.214
	Factor 2	**-1**	**-0.786**
	Factor 3	-0.7	0.568
	Factor 4	-0.155	0.485
	Factor 5	-0.759	-0.567

	Variables	HAZE 2011	HAZE 2012
WS	$PM_{2.5}$ mass	-0.921	-0.432
	SO_4^{2-}	-0.673	-0.642
	NO_3^-		**0.759**
	NH_4^+	-0.63	-0.567
	Sea salt	-0.755	0.054
	Dust	-0.894	0.385
	BC	-0.941	-0.009
	Factor 1	0.176	0.17
	Factor 2	**-1**	0.413
	Factor 3	-0.929	-0.658
	Factor 4	-0.972	0.063
	Factor 5	0.309	0.234
WD	$PM_{2.5}$ mass	0.6	0.427
	SO_4^{2-}	0.88	0.316
	NO_3^-		0.405
	NH_4^+	0.905	0.334
	Sea salt	0.818	-0.11
	Dust	0.65	0.095
	BC	0.555	0.347
	Factor 1	0.913	0.713
	Factor 2	**1**	0.243
	Factor 3	0.583	0.284
	Factor 4	0.003	0.07
	Factor 5	0.849	-0.111
Rainfall	$PM_{2.5}$ mass	**-1**	-0.177
	SO_4^{2-}	**-1**	0.064
	NO_3^-		-0.244
	NH_4^+	**-1**	-0.013
	Sea salt	**-1**	-0.211
	Dust	**-1**	-0.389
	BC	**-1**	-0.512
	Factor 1	**1**	
	Factor 2		-0.44
	Factor 3	**-1**	0.022
	Factor 4	**-1**	0.295
	Factor 5	**1**	-0.152

1

b)

	Variables	HAZE 2011	HAZE 2012
CO	$PM_{2.5}$ mass	0.541	**0.907**
	SO_4^{2-}	0.843	**0.797**
	NO_3^-		-0.18
	NH_4^+	0.872	**0.819**
	Sea salt	0.775	-0.028
	Dust	0.594	-0.014
	BC	0.494	0.691
	Factor 1	0.94	0.461
	Factor 2	**1**	0.111
	Factor 3	0.523	0.772
	Factor 4	-0.069	-0.334
	Factor 5	0.885	-0.314
O_3	$PM_{2.5}$ mass	-0.169	0.706
	SO_4^{2-}	0.259	**0.917**
	NO_3^-		-0.391
	NH_4^+	0.313	**0.919**
	Sea salt	0.145	-0.326
	Dust	-0.105	-0.505
	BC	-0.222	0.271
	Factor 1	0.924	0.451
	Factor 2	**1**	-0.403
	Factor 3	-0.189	**0.856**
	Factor 4	-0.724	0.621
	Factor 5	0.967	-0.5
SO_2	$PM_{2.5}$ mass	0.979	0.665
	SO_4^{2-}	0.974	0.545
	NO_3^-		-0.104
	NH_4^+	0.96	0.615
	Sea salt	0.994	0.147
	Dust	0.99	0.141
	BC	0.966	0.652
	Factor 1	0.416	0.741
	Factor 2	**1**	0.263
	Factor 3	0.975	0.6
	Factor 4	0.664	0.004
	Factor 5	0.288	0.027

	Variables	HAZE 2011	HAZE 2012
NO_X	$PM_{2.5}$ mass	0.577	0.319
	SO_4^{2-}	0.866	-0.068
	NO_3^-		0.403
	NH_4^+	0.892	0.028
	Sea salt	0.802	0.227
	Dust	0.629	0.552
	BC	0.532	0.604
	Factor 1	0.924	0.797
	Factor 2	**1**	0.677
	Factor 3	0.56	0.299
	Factor 4	-0.025	-0.548
	Factor 5	0.864	0.126
NO	$PM_{2.5}$ mass	0.492	-0.493
	SO_4^{2-}	0.811	**-0.778**
	NO_3^-		0.336
	NH_4^+	0.842	**-0.715**
	Sea salt	0.737	0.394
	Dust	0.546	0.625
	BC	0.443	-0.034
	Factor 1	0.958	0.142
	Factor 2	**1**	0.622
	Factor 3	0.473	-0.71
	Factor 4	-0.126	-0.443
	Factor 5	0.91	0.52
NO_2	$PM_{2.5}$ mass	0.663	**0.898**
	SO_4^{2-}	0.915	**0.798**
	NO_3^-		0.059
	NH_4^+	0.937	**0.832**
	Sea salt	0.862	-0.193
	Dust	0.71	-0.101
	BC	0.621	0.694
	Factor 1	0.877	0.437
	Factor 2	**1**	0.037
	Factor 3	0.647	0.623
	Factor 4	0.085	-0.117
	Factor 5	0.803	-0.463

Values in bold are different from 0 with a significance level alpha=0.05

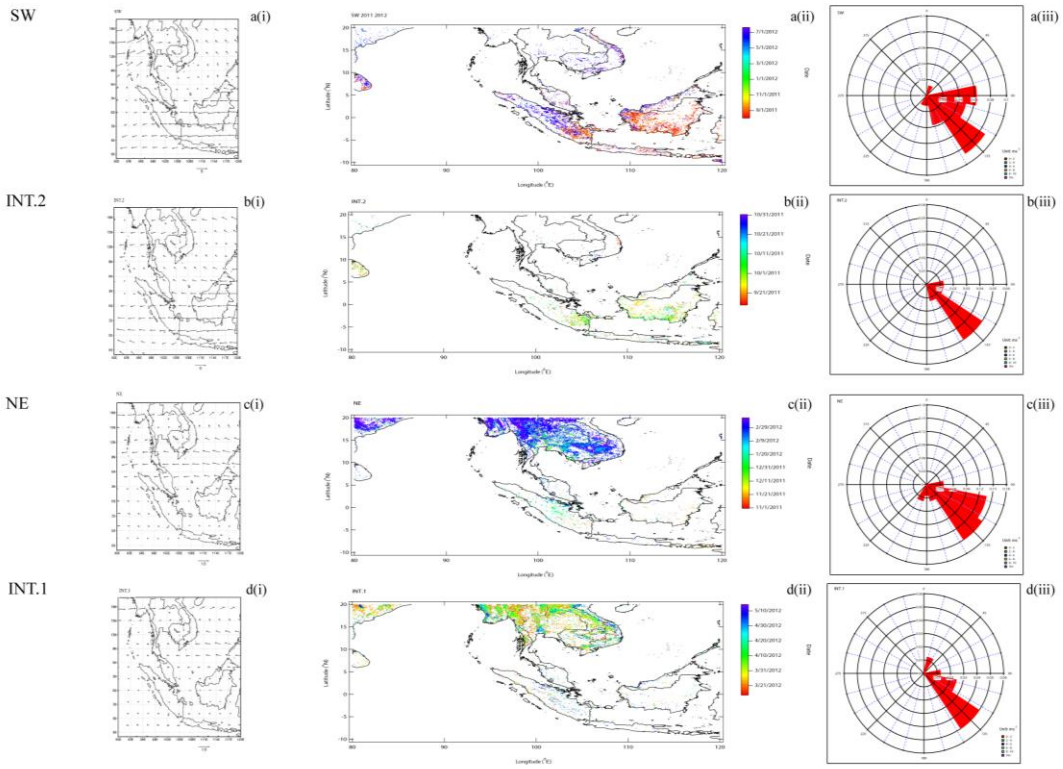


Figure S1. Seasonal plot for a) SW, b) INT.2, c) NE, and d) INT.1 pertaining to: i) regional synoptic wind field plotted for 925 hPa (500 m); ii) biomass fire hotspot; and iii) wind rose at the sampling site.

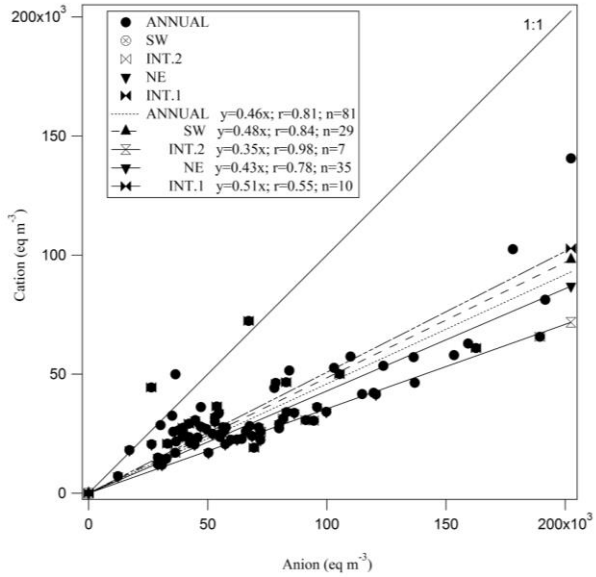
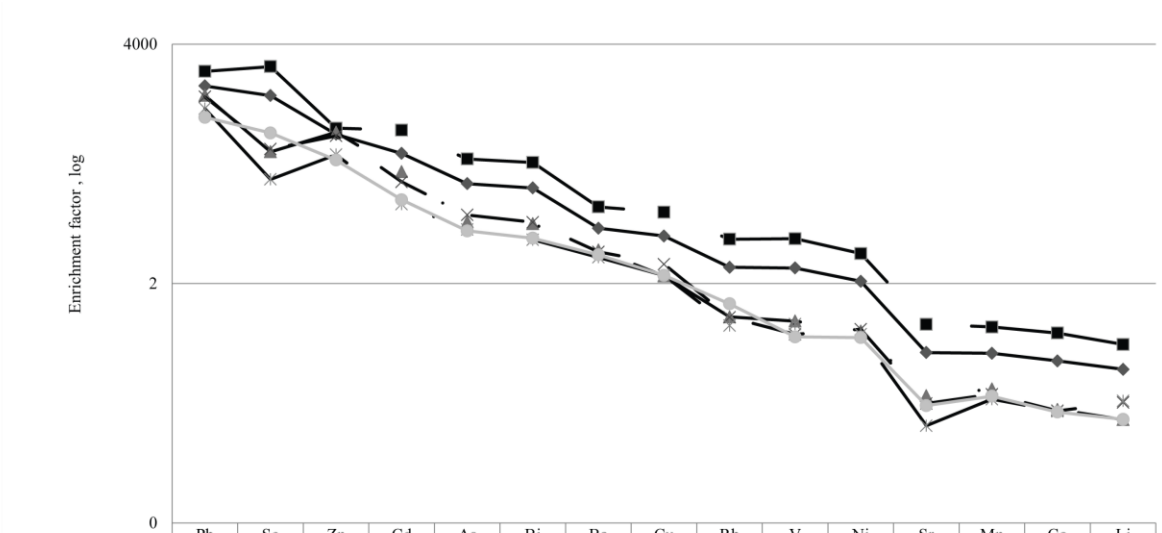


Figure S2. Correlations between cations and anions of $PM_{2.5}$ on a seasonal and annual basis, each with respective linear regression equations. The 1:1 line is given for comparison.



	Pb	Se	Zn	Cd	As	Bi	Ba	Cu	Rb	V	Ni	Sr	Mn	Co	Li
ANNUAL	1060	782	229	124.6	47.6	41.6	11.6	9.04	3.35	3.27	2.15	0.22	0.22	0.17	0.13
SW	1686	1962	277	261.8	104.5	93.3	22.8	19.29	8.19	8.31	5.19	0.55	0.50	0.42	0.29
INT.2	786	131	244	70.0	14.2	13.3	5.8	2.55	0.69	0.61	0.44	0.06	0.07	0.04	0.03
NE	752	143	217	50.4	17.6	14.0	5.5	3.70	0.68	0.40	0.47	0.04	0.06	0.04	0.05
INT.1	518	55	120	24.8	11.1	8.0	4.6	2.58	0.53	0.55	0.40	0.02	0.05	0.03	0.05
HAZE	391	238	101	28.6	10.6	8.5	5.0	2.59	1.05	0.37	0.36	0.04	0.06	0.03	0.03

Figure S3. Seasonal variation of enrichment factor (EF) in the trace element of $PM_{2.5}$.

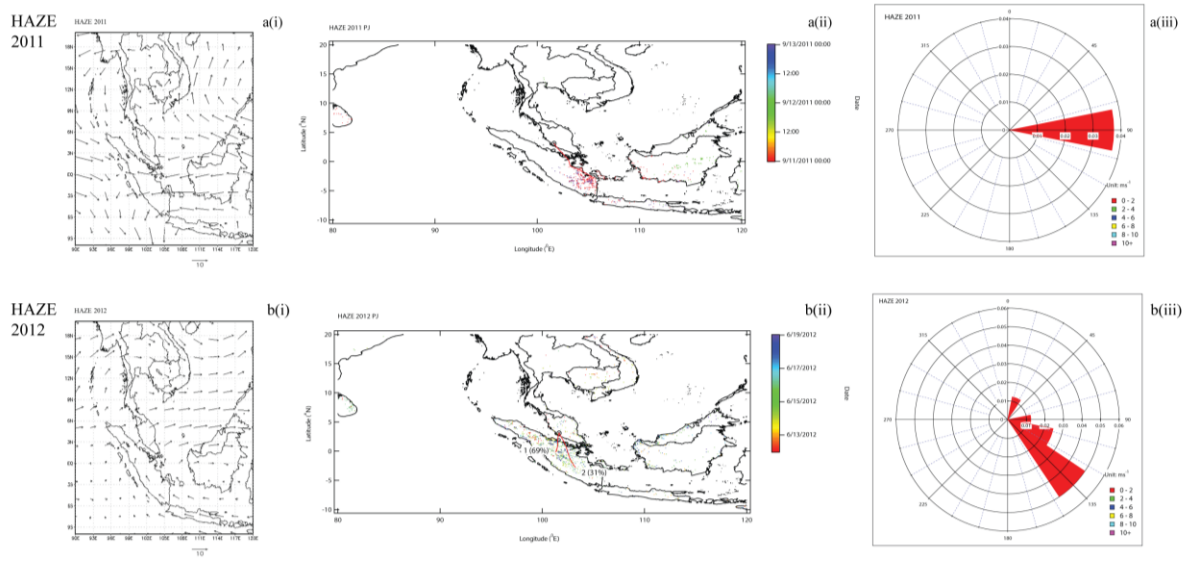


Figure S4. Haze episodes plot a) 2011 HAZE, and b) 2012 HAZE of i) synoptic wind field plotted on 925 hPa (500 m); ii) biomass fire hotspot with 48 h backwards trajectories at the releasing 925 hPa (500 m) with 6 h trajectory intervals; and iii) wind rose at the sampling site.

Reference

Squizzato, S., Masiol, M., Brunelli, A., Pistollato, S., Tarabotti, E., Rampazzo, G., and Pavoni, B.: Factors determining the formation of secondary inorganic aerosol: a case study in the Po Valley (Italy), Atmos. Chem. Phys., 13, 1927-1939, 10.5194/acp-13-1927-2013, 2013.