atmosphere

Characterizing Atmospheric Brown Carbon and Its Emission Sources During Wintertime in Shanghai, China

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Table S1 Concentration of metal elements(ng/m^3) and enrichment factors (EFs) of elements in $PM_{2.5}$ in Shanghai during winter

3.2S Analysis Metallic Element Concentration

Table S2 Integration parameters of each absorption peak at 365 nm

Table S3 Elemental formulae assigned to the species responsible for major peaks in the UV-Vis chromatogram

Table S4 The absorption ratios of 4-nitrophenol at 365 nm for the other samples

Table S1 Concentration of metal elements(ng/m^3) and enrichment factors (EFs) of elements in $PM_{2.5}$ in Shanghai during winter

Elements	Entire period		EF
	Mean ± SD	Range	
Na	838.351 ± 611.181	5.222–1453.740	6.135
Mg	174.101 ± 106.750	2.108–401.356	2.269
Al	397.375 ± 182.107	65.385–771.822	/
K	432.680 ± 304.849	96.443–1248.959	2.826
V	3.664 ± 2.108	1.552–8.836	20.831
Mn	38.251 ± 20.547	15.789–90.488	22.569
Fe	457.428 ± 215.499	183.156–991.134	4.479
Co	0.364 ± 0.132	0.206–0.672	7.822
Ni	8.904 ± 5.155	2.893–25.419	135.598
Cu	9.519 ± 7.886	2.272–30.161	140.682
Zn	135.017 ± 64.970	41.278–280.465	608.878
Se	3.394 ± 2.284	0.835–8.339	8076.077
Sr	3.651 ± 1.722	1.917–8.142	2.599
Ag	0.114 ± 0.087	0.012–0.28	391.948
Cd	0.784 ± 0.572	0.140–2.201	1558.921
Sb	1.908 ± 1.836	0.0163–6.399	1163.441
Ba	11.311 ± 8.024	3.731–40.218	4.314
Pb	26.524 ± 17.415	5.316–59.081	308.389

3.2S Analysis Metallic Element Concentration

Table S2 shows that the element with the highest concentration was Na, followed by Mg, Al, K, Fe, and Zn (100–1000 ng/m^3). The elements with concentrations of 10–100 ng/m^3 were Mn, Pb and Ba. The concentrations of V, Co, Ni, Cu, Se, Sr, Ag, Cd, and Sb were less than 10 ng/m^3. Compared with the study of Hu etal. [63], the concentrations of Al, Zn, Pb, V, Cu, Mn and Fe were significantly lower. In a study located in Xi'an during the winter of 2008–2009 [64], all the elements recorded concentrations higher than those in our study, and the concentration of Fe, K and Zn exceeded

1900 ng/m^3 because of the high amount of straw used for heating and as fuel for cooking. The metal concentrations in winter were in the order of Zn > Pb > Cu > Cd, consistent with results of a study in Baoding during the winter of 2016–2017 [65]. However, the order of metals (Zn > Mn > Pb > Cu > Ni > Cd) was different from that (Zn > Pb > Cu > Mn > Ni > Cd) in Shanghai during the winter of 2015, as the concentrations of Zn, Pb, Cu in this study were relatively lower, indicating that the emissions from fuel, coal combustion, and manufacturing were reduced [34].

Table S3 Elemental formulae assigned to the species responsible for major peaks in the UV-Vis chromatogram

No ESI-	RT/min	m/z	Formula	Area/mAU	Score
1	9.348	138.0200	$C_6H_5NO_3$	0.66	98.49
2	10.818	164.0353	$C_8H_7O_3$	0.36	99.64
3	11.987	161.0357	$C_8H_6N_2O_2$	0.11	98.97
4	12.150	152.0356	$C_7H_7NO_3$	0.45	99.53
5	13.432	166.0511	$C_8H_9NO_3$	0.08	98.9
6	14.355	241.1441	$C_{13}H_{22}O_4$	0.31	95.63
7	14.430	188.0355	$C_{10}H_7NO_3$	0.24	99.48
8	15.898	293.1760	$C_{17}H_{26}O_4$	0.25	98.45
9	16.098	143.1078	$C_8H_{16}O_2$	0.09	98.64
10	16.650	351.1849	$C_{10}H_{13}NO_3$	0.11	99.77
11	17.181	242.0461	$C_{13}H_9NO_4$	0.28	98.81
12	19.288	271.2276	$C_{16}H_{32}O_3$	0.11	99.17
13	19.489	325.1845	$C_{18}H_{30}O_3S$	0.13	96.3
14	20.265	299.2595	$C_{18}H_{36}O_3$	0.16	98.94
15	21.468	375.2760	$C_{20}H_{40}O_6$	0.16	93.23
16	21.639	279.2331	$C_{18}H_{32}O_2$	0.27	99.16
17	22.036	391.2885	$C_{27}H_{38}NO$	0.24	96.72
18	22.963	417.3407	$C_{24}H_{50}O_3S$	0.28	96.31
19	23.155	283.2647	$C_{18}H_{36}O_2$	0.2	99.38
20	24.231	297.2798	$C_{19}H_{38}O_2$	0.16	99.83
21	24.963	457.3719	$C_{27}H_{54}O_3S$	0.11	94.9
22	25.703	621.4371	$C_{36}H_{32}O_8$	0.09	98.84
No ESI+	RT/min	m/z	Formula	Area/mAU	Score
1	3.248	151.0965	$C_6H_{14}O_4$	0.62	99.68
2	7.609	344.2881	$C_{21}H_{31}N_2S$	0.48	90.14
3	9.357	416.2492	$C_{17}H_{37}NO_{10}$	0.58	97.78
4	9.750	400.2179	$C_{16}H_{33}NO_{10}$	0.15	98.35
5	10.816	548.3275	$C_{23}H_{49}NO_{13}$	0.35	98.92
6	12.155	278.1388	$C_{15}H_{19}NO_4$	0.41	95.57
7	14.343	181.0674	$C_{13}H_8O$	0.31	99.44
8	15.874	219.1595	$C_{11}H_{22}O_4$	0.22	99.07
9	16.083	204.0807	$C_{15}H_9N$	0.11	98.82
10	16.203	251.1278	$C_{14}H_{18}O_4$	0.16	93.18
11	17.168	272.2222	$C_{15}H_{29}NO_3$	0.30	96.43

12	19.023	221.1539	$C_{14}H_{20}O_2$	0.14	98.71
13	19.585	247.2271	$C_{14}H_{30}O_3$	0.2	99.06
14	21.016	410.3746	$C_{26}H_{49}O_3$	0.12	96.71
15	21.359	256.2644	$C_{16}H_{33}NO$	0.27	96.12
16	22.033	550.6288	$C_{38}H_{79}N$	0.12	98.35
17	22.136	334.3106	$C_{22}H_{39}NO$	0.37	94.01
18	22.400	625.5884	$C_{38}H_{72}N_2O_4$	0.16	99.47
19	24.719	352.3575	$C_{23}H_{45}NO$	0.20	97.7

Note: The results of 22 January taken as an example.

Table S2 Integration parameters of each absorption peak at 365 nm

Peak Jan 22	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.966	0.45	1.395	0.34	3.291	0.028
2	1.018	4.07	12.62	1.57	15.2	0.065
3	1.048	4	12.4	0.78	7.551	0.125
4	1.191	1.61	4.991	0.73	7.067	0.006
5	1.268	0.71	2.201	0.92	8.906	0.022
6	1.388	0.43	1.333	0.12	1.162	0.087
7	1.687	1.11	3.441	0.13	1.258	0.095
8	1.8	0.51	1.581	0.06	0.581	0.132
9	2.756	0.27	0.837	0.05	0.484	0.192
10	3.26	0.57	1.767	0.44	4.259	0.052
11	3.733	0.11	0.341	0.02	0.194	0.091
12	5.927	0.22	0.682	0.04	0.387	0.178
13	7.053	0.32	0.992	0.08	0.774	0.132
14	7.493	2.31	7.161	0.53	5.131	0.261
15	8.418	0.1	0.31	0.02	0.194	0.128
16	9.143	0.44	1.364	0.13	1.258	0.145
17	9.355	4.22	13.08	1.16	11.23	0.162
18	10.222	0.32	0.992	0.06	0.581	0.154
19	10.586	0.5	1.55	0.1	0.968	0.158
20	10.826	0.46	1.426	0.15	1.452	0.119
21	11.382	0.1	0.31	0.04	0.387	0.071
22	11.789	0.1	0.31	0.03	0.29	0.105
23	11.986	0.5	1.55	0.17	1.646	0.106
24	12.164	0.91	2.821	0.19	1.839	0.153
25	12.872	0.47	1.457	0.15	1.452	0.122
26	13.023	0.16	0.496	0.03	0.29	0.148
27	13.445	0.14	0.434	0.05	0.484	0.097
28	14.362	0.23	0.713	0.12	1.162	0.059
29	14.432	0.25	0.775	0.09	0.871	0.091

30	14.791	0.11	0.341	0.02	0.194	0.117
31	15.512	0.17	0.527	0.04	0.387	0.133
32	15.902	0.3	0.93	0.1	0.968	0.11
33	16.1	0.29	0.899	0.12	1.162	0.079
34	16.215	0.23	0.713	0.06	0.581	0.147
35	17.186	0.47	1.457	0.15	1.452	0.112
36	17.443	0.17	0.527	0.07	0.678	0.079
37	18.069	0.3	0.93	0.11	1.065	0.093
38	18.498	0.13	0.403	0.04	0.387	0.084
39	18.715	0.2	0.62	0.06	0.581	0.119
40	18.888	0.19	0.589	0.05	0.484	0.128
41	19.291	0.23	0.713	0.07	0.678	0.144
42	19.593	0.38	1.178	0.1	0.968	0.168
43	19.81	0.18	0.558	0.04	0.387	0.171
44	20.108	0.12	0.372	0.04	0.387	0.098
45	20.264	0.06	0.186	0.02	0.194	0.019
46	20.36	0.13	0.403	0.05	0.484	0.082
47	21.019	0.12	0.372	0.06	0.581	0.059
48	21.142	0.56	1.736	0.16	1.549	0.128
49	21.363	0.41	1.271	0.16	1.549	0.101
50	22.137	0.89	2.759	0.26	2.517	0.11
51	22.805	0.16	0.496	0.04	0.387	0.103
52	23.034	0.17	0.527	0.05	0.484	0.11
53	23.538	0.13	0.403	0.03	0.29	0.136
54	23.71	0.11	0.341	0.03	0.29	0.102
55	23.988	0.1	0.31	0.03	0.29	0.105
56	25.402	0.26	0.806	0.04	0.387	0.211
57	26.049	0.1	0.31	0.03	0.29	0.109
Peak Jan 8	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.963	0.65	3.983	0.65	12.452	0.034
2	1.014	2.09	12.81	0.98	18.774	0.057
3	1.045	1.16	7.108	1.16	22.222	0.108
4	1.684	0.8	4.902	0.11	2.1073	0.123
5	2.678	2.17	13.3	0.18	3.4483	0.431
6	3.246	0.09	0.551	0.04	0.7663	0.057
7	3.998	2.33	14.28	0.11	2.1073	0.662
8	6.038	0.11	0.674	0.02	0.3831	0.168
9	9.348	0.66	4.044	0.19	3.6398	0.127
10	10.818	0.36	2.206	0.12	2.2989	0.107
11	11.987	0.11	0.674	0.04	0.7663	0.088
12	12.15	0.45	2.757	0.09	1.7241	0.149

13	13.432	0.08	0.49	0.02	0.3831	0.132
14	14.355	0.31	1.9	0.1	1.9157	0.088
15	14.43	0.24	1.471	0.07	1.341	0.11
16	15.898	0.25	1.532	0.08	1.5326	0.141
17	16.098	0.09	0.551	0.04	0.7663	0.066
18	16.65	0.11	0.674	0.03	0.5747	0.119
19	17.181	0.28	1.716	0.09	1.7241	0.108
20	18.068	0.14	0.858	0.06	1.1494	0.087
21	19.288	0.11	0.674	0.04	0.7663	0.087
22	19.489	0.13	0.797	0.02	0.3831	0.121
23	19.593	0.22	1.348	0.08	1.5326	0.091
24	19.816	0.15	0.919	0.04	0.7663	0.146
25	20.265	0.07	0.429	0.02	0.3831	0.067
26	20.498	0.11	0.674	0.04	0.7663	0.088
27	21.027	0.14	0.858	0.05	0.9579	0.113
28	21.139	0.41	2.512	0.12	2.2989	0.137
29	21.363	0.24	1.471	0.1	1.9157	0.07
30	21.468	0.16	0.98	0.04	0.7663	0.115
31	21.639	0.27	1.654	0.04	0.7663	0.218
32	22.042	0.12	0.735	0.06	1.1494	0.091
33	22.138	0.32	1.961	0.11	2.1073	0.088
34	22.389	0.2	1.225	0.04	0.7663	0.166
35	22.567	0.22	1.348	0.06	1.1494	0.149
36	22.963	0.28	1.716	0.03	0.5747	0.238
37	23.155	0.2	1.225	0.04	0.7663	0.178
38	24.231	0.16	0.98	0.03	0.5747	0.167
39	24.963	0.11	0.674	0.02	0.3831	0.096
40	25.702	0.09	0.551	0.02	0.3831	0.131
41	26.055	0.13	0.797	0.04	0.7663	0.1

Peak Jan 16	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.988	1.04	3.135	0.85	8.966	0.047
2	1.01	5.16	15.56	1.28	13.5	0.129
3	1.191	7.32	22.07	2.25	23.73	0.025
4	1.261	0.73	2.201	0.69	7.278	0.032
5	1.391	3.67	11.06	0.08	0.844	0.077
6	1.685	0.91	2.743	0.11	1.16	0.087
7	2.487	0.23	0.693	0.04	0.422	0.128
8	3.25	0.08	0.241	0.03	0.316	0.019
9	7.493	0.35	1.055	0.09	0.949	0.119
10	9.35	4.23	12.75	1.16	12.24	0.164
11	10.245	0.4	1.206	0.06	0.633	0.252

12	10.58	0.23	0.693	0.06	0.633	0.14
13	10.821	0.28	0.844	0.1	1.055	0.112
14	11.379	0.49	1.477	0.16	1.688	0.11
15	11.98	0.61	1.839	0.2	2.11	0.117
16	12.14	1.35	4.07	0.31	3.27	0.194
17	12.875	0.24	0.724	0.07	0.738	0.115
18	13.441	0.2	0.603	0.07	0.738	0.091
19	14.024	0.21	0.633	0.08	0.844	0.086
20	14.36	0.58	1.749	0.19	2.004	0.093
21	14.435	0.38	1.146	0.11	1.16	0.127
22	15.905	0.24	0.724	0.07	0.738	0.126
23	16.095	0.23	0.693	0.1	1.055	0.078
24	17.183	0.42	1.266	0.13	1.371	0.119
25	18.065	0.27	0.814	0.1	1.055	0.105
26	18.709	0.17	0.513	0.05	0.527	0.132
27	19.285	0.31	0.935	0.09	0.949	0.112
28	19.59	0.38	1.146	0.1	1.055	0.168
29	20.18	0.18	0.543	0.05	0.527	0.121
30	20.261	0.11	0.332	0.02	0.211	0.019
31	21.017	0.16	0.482	0.07	0.738	0.094
32	21.14	0.38	1.146	0.15	1.582	0.079
33	21.182	0.17	0.513	0.08	0.844	0.066
34	21.365	0.49	1.477	0.18	1.899	0.08
35	22.035	0.24	0.724	0.09	0.949	-0.018
36	22.137	0.73	2.201	0.21	2.215	0.113
Peak Jan 17	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.961	0.66	2.204409	0.41	4.437229	0.035
2	1.019	3.65	12.19105	1.47	15.90909	0.021
3	1.055	4.1	13.69405	0.72	7.792208	0.126
4	1.191	3.53	11.79025	0.4	4.329004	0.01
5	1.265	2.41	8.049432	1.7	18.39827	0.036
6	1.39	0.88	2.939212	0.27	2.922078	0.075
7	1.4	0.38	1.269205	0.27	2.922078	0.024
8	1.47	0.29	0.968604	0.03	0.324675	0.006
9	1.685	1.08	3.607214	0.13	1.406926	0.094
10	3.252	0.05	0.167001	0.01	0.108225	0.024
11	7.491	0.18	0.601202	0.05	0.541126	0.128
12	9.14	0.46	1.536406	0.15	1.623377	0.121
13	9.346	2.61	8.717435	0.71	7.683983	0.162
14	10.223	0.21	0.701403	0.04	0.4329	0.185
15	10.583	0.34	1.135605	0.07	0.757576	0.153

16	10.82	0.92	3.072812	0.29	3.138528	0.141
17	11.374	0.23	0.768203	0.08	0.865801	0.09
18	11.978	0.28	0.935204	0.09	0.974026	0.099
19	12.137	1.11	3.707415	0.26	2.813853	0.157
20	12.869	0.27	0.901804	0.08	0.865801	0.127
21	13.438	0.2	0.668003	0.06	0.649351	0.106
22	14.022	0.3	1.002004	0.1	1.082251	0.099
23	14.358	0.48	1.603206	0.16	1.731602	0.09
24	14.432	0.56	1.870407	0.16	1.731602	0.141
25	15.897	0.22	0.734803	0.07	0.757576	0.102
26	16.095	0.31	1.035404	0.12	1.298701	0.115
27	17.183	0.58	1.937208	0.17	1.839827	0.144
28	17.435	0.14	0.467602	0.05	0.541126	0.08
29	18.065	0.22	0.734803	0.09	0.974026	0.094
30	18.89	0.21	0.701403	0.05	0.541126	0.157
31	19.286	0.23	0.768203	0.08	0.865801	0.107
32	19.665	0.13	0.434202	0.04	0.4329	0.088
33	19.812	0.2	0.668003	0.04	0.4329	0.155
34	20.264	0.09	0.300601	0.03	0.324675	0.026
35	21.024	0.3	1.002004	0.09	0.974026	0.131
36	21.14	0.42	1.402806	0.17	1.839827	0.07
37	21.184	0.19	0.634603	0.09	0.974026	0.081
38	21.361	0.5	1.670007	0.17	1.839827	0.108
39	22.136	0.66	2.204409	0.22	2.380952	0.097
40	22.392	0.16	0.534402	0.03	0.324675	0.149
41	26.201	0.2	0.668003	0.02	0.21645	0.208

Peak Jan 21	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.918	0.37	1.338	0.17	1.788	0.065
2	0.964	0.46	1.664	0.35	3.68	0.03
3	0.987	0.88	3.183	0.94	9.884	0.021
4	1.016	2.91	10.52	1.4	14.72	0.002
5	1.047	3.58	12.95	0.71	7.466	0.126
6	1.191	1.64	5.931	0.71	7.466	0.004
7	1.395	0.22	0.796	0.07	0.736	0.078
8	1.685	0.22	0.796	0.05	0.526	0.043
9	3.245	0.04	0.145	0.03	0.315	0.003
10	7.085	0.21	0.759	0.04	0.421	0.178
11	7.494	0.52	1.881	0.12	1.262	0.213
12	9.146	0.46	1.664	0.13	1.367	0.168
13	9.356	2.64	9.548	0.74	7.781	0.145
14	9.692	0.59	2.134	0.17	1.788	0.127

15	10.386	0.39	1.41	0.07	0.736	0.221
16	10.591	0.67	2.423	0.13	1.367	0.204
17	10.83	0.83	3.002	0.27	2.839	0.133
18	11.168	0.11	0.398	0.05	0.526	0.08
19	11.381	0.35	1.266	0.11	1.157	0.126
20	11.99	0.5	1.808	0.17	1.788	0.103
21	12.149	1.25	4.521	0.3	3.155	0.183
22	12.876	0.78	2.821	0.26	2.734	0.114
23	13.446	0.19	0.687	0.06	0.631	0.099
24	14.029	0.22	0.796	0.08	0.841	0.096
25	14.368	0.51	1.844	0.17	1.788	0.091
26	14.453	0.61	2.206	0.18	1.893	0.119
27	15.505	0.11	0.398	0.03	0.315	0.098
28	15.659	0.17	0.615	0.04	0.421	0.146
29	15.906	0.28	1.013	0.07	0.736	0.162
30	16.099	0.3	1.085	0.13	1.367	0.087
31	16.219	0.19	0.687	0.08	0.841	0.085
32	16.826	0.11	0.398	0.03	0.315	0.132
33	17.186	0.39	1.41	0.13	1.367	0.103
34	17.439	0.13	0.47	0.06	0.631	0.075
35	18.07	0.24	0.868	0.1	1.052	0.092
36	18.721	0.16	0.579	0.05	0.526	0.111
37	18.888	0.1	0.362	0.03	0.315	0.083
38	19.286	0.23	0.832	0.08	0.841	0.098
39	19.535	0.13	0.47	0.04	0.421	0.105
40	19.594	0.11	0.398	0.05	0.526	0.059
41	19.817	0.14	0.506	0.04	0.421	0.138
42	20.173	0.11	0.398	0.03	0.315	0.081
43	20.259	0.07	0.253	0.02	0.21	0.018
44	20.866	0.21	0.759	0.04	0.421	0.131
45	21.019	0.2	0.723	0.08	0.841	0.083
46	21.138	0.61	2.206	0.18	1.893	0.136
47	21.362	0.18	0.651	0.11	1.157	0.052
48	22.136	1.01	3.653	0.29	3.049	0.126
49	22.566	0.19	0.687	0.07	0.736	0.106
50	22.803	0.13	0.47	0.04	0.421	0.115
51	22.983	0.11	0.398	0.03	0.315	0.109
52	23.147	0.2	0.723	0.04	0.421	0.167
53	23.976	0.36	1.302	0.09	0.946	0.133
54	24.644	0.22	0.796	0.03	0.315	0.185
55	26.954	0.11	0.398	0.02	0.21	0.136

Peak Jan 28	RT	Area	Area Ratio %	Height	Height Ratio %	Width
1	0.963	0.42	1.681	0.31	3.399	0.03
2	1.015	3.55	14.21	1.35	14.8	0.02
3	1.046	3.56	14.25	0.72	7.895	0.118
4	1.19	1.92	7.683	0.59	6.469	0.006
5	1.246	0.23	0.92	0.41	4.496	0.016
6	1.269	0.79	3.161	1.07	11.73	0.022
7	1.682	0.97	3.882	0.14	1.535	0.093
8	3.239	0.76	3.041	0.54	5.921	0.071
9	7.493	0.14	0.56	0.04	0.439	0.117
10	9.357	0.89	3.561	0.25	2.741	0.14
11	10.594	0.55	2.201	0.1	1.096	0.205
12	10.829	2.62	10.48	0.83	9.101	0.18
13	11.174	0.22	0.88	0.07	0.768	0.121
14	11.384	0.11	0.44	0.04	0.439	0.079
15	11.988	0.89	3.561	0.29	3.18	0.116
16	12.149	0.61	2.441	0.14	1.535	0.145
17	12.877	0.3	1.2	0.08	0.877	0.155
18	14.033	0.14	0.56	0.04	0.439	0.103
19	14.363	0.76	3.041	0.26	2.851	0.093
20	14.444	0.52	2.081	0.16	1.754	0.104
21	15.897	0.2	0.8	0.06	0.658	0.102
22	16.098	0.23	0.92	0.09	0.987	0.085
23	16.221	0.14	0.56	0.06	0.658	0.089
24	16.651	0.18	0.72	0.04	0.439	0.133
25	17.186	0.44	1.761	0.13	1.425	0.141
26	17.439	0.12	0.48	0.05	0.548	0.072
27	18.069	0.28	1.12	0.11	1.206	0.094
28	18.159	0.11	0.44	0.04	0.439	0.107
29	18.711	0.21	0.84	0.06	0.658	0.133
30	18.882	0.18	0.72	0.05	0.548	0.113
31	19.065	0.15	0.6	0.03	0.329	0.12
32	19.289	0.2	0.8	0.08	0.877	0.098
33	19.594	0.24	0.96	0.1	1.096	0.086
34	20.104	0.13	0.52	0.05	0.548	0.082
35	20.265	0.09	0.36	0.03	0.329	0.022
36	20.823	0.18	0.72	0.09	0.987	0.093
37	21.024	0.13	0.52	0.07	0.768	0.059
38	21.143	0.59	2.361	0.18	1.974	0.132
39	21.366	0.11	0.44	0.07	0.768	0.049
40	22.139	0.64	2.561	0.21	2.303	0.099

41	22.562	0.13	0.52	0.05	0.548	0.085
42	24.226	0.36	1.441	0.04	0.439	0.279

Table S4 The absorption ratios of 4-nitrophenol at 365 nm for the other samples

	$PM_{2.5}$	OC	K^+	Total absorption area	Total Absorption height	Area ratio of Nitrophenol
1.8	57.990	5.600	0.565	16.32	5.22	4.04
1.16	58.110	5.120	0.704	33.17	9.48	12.75
1.17	100.93	8.199	0.950	29.94	9.26	8.72
1.21	85.359	8.797	0.902	27.65	9.51	9.55
1.22	92.646	9.298	0.957	32.26	10.33	13.08
1.28	73.251	7.374	0.958	24.99	9.12	3.56