Supplement of

Measurement Report:

Size distributions of inorganic and organic components in particulate matter from a megacity in northern China: dependence upon seasons and pollution levels

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Table S1(a) Correlations among chemical components (percentages of 4 ions, 17 elements and 7 carbon fractions accounting for PM concentrations) in 9 sizes.

spring	<0.43	0.43-0.65	0.65-1.1	1.1-2.1	2.1-3.3	3.3-4.7	4.7-5.8	5.8-9.0	>9.0
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.87	1.00	**	**	**	**	**	**	**
0.65-1.1	0.82	0.99	1.00	**	**	**	**	**	**
1.1-2.1	0.94	0.97	0.95	1.00	**	**	**	**	**
2.1-3.3	0.96	0.78	0.73	0.90	1.00	**	.**	**	**
3.3-4.7	0.94	0.74	0.68	0.86	1.00	1.00	**	**	**
4.7-5.8	0.90	0.71	0.65	0.83	0.98	0.99	1.00	**	**
5.8-9.0	0.89	0.66	0.61	0.81	0.97	0.98	0.99	1.00	**
>9.0	0.78	0.58	0.50	0.67	0.84	0.84	0.81	0.80	1.00
summer									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.96	1.00	**	**	**	**	**	**	**
0.65-1.1	0.93	0.99	1.00	**	**	**	**	**	**
1.1-2.1	0.95	0.97	0.98	1.00	**	**	**	**	**
2.1-3.3	0.88	0.76	0.70	0.81	1.00	**	**	**	**
3.3-4.7	0.84	0.73	0.70	0.81	0.96	1.00	**	**	**
4.7-5.8	0.83	0.71	0.67	0.79	0.96	0.99	1.00	**	**
5.8-9.0	0.83	0.71	0.64	0.74	0.93	0.93	0.94	1.00	**
>9.0	0.76	0.63	0.56	0.67	0.91	0.92	0.93	0.99	1.00
autumn									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.90	1.00	**	**	**	**	**	**	**
0.65-1.1	0.82	0.98	1.00	**	**	**	**	**	**
1.1-2.1	0.81	0.97	0.99	1.00	**	**	**	**	**
2.1-3.3	0.98	0.89	0.82	0.82	1.00	**	**	**	**
3.3-4.7	0.95	0.79	0.69	0.70	0.97	1.00	**	**	**
4.7-5.8	0.91	0.71	0.60	0.60	0.93	0.99	1.00	**	**
5.8-9.0	0.83	0.62	0.50	0.52	0.88	0.94	0.95	1.00	**
>9.0	0.82	0.60	0.48	0.51	0.87	0.94	0.95	0.99	1.00
winter									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.96	1.00	**	**	**	**	**	**	**
0.65-1.1	0.90	0.98	1.00	**	**	**	**	**	**
1.1-2.1	0.88	0.96	0.99	1.00	**	**	**	**	**
2.1-3.3	0.96	0.92	0.87	0.88	1.00	**	**	**	**
3.3-4.7	0.91	0.83	0.72	0.73	0.95	1.00	**	**	**
4.7-5.8	0.89	0.78	0.65	0.64	0.91	0.98	1.00	**	**
5.8-9.0	0.85	0.72	0.59	0.58	0.87	0.97	0.99	1.00	**
>9.0	0.82	0.69	0.55	0.54	0.85	0.96	0.98	1.00	1.00

Table S1(b) Correlations among organic components (percentages of 18 PAHs, 2 cholestane, 7 hopane and 24 n-alkanes accounting for PM concentrations) in 9 sizes.

spring	<0.43	0.43-0.65	0.65-1.1	1.1-2.1	2.1-3.3	3.3-4.7	4.7-5.8	5.8-9.0	>9.0
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.99	1.00	**	**	**	**	**	**	**
0.65-1.1	0.98	0.98	1.00	**	**	**	**	**	**
1.1-2.1	0.92	0.88	0.89	1.00	**	**	**	**	**
2.1-3.3	0.93	0.89	0.91	1.00	1.00	**	**	**	**
3.3-4.7	0.84	0.78	0.81	0.98	0.97	1.00	**	**	**
4.7-5.8	0.85	0.79	0.82	0.98	0.97	1.00	1.00	**	**
5.8-9.0	0.90	0.85	0.87	1.00	0.99	0.99	0.99	1.00	**
>9.0	0.86	0.80	0.83	0.99	0.98	0.99	1.00	1.00	1.00
summer									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.99	1.00	**	**	**	**	**	**	**
0.65-1.1	0.98	0.98	1.00	**	**	**	**	**	**
1.1-2.1	0.95	0.95	0.98	1.00	**	**	**	**	**
2.1-3.3	0.97	0.97	0.98	0.99	1.00	**	**	**	**
3.3-4.7	0.88	0.88	0.91	0.96	0.93	1.00	**	**	**
4.7-5.8	0.93	0.94	0.95	0.96	0.95	0.96	1.00	**	**
5.8-9.0	0.96	0.96	0.98	0.98	0.99	0.93	0.95	1.00	**
>9.0	0.95	0.95	0.98	0.97	0.97	0.88	0.92	0.98	1.00
autumn									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.99	1.00	**	**	**	**	**	**	**
0.65-1.1	0.95	0.94	1.00	**	**	**	**	**	**
1.1-2.1	0.97	0.97	0.97	1.00	**	**	**	**	**
2.1-3.3	0.97	0.96	0.97	0.98	1.00	**	**	**	**
3.3-4.7	0.99	0.98	0.95	0.96	0.97	1.00	**	**	**
4.7-5.8	0.98	0.96	0.94	0.97	0.97	0.98	1.00	**	**
5.8-9.0	0.99	0.97	0.95	0.97	0.98	0.99	0.98	1.00	**
>9.0	0.97	0.96	0.95	0.97	0.98	0.96	0.99	0.97	1.00
winter									
<0.43	1.00	**	**	**	**	**	**	**	**
0.43-0.65	0.89	1.00	**	**	**	**	**	**	**
0.65-1.1	0.94	0.98	1.00	**	**	**	**	**	**
1.1-2.1	0.96	0.95	0.99	1.00	**	**	**	**	**
2.1-3.3	0.99	0.87	0.93	0.96	1.00	**	**	**	**
3.3-4.7	0.99	0.87	0.94	0.97	0.99	1.00	**	**	**
4.7-5.8	0.99	0.81	0.89	0.92	0.99	0.98	1.00	**	**
5.8-9.0	0.99	0.86	0.93	0.96	0.99	1.00	0.99	1.00	**
>9.0	0.99	0.84	0.92	0.95	0.99	0.99	0.99	0.99	1.00

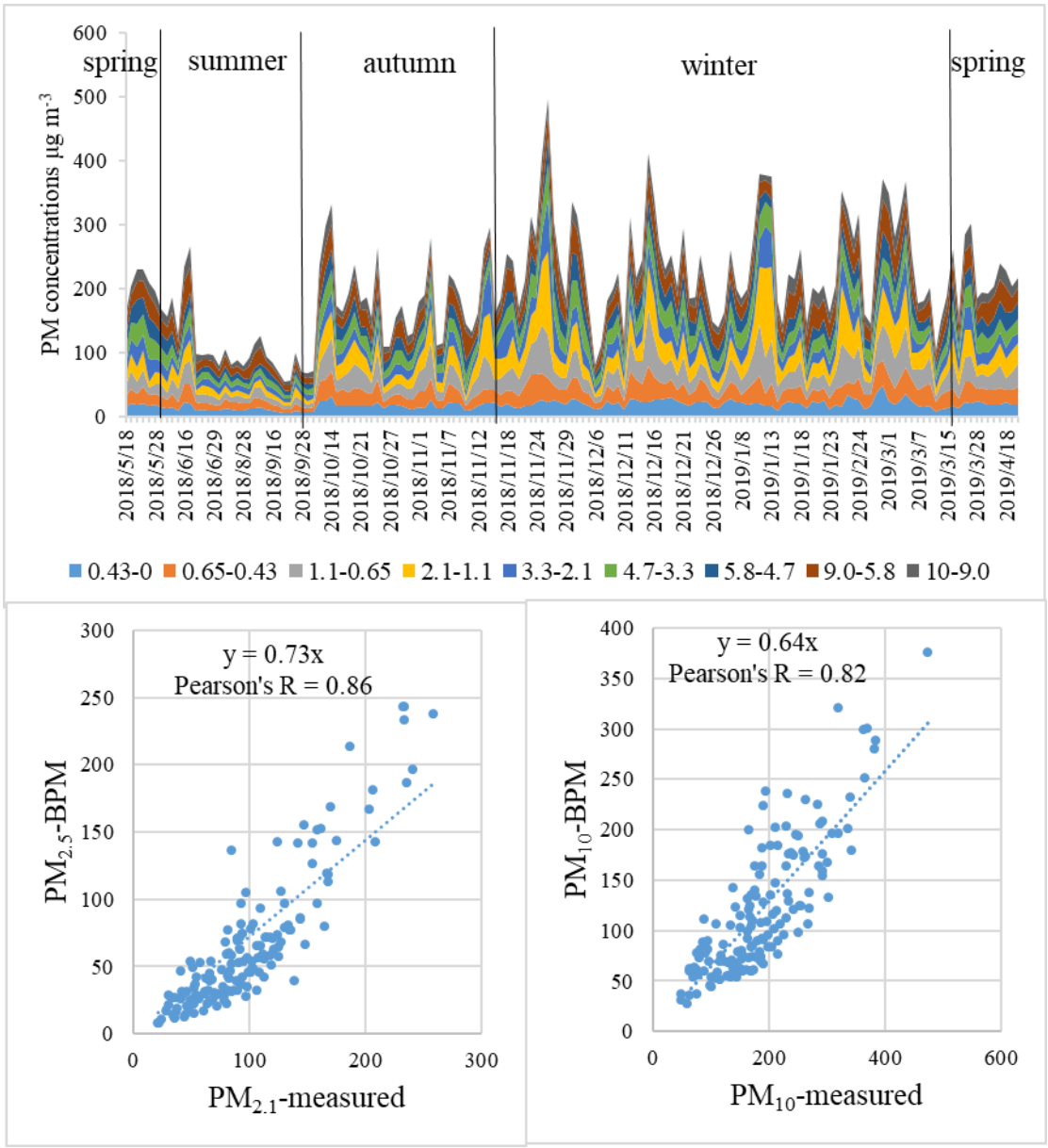

Figure S1 Temporal variations of the size-segregated particle mass concentrations, including spring (May in 2018 and 15 March to 28 April in 2019), summer (June and August in 2018), autumn (1 September to 15 November in 2018) and winter (15 November 2018 to 15 March 2019). And the correlation plots between $PM_{2.1}$ and PM_{10} mass concentrations sampled by the Andersen sampler (PM-measured) vs corresponding means of continuous $PM_{2.5}$ and PM_{10} concentrations (PM-BPM).

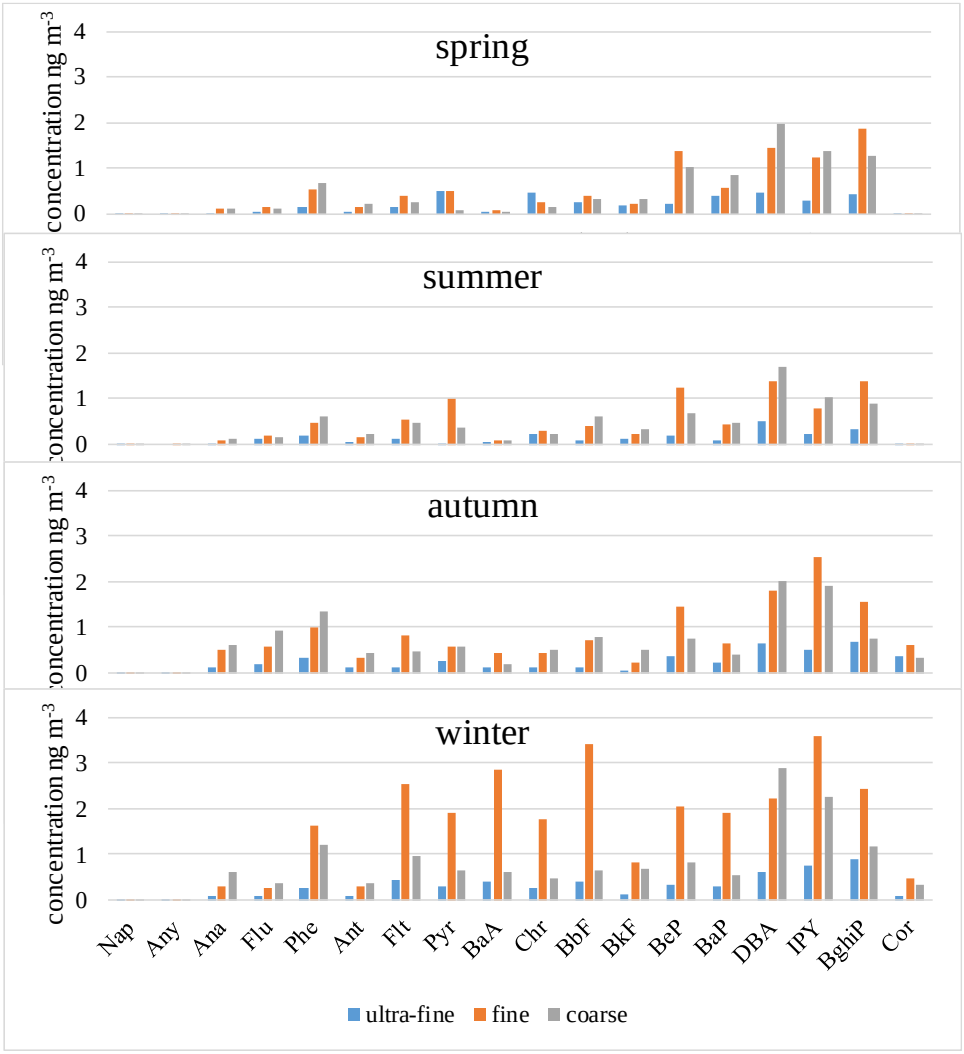

Figure S2a Concentrations of PAHs in the pseudo-ultrafine mode (size<0.43 μm), fine mode (0.43-2.1μm) and coarse mode (>2.1μm) during four seasons.

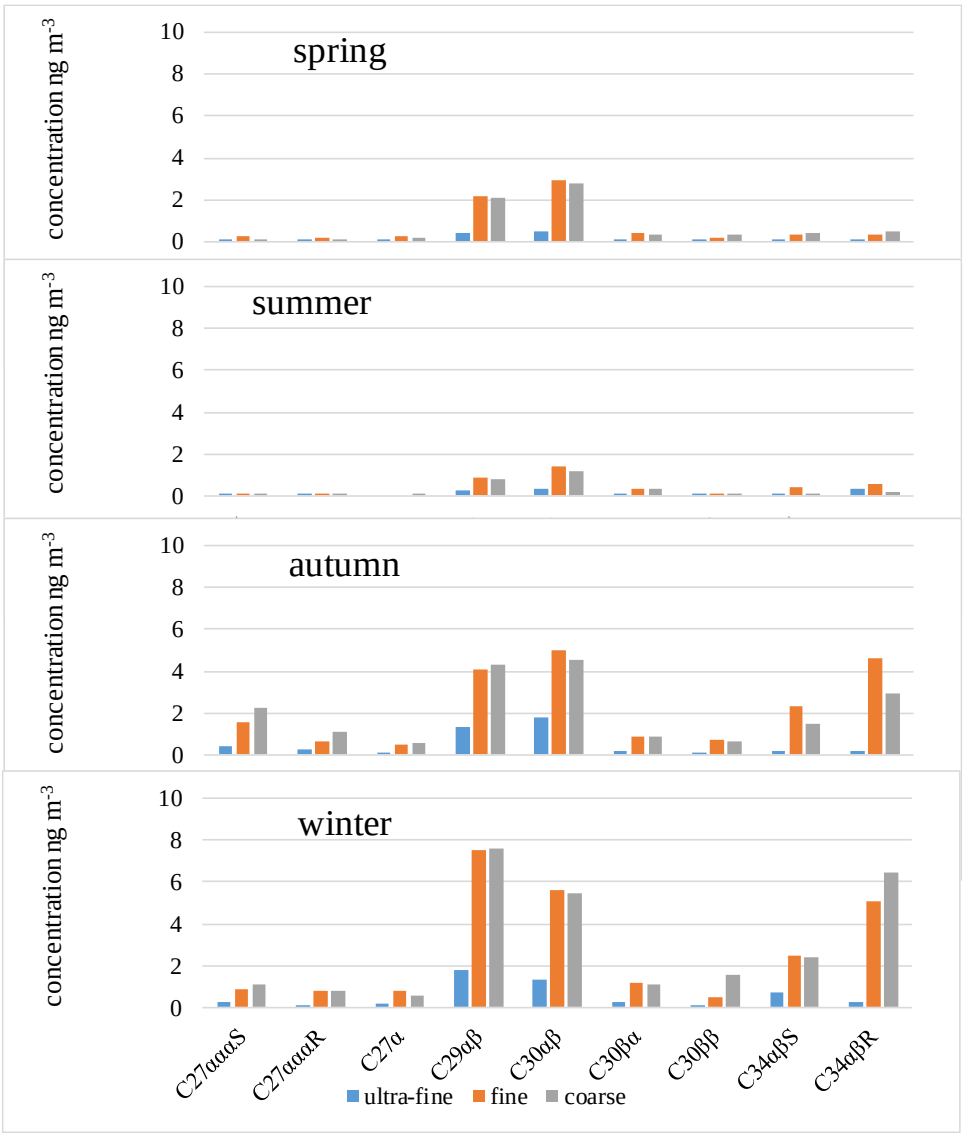

Figure S2b Concentrations of hopanes and steranes in the pseudo-ultrafine mode (size<0.43 μm), fine mode (0.43-2.1μm) and coarse mode (>2.1μm) during four seasons.

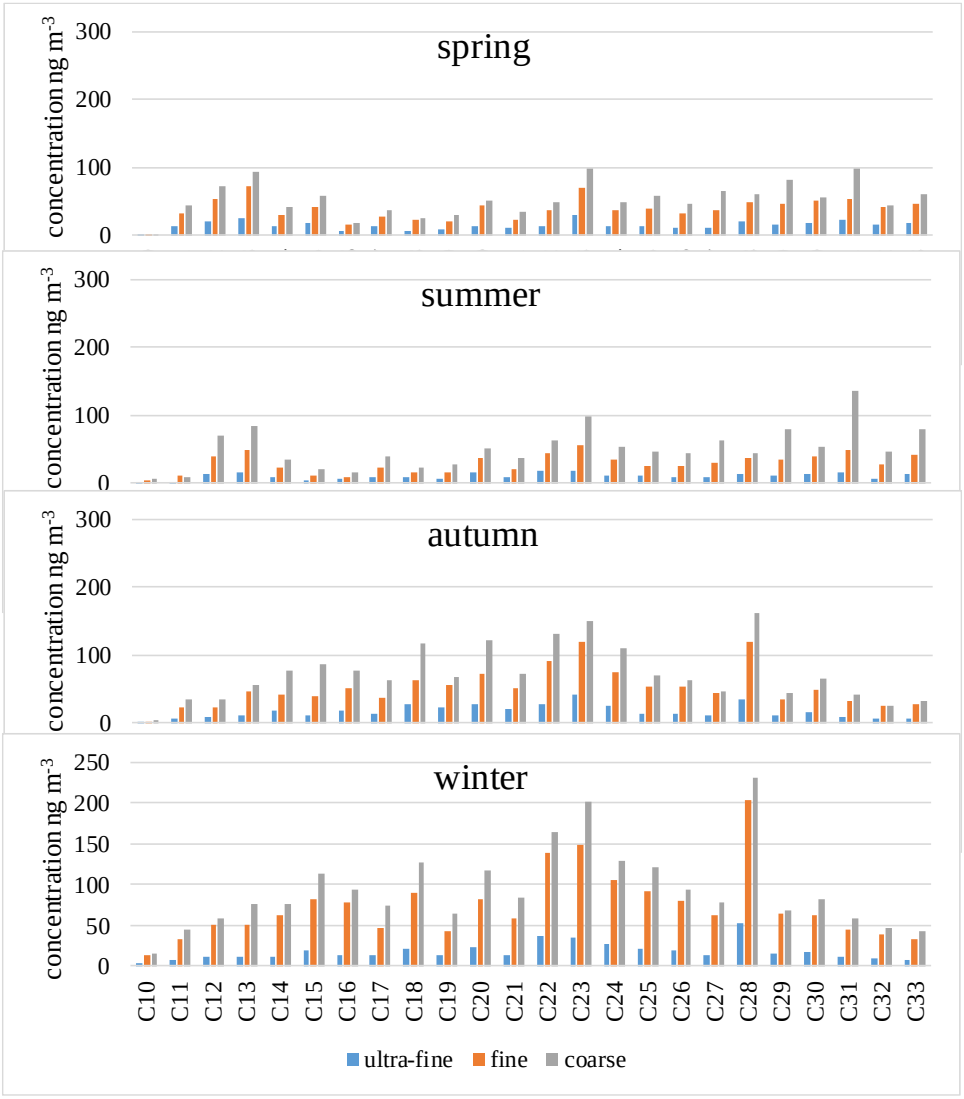

Figure S2c Concentrations of n-alkanes in the pseudo-ultrafine mode (size<0.43 μm), fine mode (0.43-2.1μm) and coarse mode (>2.1μm) during four seasons.

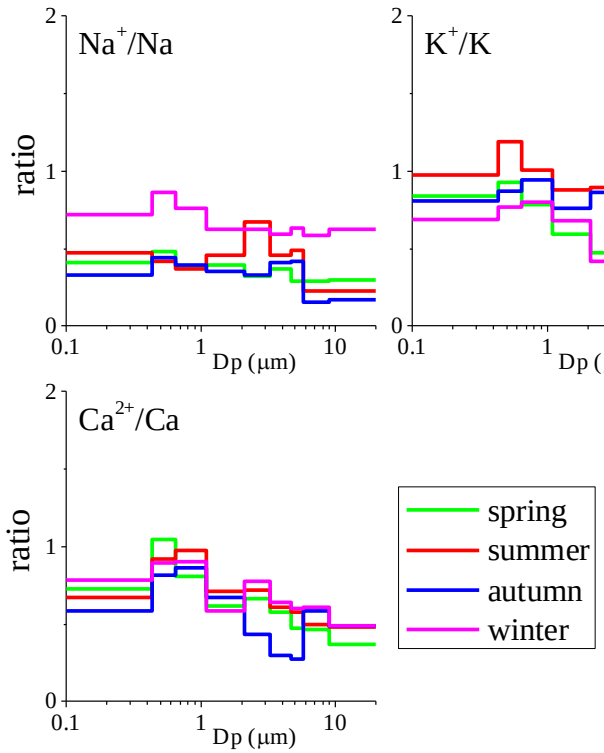

Figure S3 Size distribution of ratios between ions and corresponding elements during spring, summer, autumn and winter.