

Supplementary

Table S1 Seasonal average values of PM_{2.5} and meteorological parameters at each site during sampling periods

	Beijing				Tianjin				Shijiazhuang				Xinglong			
	SU ^a	AU ^b	WIN ^c	SP ^d	SU	AU	WIN	SP	SU	AU	WIN	SP	SU	AU	WIN	SP
PM _{2.5} ($\mu\text{g}/\text{m}^3$)	82.6 (57.3) ^e	87.7 (79.3)	124.8 (69.9)	101.0 (56.6)	82.4 (34.6)	86.4 (37.8)	136.6 (93.8)	116.8 (53.6)	110.8 (65.3)	124.4 (87.0)	231.8 (129.1)	148.4 (60.4)	64.9 (57.6)	64.4 (63.9)	56.7 (41.4)	77.9 (38.6)
Temperature ($^{\circ}\text{C}$)	28.0 (3.8)	18.0 (3.7)	1.5 (2.6)	14.0 (4.2)	27.7 (3.4)	18.4 (3.6)	1.1 (2.3)	13.0 (4.8)	26.9 (3.7)	17.9 (3.7)	1.0 (3.2)	13.8 (5.1)	25.7 (2.2)	15.8 (3.1)	-2.0 (2.5)	12.7 (3.2)
Relative humidity (%)	51 (19)	59 (21)	32 (15)	35 (18)	54 (17)	60 (18)	41 (20)	41 (20)	63 (16)	75 (16)	41 (19)	46 (23)	69 (12)	76 (15)	44 (18)	36 (16)
Wind speed (m/s)	1.0 (0.5)	0.8 (0.6)	1.5 (0.9)	1.7 (1.0)	1.5 (0.5)	1.3 (0.6)	1.4 (0.6)	1.8 (0.6)	1.2 (0.4)	0.9 (0.4)	1.0 (0.5)	1.5 (0.7)	1.7 (0.6)	1.4 (0.7)	1.8 (1.2)	2.3 (0.9)

^a summer; ^b autumn; ^c winter; ^d spring; ^e standard deviation; The presented values of meteorological parameters in spring period at Xinglong are the average of those during 20-31 March, 2015, as the data in April, 2015 is missed.

Table S2 The distribution of sample quantity during the entire study period at each site (sample quantity (proportion))

	Beijing			Tianjin			Shijiazhuang			Xinglong		
	C ^a	MP ^b	HP ^c	C	MP	HP	C	MP	HP	C	MP	HP
Total	100	70	54	80	93	41	41	87	93	149	41	21
SU	33 (33%)	15(22%)	11(20%)	25(31%)	28(30%)	2(5%)	22(54%)	17(20%)	15(16%)	36(24%)	8(20%)	7(33%)
AU	25 (25%)	17(24%)	6(11%)	21(26%)	27(29%)	3(7%)	11(27%)	29(33%)	11(12%)	33(22%)	6(15%)	7(33%)
WIN	20 (20%)	16(23%)	22(41%)	19(24%)	12(13%)	21(51%)	4(10%)	13(15%)	40(43%)	47(32%)	8(20%)	4(19%)
SP	22 (22%)	22(31%)	15(28%)	15(19%)	26(28%)	15(37%)	4(10%)	28(32%)	27(29%)	33(22%)	19(46%)	3(14%)

^a clean days ($\text{PM}_{2.5} < 75 \mu\text{g}/\text{m}^3$); ^b moderate pollution days ($75 \leq \text{PM}_{2.5} < 150 \mu\text{g}/\text{m}^3$); ^c heavy pollution days ($\text{PM}_{2.5} \geq 150 \mu\text{g}/\text{m}^3$)

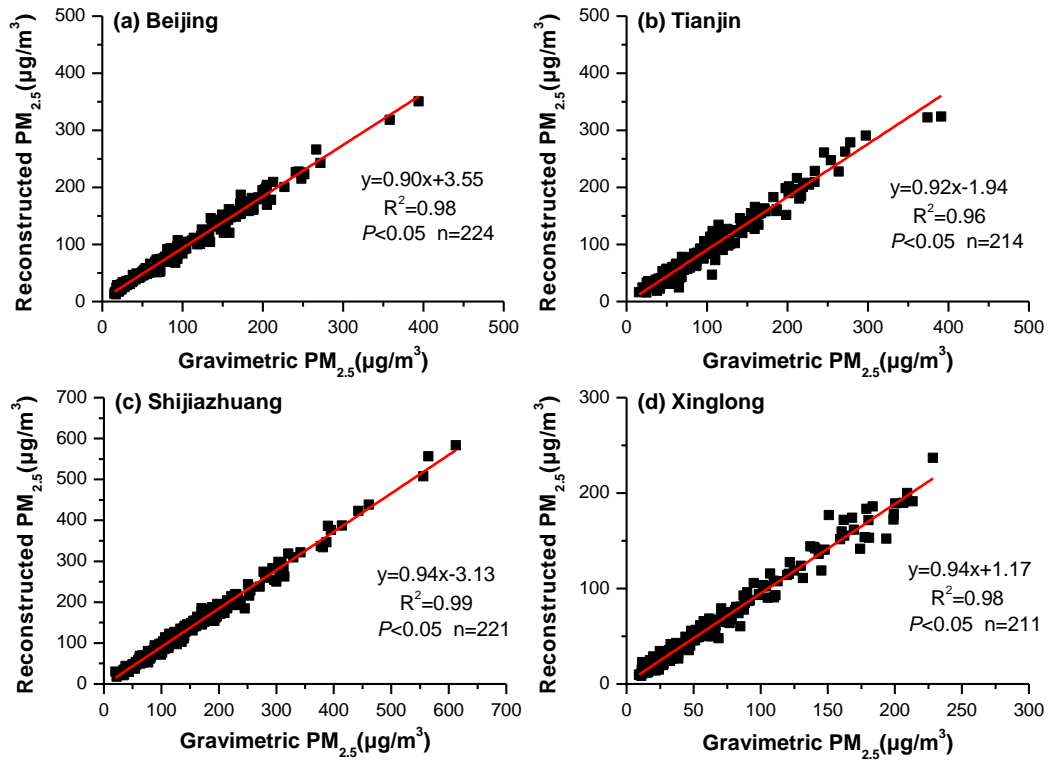


Figure S1. Gravimetric PM_{2.5} versus reconstructed PM_{2.5} mass concentrations at Beijing (a), Tianjin (b), Shijiazhuang (c) and Xinglong (d). "n" represents the samples quantity at each site.

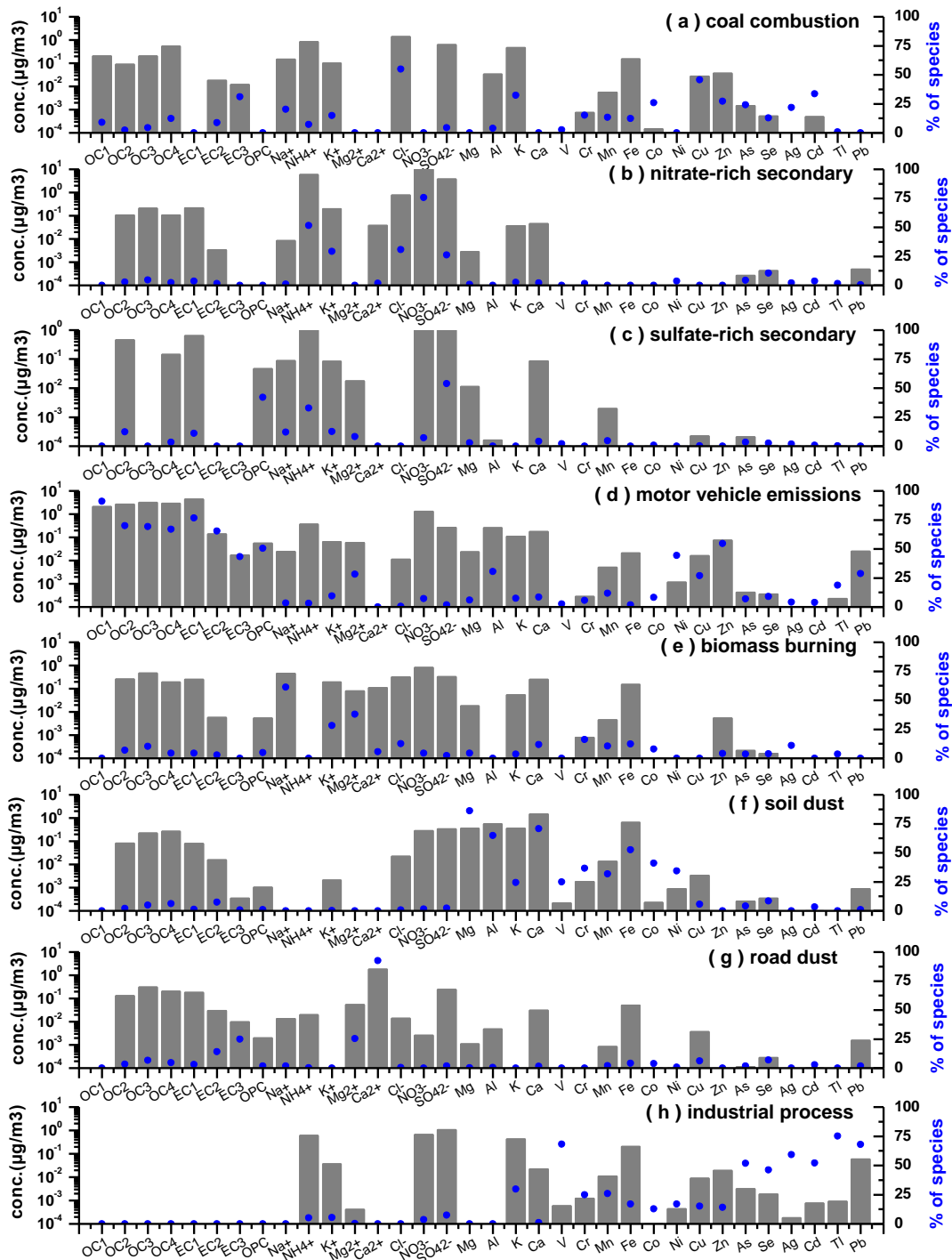


Figure S2. PMF factor/source profiles for PM_{2.5} samples throughout the entire study period at Beijing in concentration ($\mu\text{g}/\text{m}^3$) and percentage (%)

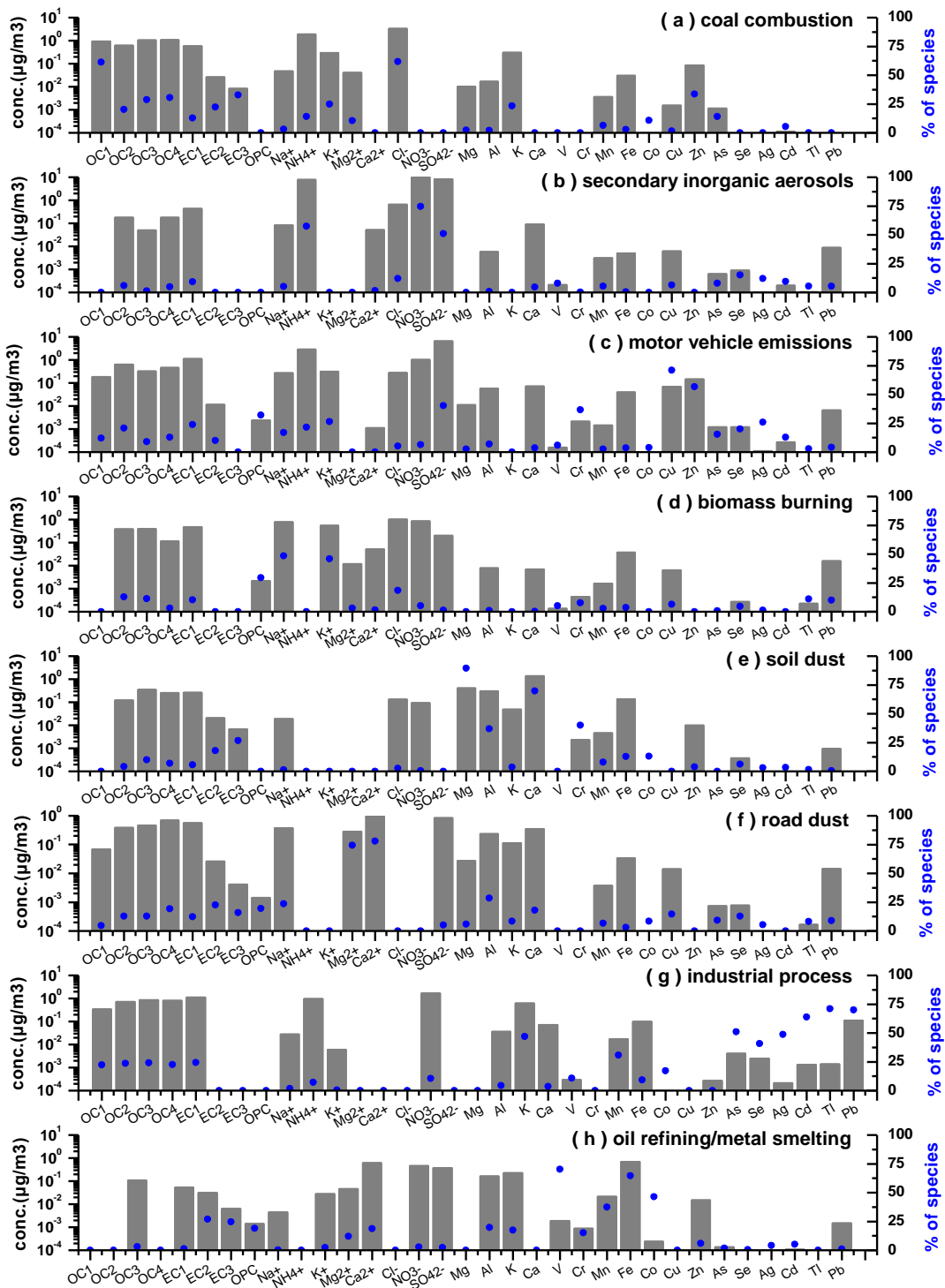


Figure S3. PMF factor/source profiles for PM_{2.5} samples throughout the entire study period at Tianjin in concentration (µg/m³) and percentage (%)

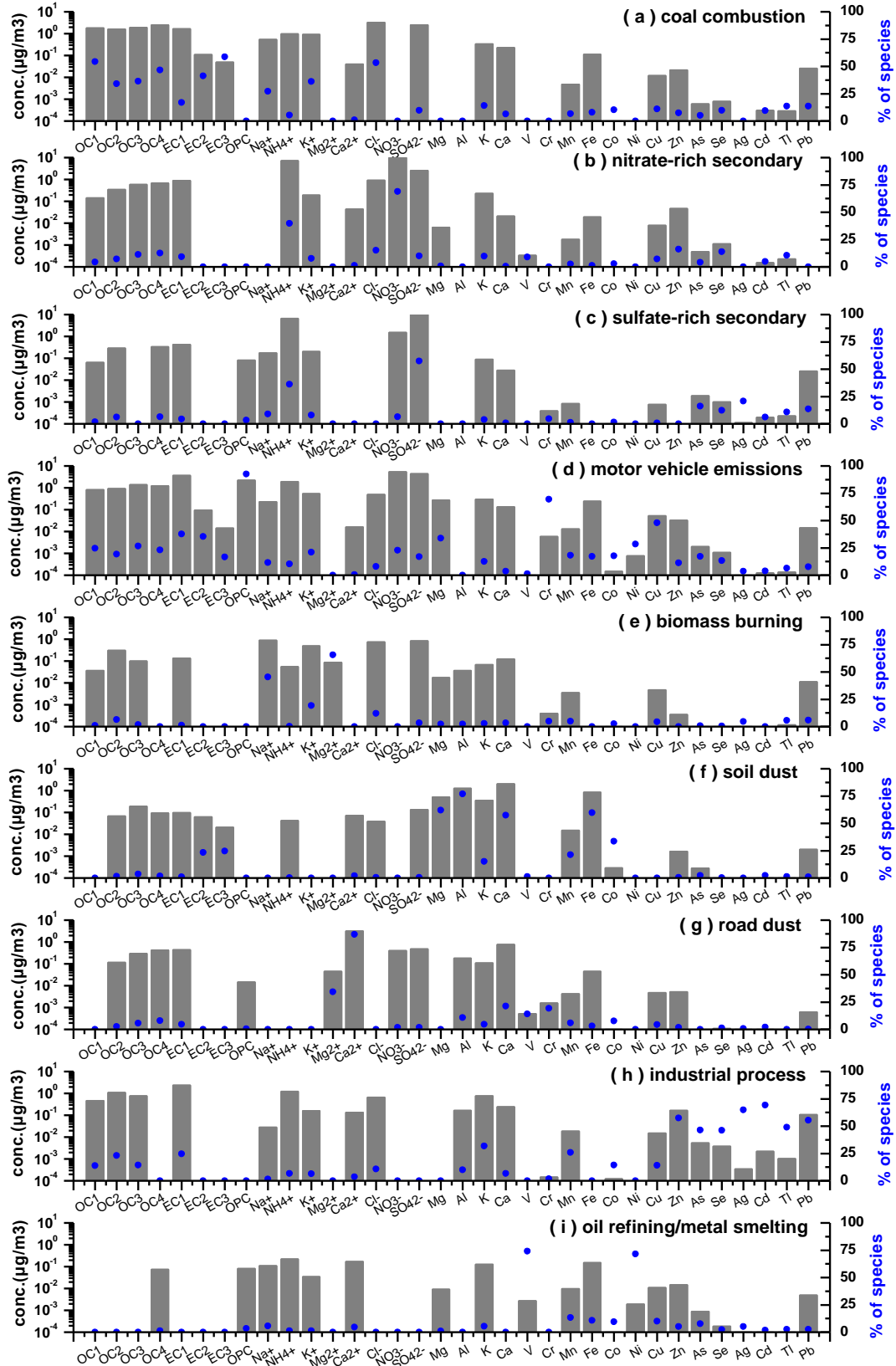


Figure S4. PMF factor/source profiles for PM_{2.5} samples throughout the entire study period at Shijiazhuang in concentration ($\mu\text{g}/\text{m}^3$) and percentage (%)