Supplement of

Using different assumptions of aerosol mixing state and chemical composition to predict CCN concentrations based on filed measurement in Beijing

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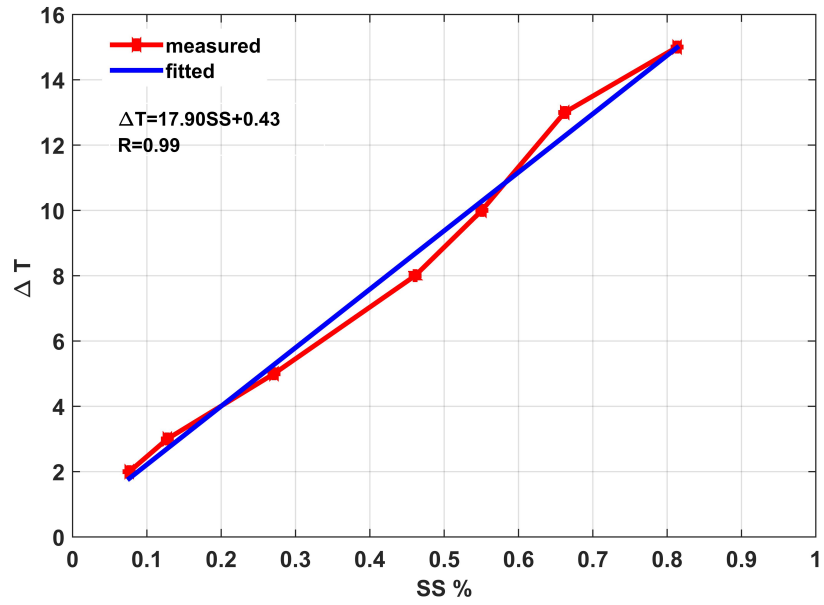


Figure S1. Temperature gradient curve for different supersaturations, the ammonium sulfate is used to calibrate the supersaturations levels of the CCNc, with the longitudinal temperature gradients of 2, 3, 5, 8, 10, 13, 15 K.

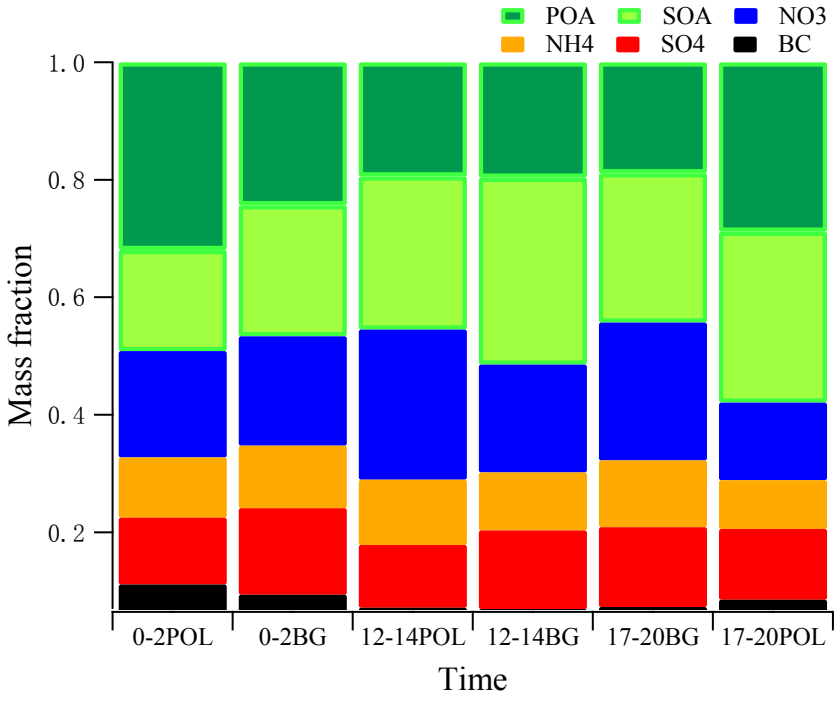
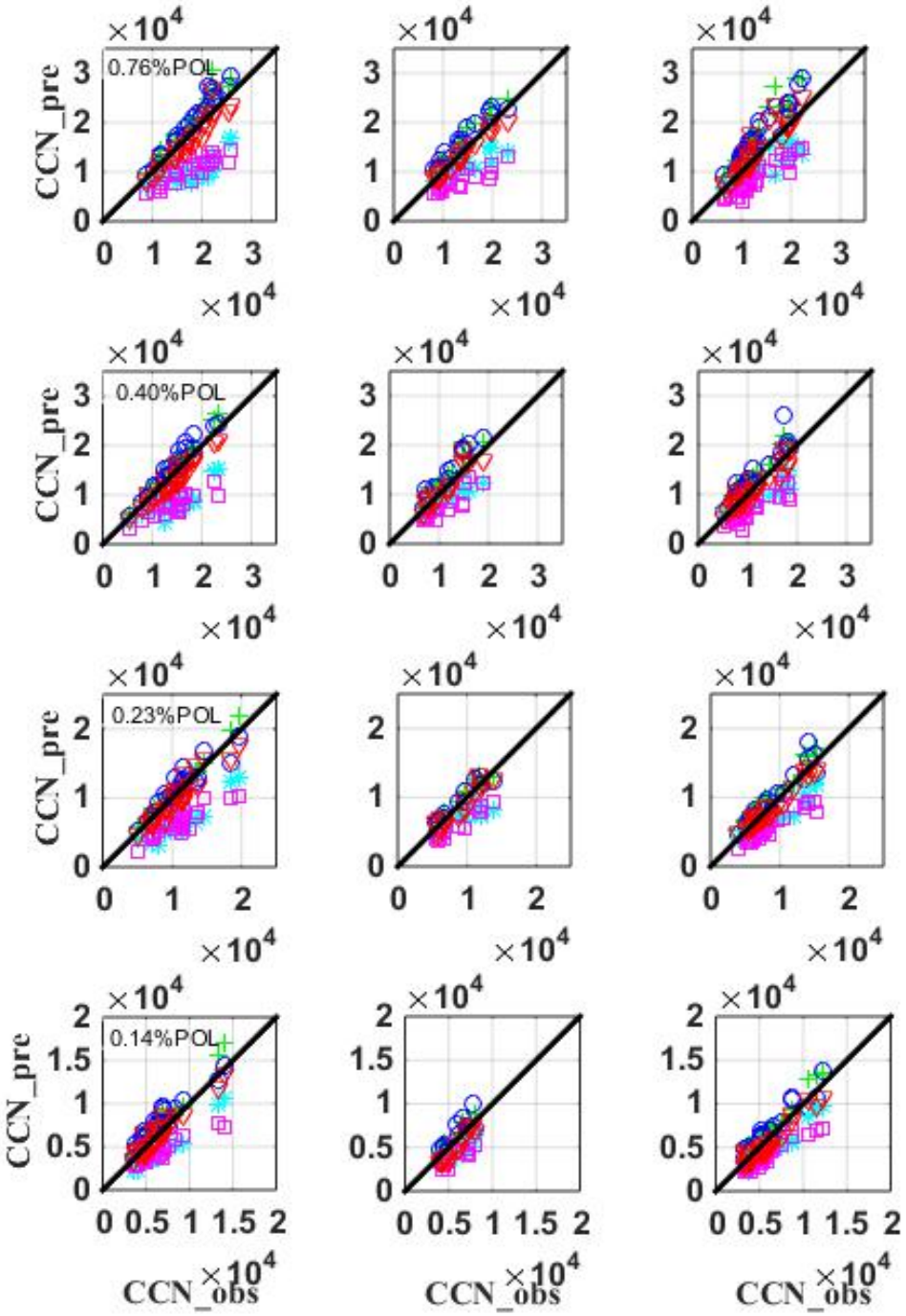


Figure S2. The variations of bulk chemical composition mass concentration fraction during three selected periods (0000–0200 LT, 1200–1400 LT, 1700–2000 LT) under

background and polluted conditions.



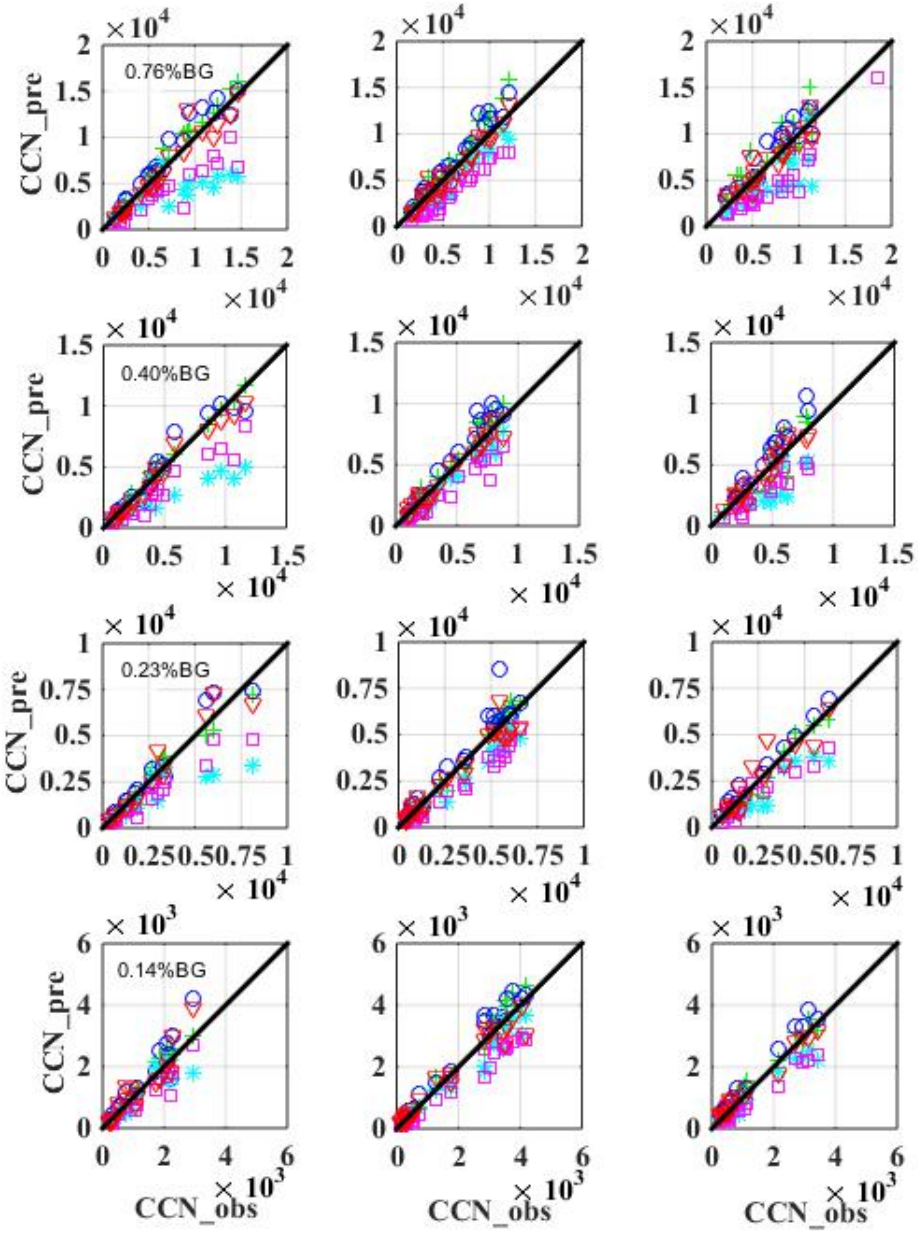


Figure S3. The comparisons of predicted N_{CCN} with measued N_{CCN} using five assumptions at four supersaturations, 0.14, 0.23, 0.40, 0.76%, during four emission peirods under background and polluted conditions. Each plot from left to right is 0000–0200 LT, 1200–1400 LT and 1700–2000 LT, respectively.

Table S1. Summary of the crtitical diameter during three selected periods (0000–0200 LT, 1200–1400 LT, 1700–2000 LT) under polluted and background conditions.

SS%	0-2POL	0-2BG	12-14POL	12-14BG	17-20POL	17-20BG
0.12	178.07±7.72	188.30±20.88	169.10±6.32	174.47±12.72	174.06±9.32	185.42±18.40
0.14	138.41±7.79	139.54±18.23	132.01±6.72	137.58±12.88	137.74±9.31	146.55±15.10
0.23	90.94±6.06	88.00±6.76	92.43±6.93	92.25±10.34	99.24±7.83	96.90±10.54
0.40	63.32±6.91	62.08±5.33	72.47±6.22	67.86±9.10	77.63±8.57	71.45±11.69
0.76	45.97±7.22	44.82±5.71	51.95±4.78	47.24±6.10	57.61±5.75	51.25±7.95

Table S2. Summary of the maximum active fraction during three selected periods (0000–0200 LT, 1200–1400 LT, 1700–2000 LT) under polluted and background conditions.

SS%	0-2POL	0-2BG	12-14POL	12-14BG	17-20POL	17-20BG
0.12	0.83±0.03	0.83±0.05	0.88±0.01	0.87±0.06	0.87±0.02	0.78±0.08
0.14	0.85±0.03	0.81±0.04	0.90±0.02	0.82±0.06	0.88±0.03	0.80±0.06
0.23	0.89±0.01	0.83±0.04	0.89±0.02	0.84±0.06	0.89±0.02	0.80±0.05
0.40	0.89±0.01	0.85±0.03	0.91±0.01	0.87±0.04	0.90±0.01	0.85±0.04
0.76	0.91±0.01	0.88±0.02	0.92±0.01	0.88±0.04	0.91±0.01	0.88±0.02