

Supplementary materials

For

Vertical profile of particle hygroscopicity and CCN effectiveness during winter in Beijing: insight into the hygroscopicity transition threshold of black carbon

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Table S1 Density and kappa of compounds used in the calculation of κ_{chem}

	Density (kg/m ³)	Kappa
NH ₄ NO ₃	1720	0.67 ^a
(NH ₄) ₂ SO ₄	1769	0.61(CCN) ^a 0.53 (HTDMA) ^a
Organics	1200 ^b	0.1 ^c
Black Carbon	1800	0

^a The kappa values are from *Petters and Kreidenweis*¹.

^b The density of organics is from *Turpin and Lim*².

^c The kappa value of organics is from *Wex et al.*³.

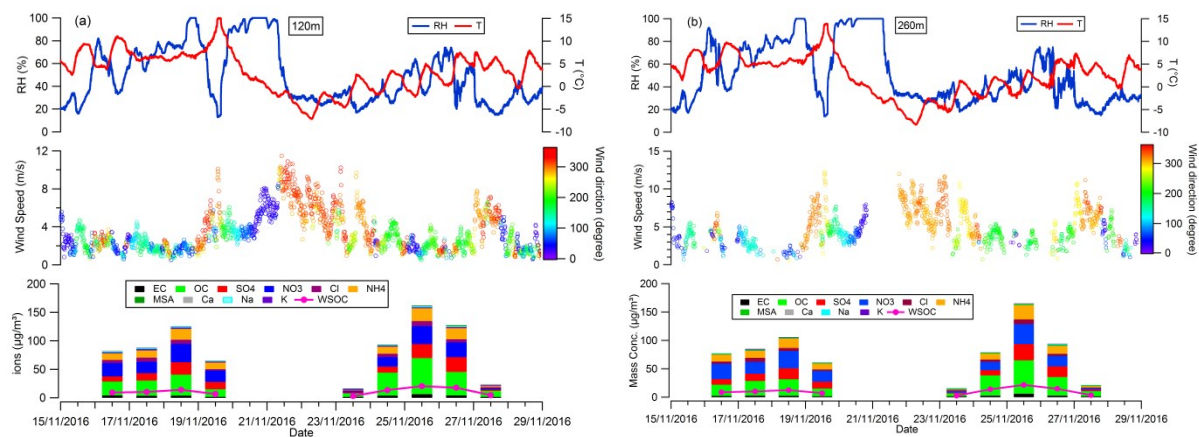


Fig. S1 Temporal evolution of RH, T, wind speed and direction, mass concentration of compositions at (a) 120 m and (b) 260 m during the experiment.

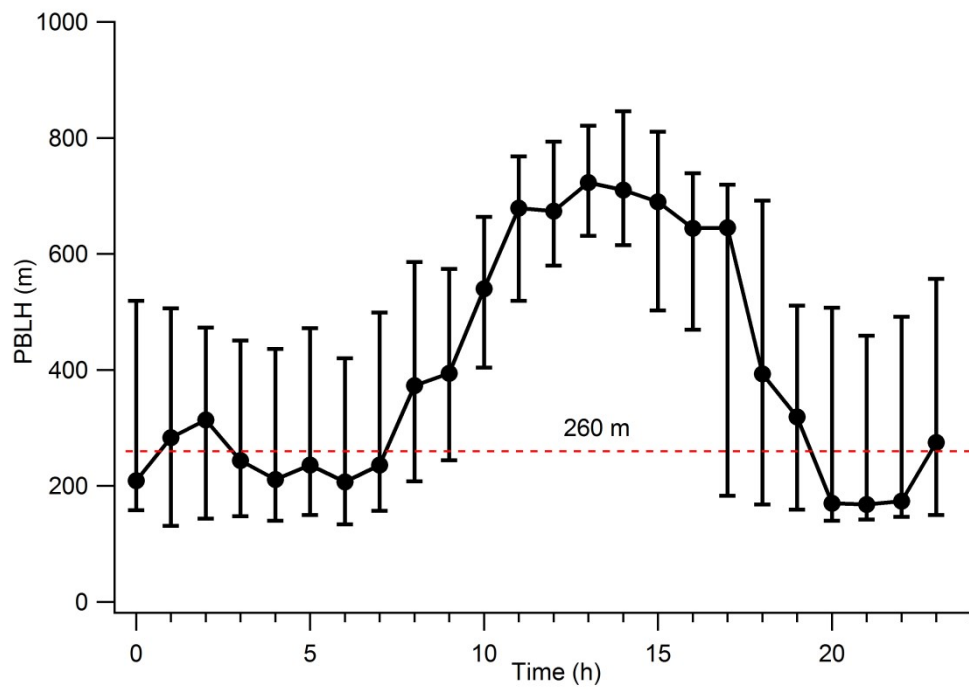


Fig. S2 Diurnal variation of planetary boundary layer height (PBLH) during the measurement.

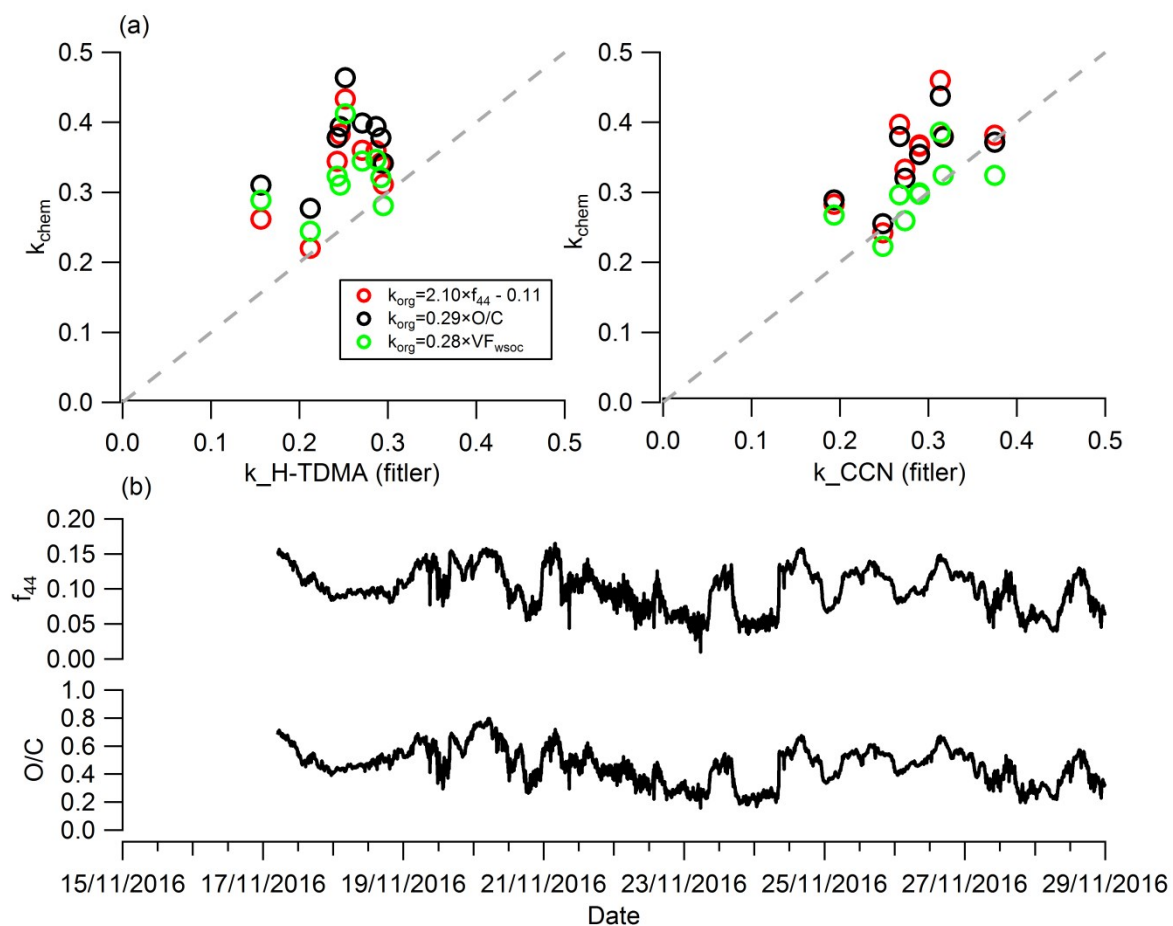


Fig. S3 (a) Correlation of κ_{chem} with the kappa from H-TDMA and CCN measurement of filter samples at 8m; (b) Temporal evolution of O/C and f_{44} of PM1.0 measured by AMS at the ground site during the experiment.

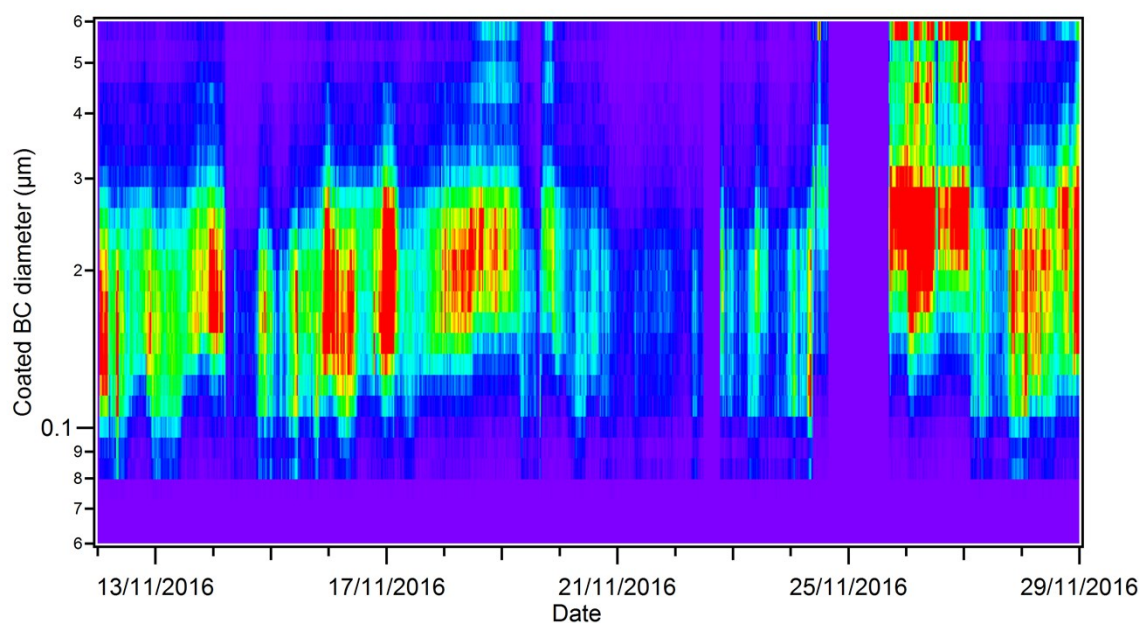


Fig. S4 Size distribution of coated BC particles during the measurement.

Reference

1. M. D. Petters and S. M. Kreidenweis, *Atmos. Chem. Phys.*, 2007, **7**, 1961-1971.
2. B. J. Turpin and H.-J. Lim, *Aerosol Science and Technology*, 2001, **35**, 602-610.
3. H. Wex, G. McFiggans, S. Henning and F. Stratmann, *Geophys. Res. Lett.*, 2010, **37**.