Supplementary Information for

Characterizing the volatility and mixing state of ambient fine particles in summer and winter of urban Beijing

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**Figure S1.** A schematic diagram of the volatility tandem differential mobility analyzer (VTDMA).

**Figure S2.** Temporal variation of number fractions of completely vaporized particles during the winter periods.

**Figure S3.** Temporal variation of number fractions of completely vaporized particles during the summer periods.
Figure S4. Temporal variation of (a) number concentrations and (b) number fractions of Non-BC (in green), In-BC (in blue), and Ex-BC (in red) in the range of 40-300 nm particles during the winter periods.
Figure S5. Temporal variation of (a) number concentrations and (b) number fractions of Non-BC (in green), In-BC (in blue), and Ex-BC (in red) in the range of 40-300 nm particles during the summer periods.
Figure S6. Time series of the size-dependent $D_p/D_c$ ratio during the winter and summer periods.