



Relationship between volatility, hygroscopicity, and CCN activity of winter aerosols: Kanpur, Indo-Gangetic Basin

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Aerosol volatility is one of the key property in deciding their lifetime and fate. The volatile species have the potential to affect SOA estimation, so their characterization and establishment of relationship with mass loading, chemical composition, hygroscopicity and CCN activity is required. A 42 days long winter campaign was conducted in an anthropogenically polluted location (Kanpur, India) where CCN activity of both ambient and thermally treated aerosols was characterized. Enhanced partitioning of semi-volatile molecules into particle phase at higher loading conditions was observed. Unexpectedly, the most oxidized organic factor was observed both least volatile and hygroscopic in nature. Lower $[U+1D705] TD$ with increased mass fraction remaining suggested more hygroscopic nature of volatile species possibly due to oligomeric species formation in the remaining ones. Overall, volatilization could increase the Dc maximum up to $\sim 80\%$ according to loading conditions and suppress the CCN activity by 4-6 folds.