

Nitrated phenols-a great indicator of biomass burning: insights from observations in the winter of North China Plain, 2017

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Nitrated phenols are one of the major components of brown carbon and thus could contribute a great deal to the light-absorbing properties of atmospheric aerosols. Biomass burning is considered as one of the most important sources of nitrated phenols which has not been fully understood. In this study, we describe the results from online measurements of nitrated phenols using two kinds high resolution time-of-flight chemical ionization mass spectrometry (HR-ToF-CIMS) with iodide and nitrate as reagent ions in a rural region of North China Plain which is deeply influenced by biomass burning and coal burning in November and December of 2017. The iodide CIMS was coupled with Filter Inlet for Gases and AEROsols (FIGAERO) to simultaneously obtain the information of gas and particle phases. Strong diurnal profiles were observed for nitrated phenols, with higher concentrations occurring at night. The good correlations between nitrated phenols and levoglucosan (a well known biomass burning molecular tracer) strongly supported the idea that biomass burning was great source of nitrated phenols. Besides, we compared the results of nitrated phenols and f60 obtained from aerosol mass spectrometry (AMS) and found similar tendency, which further convinced the idea that a main origin of nitrated phenols was biomass burning.