

## **Identification of Biomass Burning SOA Tracer Compounds in Ambient and Laboratory Produced Aerosols**

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Natural and human-initiated biomass burning releases large amounts of gases and particles into the atmosphere, impacting climate, environment and affecting public health. Several hundreds of compounds are emitted from biomass burning and these compounds largely originate from the pyrolysis of biopolymers such as lignin, cellulose and hemicellulose. Some of compounds are known to be specific to biomass burning and widely recognized as tracer compounds that can be used to identify the presence of biomass burning PM. Detailed chemical analysis of biomass burning influenced PM samples often reveals the presence compounds that correlated well with levoglucosan, a known biomass burning tracer compound. In particular, nitrated aromatic compounds correlated very well with levoglucosan, indicating that biomass burning as a source for this class of compounds. In the present study, we present evidence for the presence of biomass burning originating secondary organic aerosol (BSOA) compounds in ambient PM. These BSOA compounds are typically nitrated aromatic compounds that are produced in the oxidation of precursor compounds in the presence of  $\text{NO}_x$ . The precursor identification was performed from a series of aerosol chamber experiments. *m*-Cresol, which is emitted from biomass burning at significant levels, is found to be a major precursor compounds for nitrated BSOA compounds found in the ambient PM. We estimate that the total concentrations of these compounds in the ambient PM are comparable to biogenic SOA compounds in winter months, indicating the BSOA contributes important amounts to the regional organic aerosol loading.