



## **Molecular characterization of secondary organic aerosol from the photooxidation of isoprene and alpha-pinene**

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During the past five years considerable progress has been made in our understanding of the fate of the biogenic volatile organic compounds (BVOCs) isoprene and alpha-pinene in the atmosphere. Secondary organic aerosol (SOA) formation from the photooxidation of these BVOCs has been studied under atmospherically relevant conditions, i.e., in the presence of  $\text{NO}_x$  (low to high concentrations) and sulfuric acid seed aerosol. Molecular characterization of organic aerosol constituents is important because it allows one to gain insights into aerosol sources and the underlying mechanisms of SOA formation and transformation (or aging). A whole range of novel SOA products from the photooxidation of both isoprene and alpha-pinene were chemically characterized using a suite of analytical techniques such as gas chromatography/mass spectrometry (GC/MS) with prior derivatization and liquid chromatography/negative ion electrospray ionization mass spectrometry [LC/(-)ESI-MS], and detailed interpretation of the MS data, as well as, in some selected cases, through synthesis of reference compounds [1-3]. An emerging group of SOA tracers are organosulfates and nitrooxy organosulfates, which are generated in smog chamber experiments under highly acidic conditions and also occur in ambient fine ( $\text{PM}_{2.5}$ ) aerosol [4, 5]. These compounds

likely explain part of the polar humic-like substances and the missing organic mass. With regard to isoprene SOA tracers, major organosulfates were characterized as 2-methyltetrol sulfate and mixed sulfate/nitrate derivatives, while, in the case of alpha-pinene, mixed sulfate/nitrate derivatives with a dihydroxypinane skeleton appear to be major ambient aerosol constituents, especially at night [6].

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