Geophysical Research Abstracts
Vol. 12, EGU2010-13261, 2010
EGU General Assembly 2010

Multigenerational Oxidation of Organic Aerosols

Neil M. Donahue

Carnegie Mellon University, Center for Atmospheric Particle Studies, Chemistry, Chemical Engineering, and Engineering and Public Policy, Pittsburgh, United States (nmd@andrew.cmu.edu, +1-(0)412-4189026)

Organic aerosol should be regarded as reactive intermediates. Semi-volatile and condensed-phase organic compounds are for the most part reaction products derived from more volatile precursors, and yet they are also precursors for much more volatile oxidation products. In this talk we shall describe an emerging framework – the two-dimensional volatility basis set – that describes both volatility and the oxidation state of condensed-phase organics. While individual organic compounds can be placed in this space, our framework is equally capable of describing sequential chemical reactions of the aggregate mass of organics in this space. As an example we shall describe the sequential oxidation (aging) of a series of organic compounds that ultimately lead to the formation of highly oxidized, low volatility organic aerosol that is observed throughout the atmosphere and that dominates organic aerosol mass at remote locations.