Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04014, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04014
EGU General Assembly 2008

Evaporation of organic and inorganic/organic particles

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Biogenic sources as well as human activities contribute large amounts of volatile organic compounds to the atmosphere. Upon oxidation, polyfunctional molecules such as dicarboxylic acids are formed. These molecules generally have lower vapor pressures than the parent molecules and are able to condense on existing particles or maybe even participate in formation of new particles in the atmosphere. Current knowledge about the thermodynamic properties governing this partitioning as well as the influence of the organic molecules on properties of aqueous solution droplets is poor. We have therefore developed a new method based on the HTDMA technique (Hygroscopicity Tandem Differential Mobility Analyzer) for determining the subcooled liquid state vapor pressure as well as other thermodynamic properties of secondary organic aerosol components. We have recently measured evaporation rates of aqueous solution droplets containing one dicarboxylic acid (C3 to C5) and water [1-2-3]. In this work we expand the list of organics and investigate more complicated systems such as dicarboxylic acid together with inorganic salts.

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