

CCN Activity and Thermodynamic Properties of Water Soluble Organics in Mexico City

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In this study, we study the CCN properties of Mexico City carbonaceous aerosol collected during the MILAGRO (Megacity Initiative - Local and Global Research Observations) field campaign, in March 2006. Particulate matter of less than 2.5 μm diameter, were collected using Hi-Volume samplers for 12 and 24 hour sampling periods. The collected particles were extracted in water and sonicated with heat to extract the water soluble component of the aerosols. A method we have developed, 'Köhler theory analysis', was used to infer the average molar volume of the organics using measurements of CCN activity, surface tension and chemical composition. Pure water soluble solutions as well as mixtures with ammonium sulfate were characterized. For CCN activation and droplet growth kinetics a Streamwise Thermal Gradient CCN Chamber was used. Surface tension measurements were performed with a CAM 200 Optical Contact Angle Meter. For chemical composition, an Ion Chromatography and a Total Organic Carbon analyzer were used to measure the ions and WSOC concentration, respectively.