

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

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In this study, we characterize the aerosols collected during the MILAGRO (Megacity Initiative – Local and Global Research Observations) field campaign which took place on March 2006 in Mexico City. PM 2.5 was collected using Hi-Volume samplers for 12 and 24 hour sampling periods. It is our interest to study the CCN activity and infer thermodynamic properties, such as the molar volume, of the organic fraction of the particles collected. These parameters and properties can then be introduced into aerosol-cloud interactions to improve global climate models. The collected aerosol was extracted and sonicated with heat in order to extract the water soluble organic carbon (WSOC). Pure WSOC solutions as well as mixtures with ammonium sulfate (50 and 90 % weight) were analyzed and parameters were compared. The pure WSOC and mixtures with ammonium sulfate were characterized by measuring its CCN properties, water soluble organic carbon (WSOC) and inorganic concentration and surface tension depression. Ammonium sulfate was added to the original sample to address the impact of high content of inorganic salts on CCN activation and surface tension. Finally Köhler theory analysis was used to infer the average molar volume of the organics present in the particle.