



Measurement of internal and external mixtures of test aerosols with a new Single Particle Aerosol Mass Spectrometer

Anna Wonaschütz and Regina Hitzenberger

University of Vienna, Faculty of Physics, Wien, Austria (anna.wonaschuetz@univie.ac.at)

The mixing state of atmospheric aerosol particles is a very important property affecting processes such as CCN activation and scattering and absorption of light by the particles, but is challenging to determine. A new Single Particle Aerosol Mass Spectrometer (LAAPTOF, AeroMegt GmbH) was tested with regards to its capability of measuring internal and external mixture of aerosols using laboratory generated particles. To create the external mixture, solutions of three different salts in deionized water, and a suspension of carbon black (Cabot Corporation) in a mixture of isopropanol and water were nebulized and individually dried, before being passed into a small mixing chamber. To create the internal mixture, equal parts of each solution/suspension were mixed, fed into a single nebulizer, nebulized and dried. The LAAPTOF sampled from the mixing chamber and recorded mass spectra of individual particles. The analysis shows a heterogeneous ensemble of single particle spectra for the external mixture, and a homogeneous ensemble of spectra for the internal mixture. The ability of a fuzzy clustering algorithm to resolve the difference between the two mixing states was also tested.