

MIS001-07

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## Atmospheric cluster ions and their role in aerosol formation

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Aerosol particles play an important role in the Earth's troposphere and in the climate system: They scatter and absorb solar radiation, facilitate chemical processes, and serve as condensation nuclei for the formation of clouds. Tropospheric aerosol particles are emitted from surface sources or form in situ from the gas phase. Formation from the gas phase requires concentrations of aerosol precursor molecules aggregating to form molecular clusters able to grow faster than they evaporate. This process is called nucleation. Gas phase ions can reduce the concentration of aerosol precursor molecules required for nucleation, as they greatly stabilize molecular clusters with respect to evaporation. Therefore, ions are a potential source of aerosol particles. In this paper, we present experimental results of measuring stable cluster ions formed by corona discharge in the air containing H<sub>2</sub>O, SO<sub>2</sub> and NH<sub>3</sub> using an atmospheric pressure ionization mass spectrometer. The results will be compared with quantum chemical calculations.

Keywords: atmospheric ion, cluster ion, ion induced nucleation, aerosol