

Hygroscopic behavior of homogeneous and heterogeneous mixture particles

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The mixing state is one of the key characters to influence the hygroscopic and optical properties of atmospheric particles. However, current knowledge about the atmospheric research of the mixing structure effect on the hygroscopicity of particles is still limited. In this work, a mono-disperse distribution of particles with a desired core diameter can be coated with different thickness of shell, then the hygroscopic growth factors can be measured between 5-90%RH using a hygroscopicity tandem differential mobility analyzer (HTDMA). It is found that the difference in homogeneous and heterogeneous mixing structure may lead to the change in the interactions between organic molecular and inorganic compound (e.g. ammonium sulfate) in the aerosol and aqueous solution phase, which will influence the hygroscopicity of mixtures before and after deliquescence.