



## **Hygroscopic Properties of NaCl Nanoparticles on the Surface: A Scanning Force Microscopy Study**

Xiaoxiang Wang, Haozhi Lei, Rüdiger Berger, Hans Jürgen Butt, Ulrich Pöschl, Yafang Cheng, Yi Zhang, and Hang Su

The interplay between a surface and the hygroscopic growth of aerosol nanoparticles  $< 10$  nm has not been determined, although those nanoparticles are relevant for earth climate (Zhang et al., 2011). In this study, we used scanning force microscopy (SFM) for the analysis of the morphology and size of sodium chloride (NaCl) nanoparticles that were generated using TSI 3076 constant output atomizer and deposited on silicon substrates. All SFM studies were performed at controlled relative humidity (RH) in order to measure deliquescence relative humidity (DRH). Our results exhibit a DRH of  $\sim 77\%$  for particles with a height  $> 100$  nm and an increased DRH for particles with a height  $< 10$  nm. Our findings indicate that the substrate has only little effect on the DRH value of NaCl nanoparticles. Furthermore our previously developed theory about the deliquescence of airborne nanoparticles (Cheng et al., 2015) also applies to the adsorbed/deposited nanoparticles.