O 73: Overview Talk Karina Morgenstern

Time: Thursday 9:30–10:15 Location: HE 101

Invited Talk O 73.1 Thu 9:30 HE 101

Ice structures and dynamics on surfaces investigated on the local scale — •Karina Morgenstern — Physical Chemistry I, Ruhr-Universität Bochum, Germany

The importance of ice in Earth's atmosphere is crucial for its climate and hydrological cycle. For instance, sea salt aerosols play an important role in atmospheric chemistry. Though such general principles of atmospheric chemistry are well established on a macroscopic level, we have only a poor molecular-scale understanding of the processes involved. This limits our ability to model quantitatively processes such as how atmospheric ice influences clouds and climate. Investigating model systems by scanning tunnelling microscopy promises to fill this lack of knowledge, for instance, how water ice nucleates on different surfaces and in the presence of polar impurities. This talk will give a general introduction to the challenges and promises of using surface science tools to investigate the structure and dynamics of ice nucleation. It will be shown how water nucleates and grows on metal surfaces starting from individual molecules and how the presence of organic multi-polar molecules and cations alters this growth. By investigating the attachment of individual water molecules to these particles by low-temperature scanning tunnelling microscopy, we gain microscopic insight into the interaction of water with charged particles. Our STM study gives an unprecedented view of water ice interacting with polar species. Moreover, we present an example, of how the interaction influences the reactivity of photo-induced dissociation of chlorobenzene, a typical process induced in clouds by the sun's action.