

## Heterogeneous Ice Nucleation on Mineral Surfaces: Study of Surface Effects

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**Abstract:** Understanding the role played by solid surfaces in ice nucleation is a significant step toward designing surfaces that can control ice nucleation. This is relevant to various fields ranging from atmospheric chemistry to transportation and food industries. Our overall goal is to uncover the effects of surface properties on interfacial water structure relevant to heterogeneous ice nucleation. Such an understanding can guide the development of predictive models correlating surface properties, and interfacial water structure and dynamics to the ice nucleation propensity of that surface. To this end, we use a combined experimental and simulation approach to investigate the effect of surface properties on interfacial water structure near mica surfaces. Mica is used because it can be made atomistically smooth in experiments thereby enabling a comparison between experiments and simulations. In our talk, we will discuss the change in interfacial water structure and dynamics with different surface ions. We will particularly investigate the effect of ion size, ion charge and spatial distribution. We will correlate these changes to the differences in ice nucleating behavior. This will provide better understanding of the mechanisms of heterogeneous ice nucleation.