

Vertical Transport of Protons in Amorphous Ice

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In order to estimate the average migration lengths of H_3O^+ ions in amorphous ice, we conducted experiments of reactive ion scattering (RIS), low energy sputtering (LES), and reflection absorption IR spectroscopy (RAIRS) with an ultra-high vacuum (UHV) chamber. Doped water-ice films were grown on the clean surface of Ru single crystal and analyzed with RIS, LES and RAIRS methods. The population changes of probe molecules, which were buried at a controlled distance from the surface, were monitored by those methods so that we can measure the migration efficiencies. From the measured efficiencies, we evaluated the average migration lengths. This result is expected to give the information about the dynamics of proton in water-ice film.

Keywords: Water-ice film, Proton, Migration distance