SURFACE VIBRATIONAL SPECTROSCOPY OF SALT SOLUTION AT THE AIR/LIQUID INTERFACE

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The study of halogen anion solution/air interface is crucial for the heterogeneous atmosphere chemistry involving sea salt aerosols in the lower marine troposphere and from the Arctic snowpack during polar sunrise. In this study, sum frequency generation (SFG) spectroscopy was used to study the sodium halide salt solution/air interface. The surface SFG spectra are also compared with the bulk solution Raman spectra. The small, nonpolarizable fluoride and chloride solutions were found similar to the neat water/air interface, while the larger, polarizable bromide and iodide solutions exhibit enhancement on the disordered OH stretch region (3400 cm^{-1}) and the free OH peak (3700 cm^{-1}). These results provide evidence for the presence of bromide and iodide anion and the absence of fluoride anion at the interface, which is in agreement with the reported results from molecular dynamic (MD) simulations.