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## RAIRS-QMS Studies of Adsorption of Oxalic Acid and Ice/Oxalic Acid on the Cu Surface

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Ozone loss is found to be correlated with particle-phase bromine in the arctic boundary-layer. Oxalic acid near snow/ice surfaces plays a role to alter the bromine partitioning in the boundary-layer. Bromine reduction mechanism at the interface of oxalic acid and ice is not well established. In order to reveal the nature of this problem, we have developed an apparatus, which combines specular reflection-absorption Fourier-transform infrared spectrometry (RAIRS) and quadrupole mass spectrometry (QMS), to study the adsorption of oxalic acid and ice. The apparatus is specifically designed to determine structures of adsorbed complex and desorption kinetics. A polished copper disk was used as a substrate to optimize infrared reflectivity and to deposit oxalic acid and ice at low temperature. IR and temperature-programmed desorption (TPD) spectra of both oxalic acid and ice/oxalic acid on the Cu surface were recorded from 175 to 283K. Analysis of vibrational modes of adsorbed oxalic acid complex and TPD spectra suggests that oxalic acid is in a molecular adsorption state on the Cu surface. The interfacial interaction between oxalic acid and ice is weak. This study sheds light on the bromine reduction mechanism in the arctic boundary layer, and has demonstrated that this apparatus is suitable for the study of gas-surface heterogeneous processes.