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**Infrared Studies of Water Adsorption on Acetic Acid thin films**
MICHEL MALICK THIAM, MARYAM EBRAHIMI, KAM TONG LEUNG, WATLABs, Department of Chemistry, University of Waterloo, 200 University Ave. W., Waterloo, Ontario, N2L 3G1, Canada, WATLABS TEAM — Infrared reflection-absorption spectroscopy is used to investigate $H_2O$ ice deposited onto non-crystalline (dimers [1]) and polycrystalline (infinite chains [1]) acetic acid films. The condensed water film grown at ∼135 K on these different substrates can be characterized as amorphous dense ice. The $H_2O$ molecules are shown to interact mainly with the carbonyl and the carboxyl oxygens, forming hydrogen bonds. Upon water adsorption on the non-crystalline acetic acid film, saturation of the change induced in the intensity of the C=O and C-O peaks occurs at an average $H_2O$ exposure of ∼ 2.52 L. The amount of H-bonding involving C=O or C-O (of acetic acid) and OH (of water) on the polycrystalline film has been reduced considerably compared to the situation on the non-annealed one, but saturation of the carbonyl oxygen even for a water exposure of 9 L has not been observed while the carboxyl oxygen saturates at ∼2.76 L. Thermal evolution studies for the ice film on non-crystalline and polycrystalline acetic acid films show that water co-evaporates with acetic acid likely as a water-acetic acid complex in the temperature range of 140-155 K, which continues until the entire ice film has been exhausted at 160 K. [1]: Q. Gao and K. T. Leung, J. Phys. Chem. B 109, (2005) 13263. .

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