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Butanol, water, and graphite interactions at atmospheric temperatures

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Utilizing a graphite substrate at temperatures between 180 and 210 K, butanol, water ice, and graphite interactions are investigated using molecular beam techniques at maximum pressures of 10^{-2} mbar. Previous work [1,2] has demonstrated that water transport is very sensitive to the chain length of surfactant alcohols. Using a Quadrupole Mass Spectrometer (QMS) to measure H_2O, D_2O, and butanol intensities, coupled with reflected light intensity measurements we monitor the condensation, evaporation, and structure of ice and butanol layered surfaces. These measurements are compared with methanol measurements made using the same experimental techniques, to examine the relationship between atmospheric ice dynamics and surface/surfactant structure.

[1] Gilde, A., Siladke, N., and Lawrence, C. P. (2009). Molecular dynamics simulations of water transport through butanol films. *Journal of Physical Chemistry A*, 113(30):8586–8590.

[2] Lawrence, J. R., Glass, S. V., and Nathanson, G. M. (2005). Evaporation of water through butanol films at the surface of supercooled sulfuric acid. *Journal of Physical Chemistry A*, 109(33):7449–7457.