Atmospheric Chemistry and Physics
An Interactive Open Access Journal of the European Geosciences Union

Atmos. Chem. Phys., 4, 2083-2089, 2004
www.atmos-chem-phys.net/4/2083/2004/

Enhanced uptake of water by oxidatively processed oleic acid

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Abstract. A quartz crystal microbalance apparatus has been used to measure the room temperature uptake of water vapour by thin films of oleic acid as a function of relative humidity, both before and following exposure of the films to various partial pressures of gas phase ozone. A rapid increase in the water-sorbing ability of the film is observed as its exposure to ozone is increased, followed by a plateau region in which additional water is taken up more gradually. In this fully-processed region the mass of water taken up by the film is about 4 times that of the unprocessed film. Infrared spectra of the films, measured after variable exposures to ozone, show dramatic increases in both the "free" and hydrogen-bonded O-H stretching regions, and a decrease in the intensity of olefinic features. These results are consistent with the formation of an oxygenated polymeric product or products, as well as the gas phase products previously identified.

Final Revised Paper (PDF, 624 KB) Discussion Paper (ACPD)

Citation: Asad, A., Mmereki, B. T., and Donaldson, D. J.: Enhanced uptake of water by oxidatively processed oleic acid, Atmos. Chem. Phys., 4, 2083-2089, 2004. Bibtex EndNote Reference Manager