

Abstract Submitted
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Oxidation of oleic acid monolayers at air/liquid interfaces LAURA VOSS, Bowdoin College — Field studies of marine and continental aerosols find that fatty acid films form on aqueous tropospheric aerosols. Oxidation of oleic acid monolayers by ozone was studied to understand the fate of fat-coated aerosols from both fresh and salt water sources. Using vibrational sum frequency generation spectroscopy and reflection absorption infrared spectroscopy, we present a molecular-level investigation of fatty acid monolayers at the air-water and air-sodium chloride solution interface and explore reactions with atmospheric oxidants by these model systems. Coupling sum frequency generation spectroscopy with a Langmuir trough, concurrent spectroscopic and thermodynamic data were collected to obtain a molecular picture of the monolayers. No substantial difference was observed between oxidation of monolayers spread on water and on 0.6 molar sodium chloride solutions. Results indicate that depending on the size of the aerosol and the extent of oxidation, the subsequent oxidation products may not remain at the surface of these films, but instead be dissolved in the aqueous sub-phase of the aerosol particle. Results also indicate that oxidation of oleic acid could produce monolayers containing species that have no oxidized acyl chains.

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