Surface catalysis at environmental interfaces: atmospheric chemistry and climate

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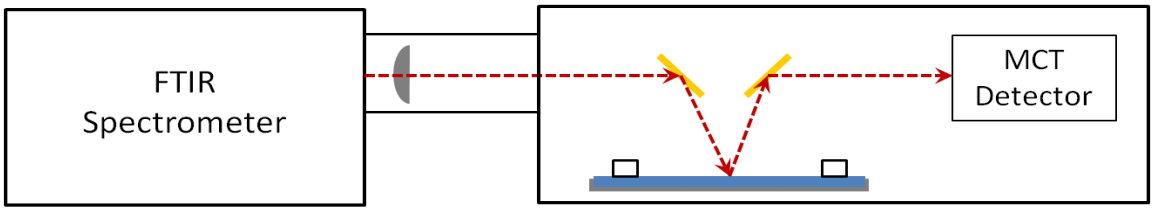
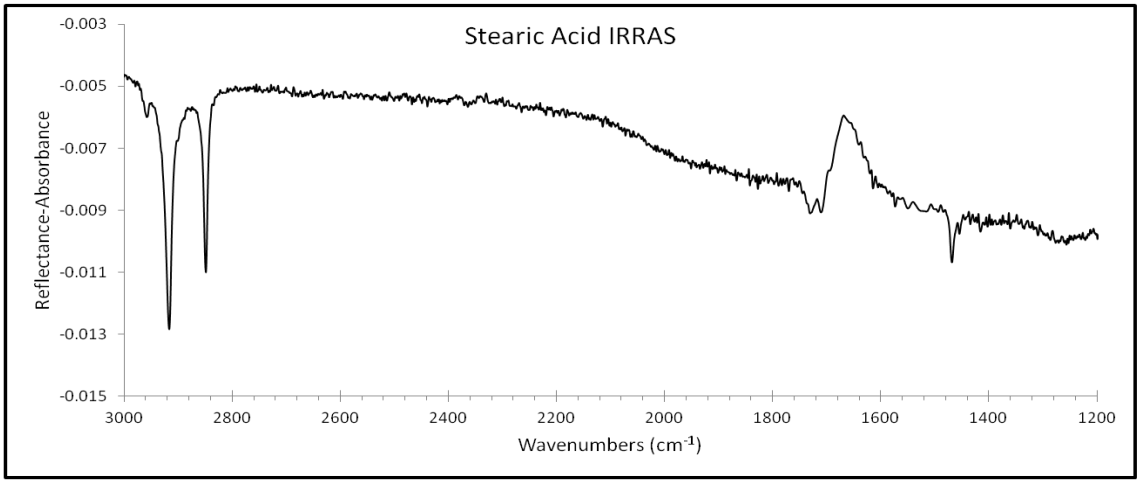
The water-air interface provides a unique environment for chemistry which, in turn, determines the surface composition and morphology. Understanding the processing of surface organics contributes to a better understanding of the effect atmospheric aerosols have on climate. Specifically, the experiments discussed investigate the phase (films, inclusions, micelles, etc.), phase changes, and kinetics of organics at the water-air interface. The nature of the surface of aerosols is still poorly understood, and therefore cannot be accurately represented in models. We have used the Langmuir-Blodgett trough along with Infrared Reflection-Absorption Spectroscopy (IRRAS) to study surface processing due to soluble organics in the aqueous phase in order to better understand the nature of such surfaces. The modification of the interfacial organic layer directly affects the particle's hygroscopicity, and may help to explain discrepancies in data concerning the aerosol's effect on climate.





Schematic of IRRAS set-up along with a preliminary spectrum of a floating stearic acid film