

Abstract Submitted  
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**Adsorption of Water, Methanol and Toluene on the Surface of Soot Particulate Matter** MOHSEN YEGANEH, SHAWN DOUGAL, BERNARD SILBERNAGEL, EL-MEKKI EL-MALKI, ExxonMobil — Soot particles are byproducts of incomplete hydrocarbon combustion. The adsorption of water and organic molecules on the soot surfaces is of technological and environmental importance. We have applied a newly developed technique of SFG spectroscopy for high surface area materials [1] to investigate the adsorption of water, methanol, and toluene on the surface of standard soot particles from the National Institute of Standards and Technology (NIST). Adaptations of standard SFG procedures are required to compensate for the high refractive index of these carbonaceous materials. We find that adsorption of water, methanol, and toluene on the soot surface is reversible at room temperature. We also find that UV radiation modifies the surface composition of these soot particles. The effect of UV radiation on the adsorption, as well as the kinetics and thermodynamics of methanol adsorption/desorption will also be discussed. [1] Mohsen S. Yeganeh, Shawn M. Dougal, and Bernard G. Silbernagel, *Langmuir* **22**, 637 (2006)

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