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Ambient STM Study of 1-Dodecanethiol SAMs on Au Thin Film Capped HOPG MACKENZIE MAURER, ALEXIS BOWERS, INDRAJITH SENEVIRATHNE, Lock Haven Univ — Thiol-based self-assembled monolayers (SAM) surfaces are ubiquitous in many device applications including sensor engineering. The conductivity characteristics and surface molecular structure and orientation of these SAMs are important as physiochemical properties are dependent on the surface arrangement. This study attempts to quantify and model long chain $-R$ terminated (hydrophobic) 1-dodecanethiol on thermally annealed Au thin films capped on Highly Oriented Pyrolytic Graphite (HOPG) substrates. Specifically, this study uses Scanning Tunneling Microscopy (STM) and contact angle measurements to assess the HOPG surface, the Au thin film capped HOPG surface, and the SAM layered surface exclusively. 5mM concentrated solutions of 1-dodecanethiol dissolved in 200 proof ethanol were prepared for the self-assembly process. These solutions were used in developing SAMs on HOPG, in which Au thin layers were sputter deposited and subsequently annealed. Data indicated Au deposition and thermally annealing changes the surface consistency. Uniqueness of this study is the ambient conditions under which data was obtained. Surface structure, consistency and possible thiol molecular arrangement of the SAM layer will be discussed.

Mackenzie Maurer
Lock Haven Univ

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