Physical Chemistry Seminar

Tuesday, September 8, 2009 | **11:00 a.m.** | **Room 1315 Chemistry Building**

Corrosion and Inhibition on Metal Surfaces Studied by Sum Frequency Generation Imaging

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Sum frequency generation imaging is used to monitor, in situ, the reaction of cyanide ions with a gold surface. Spatial and chemical variations across the surface are observed as a function of time. The initial period resulted in the formation of linearly bound cyanide to gold and with continuous exposure of gold film to cyanide solution led to the presence of higher-coordinated gold-cyanide complexes. These species were identified by their specific position in the SFG vibrational spectrum (2105 cm-1, 2140 cm-1, 2170 cm-1, and 2225 cm-1). The relative amount of these gold-cyanide species varied across the surface as resolved by sum frequency generation microscopy. In addition sum frequency generation imaging microscopy has been used to investigate a self-assembled monolayer of an alkanethiol (octadecanethiol, ODT) on a mild steel surface as a corrosion inhibitor. The images are used to analyze the orientation of the alkanethiol monolayer and the distribution of orientational angles as well as defects in the film. The results show that, on average, ODT forms an ordered monolayer on mild steel when compared to the same monolayer on gold. However, the image analysis suggests that the distribution of tilt angles and conformational defects is greater for ODT on a mild steel surface compared to ODT/Au.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:15 p.m. in Room 8305f