

Abstract Submitted
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Surface Studies of Enhanced Metal/Carbene Contacts MARCUS LAY, University of Georgia, GEORGE FLYNN, COLIN NUCKOLLS, GEORGE TULEVSKI, MIKE STEIGERWALD, MARK HYBERTSEN, Columbia University — Scanning tunneling microscopy and spectroscopy (STM and STS) have proven invaluable in understanding and manipulating the physical and electronic properties of molecular-scale systems. Such systems show great promise in current and future electronic applications. Indeed, self-assembled monolayers (SAMs) composed of alkanethiols have been extensively explored as a possible route to formation of metal-organic semiconductor contacts. While S is effective in this function, it behaves more as a capacitor than a conductor at the metal-adsorbate interface. This presentation will focus on investigations of the formation of metal-carbene complexes. For molecular electronics applications, conjugated metal-carbenes are expected to exhibit significantly greater conductance in transistor applications than corresponding thiols. A particular emphasis of this presentation is the structural and electronic information yielded by ultra-high vacuum (UHV) STM/STS studies of the formation of a Ru-carbene from diazoalkane precursors. Early theoretical predictions and UHV-STs indicate a strong coupling of the HOMO for bromophenyl diazomethane to the Ru d-band.

Marcus Lay
University of Georgia

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