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Characterization and Reactivity of $Mo_6S_8^+$ on Au (111) via Size-Selected Deposition MELISSA J. PATTERSON, JAMES M. LIGHTSTONE, StonyBrook University, MICHAEL G. WHITE, Brookhaven National Laboratory/StonyBrook University — Supported MoS_2 nanoparticles are known for their ability to catalyze a wide range of heterogenous reactions such as hydrodesulfurization (HDS)[1]. However, understanding the role of size, structure, composition and support interactions of the MoS_2 particles in these heterogenous reactions has not yet been resolved due to the inhomogeneity of commercial catalysts. Work done in our laboratory is geared towards preparing homogenous samples in ultra high vacuum that can serve as model systems for these types of catalytic reactions. We are currently investigating the reactivity of size-selected transition metal clusters generated in the gas-phase and deposited on a Au(111) surface. Using a magnetron cluster source, we are able to produce a wide range of nanocluster stoichiometries including the $Mo_6S_8^+$ cluster, which has been observed as the metal core of the well-known Chevrel phase[2]. The work presented focuses on characterization of the $Mo_6S_8^+$ cluster deposited on a Au(111) single crystal using techniques such as Auger, photoemission spectroscopy, and thermal desorption. In addition, preliminary reactivity studies will be presented of the supported $Mo_6S_8^+$ cluster with small sulfur containing molecules. 1. Topsoe, H.; et.al; *Hydrotreating Catalysis*; Springer: New York, 1996. 2. Umarji, A. M.; et.al.; *J. Phys. Chem. Solids* **1980**, 41, 421.

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