

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Interaction of Dysprosium with the Basal Plane of Graphite.**

PATRICIA THIEL, Ames Laboratory, EMMA KWOLEK, Iowa State University, HUAPING LEI, Key Laboratory of Materials Physics, Institute of Solid State Physics, CAS, YINGHUI ZHOU, Department of Physics, Xiamen University, ANN LII-ROSALES, Iowa State University, MARK WALLINGFORD, CAI-ZHUANG WANG, MICHAEL TRINGIDES, Ames Laboratory — We have studied adsorption, nucleation, growth, intercalation, and carburization of dysprosium (Dy) on graphite surfaces, and the way that these phenomena are influenced by surface defects. The experiments consist of scanning tunneling microscopy in ultrahigh vacuum. The condensation coefficient of Dy is strongly enhanced by surface defects. In the absence of defects, at room temperature, homogeneous nucleation can occur on terraces, consistent with DFT calculations of energetics. At room temperature, island shapes consist of a flat three-atom base, decorated by single-atom upper layers. Layer populations in such islands are analyzed in the context of a tailored analytic model, which provides information about interlayer mobility. At elevated temperature, Dy can intercalate with the graphite substrate and can form carbide.

Patricia Thiel  
Ames Laboratory

Date submitted: 06 Nov 2015

Electronic form version 1.4