

Abstract Submitted  
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**Fast Diffusive Behavior of Pb on Ge(111) at Low Temperatures During Island Formation.**<sup>1</sup> ANDREW KIM, ELI BAUM, SHIRLEY CHIANG, University of California, Davis, ANDRE CHILDS, DUY LE, TALAT RAHMAN, University of Central Florida — Lead deposited on Ge(111) at low temperatures (210K) was found to show unusual collective diffusion behavior upon heating towards room temperature. As the sample was heated, Pb was seen diffusing from high coverage regions into a region of low Pb coverage, forming small islands. Eventually the regions of low coverage filled with enough Pb to form a uniform layer. Similar behavior was seen with Pb on Si(111) at low temperatures, with island formation whose heights were determined by quantum size effects,[1] as well as unusually fast diffusion speed.[2] We also present a first-principles study of the structure of Pb overlayers on Ge(111) using DFT calculations with respect to experimental observations of Pb/Ge(111) phases.[3] [1] M. Hupalo et al., Surf. Sci. 493, 526 (2001). [2] M. Hupalo and M. C. Tringides, Phys. Rev. B 75, 235443 (2007). [3] Y. Sato and S. Chiang, Surf. Sci. 603, 2300 (2009)

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