

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Scaled Shell-like Pattern Formation of Selenium-Based Anthracene Derivatives at a Metal Surface** LUDWIG BARTELS, UCR, ZHIHAI CHENG, JONATHAN WYRICK, DEZHENG SUN, DAEHO KIM, YEMING ZHU, MIAOMIAO LUO, ROBERT CARP, MICHAEL MARSELLA — We investigated the behavior of selenium-substituted anthracene molecules at a Cu(111) surface. In our previous work, the sulfur and oxygen counterparts of this molecule exhibited controlled diffusion on Cu(111) violating the substrate's symmetry. In contrast Diseleno-ateanthracene shows an isotropic and very high mobility suggesting very non-local substrate interactions. However, we observe pronounced sensitivity of the diffusion to the oscillation of the Cu(111) substrate surface state. In this talk, we will focus on the coverage-dependent pattern formation of this species: at coverages close to 1 ML, two kinds of hexagonal patterns with large unit cells are formed. Both of them show a shell superstructure with an identical central empty hole. The smaller of the features one molecular shell of 6 molecules the larger a double shells of 6 and 12 molecules. Another kind of rectangular pattern is also observed, which could be an intermediate superstructure between the small and large hexagonal patterns. We will compare these patterns to prior work on sulfur and oxygen based molecules.

Theodore Einstein

Date submitted: 27 Nov 2010

Electronic form version 1.4