Abstract Submitted
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Free Energy of a 1D Metal-Molecule Interface: C_{60}-Decorated Ag Islands[1] T. J. STASEVICH, National Cancer Inst., NIH, C. TAO, E. D. WILLIAMS, T. L. EINSTEIN, U. Maryland, College Park — We study the structural and dynamical properties of one- dimensional metal-molecule interfaces by investigating Ag monolayer islands on Ag(111) decorated by C_{60}. At 300K bare Ag(111) islands have hexagonal equilibrium shapes. When C_{60} is deposited on the surface, it preferentially nucleates along island step edges, near the island corners, making them round.[2] We tune coverage so that a single chain of C_{60} fully decorates the island, forming a closed ring, circular in shape. From a simple model for the C_{60} step decoration, we derive the decorated step free energy as a function of step angle, yielding the equilibrium shape of the decorated islands via the Wulff construction. By comparing the model to experiment, we estimate the Ag-C_{60} attraction. Using fast STM scanning, we also study the fluctuations of the C_{60} decorated islands. By fitting the time correlation function of the fluctuation component Fourier modes, we show the decorated step dynamics are consistent with attachment-detachment (AD) kinetics, in contrast to the step-edge diffusion of the bare island. Finally, from our analysis, we extract the decorated step free energy and estimate the C_{60}-C_{60} attraction.

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[2]C. Tao et al., Phys. Rev. B **73**, 125436 (2006).

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