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Organization of adenine on Ag(111) and correlated interfacial electronic structure measured with low temperature scanning tunneling microscopy THOMAS P. PEARL, KATIE M. ANDREWS, BRYCE F. DAVIS, North Carolina State University — Low temperature scanning tunneling microscopy and spectroscopy has been used to observe the organization of the nucleobase adenine on the Ag(111) surface as well as to resolve modifications to Ag(111) surface electronic structure. Multiple hydrogen bonding interactions between adenine adsorbates dictate the formation of dimers on the surface as well as long range order of molecular domains, which have limited commensuration with the Ag(111) lattice. Differential conductance spectroscopy recorded at 15 K reveals an upward energetic shift of the Shockley-type surface state native to Ag(111) from a band edge of -67 meV on the clean surface to+82.5 meV recorded over adenine islands. Differential conductance maps show free-electron like scattering in the adenine domains. Dispersion of the parallel wave vector of scattered electrons in the adenine domains is compared to the dispersion for electron scattering in bare silver and the ratio of effective masses for electrons in those bands is 1.1 $\pm$ 0.05. It is hypothesized that this shift occurs due to a combination of effects brought on by the adsorption of adenine including changes in work function and dipole-induced screening of the first image potential.

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