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Molecular Scale Structure of Pentacene Interfaces SOONJOO SEO, PAUL EVANS, University of Wisconsin-Madison, ORGANIC THIN FILMS TEAM — The adsorption of organic molecules on metals, insulators, and semiconductors has been an important issue in the organic semiconductor research. The morphology and crystal structure of the first few molecular layers at organic-inorganic interfaces, in particular, affects the electrical properties of organic thin films. The first upright layer of pentacene on Si (111) forms on top of a disordered layer on which strongly bonded pentacene molecules are formed. The microstructures of interfaces between organic molecules and insulators lack understanding in molecular orientation, packing and degree of disorder. Low temperature scanning tunneling microscopy (STM) and scanning tunneling spectroscopy (STS) measurements were performed to probe molecular-scale structures of an upright layer of pentacene molecules. Our approach uses the disordered layer as a conducting analog of an insulating surface to enable a high-resolution structural study of the relevant crystalline phase of pentacene. STM and STS can be used to gain further understanding of structural defects such as vacancies, dislocations and grain boundaries within and between islands.

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