Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Scanning Tunneling Microscopy and Spectroscopy of Pentacene films Deposited on SiC SANDEEP GAAN, ROBERTO DUCA, RANDALL FEENSTRA, Carnegie Mellon University — Among various organic semiconductors, pentacene (Pn) has attracted much attention because of its ability of form ordered structures and its relatively high electron and hole mobilities. We have used SiC surfaces etched at 1600 $^\circ$C in 1 atm of hydrogen to form atomically flat substrates for Pn deposition. Oxidizing these substrates prior to Pn deposition electronically decouples the molecular films from the substrate. Scanning tunneling microscopy (STM) and spectroscopy (STS) was performed at room temperature on in-situ deposited Pn films. STM reveals a dendritic morphology of the films, consistent with prior reports [1]. We find a step height of 1.43$\pm$0.10 nm indicating that the Pn molecules are standing up, confirming the relatively weak interaction between the substrate and the film. STS reveals a band gap of about 2.0 eV, which is attributed to the edges of HOMO and LUMO bands of the molecules. Measurements over a wide range of tunnel currents are in progress, in an effort to deduce any transport limitations in the films. Supported by NSF. [1] F.-J. Meyer zu Heringdorf et al., Nature **412**, 517 (2001)

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Date submitted: 20 Nov 2006 Electronic form version 1.4