Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

A molecular view of TiOPc – C_{70}interface formation[1] YINYING WEI, University of Maryland, STEVEN ROBEY, National Institute of Standards and Technology, JANICE REUTT-ROBEY, University of Maryland — A key strategy for the improvement of organic electronic devices involves the optimization of chemical morphology for efficient charge separation. Fundamental studies of chemical morphology - electronic property relations, particularly along crucial domain boundaries, are needed to realize these goals. We present STM/STS studies of TiOPc: C_{70} films, prepared by vapor deposition on Ag (111). Sequential deposition of C_{70} onto the ordered honeycomb TiOPc phase generates extended domains of a co-crystalline $C_{70(1)}TiOPc_{(2)}$monolayer phase, characterized as a hexagonal network (2.1 nm nearest-neighbor C_{70} packing). Subsequent deposition of C_{70} onto this network proceeds in a layer-by-layer growth process, generated molecularly abrupt interfaces. The transport gap of each interface is measured by STS, and correlated to the C_{70} packing density. The orderly structure evolution of the C_{70}-TiOPc is contrasted to that of the previously reported C_{60}-TiOPc and the implications for electronic transport are discussed.

[1]This work has been supported by the Department of Commerce through the National Science Foundation under Surface Analytical Chemistry grant CHE0750203.

Yinying Wei
University of Maryland

Date submitted: 28 Nov 2009 Electronic form version 1.4