

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Preparation, Patterning, and Electrical Characterization of Conjugated Polymer Brushes** JOSE ALONZO, JIHUA CHEN, ONOME SWADER, NIKOLAY LAVRIK, MARK DADMUN, S. MICHAEL KILBEY II, DEPT. OF CHEMISTRY, UNI. OF TENNESSEE; CENTER FOR NANOPHASE MATERIALS SCIENCES, OAK RIDGE NATL LAB. COLLABORATION — Intimate contact at donor-acceptor interfaces and electrode-film interfaces is considered important for optoelectronic devices. This presentation will describe the formation and characterization of novel conjugated polymer brushes based on end-functionalized poly(3-hexylthiophene) and poly(para-phenylene) (PPP). In each case, end-functionalized polymers were synthesized and grafted to silicon substrates, with changes in film preparation method and polymer molecular weight used to manipulate the grafting density of the interfacial layers. Highly tunable PPP brushes having thickness ranging from 4 to 108 nm were obtained by in situ aromatization of poly(cyclohexadiene) brushes. Exceptionally smooth brush-modified interfaces were prepared, and neutron reflectometry, ellipsometry, AFM, and transmission electron microscopy were used to characterize layer structure and chain density. This presentation will also describe efforts to measure properties of these nanostructured layers using DC conductivity and AC electrical impedance measurements, as well as micro and nano-patterning of conjugated polymer brushes in the context of nanocircuit or organic solar cell applications.

Onome Swader  
University of Tennessee

Date submitted: 16 Dec 2010

Electronic form version 1.4