

Abstract Submitted  
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**Self-organized structures of  $\pi$ -conjugated polymer chains at the solid-polymer interface**<sup>1</sup> ZHONGJIE HU, MANI SEN, LEVENT SENDOGDULAR, MAYA K. ENDOH, TADANORI KOGA, Department of Materials Science and Chemical Engineering, Stony Brook University, Stony Brook, NY 11794-2275, USA, CHANG-YONG NAM, Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973-5000, USA — The interfacial structure of poly(3-hexylthiophene) (P3HT) conjugated polymer on planar solid substrates was investigated by a combination of surface sensitive experimental techniques. 50 nm-thick spin-cast P3HT films were prepared on hydrogen fluoride etched Si substrates and then annealed at 170 C for up to 100 h under vacuum. The films were then solvent-leached with chloroform repeatedly until the thickness of the residual layer remained unchanged. The X-ray reflectivity and atomic force microscopy experiments elucidated the formation of homogenous 3.5 nm-thick adsorbed P3HT layer on the Si substrate. Grazing incidence X-ray diffraction (GIXD) illuminated that the  $\pi$ -conjugated polymer chains in the adsorbed layer still predominantly self-assembled into “edge-on” orientated lamella at the interface despite the reduced degree of the lamellar ordering compared with that of the original 50 nm-thick P3HT thin film. In addition, the interfacial structure of a P3HT:[6,6]-phenyl C<sub>61</sub>-butyric acid methyl ester (PCBM) blend film was studied by the same experimental strategy, and the details will be also discussed in the presentation.

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