

Abstract Submitted
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Correlation of Structure and Roughness with Fabrication Conditions of P3HT-PCBM Bilayer Interfaces with X-Ray Reflectometry¹ STUART KIRSCHNER, MING-LING YEH, NATHANIEL SMITH, HOWARD KATZ, DANIEL REICH, Johns Hopkins University — Organic semiconductors, including poly(3-hexylthiophene) (P3HT) and polymer-phenyl-C61-butyric acid methyl ester (PCBM), are considered as promising materials for applications such as photovoltaics, transistors, sensors, thermoelectrics, optoelectronics, and magnetoelectronics. In many cases, the interface plays a crucial role in device performance and in determining the origins of many effects. In this research, neat bilayers of P3HT-PCBM, and PCBM blended with polystyrenes, were studied with X-ray reflectometry (XRR), atomic force microscopy, and ultraviolet-visible spectroscopy. A polymer with a high atomic number element was included to improve the scattering length density contrast, and provided improved XRR resolution. A mobility of order 10^{-4} cm²/V*s was maintained. The effect of different annealing, solvent, spin coating, and other fabrication conditions, was explored. Applicability of XRR to study interface characteristics, in these systems, will be discussed.

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Stuart Kirschner
Johns Hopkins University

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