

Abstract Submitted  
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**Investigation of the bulk heterojunction structure of organic photovoltaics using neutron reflectivity** JONATHAN KIEL, Michigan State University Department of Chemical Engineering and Materials Science, BRIAN KIRBY, National Institute of Standards and Testing Center for Neutron Research, MICHAEL MACKAY, University of Delaware Materials Science and Engineering — Organic photovoltaics have received much attention recently due to their promise of affordable and flexible solar power. A major component of these devices is the bulk heterojunction: an interconnected mixture of an electron donator, a highly conjugated polymer, and an electron acceptor, generally a fullerene derivative. We have performed neutron reflectivity experiments on 200 nm thick films of poly(3-hexylthiophene) and [6,6]-phenyl-C61- butyric acid methyl ester (PCBM) to investigate the structure of this bulk heterojunction. We observe a gradient of PCBM throughout the film that depends on processing conditions, ratio of polymer to PCBM and choice of solvent. These results are compared to working devices to show which bulk heterojunction structures are more suitable to highly efficient solar cells.

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