

Abstract Submitted
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Miscibility Study of PCBM/P3EHT Organic Photovoltaics via Small Angle Neutron Scattering WEN YIN, Department of Chemistry, University of Tennessee, BRYAN MCCULLOCH, RACHEL SEGALMAN, Department of Chemical Engineering, University of California , Berkeley, MARK DADMUN, Department of Chemistry, University of Tennessee — Organic photovoltaics (OPV) attracted considerable interest as lightweight, inexpensive, and easily processable replacement of inorganic photovoltaics. Current results indicate that the morphology of these photovoltaic materials is essential to their solar energy conversion efficiency but a detailed and fundamental understanding is absent. In this paper, the miscibility and structure of P3EHT/PCBM composites with varying PCBM loading level are investigated via small angle neutron scattering (SANS). With P3EHT having a melting temperature below 100 ° C, SANS experiments of the blends are conducted above the melting point to unequivocally determine the miscibility of PCBM and P3EHT without the added complexity of polymer crystals. Our SANS results show that blends with 20 and 50 wt% PCBM exhibit dramatically larger scattering at low-Q regime relative to 10 and 15wt% PCBM samples. This result implies that the miscibility limit of PCBM and P3EHT lies between 15:85 and 20:80. Further analysis is underway to correlate these results to OPV efficiency.

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