

Abstract Submitted  
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**Self diffusion studies of P3HT:PCBM blends using Dynamic Secondary Ion Mass Spectrometry (DSIMS)** LOUIS PEREZ, MICHAEL BRADY, NEIL TREAT, CRAIG HAWKER, MICHAEL CHABINYC, GUILLERMO BAZAN, EDWARD KRAMER — The mechanism by which conjugated polymer-fullerene blends form interpenetrating networks necessary for charge separation and collection in bulk heterojunction (BHJ) solar cells remains uncertain. Recent evidence from an experimental phase diagram of P3HT and PCBM suggests that phase separation occurs due to the crystallization of the two components rather than from immiscibility in the liquid state. Diffusion studies of P3HT/PCBM can reveal the molecular mobility in such blends both before and after crystal formation. To determine the tracer diffusion constant of P3HT, a deuterium labeled d-P3HT, has been synthesized and has been used as a tracer macromolecule for depth profiling studies. Dynamic secondary ion mass spectrometry (DSIMS) has been employed to determine concentration versus depth profiles after annealing for different times at various temperatures. Initial results indicate that d-P3HT diffuses much more slowly into a spun cast P3HT film than does deuterium labeled PCBM, a result expected from the relative sizes of the molecules.

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