

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Consequence of the miscibility and mesostructure of the photoactive layer on organic solar cell performance** ENRIQUE GOMEZ, DEREK KOZUB, KIARASH VAKHSHOURI, The Pennsylvania State University — Recent work has found that mixed phases exist in polythiophene/fullerene solar cells. Nevertheless, the consequence of miscibility between the electron donor and acceptor is not fully understood. Through model polythiophene/fullerene mixtures, we have characterized charge transport in amorphous mixed phases. These results suggest that partial miscibility may be important for device performance, due to the interplay between minimizing large scale phase separation and maximizing charge transport in the photoactive layer. However, in some systems crystallization of either the electron donor or acceptor complicates the role of miscibility on device performance by modifying the composition of amorphous phases. As a result, we utilize grazing-incidence small angle X-ray scattering results to quantitatively describe solar cell device performance from the structure of the photoactive layer.

Enrique Gomez  
The Pennsylvania State University

Date submitted: 11 Nov 2011

Electronic form version 1.4