

Abstract Submitted  
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**Improving Order and Mobility in MEH-PPV Films by Reducing Polydispersity**<sup>1</sup> JONATHON WHITE, Yuan Ze University

— The effect of polydispersity on morphology and charge transport in drop cast films of poly[2-methoxy-5-(2'-ethylhexyloxy)-p-phenylene vinylene] (MEH-PPV) was investigated using grazing incidence X-ray diffraction and time-of-flight respectively. Morphologically, reducing polydispersity by removing short chain segments promoted the capability of crystallization. This resulted in higher hole mobility and non-dispersive transport down to lower temperatures for the lower polydispersity sample. The slope for the Poole-Frenkel relationship at 298 K was increased, and its change with temperature decreased, indicating reduced spatial inhomogeneity. Analysis using Bassler's Gaussian disorder model (GDM), found that the value for energy disorder ( $\sigma \sim 53\text{meV}$  for both films) and infinite temperature zero field mobility ( $\mu_0 \sim 3 \times 10^{-6} \text{ cm}^2/\text{Vs}$ ) were similar for both films. However, a good fit for hopping site separation and spatial disorder was only possible for the lower polydispersity device, suggesting that the lower polydispersity films have less mesoscopic inhomogeneity.

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