

Abstract Submitted
for the 4CF06 Meeting of
The American Physical Society

Femtosecond transient studies of charge transfer in polymers doped with acceptor molecules; applications for organic solar cells JOSH HOLT, CHUANXIANG SHENG, (College of Optical Sciences, University of Arizona), TOMER DRORI, Z. VALY VARDENY, Department of Physics, University of Utah — Current developments in organic solar cells ($\sim 5\%$ efficiency nowadays) require understanding and control of charge carrier transfer and electronic state dynamics of donor-acceptor pairs. One current drawback to organic solar cell efficiency is negligible absorption in the near infrared region of the solar spectrum. We provide evidence that poly(2-methoxy-5(2'-ethyl)hexoxy-phenylenevinylene) (MEH-PPV) doped with 2,7-dinitrofluoronone (DNF) forms a charge transfer complex state that can extend absorption into the near infrared. We found that photoluminescence and the photoinduced absorption (PA) band of excitons are simultaneously quenched. Ultrafast spectroscopic measurements with spectral range from 0.2 to 1.2 eV provide insights into polaron and exciton band dynamics for these complexes. We also suggest a mechanism for bimolecular charge transfer in this system.

Josh Holt
Department of Physics, University of Utah

Date submitted: 07 Sep 2006

Electronic form version 1.4