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Femtosecond transient studies of photoinduced charge transfer in polymers doped with strong acceptor molecules; applications for organic solar cells JOSH HOLT, TOMER DRORI, University of Utah, CHUANXIANG SHENG, College of Optical Sciences, University of Arizona, Z. VALY VARDENY, University of Utah — Current developments in organic solar cells (∼5% efficiency nowadays) require understanding and control of photoinduced 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 and compare evidence that poly(2-methoxy-5(2'-ethyl)hexoxy-phenylenevinylene) (MEH-PPV) and regio-regular poly-3-hexyl thiophene (RR-P3HT) doped with 2,7-dinitrofluorenone (DNF) or 2,4,7-trinitrofluorenone (TNF) form below-gap charge transfer complex state that can extend absorption into the near infrared. Using fs transient and CW spectroscopies we found that the photoluminescence and mid-ir photoinduced absorption (PA) band of excitons are simultaneously quenched, when excited in the visible/uv or near ir. We compare our results to those of comparable systems using C_{60} as acceptor molecules.

Josh Holt
University of Utah

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