Abstract Submitted
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Femtosecond and CW transient studies of photoinduced charge transfer in donor/acceptor blends for organic solar cells[1] JOSH HOLT, SANJEEV SINGH, TOMER DRORI, ALEXANDRE NDOBE, Z. VALY VARDENY, University of Utah — Current developments in organic solar cells (∼6% power conversion efficiency) require understanding and control of photoinduced charge transfer of donor-acceptor pairs. In this work we provide and compare evidence that poly(2-methoxy-5(2'-ethyl)hexoxy-phenylenevinylene) (MEH-PPV, donor) blended with 2,4,7-trinitrofluorenone (TNF, strong acceptor) form a below-gap charge transfer complex (CTC) state that extends absorption into the near infrared (NIR). Transient PA measurements show direct photoexcitation into the CTC state where significant charge species are initially photogenerated, the majority of which geminately recombine within ∼10 ps, but the few that escape geminate recombination are subsequently captured in long-lived traps. Polarons could also be photogenerated with high efficiency *at NIR excitation*, with similar fate. This shows that a CTC state exists below the MEH-PPV optical gap, but with low dissociation efficiency, which leads to poor photovoltaic effect. We compare our results to those in blends of MEH-PPV/C_{60}, where apparently the obtained CTC state has a much higher dissociation efficiency.

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