Abstract Submitted
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Transient picosecond studies of pristine and DIO doped PTB7/PC71BM blend for photovoltaic applications[1] UYEN HUYNH, TEK BASEL, VALY VARDENY, Department of Physics & Astronomy, University of Utah, YONGYE LIANG, LUPING YU COLLABORATION[2] — Recently there have been reports of a significant increase of power conversion efficiency in organic solar cells upon mixing the donor-acceptor blend with various additives. We studied the photoexcitation dynamics in thin films of pristine PTB7 (a low band-gap polymer), and pristine and doped PTB7/PCBM blend with DIO additives, using the pump/probe photoinduced absorption technique with probe in the mid-IR spectral range. We found that the photogenerated charges in DIO doped blend is more efficient than in the pristine blend. Specifically we found that the charge polarons in the DIO doped blend are photogenerated instantaneously, simultaneously with photogenerated singlet excitons. The excitons decay into charge-transfer (CT) excitons at the D-A boundaries within ∼1ps.The CT excitons may geminately recombine or dissociate into free charge polarons; where the dissociation time constant was found to be ∼450 ps.

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[2]Department of Chemistry, University of Chicago

Uyen Huynh
Department of Physics & Astronomy, University of Utah

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