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**Charge transfer complex in diketopyrrolopyrrole polymers and fullerene blends: Implication for organic solar cell efficiency** D. MOGHE, P. YU, University of Missouri-Columbia, MO, C. KANIMOSHI, S. PATIL, Indian Institute of Science, Bangalore, India, S. GUHA, University of Missouri-Columbia, MO — Copolymers based on diketopyrrolopyrrole (DPP) have recently gained potential in organic photovoltaics. When blended with another acceptor such as PCBM, intermolecular charge transfer occurs which may result in the formation of charge transfer (CT) states. We present here the spectral photocurrent characteristics of two donor-acceptor DPP based copolymers, PDPP-BBT and TDPP-BBT, blended with PCBM to identify the CT states. The spectral photocurrent measured using Fourier-transform photocurrent spectroscopy (FTPS) and monochromatic photocurrent (PC) methods are compared with P3HT:PCBM, where the CT state is well known. PDPP-BBT:PCBM shows a stable CT state while TDPP-BBT does not. Our analysis shows that the larger singlet state energy difference between TDPP-BBT and PCBM along with the lower optical gap of TDPP-BBT obliterates the formation of a midgap CT state resulting in an enhanced photovoltaic efficiency over PDPP-BBT:PCBM.

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