

Abstract Submitted
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Photoinduced absorption studies of triplet-enhanced conjugated polymer-based diodes¹ DHANASHREE MOGHE, SUCHI GUHA, Dept. of Physics & Astronomy, University of Missouri-Columbia, MO65211, MOHAMMAD SAMIULLAH, Dept. of Physics, Truman State University, Kirksville, MO63501 — Trace concentration of metallic impurities present at the ppm level in conjugated polymers allow transition between the singlet and triplet manifolds, thus permitting photophysical studies of the triplet states at room temperature. We present photoinduced absorption (PIA) studies of diphenyl-substituted ladder-type poly paraphenylene (PhLPPP) containing a trace concentration of covalently bound Pd atoms. In the bulk polymer sample, the T_1 - T_N peak is observed at ~ 1.3 eV, which is also known to blue shift with increasing temperatures. In this work we present PIA studies as a function of an applied electric field from PhLPPP-based diodes. In addition to the T_1 - T_N peak at 1.3 eV, we also observe a strong signal at 1.35 eV, which is traced to the interface between the polymer and the hole transport layer. Field-induced PIA from polymer devices is thus a promising tool for probing weak electronic states, such as the triplet and charge transfer states, and further provides a mechanism for disentangling bulk and interface properties.

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