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Magneto-Optical Studies of Internal Photovoltaic Processes in Organic Solar Cells HUIDONG ZANG, ZHIHUA XU, BIN HU, University of Tennessee — It has been found that exciton dissociation inevitably forms electron-hole pairs, namely charge-transfer (CT) complexes, at donor-acceptor interfaces due to Coulomb attraction in organic solar cells. In particular, the dissociation of CT complexes is a critical process that is accountable for the generation of photocurrent. However, it is a challenging issue to study the CT complexes formed at donor-acceptor interfaces. Here, we use magneto-optical measurements: magnetic field effects of photocurrent (MFE_{PC}) and light-assisted dielectric response (LADR) as effective experimental tools to experimentally examine the formation of CT complexes and the related photovoltaic processes. Our studies reveal that internal electrical drifting and local Coulomb interaction can largely change the binding energy and dissociation probability of CT complexes through intrinsic electrical polarization in donor-acceptor interpenetrating network. This experimental finding indicates that intrinsic electrical polarization plays an important role in controlling charge dissociation, transport, and collection in organic solar cells.

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