Modulation of Properties of Conjugated Polymers for Organic Field-Effect Transistors by Insertion of Heteroaromatic Spacers

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π-Conjugated polymer-based field-effect transistors (FETs) have attracted considerable attention for fulfilling the near-future demands for bendable displays, e-paper, and radio frequency identification cards (RFIDs). Within the class of donor-acceptor materials, foremost forms of conjugated polymers, the isoindigo (IIG) unit has proven to be one of the most promising acceptor units for high performance FET materials. Inspired by outstanding charge-transport characteristics of poly(isoindigo-*alt*-benzothiadiazole) (PIIG-BT) in our previous study, we devote our attention to modulating the properties of IIG-BT by inserting five-membered heteroaromatic spacers, thiophene (T) and selenophene (Se), between the IIG and BT units. To figure out the effect of the insertion of the spacers, we investigate the optical, electrochemical properties, and the electrical performance of the OFETs, which results in effective intramolecular charge transfer and relatively well-balanced ambipolar transport. This represents the second example of IIG-based polymers exhibiting ambipolar charge transport in polymer-based FETs reported to date.