Benzodifuran-Based ?-Conjugated Copolymers for Bulk Heterojunction Solar Cells

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Novel ?-conjugated copolymers based on a sol. electroactive benzo[1,2-b:4,5-b']difuran (BDF) chromophore have been synthesized by the introduction of thiophene/benzo[c][1,2,5]thiadiazole/9-phenylcarbazole comonomer units. These copolymers cover broad absorption ranges (250-700 nm) with narrow optical band gaps of 1.71-2.01 eV. Moreover, their band gaps as well as their mol. electronic energy levels are readily tuned by copolymg. the BDF core with different ?-conjugated electron-donating or withdrawing units in different ratios. Bulk heterojunction solar cell devices are fabricated using the copolymers as the electron donor and PCBM ([6,6]-phenyl-C61-butyric acid Me ester) as the electron acceptor. Preliminary research has revealed power conversion efficiencies of 0.17-0.59% under AM 1.5 illumination (100 mW/cm2). [on SciFinder(R)]

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