Synthesis of 2*H*-benzotriazole based donor-acceptor polymers bearing carbazole derivative as pendant groups: Optical, electronical and photovoltaic properties

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Four 2*H*-benzotriazole based D-A polymers bearing carbazole derivative as pendant groups and fluorene or thiophene as donor units (**P1-P4**) were designed and synthesized. These polymers combine good thermal stability and excellent solubility in common organic solvents. Spectroscopic measurements carried out for **P1**, **P2** and **P3** indicate that polymer backbone induces effective the quenching of the 3,6-di(thiophen-2-yl)-9*H*-carbazole (**CT**) fluorescence, implying an intramolecular Förster Resonance Energy Transfer (FRET) process. Preliminary investigations on the photovoltaic multiheterojunction devices based on **P1-P4** showed power conversion efficiencies (PCEs) of up to 1.7 % for **P1** and **P2** and close to 2.0 % for **P3**. This means that the polymer/ π -conjugated pendant units structure is a promising alternative to improve the performance of organic solar cells.

Keywords: Donor-acceptor copolymers; pendant group; FRET; Electrochemical measurements; Optical and Photovoltaic properties

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