



## Oligo(benzo[c]thiophene-2-oxide) a poly(isothianaphthene) derivative with good photovoltaic properties

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Résumé en anglais

To improve the performances of organic solar cells, many efforts have been devoted to the synthesis of new compounds whose absorption spectra allow a better matching with that of the solar spectrum. To that respect, a new poly(isothianaphthene) derivative, with a low band gap, called, poly(benzo[c]thiophene-2-oxide), was synthesized and characterized by elemental analysis, UV-vis, FT-IR, <sup>1</sup>H NMR and XPS spectroscopy.

The polymer synthesis was performed from 1,3-dihydrobenzo[c]thiophene-2-oxide by oxidative coupling using sulphuric acid in methanol as oxidizing agent in the presence of air. Oligomers have an optical band gap of 1.8 eV. The oligomeric film prepared under high vacuum was probed in photovoltaic devices as an electron donor. Photovoltaic devices based on Glass/ITO/MoO<sub>3</sub>(3 nm)/poly(benzo[c]thiophene-2-oxide) (15 nm)/fullerene-C<sub>60</sub>(40 nm)/Bathocuproine (BCP) (9 nm)/Aluminium have been probed. The active area of the cells was 0.16 cm<sup>2</sup>. These cells showed a power conversion efficiency of 1.24% under the illumination of AM 1.5 at 100 mW/cm<sup>2</sup>, which shows that this family of poly(isothianaphthene) oligomers have promising properties for photovoltaic applications.

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