



Optical and photo-electrochemical characterization of organic-inorganic photosensitive materials

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This work reports on the optical and photoelectrochemical properties of polybithiophene (PBiTh) films electrochemically synthesized onto indium-tin oxide (ITO) substrates and modified with incorporation of indium phosphide (InP) when present in solution during polymerization. The properties of the composite layers were studied by electrochemical method (cyclic voltammetry), scanning electron microscopy (SEM), UV-vis spectroscopy and photocurrent measurements. From UV-vis spectroscopy studies, the absorbance of the composite is larger than the polybithiophene absorbance in the UV region. The cathodic photocurrent reflected the p-type semiconductor behaviour of the electrosynthesized polybithiophenes. Addition of InP semiconductors the improves the photocurrent at cathodic potential (4 \AA/cm^2 at 100 mW/cm^2) indicating the acceptor molecule acts as an exciton dissociation center, improving the number of charge carriers transported through the polymer to reach the solid-liquid electrolyte interface. It was found that the photosensitive composite material (PBiTh-InP) has good photoelectrochemical and optical properties.

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