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Morphology and Photoelectrochemical Characterization of MEH-PPV/PCBM Composite Film Doped with TiO_2 Nanoparticles

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Abstract: Poly[2-methoxy-5-(20-ethylhexyloxy)-p-phenylenevinylene] (MEH-PPV), [6,6]-phenyl-C61-butyric acid methyl ester (PCBM) and titanium dioxide (TiO2) nanoparticles (n-type) were dissolved, mixed and deposited by physical methods (spin-coating) on indium tin-oxide (ITO) substrate. The incorporation of the titanium dioxide nanoparticles changed the morphology and increased the roughness of polymers film (MEH-PPV/PCBM), and the photocurrent density of the composite (MEH-PPV/PCBM +n-TiO_2) was higher than that of single MEH-PPV/PCBM film. The study showed that the presence of n-TiO_2 particles in the polymeric film improves the photoelectrochemical properties of MEH-PPV/PCBM composite.

Keywords : Photocurrent density, Electrochemical property, Hybrid coating, Conducting Polymer, titanium dioxide, Organic nanostructures