

Solid-state photocells sensitized by polythiophene derivative: poly(3-thiophenyleacetic acid)

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Solvents free, solid-state solar cells were fabricated with mesoporous TiO₂ sensitized by electronically conducting polymer; poly(3-thiophenyleacetic acid (P3TAA) and reasonably high photocurrents were observed for the first time in polymer sensitized photovoltaic devices. When CuI was employed as the hole transporting material together with an ionic liquid 1-Ethyl-3-methylimidazolium bis(trifluoromethylsulfonyl) amide (EMImTf₂N) and LiTf₂N as additives for charge transport promotion, the cell TiO₂/ P3TAA/CuI delivered a respectable short circuit photocurrent of ~ 1.2 mA cm⁻² with an open-circuit voltage of ~ 275 mV under the irradiance of 100 mW cm⁻² (1.5 Air Mass) .