

Emploment of light scattering TiO_2 particles over working electrode for flexible dye sensitized solar cells

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In this paper, the flexible working electrode was designed by employing TiO_2 nanoparticles (P-25) with light scattering TiO_2 nanoparticles (200–300 nm) for the fabrication of efficient flexible dye sensitized solar cells (DSSCs). The flexible electrodes were prepared by mixing of TiO_2 nanoparticles and light scattering TiO_2 particles into the solution of titanium tertaisopropoxide and ethanol and deposited on indium tin oxide Polyethylene Naphthalate (ITO–PEN) substrates. It was found that dye absorption of TiO_2 increased as increasing the amount of light scattering TiO_2 particles in TiO_2 paste. The reasonable high conversion efficiency of 2.25% with JSC of 5.4 mA/cm^2 , VOC of 0.768 V and FF of 0.54 was obtained with the flexible DSSC fabricated with optimized TiO_2 coated ITO–PEN electrode. The significant improvement in photovoltaic performance is attributed to efficiently improved dye absorption and light harvesting efficiency via light scattering TiO_2 particles.