

# Photovoltaic devices based on nanocrystalline TiO<sub>2</sub> and a fluorene-thiophene copolymer

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## Abstract

We report studies of charge recombination and photovoltaic device performance in structures consisting of a fluorene-bithiophene co-polymer and nanocrystalline TiO<sub>2</sub>. Efficient photoinduced charge transfer is observed using a TiO<sub>2</sub> film of high interfacial area while charge recombination is remarkably slow (~ms). The influences of thickness, surface morphology, top contact material, light intensity and ionization potential of the polymer are studied. Quantum efficiencies of over 11% and monochromatic power conversion efficiencies of around 1% are achieved.

## Indexed keywords

Light intensity; Optical spectroscopy; Photoinduced charge transfer; Power conversion efficiencies

**Engineering controlled terms:** Charge transfer; Concentration (process); Ionization; Morphology; Photovoltaic effects; Quantum efficiency; Quartz; Sol-gels; Spin coating; Titanium oxides

**Engineering main heading:** Copolymers