

Photovoltaic characteristics of hybrid MEH-PPV-nanoparticles compound

Abstract

Organic solar cell research has vastly developed in recent years. These organic solar cells however are still limited to low power conversion efficiencies. This has led to the generation of photovoltaic cells based on hybrid nanoparticle-organic polymer materials. The hybrid solar cell has the potential of bridging the efficiency gap which is present in organic and inorganic semiconductor materials. This paper focuses on characterization of fabricated hybrid active layer consisting of organic polymer infused with semiconductor nanoparticles. The active layer was deposited on the substrate using the spin coating technique. Materials used in the active layer are poly (2-methoxy, 5-(2-ethyl hexyloxy) p-phenyl vinylene) MEH-PPV, cadmium telluride (CdTe) and cadmium sulphide (CdS). The fabricated solar cells with active layer of MEH-PPV only were found to have a power conversion efficiency of 0.1% for 1 W, hybrid cell with active layer of MEH-PPV/CdTe has power conversion efficiency of 0.15% for 1 W and hybrid cell with active layer of MEH-PPV/CdTe/CdS has power conversion efficiency of 0.18% for 1 W.

Keywords

CdS; CdTe; Hybrid solar cells; MEH-PPV; Nanoparticles