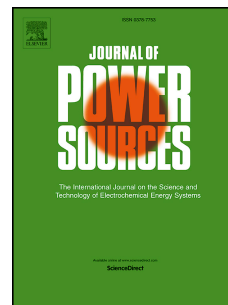


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# Improved Performance of CdS/CdSe Quantum Dots Sensitized Solar Cell by Incorporation of ZnO nanoparticles/Reduced Graphene Oxide Nanocomposite as Photoelectrode

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**Abstract:** Here we present novel quantum dot sensitized solar cells (QDSSC) based on ZnO nanoparticles (NPs)/reduced graphene oxide (RGO) nanocomposite photoanodes for better light harvesting and energy conversion. Photoelectrodes are prepared by doctor blading ZnO NPs/GO nanocomposite paste on a fluorine doped tin oxide substrate which are then sintered at 450°C to obtain ZnO NPs/RGO nanocomposites. The partial reduction of GO after thermal reduction, is studied by Fourier transform infrared and Raman spectroscopies. Cadmium sulfide (CdS) and cadmium selenide (CdSe) quantum dots are deposited on the films through successive ionic layer adsorption and reaction and chemical bath deposition methods, respectively. The unique properties of ZnO NPs/RGO photoanodes, lead to a significant enhancement in the photovoltaic properties of solar cells in comparison with bare ZnO photoanodes. Current-voltage characteristics of cells are studied and the best results are obtained from ZnO NPs-RGO/CdS/CdSe with photoelectric conversion efficiency of 2.20% which is almost two times

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