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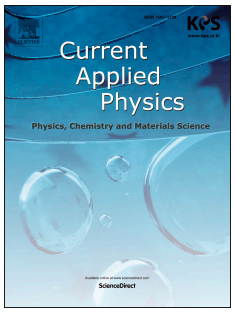

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Geometrical Thickness of Titania Photoanode as an Influential Parameter in Controlling The Photovoltaic Performance of CdS Quantum Dot Sensitized Solar Cells

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Abstract :

Geometrical thickness of photoelectrode is one of the important design considerations that can substantially improve the device performance in Quantum Dot Sensitized Solar cells. The present work deals with the influence of the Photoanode (PA) thickness on the photovoltaic performance of these excitonic solar cells. Optical, morphological and electrochemical properties of these films are studied using UV-Visible spectroscopy, Scanning electron microscopy and Cyclic Voltammetry. Sandwich solar cells assembled using these PAs are further characterized using Electrochemical Impedance Spectroscopy and Chronoamperometry to investigate the electron transfer processes occurring at the sensitized photoelectrode/Electrolyte interface. These cells are then evaluated for their photovoltaic performance using J-V characteristics. The results obtained are explained qualitatively invoking the thickness dependent parameters like Light harvesting efficiency and Electron transfer yield to establish the effect of PA thickness on the solar cell performance.

Key words : QDSSC, PA, thickness, Light harvesting efficiency ,Electron transfer yield

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