Zinc Oxide based Dye Sensitized Solar Cell using Eosin – Y as Photosensitizer

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Abstract
A zinc oxide based Dye sensitized Solar Cell (DSSC) has been fabricated, using Eosin-Y as the dye adsorbed on a nanocrystalline zinc oxide - fluorine doped tin oxide electrode, for the sensitization of the large band gap semiconductor. The absorption spectrum of Eosin-Y showed high absorption of visible light between 450 and 600 nm wavelength. The SEM image of the annealed zinc oxide film revealed a uniform, porous and small round shaped grains. These are in favour of the solar energy conversion device. The short circuit photocurrent density (Jsc), the open circuit photovoltage (Voc) and the fill factor (FF) of the solar cell using Eosin-Y were obtained to be 7.243513 x 10⁻² mA/cm², 4.325767 x 10² mV and 3.769144 x 10⁻¹. The efficiency of 1.2431 x 10⁻² % was achieved due to a high series resistance of 4.2175 x 10² Ohms cm².

Keyword: Dye sensitized, Eosin-Y, Absorption, Electrolyte, Photoanode, Zinc Oxide

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