

Preparation of chemically deposited thin films of CdS/PbS solar cell

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Abstract

The present paper reports the preparation of a solar cell which has a cross-sectional scheme: ITO/CdS/PbS, containing a commercially transparent conductive ITO; chemically deposited n-type CdS (340 nm) and absorbed layer of p-type PbS (1400 nm). The structural and optical properties of the constituent films are presented. X-ray diffraction showed that all of the thin films are polycrystalline. Using scanning electron microscopy, the present study revealed that the films have uniform surface morphology over the substrate. The solar cell was characterized by determining the open circuit voltage, short-circuit current density, and $J-V$ under 40 mW/cm² solar radiation. The efficiency of the solar cells was 1.35%, which is much higher (0.041, 0.5 and 0.1–0.4%) and slightly smaller (1.65%) than some solar cells reported in the literature.

Keywords

PbS; Nanocrystalline thin films ;Microwave-assisted CBD