REFERENCES


Chapter 13

Fabrication of CdS/CdTe Thin Film Solar Cells via the Technique of Electrodeposition

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This study focused on fabrication of CdS/CdTe solar cells using the technique of electrodeposition as it is simple, low cost and scalable method. Initially, CdS and CdTe materials were individually deposited on fluorine doped tin oxide (FTO) glass substrates and optimum growth conditions were obtained by analyzing their structural, compositional, electrical, optical and morphological properties using the techniques of X-ray diffraction, Energy Dispersive X-ray spectroscopy, photo-electrochemical cell study, optical absorption spectroscopy and scanning electron microscopy respectively. Thereafter, final device structure of glass/FTO/CdS/CdTe/Au was fabricated using the optimum growth conditions obtained for the two materials, CdS and CdTe. Finally, the current density-voltage characteristics of the devices were obtained to assess devices. The best device structure exhibited short circuit current density (Jsc) of 24.4 mA cm⁻², open circuit voltage (Voc) of 681.8 mV, Fill Factor (FF) of 0.32 and conversion efficiency of 5.4 per cent.

Keywords: Cadmium sulfide, Cadmium telluride, Thin films, Solar energy materials, Electrodeposition, Solar cells.

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