



Preliminary Results on the Preparation of CdTe Thin Films using Electro-deposition Technique for Applications in CdS/CdTe Solar Cells

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Abstract

Cadmium Telluride (CdTe) thin films were successfully electrodeposited under potentiostatic conditions on to Indium Tin Oxide (ITO) coated glass substrates, from aqueous solution of pH 2.3 containing 0.05M CdSO₄ and TeO₂ at 70°C temperature. Properties of CdTe thin films prepared at different deposition voltages, deposition time periods and deposition temperatures were investigated using the current-voltage (I-V) plots. It was found that the best quality CdTe thin films were formed under -1.36V of deposition voltage for a period of 6 hours in a solution at 70°C and pH of 2.3. The CdTe layers were annealed with CdCl₂ treatment and the I-V characteristics were compared before and after annealing. The performance of the CdTe layers was improved significantly after CdCl₂ annealing of the sample at 390°C for a period of 10 min. The analysis of SEM images indicates the enhancement of the quality of the samples and the increase of CdTe grain sizes up to few microns after annealing with CdCl₂.

Keywords: Cadmium Sulphide, Cadmium Telluride, CdS/CdTe solar cells, Electro-deposited CdTe

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