

Effect of Zinc/Cadmium Proportion in the Properties of CdS Layers Deposited by Chemical Bath Deposition Method

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Abstract : Cadmium poisoning and the cost of panel recovery which is very expensive and difficult in the buffer layers of CdS in solar cell, for these two drawbacks, we do a search on the effect of proportion of zinc/cadmium in the properties layers of CdS. For this, our studies study the properties of $Cd_xZn_{1-x}S$ layers deposited by chemical bath (CBD). CdZnS thin films were synthesized by chemical bath deposition (CBD) with different deposition protocols to optimize deposition parameters such as temperature, deposition time, ion concentrations and pH. The surface morphology, structural, optical and chemical properties of the CdZnS thin films were studied by SEM, XRD, Raman and UV-visible spectrophotometer. The transmittance is 80% in the visible region 300 nm - 800 nm; the crystalline structure is hexagonal for $x \geq 0.5$ and cubic for $x < 0.5$, the grain size is between 85.7 and 100 nm. It is observed that the transmittance and the shape change with the concentration of zinc in the solution; this result favours the application of these films in solar cells application.

Keywords : CdZnS, chemical bath, SEM, Raman, solar cells, thin films.