



Optical and Morphological Studies of Thermally Vacuum Evaporated ZnSe Thin Films

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Auteur Antohe, S. [1], Ion, L. [2], Girtan, Mihaela [3], Toma, O. [4]

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Résumé en anglais

Zinc selenide (ZnSe) thin films were deposited on optical glass substrates using thermal vacuum evaporation, by sublimation of zinc selenide powder from a single quartz crucible heated at 600 degrees C. The substrates temperatures were maintained constant during deposition at 220 degrees C. All the samples were subjected to post - deposition thermal treatments in the same deposition chamber, at 250 degrees C for 20 minutes. AFM and SEM studies confirmed that post - deposition annealing improved the grains growth and their distribution over the entire surface of the film. Optical constants (refraction indices and extinction coefficients) of semiconducting ZnSe thin films were measured by spectroscopic ellipsometry in the range of 190 nm to 500 nm. Optical measurements were completed with the spectral dependencies of transmission and absorption using a double beam UV - VIS spectrophotometer. The values for optical bandgaps calculated from the absorption spectra were found to be around 2.7 eV. All these results lead to the conclusion, that ZnSe thin films are good candidates to replace the conventional CdS thin films used as n-type window layers in the thin film heterojunction solar cells.

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