CdS thin films for solar cells by Chemical Bath Deposition: our experiences.

Aimee Arias and Osvaldo Vigil

Faculty of Physics, University of Havana
San Lzaro y L Vedado
Havana 10400
Cuba

Many researchers have devoted its efforts to Chemical Bath Deposition as it results a non- expensive method for thin film preparation. A lot of semiconductor materials thin films have been prepared for its use, for example, as antireflecting coatings and solar cells; among them, II-VI compounds have attracted a great interest. With the purpose to obtain good quality and cheaper semiconductors thin films, several recipes had been developed and the influence of various factors as temperature, concentration, stirring and others have been studied.

In our case, a bath containing CdCl2, NH3 – NH4Cl buffer and Thiourea with magnetic stirring is used, and the influence of factors as Thio/ CdCl2 initial relation in the bath (10/1, 5/1, 2.5/1 and 1/1), concentration of reactants, temperature (65 to 85 oC), substrate (Corning and SnO2 TCO) and the existence of an external magnetic field during the growing process, on the properties of the CdS thin films, have been established. Optical (transmission and pholuminescence, optical density), electrical, morphological and structural properties have been studied in relation to different growing conditions.

On the other hand, post-thermal annealing in different atmospheres and through the deposition of a layer of CdCl2 have been made and studied, in order to use the CBD-CdS thin films in solar cells applications. Some of the films have been preliminary tested for its use in CdS/CdTe solar cells.

In this work a review of our experiences in the CBD growth technique and specially in connection with II -VI compounds is presented. These results have been published in several publications, as follows:

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- O. Vigil, I. Riech, M. Garcia - Rocha and O. Zelaya - Angel “Characterization of defect levels in chemically deposited CdS films in the cubic - to - hexagonal phase transition”, J. Vac. Sci. Technol. 15 (4), (1997)1-5.
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