

# Characterization of ZnS thin films synthesized through a non-toxic precursors chemical bath

Rodríguez, C. A.

Sandoval-Paz, M. G.

Cabello, G.

Flores, M.

Fernández, H.

Carrasco, C.

©2014 Elsevier Ltd. All rights reserved. In solar cells, ZnS window layer deposited by chemical bath technique can reach the highest conversion efficiency; however, precursors used in the process normally are materials highly volatile, toxic and harmful to the environment and health (typically ammonia and hydrazine). In this work the characterization of ZnS thin films deposited by chemical bath in a non-toxic alkaline solution is reported. The effect of deposition technique (growth in several times) on the properties of the ZnS thin film was studied. The films exhibited a high percentage of optical transmission (greater than 80%); as the deposition time increased a decreasing in the band gap values from 3.83 eV to 3.71 eV was observed. From chemical analysis, the presence of ZnS and Zn(OH)<sub>2</sub> was identified and X-ray diffraction patterns exhibited a clear peak corresponding to ZnS hexagonal phase (1 0 3) plane, which was confirmed by electron diffraction patterns. From morphological studi