Comparative Study of ZnO, ZnS and Zn (O, S) Thin Films Grown by Chemical Bath Deposition for Buffer Layer Application in Solar Cells

K. Giridharan, G. Balaji, N. Prabavathy, M.D. Kannan, R. Balasundaraprabhu, S. Prasanna, K. Sivakumaran

Centre for surface science, Department of Physics, PSG College of Technology, Coimbatore, India
Email: giridharan3293@gmail.com

Abstract

Zinc Oxide (ZnO), Zinc Sulphide (ZnS) and Zinc Oxide Sulphide (Zn (O, S)) thin films were deposited on a clear soda lime glass substrates using chemical bath deposition at room temperature. The structure of ZnO, ZnS and Zn (O, S) thin films was found to be hexagonal Wurtzite with <100> and <111> orientations for ZnO and ZnS thin films respectively based on XRD measurements. Field Emission Scanning Electron Microscopy images revealed smooth surface for the films with the formation of flakes. Transmission spectra of the films were studied by UV-Vis-NIR Spectrophotometer and the transparency was found to be above 80% for ZnO, ZnS and Zn (O, S) thin films. The optical band gap was found to be around 3.3 eV for ZnO film, 3.5 eV for ZnS and 3.0 eV for Zn (O, S) film which is in accordance with the reported values. The results show that the quality ZnO, ZnS and Zn (O, S) buffers layers can be deposited using Chemical bath deposition.

.