

## **Effect of solution concentration on MnS<sub>2</sub> thin films deposited in a chemical bath**

### **ABSTRACT**

Manganese sulfide (MnS<sub>2</sub>) thin films were deposited from aqueous solutions at room temperature on indium tin oxide glass substrates by the chemical bath deposition method. The method employed was cheap, simple and did not require any special set-up process. The chemical bath contained manganese sulphate, thiourea and triethanolamine solutions. The effect of various solution concentrations on crystalline films was determined. The structure, morphology and optical absorption of the films were analysed using X-ray diffraction, atomic force microscopy and UV/Vis spectrophotometry. Formation of a cubic structure with preferential orientation along the (210) plane was confirmed from structural analysis. From atomic force microscopy images, the thin films prepared at higher concentration showed complete coverage of material over the substrate compared to the films prepared at lower concentration. The band gap energies of films ranged from 3.5 to 3.8 eV, depending upon the solution concentration.

**Keyword:** Chemical bath deposition; Thin film; Solar cells; Semiconductor