

## **Effects of deposition potential on Cu<sub>4</sub>SnS<sub>4</sub> thin films prepared by electrodeposition technique.**

### **ABSTRACT**

Cu<sub>4</sub>SnS<sub>4</sub> thin films were produced by the electrodeposition technique on indium tin oxide substrates at room temperature. The effects of deposition potential toward the properties of the thin films were investigated. The structural, morphological, and optical properties of thin films have been investigated by using x-ray diffraction, atomic force microscopy, and UV-vis spectrophotometer, respectively. The nanocrystalline film was found to be orthorhombic in structure, with the preferential orientation along the 221 plane. The AFM image reveals the electrodeposited films were smooth, compact, and uniform at deposition potential of -0.6 V. The optical band gap of films ranges from 1.58 to 1.84 eV depending upon the deposition potential. The photoresponse in the cathodic region indicated a p-type semiconductor.

**Keyword:** Electrodeposition; Thin films; Semiconducting material; Optical properties.