

Effect of pH value and electrolyte concentration on the copper sulphide thin films prepared by chemical bath deposition method

ABSTRACT

Thin films of copper sulphide were deposited using chemical bath deposition method. The deposition was carried out at various pH values and electrolyte concentrations. The structure, morphology and optical properties of thin films were investigated by means of X-ray diffraction, atomic force microscopy and UV-Visible spectrophotometer. X-ray diffraction patterns confirmed that the deposited materials were CuS with hexagonal phase. The films deposited using 0.05 M of copper chloride and sodium thiosulfate solutions at pH 3 showed the best crystallinity, uniform surface coverage and high absorption characteristics. The band gap was found to be 2.6 eV with p-type behaviour.

Keyword: Copper sulphide; Chemical bath deposition; Thin films; X-ray diffraction