

Preparation and characterization of iron sulphide thin films by chemical bath deposition method

ABSTRACT

FeS₂ thin films have been deposited by using low cost chemical bath deposition technique. The films obtained under deposition parameters such as bath temperature (90°C), deposition period (90 min), electrolyte concentration(0.15 M)and pH of the reactive mixture (pH 2.5). The thin films were characterized using X-ray diffraction and atomic force microscopy in order to study the structural and morphological properties. The band gap energy, transition type and absorption properties were determined using UV-Vis Spectrophotometer. X-ray diffraction displayed a pattern consistent with the formation of an orthorhombic structure, with a strong (110) preferred orientation. Atomic force microscopy image showed the substrate surface is well covered with irregular grains. A direct band gap of 1.85 eV was obtained according to optical absorption studies.

Keyword: Iron sulfide; X-ray diffraction; Chemical bath deposition; Thin films