

SnS photoabsorber Layers by dry and wet deposition methods

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Abstract

Thin films of tin sulphide (SnS) have been deposited onto pure glass and indium tin oxide (ITO) coated glass substrates by High Vacuum Evaporated (HVE) and electrochemical deposition (ECD) techniques. The as-grown layers were characterized by X-ray diffraction (XRD), micro-Raman spectroscopy, EDX, scanning electron microscopy and atomic force microscope. EDX studies revealed that the layers deposited by thermal evaporation had nearly stoichiometric elemental composition whereas the ECD deposited layers showed deviations from stoichiometry. XRD analysis confirms that all the layers were polycrystalline in nature with Herzbergite orthorhombic structure and also provide information on structural parameters such as crystallite size and lattice strain in dependence of method and the experimental parameters of film preparation. The Raman spectra of all HVE films exhibited pure SnS monophase. The existence of SnS₂ or / and Sn₂S₃ phases was observed in ECD grown films, in addition to dominating SnS phase. The changes occurred in the micro-structural properties of the as-grown SnS layers deposited by two techniques will be discussed.

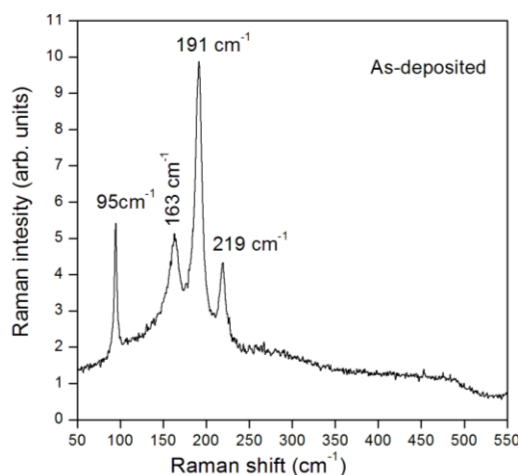


Fig: Raman Spectrum of HVE grown SnS films