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GROWTH AND CHARACTERIZATION OF TIN DISULPHIDE THIN FILMS BY SPRAY PYROLYSIS TECHNIQUE

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ABSTRACT

Thin films of tin disulphide have been deposited by using low cost spray pyrolysis technique. The deposition parameters such as concentration, flow rate, nozzle to substrate distance were optimized to obtain good quality thin film and the temperature is varied in the range 200°C to 350°C physical investigation were made to study the structural, optical and electrical properties. X-ray diffraction shows the films formed are SnS_2 with hexagonal structure. EDAX analysis conforms SnS_2 thin films. Uniform deposition & adherence of the material over glass substrate was revealed by scanning electron microscope. A direct band gap of about 2.22 eV was obtained. Photoluminescence spectra showed two peaks corresponding to green & yellow fluorescence emission. Electrical properties reveal that resistivity decreases from 3.18 x 10^{-2} Ω cm to 3.06 x 10^{-3} Ω cm, carrier concentration & mobility increases to 1.4 x 10^{20}/ cm^3 to 1.8 x 10^{20}/ cm^3, 1.92 cm^2/Vs to 5.3 cm^2/Vs respectively with increases in temperature.

KEYWORDS: Structural, Edax, Electrical, Optical Properties

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