Effect of Complexing Agent Concentration on the Properties of Tin monosulphide Films

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Tin monosulphide (SnS) films were grown on corning glass substrates by a simple and low cost wet chemical process, chemical bath deposition (CBD). The effect of the complexing agent, tartaric acid concentration that varied in the range, 0 -1 M. The X-ray diffraction analysis indicatedthat all the as-prepared films are polycrystalline nature with (111) plane as preferred orientation and exhibited orthorhombic crystal structure. The intensity of (111) plane increases with the increase of complexing agent concentration. The Raman spectra were recorded for the as-deposited films in the range of 40 - 400 cm-1. The Raman spectra showed characteristic Raman lines of SnS films at the 94 cm-1, 160 cm-1, 191 cm-1 and 217 cm-1 that were related to the orthorhombic structure of SnS. No other peaks were observed in the spectra related to other phases like SnS2 and Sn2S3 or other impurities. The optical studies revealed that the films had high optical absorption coefficient (>104 cm-1). The energy band gap was found to be allowed and direct, and varied between 1.30 eV and 1.45 eV. The details of these results will be presented and discussed.