Electrochemical, morphological and structural properties of electrodeposited ZnS Thin films

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Abstract

Known as a n-type semiconductor, Zinc sulfide (ZnS) has the advantages of low consumption, nontoxic, andhigh exciton binding energy [1]. Therefore, it is widely used inSolar cells, infrared windows, light emitting and in optoelectronique [2]. It have a direct band gap (3.7eV) with two structure Cubic 'Blende' and Hexagonal 'wurtzite' [3].

In this work, ZnS thin films have been deposited on indium tin oxide coated glass substrates by electrodeposition. The deposition was performed in acidic electrolyte containing ZnSO4 and N2S2O3 at two different pH values. From the Mott-Schottky plot, the n type conductivity was confirmed. The morphological observation was carried out by scanning electron microscopy (SEM) and atomic force microscopy (AFM) and shows spherical grains. The Structural analysis realised by X-Ray diffraction XRD indicated that the simples have a zinc blende structure. The energy gap is of the order of 3.74 eV witch is in accord with literature.

References

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