

# Accepted Manuscript

Effect of SnS addition on the morphological and optical properties of  $(\text{SnS})_m(\text{Sb}_2\text{S}_3)_n$  nano-rods elaborated by glancing angle deposition

D. Abdelkader, F. Chaffar Akkari, N. Khemiri, R. Miloua, F. Antoni, B. Gallas, M. Kanzari

PII: S0921-4526(18)30342-9

DOI: [10.1016/j.physb.2018.05.016](https://doi.org/10.1016/j.physb.2018.05.016)

Reference: PHYSB 310878

To appear in: *Physica B: Physics of Condensed Matter*

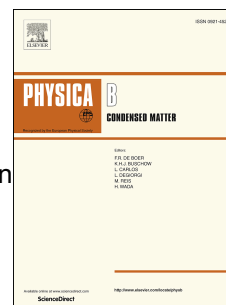
Received Date: 27 March 2018

Revised Date: 16 April 2018

Accepted Date: 10 May 2018

Please cite this article as: D. Abdelkader, F. Chaffar Akkari, N. Khemiri, R. Miloua, F. Antoni, B. Gallas, M. Kanzari, Effect of SnS addition on the morphological and optical properties of  $(\text{SnS})_m(\text{Sb}_2\text{S}_3)_n$  nano-rods elaborated by glancing angle deposition, *Physica B: Physics of Condensed Matter* (2018), doi: [10.1016/j.physb.2018.05.016](https://doi.org/10.1016/j.physb.2018.05.016).

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Effect of SnS addition on the morphological and optical properties of $(\text{SnS})_m(\text{Sb}_2\text{S}_3)_n$ nano-rods elaborated by glancing angle deposition

D. Abdelkader<sup>\*1</sup>; F. Chaffar Akkari<sup>1</sup>; N. Khemiri<sup>1</sup>; R. Miloua<sup>2</sup>; F. Antoni<sup>3</sup>; B. Gallas<sup>4</sup>; M. Kanzari<sup>1,5</sup>

<sup>1</sup> Université Tunis ElManar, Ecole Nationale d'Ingénieurs de Tunis, Laboratoire de Photovoltaïque et Matériaux Semiconducteurs, BP37, 1002 Le Belvédère, Tunis, Tunisia

<sup>2</sup> Laboratoire d'Elaboration et de Caractérisation des Matériaux, Département d'Electronique, Université Djillali Liabes, BP 89, Sidi Bel-Abbés 22000, Algeria

<sup>3</sup> ICube-Laboratoire des Sciences de l'Ingénieur, de l'Informatique et de l'Imagerie, Université de Strasbourg-CNRS, 23, rue du Loess, 67037 Strasbourg Cedex, France

<sup>4</sup> Sorbonne Université, CNRS, Institut des NanoSciences de Paris, INSP, F-75005 Paris, France

<sup>5</sup> Université de Tunis, Institut Préparatoire aux Etudes d'Ingénieurs de Tunis-IPEIT, 02, Rue Jawahar Lal Nehru, 1089 Montfleury, Tunisia

\* Corresponding author: [dhaferabdelkader@gmail.com](mailto:dhaferabdelkader@gmail.com)

## Abstract

$(\text{SnS})_m(\text{Sb}_2\text{S}_3)_n$  thin films were prepared by thermal evaporation using the glancing angle deposition technique (GLAD). The incident angle between the particle flux and the normal to the substrate was fixed at  $80^\circ$ . The Raman and XRD characterization revealed the amorphous character of the films due to the columnar structure as shown by the SEM characterization and AFM analysis. A strong change of the surface morphology of the films was observed and it depends on the composition. Optical properties were extracted from transmittance  $T$  and reflectance  $R$  spectra.  $(\text{SnS})_m(\text{Sb}_2\text{S}_3)_n$  thin films exhibit high absorption coefficients ( $10^4 - 2 \times 10^5 \text{ cm}^{-1}$ ) in the visible range and the higher values were obtained for  $\text{Sn}_3\text{Sb}_2\text{S}_6$  and it has the highest photocurrent values. The direct band gap ( $E_{g \text{ dir}}$ ) was in the range 2.11 – 1.67 eV. The refractive indices are calculated from optical transmittance spectra of the films. The  $\text{Sn}_3\text{Sb}_2\text{S}_6$  sample exhibits a lower refractive index. All the dispersion curves of refractive index match well with the Cauchy dispersion formula and they were analyzed using Wemple-DiDomenico model. The Bruggeman effective medium approximation EMA was used to calculate the packing density of different compositions, and  $\text{SnSb}_4\text{S}_7$  sample has the highest

Download English Version:

<https://daneshyari.com/en/article/8160134>

Download Persian Version:

<https://daneshyari.com/article/8160134>

[Daneshyari.com](https://daneshyari.com)