

Accepted Manuscript

Chemical bath deposition of SnS nanosheet thin films for FTO/SnS/CdS/Pt photocathode

Jiahe Jing, Meng Cao, Chuangsheng Wu, Jian huang, Jianming Lai, Yan Sun, Linjun Wang, Yue Shen



PII: S0925-8388(17)32688-9

DOI: [10.1016/j.jallcom.2017.07.303](https://doi.org/10.1016/j.jallcom.2017.07.303)

Reference: JALCOM 42719

To appear in: *Journal of Alloys and Compounds*

Received Date: 10 May 2017

Revised Date: 15 July 2017

Accepted Date: 28 July 2017

Please cite this article as: J. Jing, M. Cao, C. Wu, J. huang, J. Lai, Y. Sun, L. Wang, Y. Shen, Chemical bath deposition of SnS nanosheet thin films for FTO/SnS/CdS/Pt photocathode, *Journal of Alloys and Compounds* (2017), doi: 10.1016/j.jallcom.2017.07.303.

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.

Chemical bath deposition of SnS nanosheet thin films for FTO/SnS/**CdS/Pt photocathode**

Jiahe Jing^a, Meng Cao^{a*}, Chuangsheng Wu^a, Jian huang^a, Jianming Lai^a,

Yan Sun^b, Linjun Wang^a, Yue Shen^{a*}

^a*School of Materials Science and Engineering, Shanghai University, Shanghai, 200072, China*

^b*National Laboratory for Infrared Physics, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Shanghai 200083, China*

Abstract:

SnS nanosheet thin films were prepared by chemical bath deposition in acidic solution, which used tin (II) chloride dihydrate and thioacetamide as precursors of Sn and S, respectively. The influences of pH levels, precursors' mole ratios, deposition times on the physical properties of SnS nanosheet thin films were investigated. The sheet-like morphologies and compositions of as-deposited SnS thin film were characterized by Scanning electron microscope (SEM). X-ray diffraction (XRD), Raman and X-ray photoelectron spectra (XPS) were used to confirm the crystal structures and phase purities of SnS nanosheet thin films. When employed as a photocathode for photo-electrochemical (PEC) solar hydrogen production, the as-deposited SnS nanosheet thin films yielded photocurrent densities of $31.94 \mu\text{A}\cdot\text{cm}^{-2}$ at -0.4 V under illumination of AM 1.5G. After deposition of CdS and Pt layers, the cathodic photocurrent densities of FTO/SnS/CdS/Pt and FTO/annealed SnS/CdS/Pt were improved to $0.572 \text{ mA}\cdot\text{cm}^{-2}$ and $0.702 \text{ mA}\cdot\text{cm}^{-2}$, respectively,

Download English Version:

<https://daneshyari.com/en/article/5459403>

Download Persian Version:

<https://daneshyari.com/article/5459403>

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