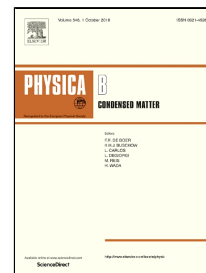


Accepted Manuscript

Synthesis and light absorption properties of copper sulfide nanowire arrays on different substrates

Liqiang Li, Wenxing Zhang



PII: S0921-4526(18)30538-6

DOI: 10.1016/j.physb.2018.08.047

Reference: PHYSB 311034

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

Received Date: 12 July 2018

Accepted Date: 27 August 2018

Please cite this article as: Liqiang Li, Wenxing Zhang, Synthesis and light absorption properties of copper sulfide nanowire arrays on different substrates, *Physica B: Physics of Condensed Matter* (2018), doi: 10.1016/j.physb.2018.08.047

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.

1 **Synthesis and light absorption properties of copper sulfide nanowire arrays on**
2 **different substrates**

3 **Liqiang Li^{*1,2}, Wenxing Zhang²**

4 ¹School of physics and engineering, Zhengzhou University, Zhengzhou 450001, China

5 ²School of Physics, Shangqiu Normal University, Shangqiu 476000, PR China

6 E-mail: liliqiang3672603@163.com

7 **Abstract**

8 A series of copper sulfide (Cu_7S_4) nanowire arrays were prepared via a solid-gas reaction on Si and
9 indium tin oxide (ITO)-coated glass substrates. The characterization of the Cu_7S_4 nanowire arrays was
10 performed using scanning electron microscopy, X-ray diffraction, transmission electron microscopy,
11 and diffuse reflectance spectroscopy. The nanowires on the Si wafer were orthorhombic and
12 monoclinic Cu_7S_4 , which were thin and straight, whereas the nanowires on ITO-coated glass were
13 monoclinic Cu_7S_4 , had a bigger diameter, and were bent. Although the average light absorption of
14 Cu_7S_4 nanowire arrays on Si and ITO-coated glass substrates is lower than that of the Cu_2S nanowire
15 arrays grown directly on Cu foil, the light absorption of the nanowire arrays on the Si and ITO-coated
16 glass substrates remains high (59% and 84%, respectively) across a wide range of wavelengths. The
17 light absorption and composition of the nanowire arrays can be adjusted by changing the thickness of
18 the precursor Cu film. Our results demonstrate that copper sulfide nanowire arrays could potentially be
19 applied in photovoltaics.

20 Keywords: Copper sulfide nanowire arrays; synthesis; solid-gas reaction; light absorption

21 **1. Introduction**

Download English Version:

<https://daneshyari.com/en/article/10148003>

Download Persian Version:

<https://daneshyari.com/article/10148003>

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