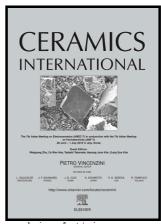
### Author's Accepted Manuscript

Incorporation of carbon nanotube and graphene in ZnO nanorods-based hydrogen gas sensor

Wen Chang Huang, Hsin Jie Tsai, Tien Chai Lin, Wei Chih Weng, Yu Cheng Chang, Jo Lun Chiu, Jing Jenn Lin, Chia Feng Lin, Yung Sen Lin, Hsiang Chen



www.elsevier.com/locate/ceri

PII: S0272-8842(18)30877-0

DOI: https://doi.org/10.1016/j.ceramint.2018.04.018

Reference: CERI17935

To appear in: Ceramics International

Received date: 23 January 2018 Revised date: 3 April 2018 Accepted date: 3 April 2018

Cite this article as: Wen Chang Huang, Hsin Jie Tsai, Tien Chai Lin, Wei Chih Weng, Yu Cheng Chang, Jo Lun Chiu, Jing Jenn Lin, Chia Feng Lin, Yung Sen Lin and Hsiang Chen, Incorporation of carbon nanotube and graphene in ZnO nanorods-based hydrogen gas sensor, *Ceramics International*, https://doi.org/10.1016/j.ceramint.2018.04.018

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 galley proof before it is published in its final citable 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.

#### **ACCEPTED MANUSCRIPT**

# Incorporation of carbon nanotube and graphene in ZnO nanorods-based hydrogen gas sensor

Wen Chang Huang<sup>a</sup>, Hsin Jie Tsai<sup>b</sup>, Tien Chai Lin<sup>c</sup>, Wei Chih Weng<sup>b</sup>, Yu Cheng Chang<sup>b</sup>, Jo Lun Chiu<sup>b</sup>, Jing Jenn Lin<sup>b</sup>, Chia Feng Lin<sup>d</sup>, Yung Sen Lin<sup>e</sup>, Hsiang Chen<sup>b\*</sup>,

<sup>a</sup>Department of Electro-Optical Engineering, Kun Shan University, Taiwan, ROC

<sup>b</sup> Department of Applied Materials and Optoelectronic Engineering, National Chi Nan University, Taiwan, ROC

<sup>c</sup> Department of Electrrical Engineering, Kun Shan University, Taiwan, ROC

<sup>d</sup>Department of Materials Science and Engineering, National Chung Hsing University, Taichung, 402, Taiwan.

<sup>e</sup>Department of Photonics, Feng Chia University, 100, Wenhwa Road, Seatwen, Taichung, 40724, Taiwan

\*Electronic mail: hchen@ncnu.edu.tw. Tel.: 886-49-2910960. Fax: 886-49-2912238.

#### Abstract

In this study, ZnO nanorods (NRs) were grown using solgel/hydrothermal methods on SiO<sub>2</sub>, carbon nanotube (CNT)/SiO<sub>2</sub>, and graphene/SiO<sub>2</sub> substrates to form hydrogen gas sensing chips. Results indicate that ZnO NRs/CNT/SiO<sub>2</sub> structures exhibited better H<sub>2</sub> sensing performance than the other two types of ZnO NRs-based structures. Furthermore, multiple electrical and material characterizations show that ZnO NRs/CNT/SiO<sub>2</sub> structures had a stronger (002) crystalline phase, with nanorod fusion near the bottom, and more oxygen-related defects. Owing to their small size, simple fabrication, and low cost, the ZnO NRs/CNT/SiO<sub>2</sub>based H<sub>2</sub> gas sensors are promising for future industrial H<sub>2</sub> sensing applications.

#### Download English Version:

## https://daneshyari.com/en/article/7886907

Download Persian Version:

https://daneshyari.com/article/7886907

<u>Daneshyari.com</u>