

Accepted Manuscript

Effect of structure morphologies on hydrogen gas sensing by ZnO nanotubes

Kyo-Sang Choi, Sung-Pil Chang

PII: S0167-577X(18)31062-0
DOI: <https://doi.org/10.1016/j.matlet.2018.07.031>
Reference: MLBLUE 24597

To appear in: *Materials Letters*

Received Date: 25 May 2018
Revised Date: 9 July 2018
Accepted Date: 9 July 2018

Please cite this article as: K-S. Choi, S-P. Chang, Effect of structure morphologies on hydrogen gas sensing by ZnO nanotubes, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.07.031>

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 structure morphologies on hydrogen gas sensing by ZnO nanotubes

Kyo-Sang Choi, Sung-Pil Chang*

*Department of Electronic Engineering, Inha University, 100 Inha-ro, Nam-gu, Incheon 22212,
Republic of Korea*

Abstract

Surface area is an important factor in a nanostructured material based gas sensor. A nanotube has outer as well as inner surfaces, and sensing response can be improved to adopt nanotubes as a gas sensor. Owing to extremely high aspect ratio of the nanotubes, it is difficult for gas molecules to seep into the nanotube; as a result, the sensing response of the nanotube sensor decreases. To improve this problem, porous structured nanotubes are synthesized in this study. Sputtering process is performed on PVA nanowire sacrificial templates with various sputtering power, and the sputtering durations are adjusted to fix the thickness of the nanotube wall to 30 nm. Nonporous ZnO nanotube, porous ZnO nanotube, and porous ZnO film samples are prepared through these procedures. Hydrogen sensing response is examined to study the effects of the morphologies of the nanotubes. The results of these experiments show that the sensing response is improved by 2.5 and 4.2 times as the morphology of the sensor is changed to porous structured ZnO nanotube from nonporous ZnO nanotube or porous ZnO film, respectively. In this study, the morphologies of the nanostructures of these

* Corresponding author. Tel.: +82 32 860 7422; Fax: +82 32 868 3654

E-mail address: spchang@inha.ac.kr (S.-P. Chang)

Download English Version:

<https://daneshyari.com/en/article/8012352>

Download Persian Version:

<https://daneshyari.com/article/8012352>

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