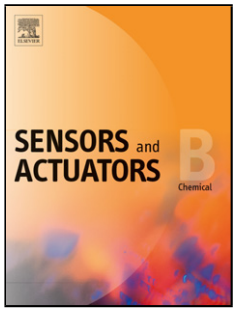
Accepted Manuscript



Title: SnO_2 (*n*)-NiO (*p*) composite nanowebs: gas sensing properties and sensing mechanisms

Authors: Jae-Hun Kim, Jae-Hyoung Lee, Ali Mirzaei, Hyoun Woo Kim, Sang Sub Kim

PII: S0925-4005(17)32194-9
DOI: https://doi.org/10.1016/j.snb.2017.11.063
Reference: SNB 23557

To appear in: *Sensors and Actuators B*

Received date: 10-7-2017
Revised date: 6-10-2017
Accepted date: 14-11-2017

Please cite this article as: Jae-Hun Kim, Jae-Hyoung Lee, Ali Mirzaei, Hyoun Woo Kim, Sang Sub Kim, SnO2 (n)-NiO (p) composite nanowebs: gas sensing properties and sensing mechanisms, Sensors and Actuators B: Chemical https://doi.org/10.1016/j.snb.2017.11.063

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.

ACCEPTED MANUSCRIPT

SnO_2 (*n*)-NiO (*p*) composite nanowebs: gas sensing properties and sensing mechanisms

Jae-Hun Kim[a], Jae-Hyoung Lee[a], Ali Mirzaei[b], Hyoun Woo Kim[b,c,*], Sang Sub Kim[a,*]

[a]*Department of Materials Science and Engineering, Inha University, Incheon 22212, Republic of Korea*

[b]*The Research Institute of Industrial Science, Hanyang University, Seoul 04763, Republic of Korea*

[c]*Division of Materials Science and Engineering, Hanyang University, Seoul 04763, Republic of Korea*

---

[*]Corresponding authors.

E-mail address: sangsub@inha.ac.kr (S.S. Kim). hyounwoo@hanyang.ac.kr (H.W.Kim).

Highlights

- We optimized SnO_2-NiO nanocomposite sensors for detection of hazardous gases
- Depending on the composition, SnO_2-NiO composite nanowebs showed either n-type or p-type behavior
- The p-n junctions, NiO with high oxygen adsorption capability, and crystallographic defects generated by possible substitution of Ni^{+2} in Sn^{+4} were the main reasons for the efficient sensing

ABSTRACT

Aiming to optimize SnO_2-NiO nanocomposite sensors for detection of hazardous gases, a series of $xSnO_2$-(1-x) NiO composite nanowebs with different compositions (x=0.1, 0.3, 0.5, 0.7, and 0.9) were synthesized using an electrospinning process. The formation of long and continuous SnO_2-NiO nanowebs was verified. Depending on the composition, $xSnO_2$-(1-x) NiO composite nanowebs showed either n-type (SnO_2-rich composition) or p-type (NiO-rich composition) gas-sensing behavior. The best sensing performance was

Download English Version:

https://daneshyari.com/en/article/7141077

Download Persian Version:

https://daneshyari.com/article/7141077

Daneshyari.com