

2015년 韓國센서學會 綜合學術大會 論文集

제 26 권 제 1 호

www.sensors.or.kr



- 일시 : 2015년 11월 13일(금) ~ 14일(토)
- 장소 : 포항공과대학교 국제관
- 주최 : (사)한국센서학회
- 주관 : 포항공과대학교
- 후원 : 한국과학기술단체총연합회
- 공동주최 : 경북대학교 기능성소자융합플랫폼연구센터
경북대학교 반도체융합기술연구원



사단 한국센서학회
법인 THE KOREAN SENSORS SOCIETY

P5-14	Highly Sensitive and Selective Methyl benzenes Sensors using Pd-loaded Co ₃ O ₄ Hollow Hierarchical Nanostructures Jae-Hyeok Kim, Su-Jin Hwang, Kwon-Il Choi, Ji-Wook Yoon, Yun Chan Kang, Jong-Heun Lee <i>Korea University</i>98	98
P5-15	Chemiresistive E-Nose based on Metal Oxide Nanostructures for Detection of Hazardous Gases Hi Gyu Moon ¹⁾ , Soo Deok Han ^{1,2)} , Youngmo Jung ³⁾ , Chulki Kim ³⁾ , Seok Lee ³⁾ , and Chong-Yun Kang ^{1,2)*} ¹⁾ KIST, ²⁾ KU-KIST99	99
P5-16	Electrospun CuO-loaded In ₂ O ₃ nanofiber sensors assisted by pulse heating for ultrasensitive and ultrasensitive detection of H ₂ S Seong-Yong Jeong ¹⁾ , Xisuang Liang ¹⁾ , Tae-Hyung Kim ¹⁾ , Ji-Wook Yoon ¹⁾ , Chang-Hoon Kwak ¹⁾ , and Jong-Heun Lee ¹⁾ <i>Korea University</i>100	100
P5-17	Effects of thickness on the H ₂ S sensing properties of SnO ₂ thin-film using Ion sputtering Joong Hee Ahn ¹⁾ , Soo Chool Lee ²⁾ , Byung wook Hwang ¹⁾ , Seong Yeol Kim ¹⁾ , Suk Yong Jung ²⁾ , Duk Dong Lee ³⁾ , Jeung Soo Huh ⁴⁾ , Jae Chang Kim ^{1),†} <i>Kyungpook National University</i>101	101
P5-18	Selective H ₂ S gas sensing characteristics of noble metal doped NiO nano-structure Yun-Jin Jeong, C. Balamurugan and Dong-Weon Lee [†] <i>Chonnam National University</i>103	103
P5-19	Synthesis of Au-decorated hematite nanotube films for high performance gas sensors Do Hong Kim ¹⁾ , and Jong-Heun Lee ^{1),†} and Ho Won Jang ^{2),†} ¹⁾ Korea University, ²⁾ Seoul National University104	104

Biosensors and Bioanalytic Systems

P6-01	Fabrication of plasmonic biosensor using transfer printing Joo-Yun Jung ^{1),†} <i>Korea Institute of Machinery & Materials</i>105	105
P6-02	Measurement of the compressive loading using FSR sensor in bioreactor Hoon-Jin Jeong ¹⁾ , Nae-Woon Kang ²⁾ and Seung-Jae Lee ^{2),†} <i>Wonkwang University</i>106	106
P6-03	Metal Microneedle-based Multi-channel Interface for Biosignal Measurement Minjae Kim ¹⁾ , Taewan Kim ¹⁾ , Dong Sung Kim ¹⁾ , and Wan Kyun Chung ^{1),†} <i>Pohang University of Science and Technology(POSTECH)</i>107	107

Selective H₂S gas sensing characteristics of noble metal doped NiO nano-structure

Yun-Jin Jeong, C. Balamurugan and Dong-Weon Lee

MEMS and Nanotechnology Laboratory, School of Mechanical Engineering, Chonnam National University, Gwangju 500757, Republic of Korea

E-mail: mems@jun.ac.kr

Abstract

Semiconductor based gas sensors will be defined as “a device which provides an electrical output in response to the change in concentration of a gas”. Gas sensors based on semiconductor metal oxides focused numerous research efforts during the last few years. Among the various semiconductor, NiO based semiconductor has taken much attention because of its special properties and its various applications. In this work, we report for the first time semiconducting nano-structured NiO and Pd-doped NiO sensor with high sensitivity and excellent selectivity for H₂S gas was synthesized by the chemical method. Related structural and electrical properties of pure and different wt% Pd-doped NiO sensor materials were studied used to XRD, XPS, SEM, EDX, BET/BJH. Finally the sensing properties of pure and different wt% Pd-doped NiO sensor materials were analyzed by measuring the change in resistance of the sensor material in the presence of reducing gas such as H₂S, CO, LPG and ethanol. The 5 wt% Pd doped NiO based sensor showed a maximum response to 20 ppm H₂S (93%) at an operating temperature of 60 °C compare to other interfering gas.

Keywords: gas sensor, p-type semiconductor, Pd-doped NiO nano-structure, H₂S gas

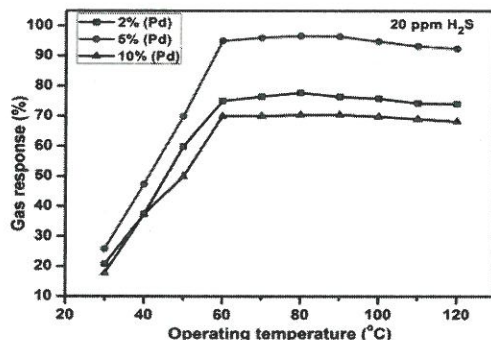


Figure 1. Pd-doped NiO based sensor response for H₂S at operating temperature.

ACKNOWLEDGEMENTS

This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (No. 2015R1A4A1041746) and the National Research Foundation (NRF) grant (No.2015R1A2A2A05001405) funded by the Korea government.

References

- [1] Y.G. Yu, D.K. Ning, L.J. Qian, " first-principle calculation of H₂S adsorption and decomposition on the ZnO (0001) surface ", *Chinese J. Struct. Chem.*, Vol. 29, pp. 1139-1146, 2010.
- [2] D.D. Vuong, G. Sakai, K. Shimano, N. Yamazoe, " Hydrogen sulfide gas sensing properties of thin films derived from SnO₂ sols different in grain size ", *Sens. Actuators B: Chem.*, Vol. 105, pp. 437-342, 2005.