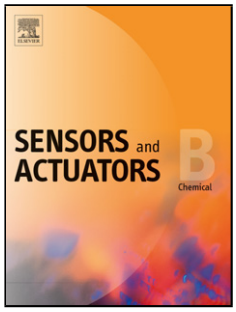
Accepted Manuscript



Title: *p*-CoO_x/*n*-SnO_2 nanostructures: New highly selective materials for H_2S detection

Authors: M.N. Rumyantseva, S.A. Vladimirova, N.A. Vorobyeva, I. Giebelhaus, S. Mathur, A.S. Chizhov, N.O. Khmelevsky, A. Yu. Aksenenko, V.F. Kozlovsky, O.M. Karakulina, J. Hadermann, A.M. Abakumov, A.M. Gaskov

PII: S0925-4005(17)31520-4
DOI: http://dx.doi.org/doi:10.1016/j.snb.2017.08.096
Reference: SNB 22963

To appear in: *Sensors and Actuators B*

Received date: 11-2-2017
Revised date: 18-7-2017
Accepted date: 10-8-2017

Please cite this article as: M.N.Rumyantseva, S.A.Vladimirova, N.A.Vorobyeva, I.Giebelhaus, S.Mathur, A.S.Chizhov, N.O.Khmelevsky, A.Yu.Aksenenko, V.F.Kozlovsky, O.M.Karakulina, J.Hadermann, A.M.Abakumov, A.M.Gaskov, p-CoOx/n-SnO2 nanostructures: New highly selective materials for H2S detection, Sensors and Actuators B: Chemicalhttp://dx.doi.org/10.1016/j.snb.2017.08.096

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

p-CoO_x/*n*-SnO_2 nanostructures: new highly selective materials for H_2S detection

M.N. Rumyantseva[a],[*], S.A. Vladimirova[a], N.A. Vorobyeva[a], I. Giebelhaus[b], S. Mathur[b], A.S. Chizhov[a], N.O. Khmelevsky[c], A.Yu. Aksenenko[c], V.F. Kozlovsky[a], O.M. Karakulina[d], J. Hadermann[d], A.M. Abakumov[d,e], A.M. Gaskov[a]

[a]*Chemistry Department, Moscow State University, Moscow 119991 Russia*

[b]*Institute of Inorganic Chemistry, University of Cologne, D-50939 Cologne, Germany*

[c]*LISM, Moscow State Technological University Stankin, 127055 Moscow, Russia*

[d]*EMAT, University of Antwerp, B-2020 Antwerp, Belgium*

[e]*Skolkovo Institute of Science and Technology, 143026 Moscow, Russia*

[*] Corresponding author. Tel: +7 495 939 54 71, Fax: +7 495 939 09 98. E-mail address: roum@inorg.chem.msu.ru

Highlight

- Nanostructures *p*-CoO_x/*n*-SnO_2 designed for selective H_2S detection
- Tuning of sensor properties is based on catalytic activity of cobalt oxides
- Removal of *p* – *n* junction provides excellent selectivity of CoO_x/SnO_2 in H_2S detection

Abstract

Nanostructures *p*-CoO_x/*n*-SnO_2 based on tin oxide nanowires have been prepared by two step CVD technique and characterized in detail by XRD, XRF, XPS, HAADF-STEM imaging and EDX-STEM mapping. Depending on the temperature of decomposition of cobalt complex during the second step of CVD synthesis of nanostructures cobalt oxide forms a coating and/or isolated nanoparticles on SnO_2 nanowire surface. It was found that cobalt presents in +2 and +3 oxidation states. The measurements of gas sensor properties have been carried out during exposure to CO (14 ppm), NH_3 (21 ppm), and H_2S (2 ppm) in dry air. The opposite trends were observed in the

Download English Version:

https://daneshyari.com/en/article/7141971

Download Persian Version:

https://daneshyari.com/article/7141971

Daneshyari.com