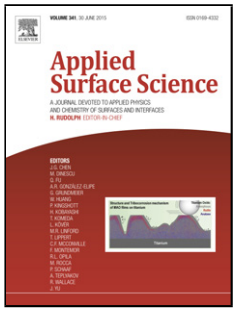
Accepted Manuscript



Title: Synthesis of La_2O_3 doped Zn_2SnO_4 hollow fibers by electrospinning method and application in detecting of acetone

Authors: H.M. Yang, S.Y. Ma, G.J. Yang, Q. Chen, Q.Z. Zeng, Q. Ge, L. Ma, Y. Tie

PII: S0169-4332(17)32063-9
DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2017.07.073
Reference: APSUSC 36607

To appear in: *APSUSC*

Received date: 23-4-2017
Revised date: 9-6-2017
Accepted date: 10-7-2017

Please cite this article as: H.M.Yang, S.Y.Ma, G.J.Yang, Q.Chen, Q.Z.Zeng, Q.Ge, L.Ma, Y.Tie, Synthesis of La2O3 doped Zn2SnO4 hollow fibers by electrospinning method and application in detecting of acetone, Applied Surface Sciencehttp://dx.doi.org/10.1016/j.apsusc.2017.07.073

Synthesis of La_2O_3 doped Zn_2SnO_4 hollow fibers by electrospinning method and application in detecting of acetone

H.M. Yang[a], S.Y. Ma[a,*], G.J. Yang[a], Q. Chen[a, b], Q. Z. Zeng[a], Q. Ge[a], L. Ma[a], Y. Tie[a]

[a]*Key Laboratory of Atomic and Molecular Physics & Functional Materials of Gansu Province, College of Physics and Electronic Engineering, Northwest Normal University, Lanzhou 730070, China*

[b]*College of Electric Engineering, Key Laboratory for Electronic Materials of the State Ethnic Affairs Commission of PRC, Northwest University for Nationalities, Lanzhou, Gansu, 730030, PR China*

[*] Corresponding author: S.Y. Ma Tel.: +86 13893422608 Fax: +86 9317971503

E-mail address: 13893332475@163.com (S.Y. Ma)

Highlights

- Hollow porous pure and La doped Zn_2SnO_4 nanofibers were synthesized by single capillary electrospinning technology.
- The sample exhibits excellent response to acetone at the low operating temperature of 200°C.
- The sensor with rapidly response time (7 s) and recovery time (9 s).

Abstract:

Hollow porous pure and La_2O_3 doped Zn_2SnO_4 fibers were synthesized via single capillary electrospinning technology and used for obtaining of gas sensors. The as-prepared samples were characterized by microscopy, Brunauer–Emmett–Teller, X-ray photoelectron spectroscopy and UV-vis absorption spectra. The newly obtained gas sensors were investigated for acetone detection. Compared with pure Zn_2SnO_4 hollow fibers, the La_2O_3 doped Zn_2SnO_4 hollow fibers not only exhibited perfect sensing performance toward acetone with excellent selectivity, high response and fast response/recovery capability (7 s for adsorption and 9 s for desorption), but also the operating temperature was reduced from 240℃ to 200℃. These results demonstrated that the special hollow porous La doped Zn_2SnO_4 fibers structures were