

Fabrication and photoluminescence properties of ZnS nanoribbons and nanowires

Dai N.X., Long D.T., Long N.N., Hien N.T.T.

Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan, Hanoi, Viet Nam

Abstract: Zinc-sulfide (ZnS) nanoribbons and nanowires were fabricated via thermal evaporation of ZnS powder using a gold catalyst. The ZnS nanoribbons had thicknesses of about 100 nm, lateral dimensions of several micrometers and lengths of hundreds to thousands of micrometers. The ZnS nanowires have diameters of 200 nm and lengths of thousands of micrometers. The photoluminescence of the as-synthesized ZnS nanostructures in temperature range from 15 K to room temperature was investigated. We observed two groups of lines, one in the ultraviolet (UV) and one in the visible regions of the photoluminescence spectrum, at 15 K for the ZnS nanoribbons and nanowires. The UV lines were located at 3.777 eV (328.3 nm), 3.735 eV (332.0 nm), 3.699 eV (335.2 nm), 3.657 eV (339.0 nm), 3.618 eV (342.7 nm), 3.573 eV (347.0 nm) and 3.391 eV (365.6 nm). The visible lines were located at 3.024 eV (410.0 nm), 2.842 eV (436.3 nm) and 2.450 eV (506.1 nm). The origins of these emission lines will be discussed.

Author Keywords: Luminescence; Nanomaterials; Optical property; ZnS nanowires

Year: 2008

Source title: Journal of the Korean Physical Society

Volume: 52

Issue: 5

Page : 1530-1533

Link: [Scopus Link](#)

Correspondence Address: Dai, N. X.; Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan, Hanoi, Viet Nam

ISSN: 3744884

Language of Original Document: English

Abbreviated Source Title: Journal of the Korean Physical Society

Document Type: Article

Source: Scopus

Authors with affiliations:

- Dai, N.X., Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan, Hanoi, Viet Nam
- Long, D.T., Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan, Hanoi, Viet Nam
- Long, N.N., Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan, Hanoi, Viet Nam
- Hien, N.T.T., Faculty of Physics, Hanoi University of Science, Vietnam National University, 334 Nguyen Trai, Thanh Xuan,

Hanoi, Viet Nam

References:

- Pan, Z.W., Dai, Z.R., Wang, Z.L., (2001) *Science*, 291, p. 1947
- Huang, M.H., Mao, S., Feick, H., Yan, H.Q., Wu, Y.Y., Kind, H., Weber, E., Yang, P.D., (2001) *Science*, 292, p. 1897
- Xiong, Q., Chen, G., Acord, J.D., Liu, X., Zengel, J.J., Gutierrez, H.R., Redwing, J.M., Eklund, P.C., (2004) *Nano Letters*, 4, p. 1663
- Kar, S., Biswas, S., Chaudhuri, S., (2005) *Nanotechnology*, 16, p. 737
- Geng, B.Y., Liu, X.W., Du, Q.B., Wei, X.W., (2006) *Appl. Phys. Lett*, 88, p. 163104
- Kar, S., Chaudhuri, S., (2005) *Chem. Phys. Lett*, 414, p. 40
- Meng, X.M., Liu, J., Jiang, Y., Chen, W.W., Lee, C.S., Bello, I., Lee, S.T., (2003) *Chem. Phys. Lett*, 382, p. 434
- Zhang, J., Yang, Y., Jiang, F., Li, J., Xu, B., Wang, X., Wang, S., (2006) *Nanotechnology*, 17, p. 2695
- Aven, M., Prener, J.S., (1967) *Physics and Chemistry of II- VI Compounds*, , North-Holland Publishing Company, Amsterdam
- Voronov, Y.V., (1969), Ph.D Dissertation, Lebedev Institute of Physics