

Abstract Submitted
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Synthesis and Optical Properties of Boron Nitride Nanotubes, Nanowires and Nanorods YING CHEN, HUA CHEN, JUN YU, HONGZHOU ZHANG, Research School of Physical Sciences and Engineering, The Australian National University, Canberra, Australia — Quasi-one-dimensional boron nitride nanomaterials such as BN nanotubes, BN nanowires, BN nanorods, and BN whiskers have different nanostructures but uniform electronic band gaps independent of their diameters and chiralities. Their quantum confinement effects in these low dimensional materials can enhance their optical emission substantially by inducing an indirect-to-direct conversion of the optical transition. Different nanostructures and dimensions have different emission behaviors. Therefore, one-dimensional BN nanomaterials are likely to find further applications in optoelectronics. We have achieved controlled and patterned growth of the BN nanotubes [1,2], BN nanowires [3,4] and conical boron nitride nanorods [5, 6] and investigated their optical properties including photoluminescence, cathodoluminescence and Raman spectroscopy. Relationships between the different nanostructures and corresponding properties will be discussed. [1] J. Yu, Y. Chen, et al., Chemistry of Materials, 17 (2005) 5172. [2] H. Chen, Y. Chen, et al. Chemical Physics Letters 42(2006) 315. [3] YJ Chen, H. Zhang, Y. Chen, Nanotechnology, 17 (2006) 786. [4] YJ Chen, et al., Nanotechnology, 17 (2006) 2942 [5] H. Zhang, et al., Physical Review B, 74 (2006) 045407 [6] H. Zhang, et al., Applied Physics letters, 88 (2006)093117.

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