

Characterization of Individual Zincoxide Nano-belts by using X-Ray Nano-Diffraction Technique

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Nano-structures, such as wires, rods, belts and tubes, whose lateral dimensions fall in the range of 1 to 100 nm, have received growing interests due to their outstanding proprieties and their potential applications in electronic and biological fields. The development of these new structures into future nano-devices crucially depends on the development of new characterization techniques and theoretical models for a fundamental understanding of the relationship between the structure and properties [1].

X-ray diffraction technique has been successfully applied for characterization of bulk or powder nano-structured materials, where useful information, such as crystallite size distribution, crystallite shapes and lattice defects were evaluated from the X-ray pattern. In those cases the determined quantities are characteristic to a large volume of sample.

In the present case the X-ray diffraction technique was employed for characterization of individual nano-belts. The measurements of X-ray diffraction lines from a single nano-belt were achieved by using the unique nano-diffraction technique described in [2]. The results were compared with those obtained from SEM/TEM.

[1] Zhao M. H., Wang Z.L., Mao S. X., *Nano Letters*, 2004, **4**, 587. [2] Xiao Y., Cai Z., Wang Z. L., Lai B., Chu Y. S., *J. Synchr. Rad.*, 2005, **12(2)**, 124.

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