Synthesis and characterization of ZnO particles in the nanoscale regime

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Abstract:

ZnO nanoparticles have been successfully prepared by using $Zn(NO_3).6H_2O$, NaOH and sodium dodecyl sulfate as a surfactant at 100°C for 4 h. The microstructure of ZnO nanoparticles was examined by means of scanning electron microscopy (SEM). X-ray diffraction (XRD) and FTIR analysis confirmed the single crystalline struct ure of the ZnO nanoparticles. Rietveld analysis was used successfully to refine and derive the ZnO structural parameters. The average diameter was estimated in the range of 20-23 nm from X-ray and high resolution transmission electron microscopy (HRTEM) measurements. The effect of ultrasonic irradiation on the diameter and crystallinity of ZnO nanoparticles has been examined.

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