

Normality Effect on Characterization of Chemically Synthesized ZnO Nanoparticles

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Abstract: The current research activities that focus on the preparation of ZnO nanostructure material and their physical and optical properties characterization. ZnO nanoparticles were synthesized using sol-gel chemical precipitation technique with zinc acetate and sodium hydroxide in distilled water as a starting materials. Stock solutions of zinc acetate and sodium hydroxide at different normality (0.10N, 0.25N, 0.50N, 0.75N and 1N) were used for preparation of ZnO's. Synthesized sample of ZnO precipitate was dried at ordinary temperature for 12 hours and calcined at 100°C for 2 hours and were physically characterized by using XRD (X-ray diffraction), SEM (scanning electron microscope) and FTIR spectroscopy. The XRD spectra exhibit wurtzite hexagonal crystal structure. The particle size statistically estimated from XRD data show that the ZnO samples consist of nanosize particles. The optical properties of ZnO nanoparticles was studied by using UV-visible absorption and PL (photoluminescence). The effect of normality of different precursors used in preparation of ZnO nanoparticles, on spectroscopic characterizations was investigated. UV-Visible spectra give blue luminescence near band edge. PL exhibits green luminescence that suggest surface defect due to oxygen vacancies effect in ZnO nanoparticles.

Keywords: ZnO nanoparticles, N-normality, XRD, SEM, FTIR, UV (Visible absorption), PL (photoluminescence)

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