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Synthesis and Characterization of spinel type Zinc Ferrite for possible application in gas sensing

Thursday, 28 June 2018 15:00 (2 hours)

Spinel ferrite nanomaterials have attracted a lot of attention in chemical gas sensing due to their tuneable electronic and magnetic properties through the variation of cation distribution. Cation distribution, structural morphologies and particle size has become of great interest in gas sensing as they enhance the sensing properties of spinel ferrites. Morphological control heavily depends on the synthesis parameters of different synthesis methods. In this study, we prepared ZnFe2O4 nanoparticles through electrospinning and microwave-assisted hydrothermal methods using metal nitrates as starting precursors, PVP and CTAB as a capping agents, distilled water and ethanol as solvents. X-ray diffraction (XRD) revealed spinel type phase purity. The particle size was estimated using the Scherrer's equation and lattice parameter calculated using reciprocal lattice metric tensor equations. Scanning electron microscopy (SEM) images showed the formed nanofibers and mesoporous nanoparticles with a good surface area identified by BET. Characterization results show good possibilities of gas sensing application and various parameters can be tuned for optimum sensing properties.

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