

Preparation and Characterization of Nanometric Ni-Zn Ferrite via Different Methods

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Abstract : The aim of the presented study was the possibility of developing a nanosized material with enhanced structural properties that was suitable for many applications. Nanostructure ferrite of composition $\text{Ni}_{0.5} \text{Zn}_{0.5} \text{Cr}_{0.1} \text{Fe}_{1.9} \text{O}_4$ were prepared by sol-gel, co-precipitation, citrate-gel, flash and oxalate precursor methods. The Structural and micro structural analysis of the investigated samples were carried out. It was observed that the lattice parameter of cubic spinel was constant, and the positions of both tetrahedral and the octahedral bands had a fixed position. The values of the lattice parameter had a significant role in determining the stoichiometric cation distribution of the composition. The average crystalline sizes of the investigated samples were from 16.4 to 69 nm. Discussion was made on the basis of a comparison of average crystallite size of the investigated samples, indicating that the co-precipitation method was the effective one in producing small crystallite sized samples.

Keywords : chemical preparation, ferrite, grain size, nanocomposites, sol-gel

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