

Synthesis, Structural and Magnetic Properties of CdFe₂O₄ Ferrite

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Abstract : Nanoparticles of CdFe₂O₄ with particle size of about 10 nm have been synthesized by high energy ball milling and co-precipitation processes. The synthesis route appears to have some effects on the properties. The compounds have been characterized by X-ray diffraction, Fourier Transform Infrared (FTIR), transmission electron microscopy (TEM), Mössbauer and magnetization measurements. The XRD pattern of CdFe₂O₄ provides information about single-phase formation of spinel structure with cubic symmetry. The FTIR measurements between 400 and 4000 cm⁻¹ indicate intrinsic cation vibration of the spinel structure. The Mössbauer spectra were recorded at 4 K and 300 K. The hyperfine fields appear to be highly sensitive on particle size. The evolution of the properties as a function of particle size is also presented.

Keywords : ferrite, nanoparticles, magnetization, Mössbauer

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