

Effect of Fabrication Method on the Structural and Magnetic Properties of Copper Ferrite

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Copper ferrites (CuFe_2O_4) were fabricated by self-combustion urea and glycine process (UNP, GNP), polymerized complex (PC), solid-state reaction (SSR), and molten-salt (MS) methods. The synthesized powders were calcined in static air at different temperature from 500 – 900°C. The effects of the fabrication method on the microstructural and magnetic properties were investigated. X-ray diffraction (XRD) analysis results revealed the cubic CuFe_2O_4 spinel structure for UNP and MS samples and tetragonal CuFe_2O_4 spinel structure for GNP, PC, and SSR samples. Scanning electron microscopy (SEM) investigation showed that the synthesized ferrite is made up of very fine nanoparticles. By using vibrating sample magnetometer (VSM) technique, a significant change in the magnetic properties was observed in CuFe_2O_4 system with fabrication method and heat treatment. The magnetic hysteresis loops measured at room temperature showed that the saturation magnetization increases with increasing calcinations temperature, whereas the coercivity values decrease.

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