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# Synthesis characterization and magnetic properties of Cr-substituted NiCuZn nanocrystalline ferrite

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### ABSTRACT

Egg-white method was used to produce nanocrystalline Cr-substituted NiCuZn ferrites;  $\text{Ni}_{0.50}\text{Cu}_{0.25}\text{Zn}_{0.25}\text{Fe}_{2-x}\text{Cr}_x\text{O}_4$  ( $0.0 \leq x \leq 1.0$ ) from stoichiometric mixture of their respective metal nitrate. The structural, morphological and magnetic properties of the products were determined by X-ray powder diffractometry (XRD), Fourier transform infrared spectroscopy (FT-IR), transmission electron microscopy (TEM) and vibrating sample magnetometer (VSM). The average crystallite sizes obtained from XRD were between 15 and 25 nm. Magnetization measurements indicated that when the Cr substitution increases the saturation magnetization decreases due to the magnetic character of the chromium ions which prefers octahedral site occupation. The coercivity was found to change proportionally with the particle sizes of the investigated ferrites.

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