**Elucidation of Structural and Morphological Properties of Cu0.6Ni0.4Fe2O4 Ferrite**

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**Abstract**

Solid state reaction has been used successfully to prepare the spinel ferrite Cu0.6Ni0.4Fe2O4. The cubic structure of the sample was discovered by XRD crystal structure analyses. The Rietveld Refinement was used to further refine the XRD spectra, and all of the structure-related data were acquired, confirming the cubic (Fd3m) structure. The calculated particle size was 91 nm. Five active Raman modes were visible in the Raman spectra, confirming the spinel structure. Raman analysis of the produced samples provided evidence of the lattice structure. Employing Fourier transform infrared (FTIR) spectroscopy, the sample formation was further confirmed. Energy dispersive analysis of X-rays (EDAX) and analysis of field emission scanning electron microscopy (FESEM) were used, respectively, to verify the compositional and morphological analyses.

**Keywords:** Spinel Ferrites, crystal structure, Rietveld refinement, Microstructure

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