

Synthesis and structural analysis of $\text{Ni}_{0.45}\text{Cu}_{0.55}\text{Mn}_2\text{O}_4$ by Williamson–Hall and size–strain plot methods

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Abstract. This paper describes synthesis and structural properties of $\text{Ni}_{0.45}\text{Cu}_{0.55}\text{Mn}_2\text{O}_4$ nanopowder, obtained by co-precipitation route. XRD pattern reveals cubic structure with lattice parameter 8.305 Å. We report crystallite size (D), micro strain (ϵ), dislocation density (ρ_D), and hopping lengths (L_A and L_B). We also report preferential orientation by texture coefficients [T_c ($h k l$)]. The Williamson-Hall plot and stress-strain plot also employed to understand the mechanical properties of materials.

Keywords: $\text{Ni}_{0.45}\text{Cu}_{0.55}\text{Mn}_2\text{O}_4$, crystallite size (D), micro strain (ϵ), dislocation density (ρ_D), texture coefficients.

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