

Study of magnetic and electrical properties of lithium-magnesium ferrites

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A series of polycrystalline spinel type ferrites with composition $\text{Li}_x\text{Mg}_{0.5}\text{Ni}_{0.5-2x}\text{Fe}_{2+x}\text{O}_4$, where $x=0.00$ to 0.25 in steps of 0.05 , have been prepared by the conventional solid state reaction route. In this research, investigations have been carried out by the measurements of X-ray diffraction (XRD), Curie temperature, permeability, loss tangent, Q-factor, dielectric constant and ac electrical resistivity of the samples. Some measurements have been done at room temperature while other measurements have been done as a function of temperature and as a function of frequency in the range from 1 kHz to 500 kHz. Curie temperature, the real part of initial permeability (μ_i'), the loss tangent ($\tan\delta$), and the Q-factor have been found to be increase with the increase of Li-content of $\text{Li}_x\text{Mg}_{0.5}\text{Ni}_{0.5-2x}\text{Fe}_{2+x}\text{O}_4$ ferrites. The frequency characteristic of dielectric constant and AC resistivity decreases with the increase in frequency and Li-content.

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