

Resonance Measurements on Nickel-Cobalt Ferrites as a Function of Temperature and on Nickel Ferrite-Aluminates

J.E. Pippin and C.L. Hogan. "Resonance Measurements on Nickel-Cobalt Ferrites as a Function of Temperature and on Nickel Ferrite-Aluminates." 1958 Transactions on Microwave Theory and Techniques 6.1 (Jan. 1958 [T-MTT]): 77-82.

The variation of line width (ΔH) and effective g factor (g_{eff}) with cobalt content and with temperature is studied in a series of ferrites of composition $\text{Ni}_{1-\alpha}\text{Co}_{\alpha}\text{Mn}_{0.02}\text{Fe}_{1.9}\text{O}_{4\pm}$. Here α lies between 0 and 0.09; temperatures range from 20° to 340° C. A minimum in ΔH is observed at $\alpha=0.027$; g_{eff} decreases with increasing α . The temperature dependence of each is qualitatively that which would be expected on the basis of the temperature dependence of the anisotropy of the mixed ferrite. Above room temperature ΔH and g_{eff} increase or decrease, depending on the cobalt content. It is also shown that the shape of the resonance line is determined by the sign of the anisotropy constant. For negative K_1 the line is steeper on the low-field side of resonance--for positive K_1 it is steeper on the high-field side. Resonance data are presented on several nickel-cobalt ferrite-aluminates, of composition $\text{Ni}_{1-\alpha}\text{Co}_{\alpha}\text{Mn}_{0.02}\text{Fe}_{2-t}\text{Al}_t\text{O}_{4\pm}$, with α varying from 0 to 0.025 for $t=0.3, 0.4, 0.5$, and 0.6 . The reduction of ΔH and g_{eff} expected from anisotropy considerations is observed.

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