

Abstracts

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 ($g_{\text{sub eff}}$) with cobalt content and with temperature is studied in a series of ferrites of composition $\text{Ni}_{\text{sub 1-alpha}}\text{Co}_{\text{sub alpha}}\text{Mn}_{\text{sub 0.02}}\text{Fe}_{\text{sub 1.9}}\text{O}_{\text{sub 4}}$. Here α lies between 0 and 0.09; temperatures range from 20° to 340° C. A minimum in ΔH is observed at $\alpha=0.027$; $g_{\text{sub eff}}$ 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 $g_{\text{sub eff}}$ 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 $K_{\text{sub 1}}$ the line is steeper on the low-field side of resonance--for positive $K_{\text{sub 1}}$ it is steeper on the high-field side. Resonance data are presented on several nickel-cobalt ferrite-aluminates, of composition $\text{Ni}_{\text{sub 1-alpha}}\text{Co}_{\text{sub alpha}}\text{Mn}_{\text{sub 0.02}}\text{Fe}_{\text{sub 2-t}}\text{Al}_{\text{sub t}}\text{O}_{\text{sub 4}}$, with α varying from 0 to 0.025 for $t=0.3$, 0.4, 0.5, and 0.6. The reduction of ΔH and $g_{\text{sub eff}}$ expected from anisotropy considerations is observed.

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