

Abstract Submitted
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Determination of superconducting parameters of Gd-123 phase added with Co_2FeO_4 nano ferrite from Excess conductivity and magneto conductivity analysis ALY ABOU-ALY, NAYERA MOHAMMED, RAMADAN AWAD, Alexandria University, HUSSEIN MOTAWEH, DOAA BAKEER, Damanhur University — Excess conductivity and magneto conductivity data of the Gd-123 added with Co_2FeO_4 nano ferrite were analyzed in terms of Aslamazov–Larkin and Maki–Thompson models for layered superconductors. Co_2FeO_4 nano ferrite was prepared by Co-perceptions method with grain size of about 20 nm. The concentrations of Co_2FeO_4 nano ferrite were varied from 0.0 to 0.1 % wt. of the total sample's weight. The superconducting parameters such as superconducting transition temperature, coherence lengths along ab -plane and along c -direction at 0K and phase breaking time at 100 K were determined as a function of Co_2FeO_4 nano ferrite concentrations. The superconducting transition temperature decreased from 91.7 K to 79.3 K as Co_2FeO_4 nano ferrite concentrations increased from 0.0 to 0.1 % wt. of the total sample's weight, confirming with the decrease of phase breaking time at 100 K from 2.7×10^{-14} sec to 1.93×10^{-14} sec. The superconducting anisotropy parameter was calculated as a function of Co_2FeO_4 nano ferrite concentrations and its value varied from 6.7 to 8.3.

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