

GMR Effect in Co-Cu Microwires

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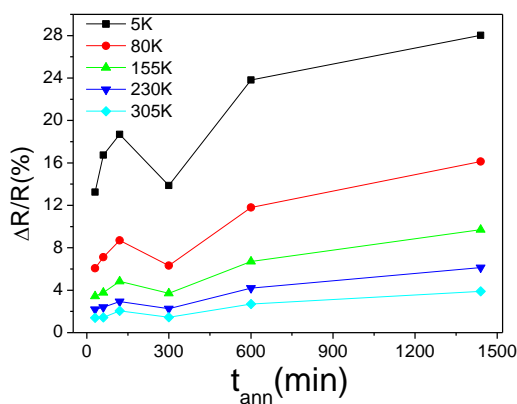
Abstract After discovery of giant magnetoresistance (GMR) in 1988 in magnetic multilayered films [1] many new materials with GMR have been developed. In particular GMR effect was found in granular materials consisting of small grains distributed inside a non-magnetic matrix [2,3]. Consequently granular materials usually formed by immiscible elements (Co, Fe, Ni)-(Cu, Pt, Au, Ag) attracted considerable attention since beginning of 1990-th [2,3]. Like in the case of multilayered thin films, GMR effect has been attributed to spin-dependent scattering of conduction electrons within the magnetic granules as well as at the interfaces between magnetic and nonmagnetic regions [2,3].

We prepared $\text{Cu}_{100-x}\text{Co}_x$ ($x=5,10,20$) glass-coated microwires using Taylor-Ulitovsky technique and studied the influence of annealing on structure and giant magnetoresistance (GMR) effect. We observed a significant increasing of the GMR effect in the samples annealed at 400 °C with long enough annealing time. Considerable enhancement of the GMR effect are related to structural changes of the studied samples after annealing and quite promising for technical applications.

References

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Figures



Dependences of GMR ratio, $\Delta R/R$, on annealing time measured in $\text{Cu}_{80}\text{Co}_{20}$ microwires.