ELECTRICAL AND MAGNETIC PROPERTIES OF AMORPHOUS REM–M–Ge THIN FILMS

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9.7 cm

Study of magnetic properties of amorphous ternary alloys of REM–M–Ge (REM – rare earth metal; M – transition metal) thin films has prime value at the analysis of effects on low-temperature resistivity. The availability in such materials local magnetic moments, which interacts with carriers, leads to changes in electrical characteristics at low temperature range, where magnetic adds are in role of scattering centers. This statement brings to light in resistivity anomalies – abnormal increasing of resistance, resistivity minimum so on. The band structure models of amorphous and crystallized ternary alloys REM–M–Ge (REM: Ce, Y, La, Er; M: Fe, Co, Ni), were elaboration due to measurements of magnetic susceptibility, coercitive force and resistivity in wide temperature interval (from 77 K to 500 K). The main attention was concentrated on many-sided influence s- and f-electrons of REM on general magnetic alloy's moment and on localization effects of semiconductor atoms (consequence of weakening interaction between M atoms and overchange inter-action, also as electron transfer from the germanium atoms to the iron d-band). The band structure, electrical and magnetic properties amorphous materials are correlated.

13.4 cm

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