ELECTRONIC STRUCTURE CALCULATIONS AND ELECTRICAL RESISTIVITY OF $Dy(Co_{1-x}M_x)_2$ (M=Ni, Cu)

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9.7 cm

$R(Co_{1-x}M_x)_2$ (R=rare earth; M=transition metal) alloys exhibit interesting magnetic properties because of the differing nature of magnetism (localized and band) of their constituents. Results of measurements of the magnetic susceptibility, electrical resistivity of intermetallic compounds $Dy(Co_{1-x}M_x)_2$ (M=Ni, Cu) are presented. The dependence of the Curie temperature and lattice parameters versus concentration x of the M element are established. The effect of partial substitution of Co by M is reflected in a change of T_C, in the temperature dependence of electrical resistivity and in the magnetization as a function of externally applied magnetic field. The experimental results are compared with theoretical calculations based on the $ab-initio$ tight-binding linear muffin-tin orbitals method. The Ni and Cu impurities reduce magnetic moments on Co atoms from 1.21 μ_B/atom for the $DyCo_2$ compound to 1.17 and 1.07 μ_B/atom for Ni and Cu impurities, respectively. The densities of states at the Fermi level are reduced about two times.

13.4 cm

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