Electrical resistivity and electronic structure of the $Tb_xGd_{1-x}Ni_3$ system

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In the paper the electric properties and electronic structure of the polycrystalline $Tb_xGd_{1-x}Ni_3$ intermetallic compounds are presented. The electrical resistivity ρ(T)has been examined by a standard four - probe technique. The electronic structure measurements has been performed by using XPS method.

The partial replacement of Gd by Tb atoms causes the decrease of Curie temperature T_C and the increase of the residual resistivity. According to the Matthiessen rule the scattering mechanisms in ρ(T) have been analyzed. Moreover, the reduced form of the electrical resistivity ρ_Z(T-T_o) indicates a deviation from the linearity for x>0.2. This kind of behaviour can be explained as the dependence of density of d states near by the Fermi level (E_F) which are dominated by Ni3d states. The valence band spectra as well as the core level lines have been analyzed as the influence of Tb/Gd substitution on the electronic structure.

9.7 cm

13.4 cm

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