

The influence of Yb substitution on the magnetic, electric properties and electronic structure of $\text{Yb}_x\text{Gd}_{1-x}\text{Ni}_5$ system.

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The crystal and electronic structure, magnetic and electric properties of intermetallic compounds $\text{Yb}_x\text{Gd}_{1-x}\text{Ni}_5$ ($x = 0.0, 0.2, 0.4, 0.5$) are presented. The change of crystal structure parameters was obtained from XRD measurements which show that all studied compounds crystallize in the hexagonal CaCu_5 type of crystal structure. The ordering temperatures T_C were identified from the temperature dependence of AC magnetic susceptibility as well as from the temperature dependence of electrical resistance $R(T)$. The values of T_C obtained from both methods decrease with the increasing of ytterbium concentration. The same behaviour was evidenced for the effective magnetic moment estimated from the temperature dependence of DC magnetic susceptibility. The analysis of the electronic structure studied by XPS method shows that the valence band spectra near by Fermi level are dominated by Ni3d states. The multiplet structure visible in valence bands is typical for Yb^{3+} ions. The satellite structure for Ni2p core level lines suggest that Ni3d band is not fully filled.

9.7 cm

13.4 cm

Subject category :

3. Magnetic Structure and Dynamics

Presentation mode :

poster

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