Electrical resistivity of RNi_4Cu and RNi_4Al

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A comparative studies of the temperature dependence of resistivity for RNi_4Cu and RNi_4Al compounds (R = Y or rare earth) are presented. Both series of compounds crystallize in the hexagonal $CaCu_5$-type of structure. It is observed that the temperatures of the transition between the paramagnetic and the magnetically ordered state are well identified on the $\rho(T)$ curves as a sharp change of the slope and they are in a good agreement with the previous magnetic studies [1-4]. The residual resistivity ρ_0 of RNi_4Al is several times higher than for RNi_4Cu but the last one has ρ_0 still twice the values for the previously studied RNi_4B [5]. The compounds YNi_4Cu and YNi_4Al are included in these studies as the nonmagnetic isostructural reference materials. The phonon contribution has been determined for both Y-based compounds employing the Bloch-Grüneisen formula. The paramagnetic $CeNi_4Cu$ and $CeNi_4Al$ compounds show a shallow minimum in $\rho(T)$ at low temperatures (about 15 K). This anomaly has been ascribed to a Kondo impurity - like behavior. For the other rare earths, the $\rho(T)$ dependences below T_C have been analyzed assuming the scattering on magnons as the predominant mechanism.

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