Antiferromagnetism in the Kondo lattice system Ce(Ni\textsubscript{0.25}In\textsubscript{1.75}).\textsuperscript{1}

W.H. LEE, H.H. WU, H.H. SUNG, K.J. SYU, Department of Physics, National Chung Cheng University, Ming-Hsiung, Chia-Yi, Taiwan, ROC, Y.Y. CHEN, Academia Sinica, Nankang, Taipei, Taiwan, ROC, W.H. LEE/Y.Y. CHEN TEAM — The pseudobinary compound Ce(Ni\textsubscript{0.25}In\textsubscript{1.75}), which crystallizes in a hexagonal AlB\textsubscript{2} type structure with space group P\textbar{6}/mmm, exhibits antiferromagnetic ordering below the temperature 3.9 K, as revealed in the magnetic susceptibility, electrical resistivity and low-temperature specific-heat data. A ln(T) dependence is seen in the high temperature region for the magnetic contribution to the resistivity $\rho_m$, which is one of the characteristic features of dense Kondo systems. The magnetic entropy $S_m(T_N)$ associated with the magnetic structure of Ce(Ni\textsubscript{0.25}In\textsubscript{1.75}) is found to be only 62% of Rln(2), corresponding to a reduction of 38% of the cerium moment. This large magnetic reduction may be able to be attributed to Kondo effect. The heat capacity $C(T)$ of Ce(Ni\textsubscript{0.25}In\textsubscript{1.75}), in the paramagnetic state at temperatures between 8 and 20 K, can be fitted to the expression $C_n = \gamma T + \beta T^3$ by a least squares analysis, which yields the value $\gamma = 123$ mJ/mol K\textsuperscript{2} and $\beta = 1.2$ mJ/mol K\textsuperscript{4}, the latter value corresponding to the Debye temperature $\Theta_D = 169$ K.

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