Heat capacity studies of the $NdNi_4Si$ compound

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The study of the heat capacity of the intermetallic compound $NdNi_4Si$ and the influence of magnetic fields up to 4 T is presented. This compound crystallizes in the hexagonal $CaCu_5$-type structure, space group P6/mmm. Nd atoms occupy the (1a) site, Ni(1) the 2c site and Ni(2) and Si are statistically distributed on the 3g positions. $NdNi_4Si$ is ferromagnetic with $T_C = 8$ K and saturation moment of $1.5\mu_B$/f.u. at 4.2 K (in $H =$ 9 T). The heat capacity has been analyzed considering the electronic contribution, the Schottky anomaly, and the lattice contributions in frames of the Debye model. The scheme of the energy levels created by the crystal electric field split is determined from Schottky contribution to the specific heat. Zero field heat capacity reveals a peak close to the magnetic ordering temperature. The maximum is shifting to higher temperatures with increasing magnetic fields. The ferromagnetic $NdNi_4Si$ was characterized by the electronic heat capacity coefficient $\gamma = 85$ mJmol^{-1}K^{-2} and the Debye temperature $\Theta_D = 325$ K.

9.7 cm

13.4 cm

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