

Heat capacity analysis of LaB₆

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Rare earth hexaborides (RB₆) have been attracting much attention because of variety of their electronic and magnetic properties, which include antiferromagnetic (R-Ce, Pr, Nd, Gd, Dy, Tb, Ho), ferromagnetic (EuB₆), intermediate valence (SmB₆) and heavy fermion behavior (CeB₆). At the same time nonmagnetic LaB₆ plays the important role in estimating of magnetic contribution of above mentioned systems¹. The goal of present research is to investigate in details the heat capacity $C_P(T)$ on the high quality single crystals of La^NB₆ with the various boron isotope content (N= 10, 11, nat) in the wide range of temperatures 2-300K and in magnetic fields up to 9T. The data obtained allow to estimate correctly (*i*) the electronic component with $\gamma \sim 2.4\text{mJ}/(\text{mol}\cdot\text{K})$, (*ii*) contribution from quasilocal vibrational mode of La³⁺ ion with $\Theta_E \sim 152\text{K}$, (*iii*) the Debye-type term from boron cage with $\Theta_D \sim 1160\text{K}$ and (*iv*) the low temperature defect mode component². The quantitative analysis of each contribution is presented.

¹T. Gürel, R. Eryiğit Phys. Rev. B **82**, 104302 (2010).

²K.Takegahara and T.Kasuya, Sol. St. Commun. **53**, 21 (1985).