

Low-temperature anomalies in thermal properties of YbB_{50} boride

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Heat capacity and thermal expansion of YbB_{50} boride have been studied at 2-300 K. The sharp anomaly at about 5 K and smooth humps of the studied properties of boride at elevated temperatures was detected. The excess heat capacity and abnormal contribution to the thermal expansion of YbB_{50} have been determined by comparison with a paramagnetic LuB_{50} compound. Low-temperature anomalies of YbB_{50} thermal characteristics have been attributed to the magnetic phase transition to the antiferromagnetic state. The anomalies at 50-150 K temperature region were satisfactory described as results of the ground level splitting by the crystal an electric field (CEF). The scheme of CEF splitting was proposed.

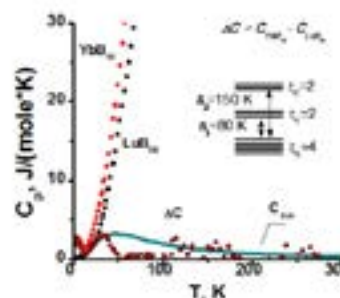


Figure 1: Heat capacity of YbB_{50} and LuB_{50} . The excess heat capacity $\Delta C(T)$ and Schottky contribution $C_{\text{Sch}}(T)$ to the ytterbium boride heat capacity. Insert: CEF-splitting scheme of the ground f-level Yb^{3+} ion.

Biography

Nikolay A Zhemodov has completed from Bryansk State University at the age of 22 years. Now he is a Post-graduate student at Bryansk State University. The field of his scientific interest is low-temperature physics of crystals, which are perspective in modern areas of technology. His research is supported by a grant from the Russian Science Foundation (Project "Development of new thermoelectric materials based on clathrates and clathrate-like substances", No. 16-12-00004, 2016-2018). He took part in some International conferences on the physics and chemistry of borides. He has four publications in reputed journals that have been cited 7 times and two presentations on international conferences. His h-index is two.

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