Thermodynamic and electrical transport properties of single-crystalline Ce_2PdGa_{12}

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High-quality single crystals of Ce_2PdGa_{12} were studied by means of magnetization, specific heat and electrical transport measurements. The compound was previously reported to crystallize with a tetragonal crystal structure, and to order antiferromagnetically at $T_N = 11$ K [1]. Our results have confirmed those findings and additionally revealed Kondo lattice character of the electronic conduction in the paramagnetic region. At low temperatures, the electronic specific heat is strongly enhanced, suggesting that Ce_2PdGa_{12} can be regarded as a heavy-fermion antiferromagnet. In the ordered state, the electrical resistivity is governed mainly by electron-magnon scattering. In line with the antiferromagnetic nature of the ground state, the field variations of both the magnetization and the electrical resistivity exhibit metamagnetic-like anomalies at some temperature-dependent critical field. Unique sharpness of the singularities observed on the magnetoresistance isotherms hints at a first-order spin-flip character of the latter transition, however the magnetization data indicates rather a spin-flop mechanism.

[1] R.T. Macaluso *et al.*, J. Solid State Chem. 178 (2005) 3547.

9.7 cm

13.4 cm

Subject category :

1. Strongly Correlated Electrons and High Temperature Superconductivity

Presentation mode :

poster

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