Low-temperature physical properties of heavy-fermion $CeRh_2Sn_2$

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Intermetallic f-electron compounds comprising rare earth elements Ce or Yb are known to exhibit a variety of complex electronic and magnetic features that originate essentially from hybridization between localized f-electrons and conduction electrons. Ground states and low-temperatures properties of these compounds have been an exceptionally rich source of new physics. The scope of thermal properties exhibited by compounds in the isostructural tetragonal stannide series CeM_2Sn_2 in which M is a d-electron element, are capturing the essential features of the strongly correlated electron class of systems. Cerium-based antiferromagnetic order is prevalent among the series at temperatures typically below about 4 K, but with a particularly large enhancement of the electronic specific heat in the neighborhood of T_N[1]. The title compound of the present study, $CeRh_2Sn_2$, is a heavy-fermion compound and exhibits competitive Kondo and RKKY interactions, both originating from the magnetic cerium $4f^1$ electron. In the work of Beyermann *et al*, an unusually broad peak feature in the specific heat of $CeRh_2Sn_2$ at low temperature was ascribed to antiferromagnetic order setting in below $T_N = 0.47$ K. Here we present results of low-temperature studies of the specific heat, magnetic susceptibility, and electrical resistivity of $CeRh_2Sn_2$ in order to map its low-temperature behaviour, and to demonstrate the magnetic field dependence of salient electronic and transport features of its ground state.

[1]W. P. Beyermann *et al.*, Phys. Rev. B **163** (1991) 13130