Pressure Effects on Electrical Resistivity of Heavy-Fermion Antiferromagnet Ce_2PdGa_{12}

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Many Ce-based intermetallics have been noticed owning to their attractive electronic properties, such as unconventional heavy-fermion superconductivity and magnetic transition. Pressure can change the magnetically ordered ground states of Ce-based systems to non-magnetic one. Furthermore, in some cases anomalous phenomena such as non-Fermi liquids and heavy-fermion superconductivity appear in the vicinity of quantum critical point.
We have succeeded in growing high purity single crystalline Ce_2PdGa_{12} which crystalizes in the tetragonal system (space group P4/nbm)[1]. The electrical resistivity of Ce_2PdGa_{12} behaves as typical heavy-fermion antiferromagnets. The magnetic ordering temperature is 11 K at ambient pressure. We investigate the pressure effects on the electrical resistivity up to 8 GPa. With pressure, the ordering temperature is dramatically suppressed to 3.5 K at 3 GPa. Whereas above this pressure, the ordering temperature gradually increases, and then shows a broad maximum around 6 GPa. We speculate that the non-magnetic ground state of Ce_2PdGa_{12} might appear around 10 GPa.

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