(6a8)

Heavy fermion behaviors in $SmOs_4Sb_{12}$

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Specific heat C and electrical resistivity ρ measurements have revealed an unconventional heavy-fermion (HF) state in $SmOs_4Sb_{12}$ single crystals [1]. The electronic specific-heat-coefficient ($\gamma = 0.82$ J/K^{2}mol) and the coefficient (A) of the T^2 dependence of ρ are largely enhanced as shown in Fig. 1 (a-c). Both γ and A do not show any significant decrease in applied fields in contrast with ordinary Ce-based HF compounds, suggesting an unconventional origin of the heavy-quasiparticle formation. The ratio $A\gamma^{-2}$ (in the unit of $\mu\Omega$cm(mol·K/mJ)^2) of 1.1×10^{-6} is reduced from the Kadowaki-Woods ratio 1×10^{-5}; see Fig. 1 (d). This reduction may be attributed to the effects of moderate many-body correlations [2] or the degeneracy of the CEF ground state [3] (a quartet CEF ground state is expected as discussed in [1]). A weak ferromagnetic (FM) ordering appearing below 3 K probably originates in the itinerant quasiparticles. Investigation on the FM behaviors, e.g. see [4], may offer insight into the anomalous HF state in $SmOs_4Sb_{12}$.

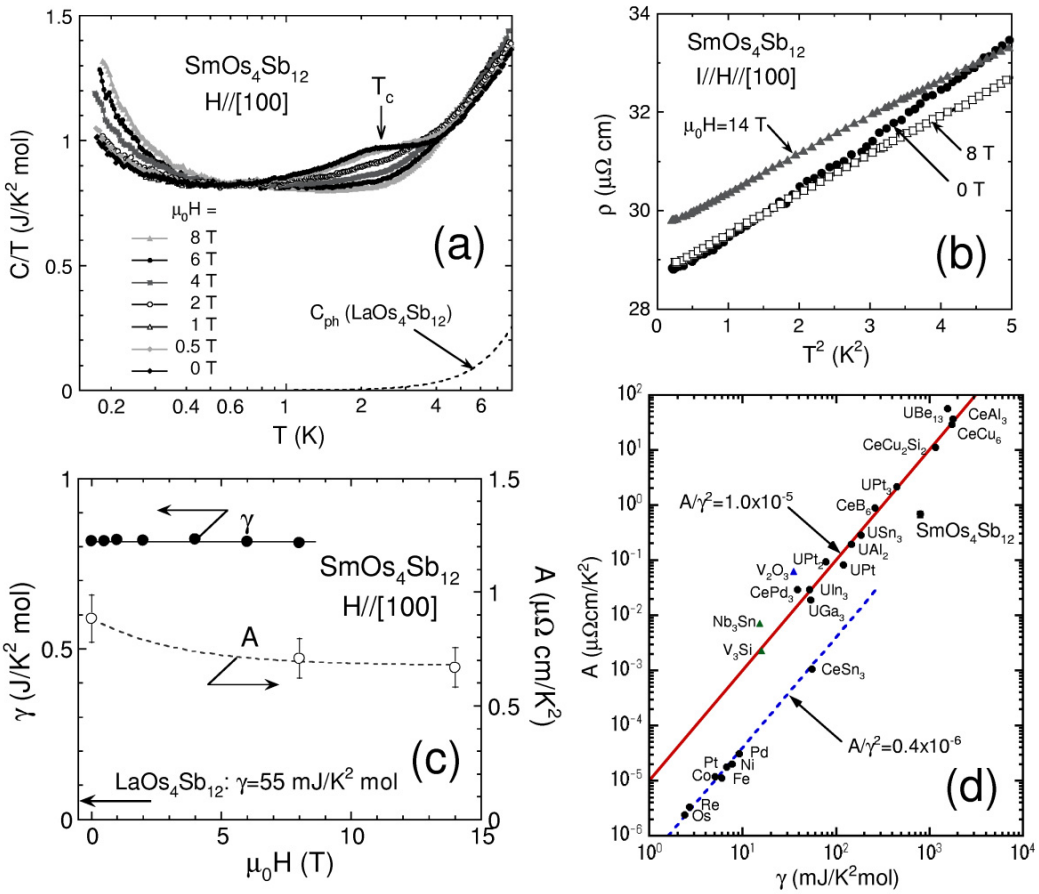

Figure 1: (a) C/T vs T, (b) ρ vs T^2, (c) γ and A vs magnetic field, and (d) Kadowaki-Woods plot A vs γ indicate that the HF state in $SmOs_4Sb_{12}$ is anomalous.

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