

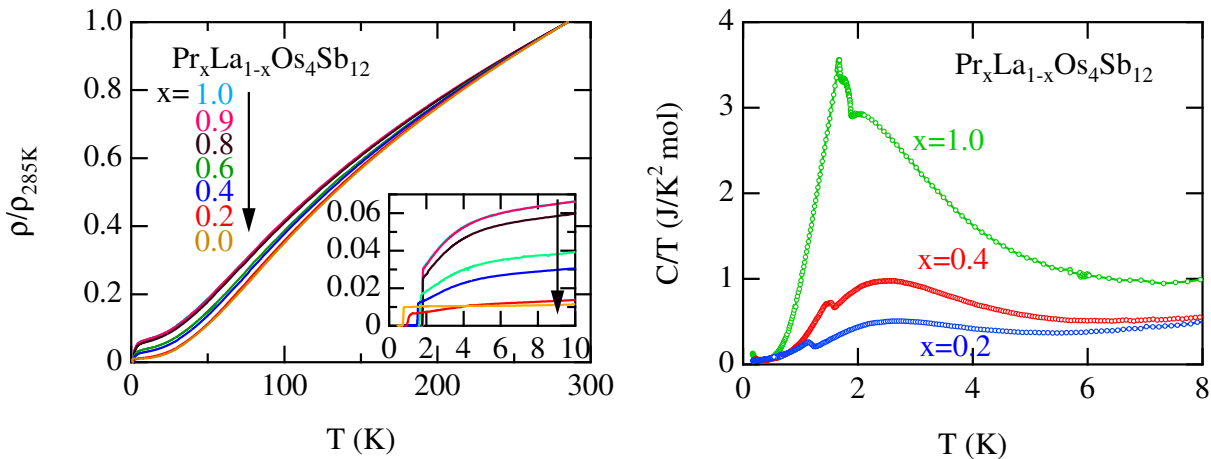
The effect of La substitution on the heavy fermion superconductivity in $\text{PrOs}_4\text{Sb}_{12}$

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$\text{PrOs}_4\text{Sb}_{12}$ with the filled skutterudite structure has reported to be the first Pr-based heavy fermion (HF) superconductor [1]. From the various microscopic measurements; *i.e.* dHvA effect [2], Sb-NQR [3], thermal conductivity [4], penetration depth [5] and μ SR measurement [6] *etc.*, the superconductivity has been realized as an unconventional, which differs from Ce- and U-based HF-superconductors. This compound has a non-magnetic ground state and it is suggested that the quadrupolar interaction creates such anomalous properties. In order to have deeper insight into such an unconventional superconducting state, we have investigated the electrical resistivity, magnetic susceptibility and the specific heat in $\text{Pr}_x\text{La}_{1-x}\text{Os}_4\text{Sb}_{12}$, because substituting La for Pr could have a strong effect on the superconductivity.

Figures show the temperature dependence of electrical resistivity ρ normalized at 285 K, and the temperature dependence of specific heat C/T . The superconducting critical temperature T_C almost unchanges above $x=0.8$, and monotonously decreases with decreasing x . On the other hand, the large specific heat jump at T_C $\Delta C/T_C \sim 680 \text{ mJ/K}^2 \cdot \text{mol}$ for $x=1$ is drastically reduced to $\sim 60 \text{ mJ/K}^2 \cdot \text{mol}$ for $x=0.4$, which is almost the same value of conventional superconductor $\text{LaOs}_4\text{Sb}_{12}$. These results imply that the interaction among the Pr-ions plays an important role for the HF superconductivity.



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