(P2-5)

Specific heat of $Pr(Oa_{1-x}Ru_x)_4Sb_{12}$

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A superconducting state in high Os-concentration region of $Pr(Os_{1-x}Ru_x)_4Sb_{12}$ is very un-conventional in contrast to the usual BCS-type superconductor of the low Os-concentration region. One of characteristics in the high Os-concentration region is rattling motion of a Pr ion in a Sb-cage. Furthermore, relevance between the unconventional superconductivity and the rattling motion is suggested[1]. In this work-shop we will report the specific heat of $Pr(Os_{1-x}Ru_x)_4Sb_{12}$. In fig.1(a), we demonstrate the magnetic part of the specific heat (C_M) obtained by subtracting the specific heat of $La(Os_{1-x}Ru_x)_4Sb_{12}$ from that of corresponding $Pr(Os_{1-x}Ru_x)_4Sb_{12}$, accompanied by the calculated specific heat(C_{CEF}) using the CEF model[2]. It should be noted that C_M of $PrOs_4Sb_{12}$ makes a broad peak around 15 K which could not be explained by the CEF model and probably originates from the rattling motion of the Pr ion. In fig.1(b), we show temperature dependence of ΔC obtained by subtracting C_{CEF} from C_M. In the high Os-concentration region, ΔC shows a peak around 15 K. On the other hand, the peak of ΔC in the low Os-concentration region is located around 30 K. These results suggest that the rattling motion of the Pr ion in the high and low Os-concentration regions may be different.
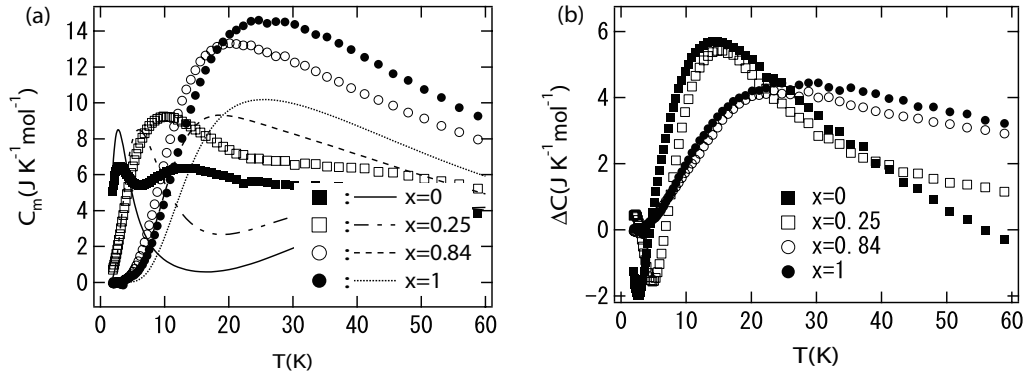

Figure 1: (a) Magnetic part of the specific heat(C_M) of $Pr(Os_{1-x}Ru_x)_4Sb_{12}$. Liens are calculated specific heats(C_{CEF}) using the CEF model. (b) Temperature dependence of ΔC obtained by subtracting C_{CEF} from C_M

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