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**Sb-NMR/NQR studies on Ce-based filled skutterudites**

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Most of Ce-based filled-skutterudite compounds show semiconducting behavior, on the basis of which they are called *hybridization-gap semiconductors*. The $CeT_4P_{12}$ (T=Fe,Ru and Os) compounds have a hybridization gap of 400∼1500 K, and as a lattice constant increases, the value of energy gap becomes smaller[1]. Among them, $CeOs_4Sb_{12}$ is suggested to exhibit Kondo insulating behavior with a large specific heat coefficient, $\gamma \sim 92$ mJ/K$^2$mol, and a very small gap of about $\Delta/k_{\rm B} \sim 10$ K at the Fermi level[2].

Sb nuclear quadrupole resonance (NQR) measurements were carried out on this compound. An exponential decrease of $1/T_1$ below 300 K suggests an existence of $c-f$ hybridized gap which is inherent to Kondo semiconductors. It is noteworthy that there is large residual density of state inside the gap and spin fluctuation develops with decreasing temperature ($T$) below $\sim 25$ K (Fig. 1(a)). The $T$ dependence of $1/T_1$ follows $1/T_1 \propto (T-\theta)^{1/2}$ with $\theta = 0.06$ K in the range of 1.3 K $< T <$ 25 K, suggesting that the system is close to an antiferromagnetic critical point. Furthermore, $1/T_1$ showed a marked reduction below $\sim 0.9$ K, indicating an occurrence of intrinsic phase transition[3].

To investigate an effect of magnetic fields for the spin fluctuation, we measured magnetic field ($H$) variation of $1/T_1$. Figure 1 shows $H$ vs. $1/T_1T$ plot at $T = 4.2$ K. $1/T_1T$ decreases with increasing magnetic fields, which indicate the spin fluctuation is suppressed by the fields. In order to investigate these behavior in detail, further measurements, such as the temperature dependence of $1/T_1T$ at high field, are required, and now in progress.

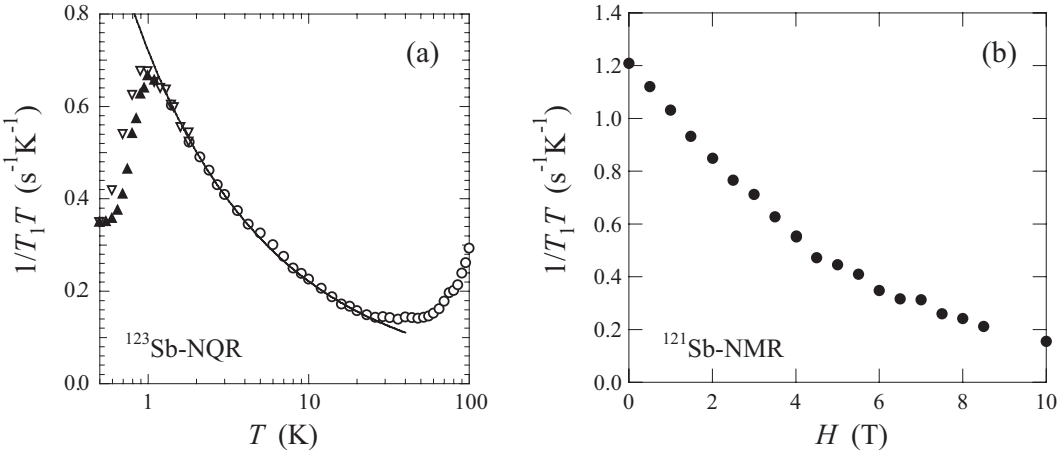


Figure 1: (a) $T$ dependence of $1/T_1T$ at $H = 0$. The solid curve indicates the relation $1/T_1 \propto T/(T-\theta)^{1/2}$ with $\theta = 0.06$. (b) $H$ variation of $1/T_1T$ at $T = 4.2$ K

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