

Sb-NQR study on heavy fermion system $\text{SmOs}_4\text{Sb}_{12}$ H. Kotegawa¹, H. Hidaka¹, T. C. Kobayashi¹, D. Kikuchi², H. Sugawara³, and H. Sato²¹Graduate School of Natural Science and Technology, Okayama University, Okayama, 700-8530²Graduate School of Science, Tokyo Metropolitan University, Hachioji, 192-0397³Faculty of Integrated Arts and Sciences, Tokushima University, Tokushima 770-8502

$\text{SmOs}_4\text{Sb}_{12}$ is a heavy fermion system which is quite rare among Sm-based compounds.[1] The heavy fermion state is characterized by the large electronic specific heat coefficient of $\gamma \sim 800 \text{ mJ/molK}^2$ and the insensitivity to magnetic field. We have investigated the origin of this heavy fermion state by means of Sb-NQR study including pressure effect.

Figure shows the pressure-temperature phase diagram up to $\sim 4 \text{ GPa}$, investigated by the resistivity measurements.[2] $\text{SmOs}_4\text{Sb}_{12}$ shows the ferromagnetic ordering below $T_C \sim 2.2 \text{ K}$ at ambient pressure and the characteristic temperature T^* corresponding to Kondo temperature can be deduced to be $20 - 25 \text{ K}$ by the resistivity and NQR measurements. The T_C increases with increasing pressure, while T^* decreases with increasing pressure. This pressure dependence is a feature of the f -electron systems with the mixed-valence state of $2+$ and $3+$, as seen in some Yb-based compounds. Recently the mixed-valence state has been observed directly in $\text{SmOs}_4\text{Sb}_{12}$. [3,4] This phase diagram suggests that $\text{SmOs}_4\text{Sb}_{12}$ is located in the vicinity of ferromagnetic critical point.

We will report Sb-NQR results and compare them with Ce-based heavy fermion systems.

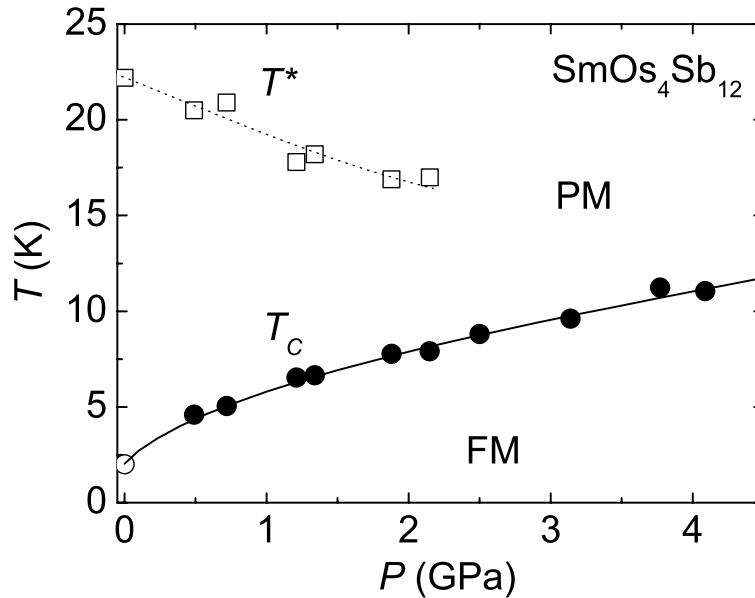


Figure 1: The pressure-temperature phase diagram of $\text{SmOs}_4\text{Sb}_{12}$.

[1] S. Sanada *et al.*, J. Phys. Soc. Jpn. 74 (2005) 246.

[2] H. Kotegawa *et al.*, J. Phys. Soc. Jpn. 74 (2005) 2173.

[3] M. Mizumaki *et al.*, this workshop P1-2.

[4] S. Imada *et al.*, this workshop O2-4.