(7b2)

T_1 of La-NMR in clathrate compound $La_3Pd_{20}Ge_6$

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Recently, Goto and his colleagues found, from their ultrasonic measurements[1], that the elastic constant C_{44} in $La_3Pd_{20}Ge_6$ abruptly increases at around 20 K with decreasing temperature, T. They argued that the anomaly of the C_{44} is due to a thermally-excited motion of the La atom which resides in the off-centered positions within the cage.

To investigate their argument, we performed one of the site-selective measurements, NMR, on the La-sites in $La_3Pd_{20}Ge_6$, and obtained the following findings.
(1) Below 10 K, the nuclear spin-lattice relaxation rate $1/T_1$ shows the Korringa-like behavior, which is consistent with the metallic conductivity.
(2) Above 40 K, $1/T_1$ drastically increases with increasing T and the T^2 dependence indicates that the relaxation is caused by phonons (the Raman process).
(3) Between 10 K and 40 K, there is an additional relaxation which cannot be explained by the Korringa or the Raman process, but can be ascribed to the La motion with the correlation time equal to the inverse of the NMR frequency.

To clarify how the La motion is like, further investigation is now in progress.

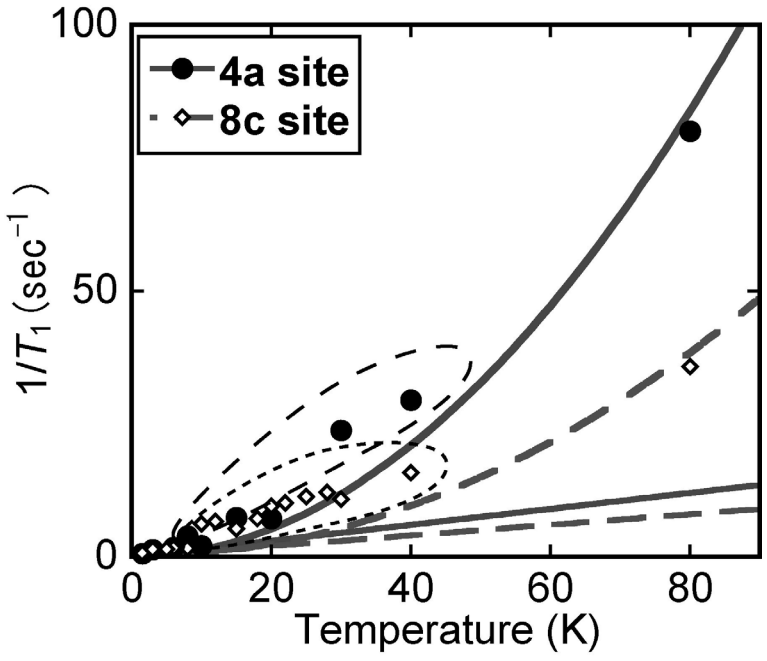

Figure 1: Temperature dependence of T_1 of La-NMR in $La_3Pd_{20}Ge_6$

[1]T.Goto *et al.*, Phys, Rev, B 70 (2004) 184126.