(28a5)

**Low temperature magnetization of $PrT_4P_{12}$ (T=Fe,Ru)**

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We present the dc magnetization of $PrT_4P_{12}$ (T=Fe,Ru) at very low temperature down to 60 mK. $PrFe_4P_{12}$ undergoes a second order phase transition (presumably an antiferro-quadrupolar ordering transition) at 6.5 K. Recently, a non-Fermi liquid (nFL) behavior has been observed in the temperature dependence of the resistibility $\rho(T)$ and the specific heat $C(T)$ of $PrFe_4P_{12}$ in the normal state below 2 K only for the [111] direction [1]. In order to obtain more information about this behavior, we measured the temperature dependence of the magnetization $M(T)$ of $PrFe_4P_{12}$ for the normal state below 2 K. The $M(T)$ curve for the [111] direction shows a slight decrease upon cooling. Thus, it is found that the magnetization also exhibits a nFL behavior.

$PrRu_4P_{12}$ shows a metal-insulator (MI) transition at $T_{MI}$ = 62 K. The origin of the MI transition and the ground state in this compound are not clear yet. The magnetic susceptibility $M(T)/H$ of $PrRu_4P_{12}$ at 0.05 T (Fig. 1(a)) follows the Curie's law down to 0.2 K. Figure 1(b) displays the isothermal magnetization $M(H)$ curve for three principal directions of [100], [110], and [111] at 60 mK. A sharp increase is found in low fields below 0.1 T. Interestingly, the magnetization is nearly isotropic up to 12 T. These data suggest that the lowlying ground state is magnetic. In order to explain the present magnetization data, we performed a numerical calculation using a CEF Hamiltonian in the $T_h$ group. We assume that there is a two sublattice structure in the ordering state below $T_{MI}$, and that the ground state of one sublattice is a well isolated magnetic $\Gamma_4^{(2)}$ triplet and the ground state of another one a $\Gamma_1$ singlet. According to this model, we found that the observed magnetization result is reproducible quantitatively.

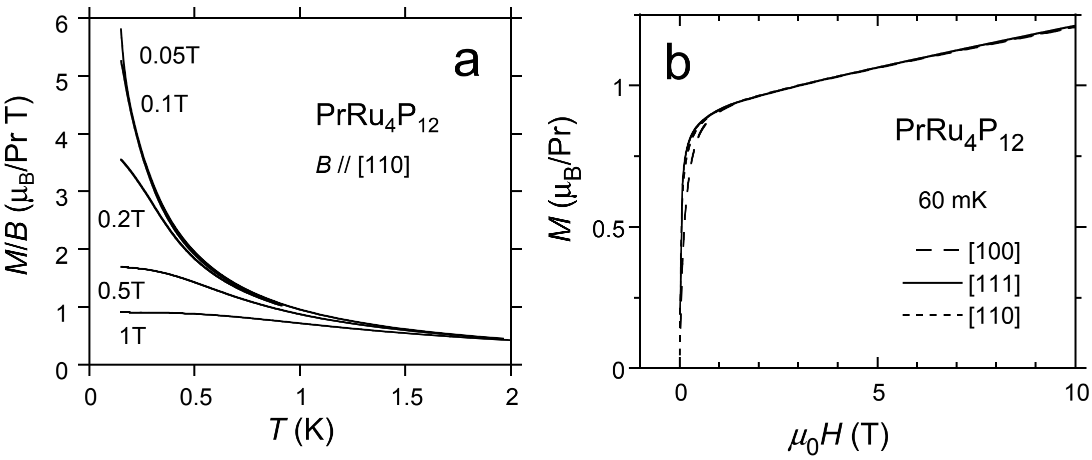


Figure 1: (a)Magnetic susceptibility $M/H$ of $PrRu_4P_{12}$ for the [110] direction at several fixed fields. (b)Isothermal magnetization $M(H)$ curve of $PrRu_4P_{12}$ for the three principal directions [100], [110], and [111] at 60 mK.

[1] Private communication from H. Sato.