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Brief summary of the area at present stage and several questions to be solved.

H. Sato[1], Y. Aoki[1], K. Kuwahara[1], M. Kohgi[1], H. Sugawara[2] and K. Iwasa[3]

[1]Department of Physics, Tokyo Metropolitan University, Hachioji 192-0397
[2]Faculty of Integrated Arts and Sciences, Tokushima University, Tokushima 770-8502
[3]Department of Physics, Tohoku University, Sendai 980-8578

In these three years, this area has made significant progress both in finding new attractive features of the filled skutterudite compounds and in understanding their mechanisms, as a result of the active cooperative research works within our area and with many research groups outside.

Pr-based skutterudites are the most attractive and most intensively investigated systems which includes $PrOs_4Sb_{12}$ known as the first heavy Fermion superconductor, $PrFe_4P_{12}$ exhibiting competing nonmagnetic ordered states and the field induced heavy Fermion state, and $PrRu_4P_{12}$ showing a metal to non-metal transition with nonmagnetic nature. Recently, consensus was reached to certain extent regarding the important role of the orbital degree of freedom in many of their behaviors. Of course, there still remain important several disputable points. The understanding of the crystal electric field (CEF) level scheme is also highly improved as given in the right table, neutron inelastic scattering experiment as a main technique. The drastic temperature dependence of recently determined CEF scheme in $PrRu_4P_{12}$ is one of the highlights, which is reinforced by the Raman scattering experiment and the theoretical models. However, the CEF level scheme and order parameter of the nonmagnetic phases in $PrFe_4P_{12}$ and the superconducting state in $PrOs_4Sb_{12}$ have not yet been fully settled. Those are the problems left for Pr-based systems.

sample	CEF-GS	1st	T_{TR} [(*1)] (GS)	Δ_{1st}
$PrFe_4P_{12}$	Γ_1	$\Gamma_4^{(2)}$?	T_{NM}: 6.5K	~16K (OS)
$PrRu_4P_{12}$ [(*2)]	Γ_1	$\Gamma_4^{(1)}$	T_{MI}: 62K	68K (RT)
$PrOs_4P_{12}$	Γ_1	$\Gamma_4^{(2)}$	T_{AF}: 2 K	48K
$PrFe_4As_{12}$				
$PrRu_4As_{12}$	Γ_1 ?		T_{SU}: 2.4 K	
$PrOs_4As_{12}$	Γ_5 ($\Gamma_4^{(2)}$)	1	T_{AF}: 2.3 K	~15K
$PrFe_4Sb_{12}$	Γ_1	Γ_5 ($\Gamma_4^{(2)}$)	non	22K
$PrRu_4Sb_{12}$	Γ_1	$\Gamma_4^{(2)}$	T_{SU}: 1.3K	73K
$PrOs_4Sb_{12}$	Γ_1	$\Gamma_4^{(2)}$	T_{SU}:1.85K	8K

(*1) NM: non-magnetic, MI: metal to insulator, AF: antiferromagnetic, SU: superconducting
(*2) CEF is for the metallic phase.

Recently, new findings on Sm-based systems, such as the unusual heavy fermion state robust against magnetic field in $SmOs_4Sb_{12}$, mysterious two step phase transitions in $SmRu_4P_{12}$, have been found. They are not yet well understood, and intensive research works are now in progress from both experimental and theoretical views. The mechanism of the weak magnetic order found in $SmFe_4P_{12}$, $SmOs_4Sb_{12}$, and also $CeOs_4Sb_{12}$ might be one of the questions to be clarified.

Concerning the systems with other rare earth elements, only limited data have been reported. Even so, there came out several common features such as; (1) Ferromagnetic state tends to be stabilized for most combinations of constituent elements, unless some other nonmagnetic ordered phases appear, (2) a resistance minimum is commonly observed above T_c in many of the ferromagnet. The understanding of those behaviors might help to get general view on the filled skutterudite compounds.

Especially, the research on arsenide skutterudites is behind our initial schedule, and only limited information on their basic features has been reported. It is the responsibility for the two groups in charge of crystal growth to catch up with the initial plan on the crystal growth and the quality improvement of those crystals.

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