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Physical properties of $\text{Yb}_3\text{Ru}_4\text{Ge}_{13}$ and $\text{Lu}_3\text{Ru}_4\text{Ge}_{13}$

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Cubic compounds with $\text{Yb}_3\text{Rh}_4\text{Sn}_{13}$ -type structure have drawn attention because of their rich ground states such as heavy fermion behavior, intermediate valence behavior, charge density wave, and superconductivity. In this talk, we will present the structural, magnetic, and electrical properties of cubic $\text{R}_3\text{Ru}_4\text{Ge}_{13}$ ($\text{R} = \text{Yb}$ and Lu) compounds. Single crystals of $\text{R}_3\text{Ru}_4\text{Ge}_{13}$ were characterized by magnetization, specific heat and electrical resistivity measurements. The resistivity measurement of $\text{Yb}_3\text{Ru}_4\text{Ge}_{13}$ compound exhibits a metallic behavior, whereas $\text{Lu}_3\text{Ru}_4\text{Sn}_{13}$ compound shows a semiconductor-like behavior with a superconducting transition at ~ 2.2 K. Low-temperature specific heat measurement indicates $\text{Yb}_3\text{Ru}_4\text{Ge}_{13}$ is a heavy fermion.

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