

Abstract Submitted
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Intermediate valence to heavy fermion through a quantum phase transition in $\text{Yb}_3(\text{Rh}_{1-x}\text{T}_x)_4\text{Ge}_{13}$ ($T = \text{Co}, \text{Ir}$) single crystals¹ BINOD RAI, EMILIA MOROSAN, Rice University, Houston TX, 77005 — Single crystals of $\text{Yb}_3(\text{Rh}_{1-x}\text{T}_x)_4\text{Ge}_{13}$ ($T = \text{Co}, \text{Ir}$) have been grown using the self-flux method. Powder X-ray diffraction data on these compounds are consistent with the cubic structure with space group $Pm\bar{3}n$. Intermediate valence behavior is observed in $\text{Yb}_3(\text{Rh}_{1-x}\text{T}_x)_4\text{Ge}_{13}$ upon $T = \text{Co}$ doping, while $T = \text{Ir}$ doping drives the system into a heavy fermion state. Antiferromagnetic order is observed in the Ir-doped samples $\text{Yb}_3(\text{Rh}_{1-x}\text{T}_x)_4\text{Ge}_{13}$ for $0.5 < x \leq 1$ with $T_N = 0.96$ K for $\text{Yb}_3\text{Ir}_4\text{Ge}_{13}$. With decreasing x , the magnetic order is suppressed towards a quantum critical point around $x_c = 0.5$, accompanied by non-Fermi liquid behavior evidenced by logarithmic divergence of the specific heat and linear temperature dependence of the resistivity. The Fermi liquid behavior is recovered with the application of large magnetic fields.

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