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A comparison of the normal and superconducting state properties of $\mathbf{Pr(Os_{1-x}Ru_x)_4Sb_{12}}$ and $\mathbf{Pr_{1-x}Nd_xOs_4Sb_{12}}$[1] P.-C. HO, T. YANAGISAWA, N.P. BUTCH, W.M. YUHASZ, N.A. FREDERICK, M.B. MAPLE, Physics and IPAPS/UCSD — The evolution of unconventional superconductivity and the high field ordered phase (HFOP), the latter of which has been identified with antiferroquadrupolar order, in $PrOs_4Sb_{12}$ has been investigated in two pseudoternary systems, $Pr(Os_{1-x}Ru_x)_4Sb_{12}$ and $Pr_{1-x}Nd_xOs_4Sb_{12}$. In the $Pr(Os_{1-x}Ru_x)_4Sb_{12}$ system, the superconducting transition temperature T_c is suppressed nearly linearly with x to a minimum at $x = 0.6$ from both end member compounds, the upper critical field H_{c2} has an approximately linear dependence on T for $x > 0.4$, and the features related to the HFOP in the electrical resistivity disappear for $x \geq 0.1$. On the other hand, in the $Pr_{1-x}Nd_xOs_4Sb_{12}$ system, T_c and the Curie temperature Θ_C are suppressed monotonically toward $x = 0.55$ from $x = 0$ and $x = 1$, respectively, no linear T dependence of H_{c2} is observed, the HFOP persists up to at least $x \sim 0.45$, and there is an indication of the coexistence of superconductivity and ferromagnetism for $x \sim 0.45$ according to specific heat measurements. In both systems, $H_{c2}(T)$ is limited by the orbital motion of the electrons and the decrease of T_c with x from $x = 0$ is nearly the same.

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