Investigation of magnetic order in Sm\textit{T}r\textsubscript{2}Zn\textsubscript{20} (\textit{T}r = Fe, Co, Ru) and Sm\textit{T}r\textsubscript{2}Cd\textsubscript{20} (\textit{T}r = Ni, Pd)\textsuperscript{1} DUYGU YAZICI, B. D. WHITE, UC, San Diego, P.-C. HO, California State University, Fresno, N. KANCHANAVATEE, K. HUANG, UC, San Diego, N. R. DILLEY, Quantum Design, M. B. MAPLE, UC, San Diego — Single crystals of the cage compounds Sm\textit{T}r\textsubscript{2}Zn\textsubscript{20} (\textit{T}r = Fe, Co, Ru) and Sm\textit{T}r\textsubscript{2}Cd\textsubscript{20} (\textit{T}r = Ni, Pd) have been investigated by means of electrical resistivity, magnetization, and specific heat measurements. The compounds SmFe\textsubscript{2}Zn\textsubscript{20}, SmRu\textsubscript{2}Zn\textsubscript{20}, and SmNi\textsubscript{2}Cd\textsubscript{20} exhibit ferromagnetic order with Curie temperatures of $T_C = 47.4$ K, 7.6 K, and 7.5 K, respectively, whereas SmPd\textsubscript{2}Cd\textsubscript{20} is an antiferromagnet with a Néel temperature of $T_N = 3.4$ K. No evidence for magnetic order is observed in SmCo\textsubscript{2}Zn\textsubscript{20} down to 110 mK. The Sommerfeld coefficients $\gamma$ are found to be 57 mJ/mol-K$^2$ for SmFe\textsubscript{2}Zn\textsubscript{20}, 79.5 mJ/mol-K$^2$ for SmCo\textsubscript{2}Zn\textsubscript{20}, 258 mJ/mol-K$^2$ for SmRu\textsubscript{2}Zn\textsubscript{20}, 165 mJ/mol-K$^2$ for SmNi\textsubscript{2}Cd\textsubscript{20}, and 208 mJ/mol-K$^2$ for SmPd\textsubscript{2}Cd\textsubscript{20}. Enhanced values of Sommerfeld coefficients $\gamma$ and a quadratic temperature dependence of the electrical resistivity at low temperature for SmRu\textsubscript{2}Zn\textsubscript{20} and SmPd\textsubscript{2}Cd\textsubscript{20} suggest an enhancement of the quasiparticle masses due to hybridization between localized 4$f$ and conduction electron states.

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