Abstract Submitted
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Pressure-Dependent Magnetization Studies of Two Rare Earth-Based Intermetallic Systems[1] R.P. GUERTIN, Tufts Univ., E.S. CHOI, Florida State Univ., B. ANDRAKA, C.R. ROTUNDU, Univ. of Florida, W. MCCALLUM, Y. JANSSEN, Iowa State Univ. — Pressure dependent magnetization studies have been performed on two rare earth-based ternary intermetallic systems, R_2CoIn_8, where R=Gd, Dy and Pr, and $Pr_6Ni_2Si_3$, the n=2 member of the $Pr_{(n+1)(n+2)}Ni_{n(n+1)+2}Si_{n(n+1)}$ family. The pressure dependence of the magnetization was measured for $2<T<300$ K, $0<H<9$ T and hydrostatic pressures $0\leq P\leq 8$ kbar using a vibrating sample magnetometer. For the R_2CoIn_8 system, R=Dy and Gd order antiferromagnetically at T_N=17.0 and 34.5 K, respectively and dT_N/dP=+0.1 K/kbar for R=Dy and +0.4 K/kbar for R=Gd. Pr_2CoIn_8 is a van Vleck paramagnet, indicating a crystalline electric field (CEF) singlet ground state. For $Pr_6Ni_2Si_3$, the Curie temperature (T_C= 35.0 K) and the saturation magnetization (1.35 μ_B/Pr) decrease non-linearly with increasing pressure, consistent with a pressure-induced increase in the CEF splitting. The Pr^{3+} ground state is presumably a singlet, as the local Pr symmetry is very low. Preliminary high field VSM data suggest that a CEF level crossing occurs at 10.5 T where magnetization increases sharply to above 3.0 μ_B/Pr.

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