

Abstract Submitted
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Phase transitions in $R_5\text{NiPb}_3$ ($R=\text{Ce,Nd,Gd}$)¹ V. GORUGANTI, K. D. D. RATHNYAYAKA, JOSEPH H. ROSS, JR., Department of Physics, Texas A&M University — We report magnetic and thermodynamic measurements for recently-synthesized $R_5\text{NiPb}_3$ ($R=\text{Ce,Nd,Gd}$) (hexagonal Hf_5CuSn_3 -type structure), as well as non-magnetic La-based analogs. High-temperature Curie-Weiss fits yield effective moments of 2.43, 3.70 and $9 \mu_B$ for Ce_5NiPb_3 , Nd_5NiPb_3 and Gd_5NiPb_3 respectively. These are close to the R^{3+} ionic moments, showing that Ni is nonmagnetic in all cases. For Ce_5NiPb_3 a peak seen in both the magnetization and specific heat at 48 K indicates an apparent ferromagnetic transition at that temperature, which is also confirmed by field dependent heat capacity and a positive Curie-Weiss temperature. Nd_5NiPb_3 exhibits two magnetic transitions, an antiferromagnetic transition at 42 K and an apparently weak ferromagnetic canting transition at 8 K. Ce_5NiPb_3 shows a kink in both the magnetization and specific heat at 68 K indicates a ferro- or ferrimagnetic transition at that temperature, which is also confirmed by a positive Curie-Weiss temperature. For this material, ZFC and FC measurements show irreversibility at transition temperature. For Ce and Nd samples M - H curves show metamagnetism at low temperatures. We will compare the results with the non magnetic analog La_5NiPb_3 .

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