

Abstract Submitted
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Structural and magnetic properties of LnNiGa₄ (Ln = Y, Gd-Yb)¹ YI LI, KANDACE THOMAS, RICHARD HEMBREE, AMAR KARKI, DAVID YOUNG, JOHN DITUSA, JIANDI ZHANG, JULIA CHAN, Louisiana State University, LOUISIANA STATE UNIVERSITY TEAM — Rare earth intermetallic compounds often display a competition between RKKY- and Kondo-type interactions as evident in magnetic and transport properties. To understand how exchange interactions vary with rare earth elements, we have synthesized and studied a series of LnNiGa₄ (Ln = Y, Gd - Tm) compounds. Single crystals of the orthorhombic LnNiGa₄ with C₂cm space group symmetry have been grown. Along the crystallographic b-axis, slabs of Ni@Ga₇Ln₂ and non-magnetic slabs of Ga-only atoms alternate throughout the lattice. Two distinct Ga-sites have been confirmed with X-ray photoelectron spectroscopy. In addition, XPS of TmNiGa₄ shows that Ni is in the metallic state. There is a transition from antiferromagnetic to ferromagnetic behavior in the series. The magnetic susceptibility and magnetization measurements reveal magnetic moments larger than expected for a free rare earth ion and is due to conduction electrons contributing to the magnetism. The changes in the Curie-Weiss temperatures are consistent with an RKKY coupling of the magnetic moments.

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