Abstract Submitted
for the TSF05 Meeting of
The American Physical Society

Magnetic and Physical Properties of Nd_2Ni_2Pb and NdNiPb V. GORUGANTI, YANG LI, JOSEPH H. ROSS, JR., K. D. D. RATHNAYAKA, Department of Physics, Texas A&M University, Y. ONER, Department of Physics, Istanbul Technical University — We report magnetic, transport and thermodynamic measurements for Nd_2Ni_2Pb and NdNiPb, which are members of recently-discovered R-Ni-Pb families of intermetallics. In Nd_2Ni_2Pb a λ type specific heat jump was observed at 19 K corresponding to an antiferromagnetic transition. Magnetization measurements show this phase to have a canted structure, with a metamagnetic transition to an aligned phase in $H = 3$ T at low temperatures. We have further explored the metamagnetic transition using field dependent specific heat. The single antiferromagnetic phase stands in contrast to the more complex magnetic structures observed in the heavy-rare-earth members of this family. At high temperatures the magnetization obeys a Curie law and the estimated magnetic moment agrees with the free ion moment of Nd. Resistivity measurements were conducted in the presence of an applied magnetic field and a kink was observed at 19 K. We performed similar measurements on NdNiPb and observed an antiferromagnetic transition at 5 K. A high temperature Curie fit showed that Ni is non-magnetic, while resistivity measurements show a kink at the transition temperature. This work was supported by the Robert A. Welch Foundation (grant A-1526), the National Science Foundation (DMR-0103455), and by the Texas A&M University Telecommunications and Informatics Task Force.

Joseph Ross
Texas A&M University

Date submitted: 15 Sep 2005 Electronic form version 1.4