

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Structural Studies on First-Order Phase Transitions in RPd_2Ga_2

ROBIN MACALUSO, University of Northern Colorado, L. CHAPON, E. GOREMYCHKIN, ISIS Facility, Rutherford Appleton Laboratory, R. OSBORN, J. MITCHELL, Argonne National Laboratory, B. RAINFORD, Southampton University — We have investigated the structure of RPd_2Ga_2 ($\text{R} = \text{La}, \text{Ce}$) compounds by neutron powder diffraction. For the first time, a first-order structural transition is observed at $T_t = 70$ K and $T_t = 125$ K for CePd_2Ga_2 and LaPd_2Ga_2 , respectively. The high-temperature structure ($T > T_t$) for both compounds is the tetragonal CaBe_2Ge_2 type with lattice parameters of $a = 4.4791(4)$ Å and $c = 9.83732(17)$ Å and $a = 4.83185(19)$ Å and $c = 10.7548(5)$ Å for LaPd_2Ga_2 and CePd_2Ga_2 at 305 K, respectively. Below T_t the symmetry of both structures descends to an orthorhombic space group, $Pmmn$. Lattice parameters at 2 K are $a = 6.07032(3)$ Å; $b = 12.90921(6)$ Å; $c = 9.87899(5)$ Å and $a = 6.3996(4)$, $b = 11.9508(8)$, $c = 9.9291(7)$ for LaPd_2Ga_2 and CePd_2Ga_2 . In this talk, evidence for the order of the structural transition will be presented and the low and high temperature structures will be discussed.

Robin Macaluso
University of Northern Colorado

Date submitted: 14 Dec 2006

Electronic form version 1.4