

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Superconductivity and Magnetic Ordering in $RE_2Pt_3Ge_5$ ($RE = La$ and Pr) Single Crystals

NAKHEON SUNG, C.J. ROH, B.K. CHO¹, School of Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju 500-712, Korea — Superconductivity and magnetic properties of rare-earth ternary germanide intermetallic compounds, $RE_2Pt_3Ge_5$ ($RE = La$ and Pr), are investigated. $La_2Pt_3Ge_5$ and $Pr_2Pt_3Ge_5$ single crystals were synthesized by high temperature metal flux method with Ge self flux. These two compounds were formed in $U_2Co_3Si_5$ -type orthorhombic structure (space group $Ibam$) and the lattice parameters were determined using XRD of pulverized single crystals. $La_2Pt_3Ge_5$ exhibits an onset of superconducting phase transition at $T_c = 8.1$ K, which, to the best of our knowledge, is the highest T_c in $U_2Co_3Si_5$ -type superconductors. $Pr_2Pt_3Ge_5$ shows both superconducting phase transition at $T_c = 7.9$ K and antiferromagnetic transition at $T_N = 4.4$ K. In addition, $Pr_2Pt_3Ge_5$ reveals strong magnetic anisotropy with an easy magnetic axis perpendicular to the c -axis, due to crystalline electric field effect. Including these results, we will discuss the nature of $RE_2Pt_3Ge_5$ single crystals in detail.

¹Author to whom correspondence should be addressed. Electronic mail: chobk@gist.ac.kr

Nakheon Sung
GIST

Date submitted: 11 Nov 2011

Electronic form version 1.4