Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Systematic investigation of structural, transport, magnetic and thermodynamic properties of hexagonal $R_2Pt_6Al_{15}$ (R = Y, La-Nd, Sm-Lu) series.[1] SOHAM MANNI, Q. LIN, S. L BUD'KO, P. C. CANFIELD, Ames Laboratory/ Iowa State University, Ames, IA 50011, USA — We have synthesized single crystals of new hexagonal intermetallic series of compounds $R_2Pt_6Al_{15}$ with R = Y, La-Nd, Sm-Lu. Structural analysis have confirmed hexagonal $P6_3/mmc$ crystal structure with ordered R-site. Magnetic, transport and heat capacity measurements show that most of the members of the series order antiferromagnetically at low temperature with highest $T_N = 7.5$ K for $Gd_2Pt_6Al_{15}$ and moments are along c-axis except $Dy_2Pt_6Al_{15}$ and $Ho_2Pt_6Al_{15}$. $Ce_2Pt_6Al_{15}$ does not order, but shows insulating behavior with a strong divergence in heat capacity divided by temperature (C/T). Mixed valence state of Eu^{2+}/Eu^{3+} state has been observed in $Eu_2Pt_6Al_{15}$ with antiferromagnetic ordering below 3 K. Magnetic entropy and crystal electric field are analyzed for all the members from the magnetic contribution of heat capacity. This series of compounds serves a unique example of a rare earth series with only one rare earth (R) site having hexagonal point-symmetry.

[1]This research is funded by the Gordon and Betty Moore Foundations EPiQS Initiative through Grant GBMF4411 and by U.S. Department of Energy under Contract No. DE-AC02-07CH11358.

Soham Manni
Ames Laboratory/ Iowa State University, Ames, IA 50011, USA

Date submitted: 05 Nov 2015 Electronic form version 1.4