

Abstract Submitted
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Effect of Co doping on the structural, magnetic and electron transport properties of Mn_2PtSn Heusler alloy¹ PARASHU KHAREL, YUNG HUH, AUSTIN NELSON, South Dakota State University, VALLOPPILLY SHAH, RALPH SKOMSKI, DAVID SELLMYER, University of Nebraska — Materials with high magnetic anisotropy and Curie temperature well above room temperature have huge potential for a range of applications including permanent magnet, high density recording and spintronic devices. Tetragonal Mn_2PtSn is one such Heusler compounds which has been predicted to have very high magnetic anisotropy but its low Curie temperature ($T_c = 374$ K) is a drawback [1]. Our experimental investigation of the rapidly quenched nanostructured ribbons shows that a single phase Mn_2PtSn in the tetragonal structure cannot be easily prepared without the substitution of an external element. We have found that a partial replacement of Pt with Co in Mn_2PtSn stabilizes the tetragonal structure and also improves the magnetic properties. The experimentally observed values of the room-temperature saturation magnetization (M_s) and Curie temperature (T_c) are respectively 35 emu/g and 385 K for Mn_2PtSn and 43 emu/g and 516 K for $\text{Mn}_2\text{Pt}_{0.3}\text{Co}_{0.7}\text{Sn}$. The effect of cobalt on the magnetic anisotropy and electron transport properties of this material will be discussed.

[1] J. Winterlik et al., *Adv. Mater.* **24**, 6283 (2012).

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