Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Growth of Mn_2TiSn alloy and its magnetic and structural characterizations[1] YUNG HUH, Physics Department, South Dakota State University, Brookings, 57007, P. KHAREL, V.R. SHAH, X.Z. LI, N. AL-AQTASH, K. TARAWNEH, E.S. KRAGE, R.F. SABIRIANOV, R. SKOMSKI, D.J. SELLMYER, NCNM, University of Nebraska, Lincoln, NE 68588 — A ternary inter-metallic alloy Mn_2TiSn is one of the candidates predicted to be a Heusler compound with high spin polarization and Curie temperature well above room temperature, which is suitable for spintronic applications. Mn_2TiSn powder samples were prepared by arc melting and annealing under controlled environment to study magnetic and structural properties. Temperature and field dependent magnetization measurements show the sample is ferromagnetically ordered with a Curie temperature above 400 K. The low temperature magnetization at 10 K is about 2.5 emu/g under 100 Oe. The coercivity increases as temperature decreases from 1 kOe at room temperature to 2.4 kOe at 10 K. Theoretical calculation from the high field data shows the anisotropy energy is 4.0×10^5 ergs/cm^3 at 300 K but it becomes slightly more than doubled at 10 K. TEM and XRD characterizations reveal that the compound crystallizes in the hexagonal structure ($D0_{19}$, $P6_3/mmc$) rather than the theoretically proposed $L2_1$ cubic structure, which is supported by the first-principle structure calculations where the total energy per unit cell volume is preferred for the hexagonal structure.

[1]This research is supported by ARO (W911NF-10-2-0099) (DJS, PK, XZL, VRS), NSF-MRSEC (NSF-DMR-0820521) (YH, EK, RFS, KT, NA and RS) and NCMN (Central Facility support).

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Date submitted: 25 Nov 2011 Electronic form version 1.4