Abstract Submitted
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Phase transition temperatures and magnetic entropy change in Ni-Mn-In-B based Heusler alloys ARJUN PATHAK, BHOJ GAUTAM, IGOR DUBENKO, NAUSHAD ALI, Department of Physics, Southern Illinois University, Carbondale, IL, 62901, MAGNETIC MATERIALS RESEARCH LAB TEAM — One of the aspects of great attention of Heusler alloys is the large value of magnetic entropy change (ΔS_M) and their possible application as a working material in magnetocaloric effect based magnetic refrigerators. It was reported earlier that $Ni_{50}Mn_{34.8}In_{15.2}$ has first order martensitic transition temperature $T_M \approx 212$K, Curie temperature of austenitic phase $T_C \approx 328$K and ΔS_M value associated with T_M and T_C are respectively 13 and -7 J/kg K [1]. In the present study, we are reporting the effect of partial substitution of In by B in $Ni_{50}Mn_{34.8}In_{15.2}$ by AC susceptibility, thermal expansion, and magnetization measurements. We observed that substitution of boron sharply increase T_M, and significantly enhance the ΔS_M peak value higher than 30 J/kg K at $T_M \approx 296$K; however the ΔS_M value remains almost same at T_C. Therefore, the Ni-Mn-In-B based Heusler alloys will be potential material for the study of room temperature magnetic refrigerator materials. Reference: [1] A. K. Pathak, M. Khan, I. Dubenko, S. Stadler, and N. Ali, Appl. Phys. Lett. **90**, 262504 (2007).

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