

Abstract Submitted
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Structural analysis of ferromagnetic Ni-Mn-Sn thin films fabricated by co-sputter deposition SEMA GUVENC, MEHMET YUMAK, Bogazici University, Dept. of Physics, 34342, Istanbul, Turkey, A. QUINTANA NEDELCO, J. L. SANCHEZ LLAMAZARES, Instituto Potosino de Investigacion Cientifica y Tecnologica, Mexico, CARLOS GARCIA GARCIA, Departamento de Fisica, Universidad Tecnica Federico Santa Maria, Valparaiso, Chile — Ferromagnetic Ni-Mn-X (Sn, In) alloys are predicted as potential candidates for energy efficient Magnetocaloric Effect (MCE) technologies. The MCE is the basis of magnetic refrigeration and it leads to a groundbreaking progress on conventional refrigeration methods. In our research, Ni-Mn-Sn thin films were fabricated by co-sputter deposition method. The Mn losses due to the high Mn vapor pressure produce a deviation from the desired $\text{Ni}_{50}\text{Mn}_{37}\text{Sn}_{13}$ composition, which are partially compensated by increasing power of the Mn target gun. A systematic study of thin film co-sputter fabrication was divided into three stages; i) a Ni-Mn-Sn target was evaporated at different temperatures in order to study the grain size temperature dependence, ii) the nominal chemical composition ($\text{Ni}_{50}\text{Mn}_{37}\text{Sn}_{13}$) was reached by controlling the power value applied to the Mn target, iii) the dependence of the phase transformation temperature with the grain size of the thin film alloys was studied. Grain size can be controlled by modifying the substrate temperature (T_s).

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