

MAGNETIC PROPERTIES AND MAGNETIC ENTROPY CHANGE IN TERNARY RARE EARTH INTERMETALLICS

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In this work the magnetic properties, magnetic phase transitions and magnetic entropy changes in polycrystalline ternary rare earth intermetallic compounds are discussed. These compounds crystallize in the tetragonal ThCr₂Si₂-type structure with the space group I4/mmm. It is known that the magnetic properties of these compounds are sensitive to the atomic distance and the magnetic structure can be easily modified by external pressure, temperature and magnetic field. The general magnetic phase diagrams for Sm_{1-x}Gd_xMn₂Ge₂ are similar to those observed for SmMn₂Ge₂ under external pressure. For 0.1 ≤ x ≤ 0.6 a typical SmMnGe₂-like magnetic behavior is observed. In this paper, we discussed the magnetic entropy change ΔS_M and magnetic properties deduced by the magnetization and structural properties. For Sm_{1-x}Gd_xMn₂Ge₂ with x = 0, 0.1, 0.15, the value of relative volume ΔV/V at magnetic phase transition is negative at T₁ and positive in T₂. The magnetic entropy change is found to be |Δ S_M(T₁)| = 0.96 ÷ 1.34 JK⁻¹mol⁻¹ at the re-entrant ferromagnetic transition and |Δ S_M(T₂)| = 1.05 ÷ 1.24 JK⁻¹mol⁻¹ at the antiferro-ferromagnetic one.

9.7 cm

13.4 cm

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