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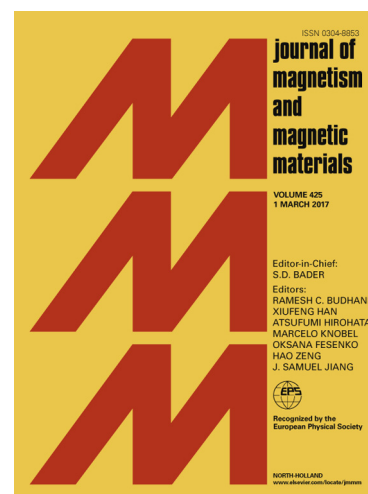
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Phase evolution and magnetic characteristics of TiFeNiCr and TiFeNiCrM (M= Mn, Co) high entropy alloys

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ABSTRACT

The report describes the effect of elemental addition (Mn and Co) on the phase evolution and magnetic properties of equiatomic TiFeNiCr based high entropy alloys (HEAs). HEAs were synthesized through mechanical alloying (MA) of constituent elements for different milling duration. XRD analysis confirms that simple solid solution of face centered cubic structure is formed for all the three selected HEAs. Double FCC and a sigma phase are evolved for TiFeNiCr and TiFeNiCrMn HEAs. However, for TiFeNiCrCo HEA single FCC phase is formed. Synthesized HEAs show soft magnetic characteristics and the value of saturation magnetization increases as the content of magnetic element increases. Moreover, the investigation also describes the effect of annealing on phase evolution and magnetic properties of synthesized HEAs. The value of saturation magnetization altered for annealed TiFeNiCrM (M= Mn, Co) HEAs.

Keywords; Metals and alloys; Magnetic materials; High entropy alloys; Mechanical alloying

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