

عنوان مقاله:

(The effect of Ni addition on thermal properties of FeNiMoPCB Bulk Glassy Alloy (BGA

محل انتشار:

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خلاصه مقاله:

Metallic Glasses have recently gained a lot of attention due to their appropriate mechanical and corrosion properties. Adding a secondary phase in these alloys can result in the fabrication of in-situ or ex-situ metallic glass matrix composites which in turn improves the mechanical properties. Among these glassy alloys, Fe-based alloys have gained the focus of many studies in recent years. In the present study, the  $(\text{Fe}_{1-x}\text{Ni}_x)_{77}\text{Mo}_5\text{P}_4\text{Cu}_{15}\text{B}_{1.5}$  ( $x = 0.05, 0.1$ ) glassy alloy is fabricated by the induction melting technique in an alumina tube, and the subsequent injection casting in a water circumference copper mold. The X-ray diffraction and differential scanning calorimetry analyses for alloys with 2 mm diameter showed that the  $x = 0.05$  sample contains in-situ Fe<sub>2</sub>NiP nanocrystalline phase embedded in the amorphous matrix which is formed during cooling from the melt, while the  $x = 0.1$  sample contains a fully amorphous microstructure. Increasing the amount of Ni led to a fully amorphous configuration in samples with  $x = 0.1$  having diameters of 1 and 2 mm. Using the X-ray diffraction pattern, the size and volume fraction of Fe<sub>2</sub>NiP nanocrystals formed in the in-situ amorphous/crystalline nanocomposite with the composition of  $(\text{Fe}_{0.95}\text{Ni}_{0.05})_{77}\text{Mo}_5\text{P}_4\text{Cu}_{15}\text{B}_{1.5}$  are estimated to be around 22 nm and 18%, respectively.

کلمات کلیدی:

Metallic Glasses, nanocomposite, in-situ method, Glass Forming Ability

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