عنوان مقاله:

Structure and properties of nanostructured Cu-Al-Ni shape memory alloy produced by melt spinning compared with ingot microstructure

محل انتشار:

سومین کنفرانس نانوساختارها (سال: 1388)

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خلاصه مقاله:

In this study, the structure and properties of nanostructured Cu-Al-Ni shape memory alloy (SMA) is compared with conventional grain size of this alloy. Cu-Al-Ni SMA, containing 13.2 wt% Al and 5.1 wt% Ni was cast by induction furnace. The ingot was solution treated at 950 C for one hour and then water quenched. Nanostructured Cu-Al-Ni ribbons were produced using chill-block melt spinning technique. The nanostructured melt-spun ribbons and conventional structure were investigated by X-ray diffraction (XRD) and spectroscopy electron microscopy (SEM).Differential scanning calorimetry (DSC) was used to characterize the influence of produced nanostructure on the transformation temperature. In order to investigate the shape memory effect (SME), the samples were deformed to 3 % and then heated in 250 C oil bath. The results show, ribbons demonstrate one way shape memory effect in melt-spun condition, the formation of nanoparticles γ2 (Cu4Al9), the nano grains about 70 to 120 nm, significantly decrease in transformation temperature and extremely increase in reversible deformation and stability of it in successive cycles.

کلمات کلیدی:

Rapid solidification; Nanostructure; Cu-Al-Ni; Shape memory alloys