

عنوان مقاله:

.Optimization of magnetic components used in information storage in Radar

محل انتشار:

دهمین کنگره سراسری فناوری های نوین در حوزه توسعه پایدار ایران (سال: 1399)

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خلاصه مقاله:

Iron-cobalt based alloys exhibit particularly interesting magnetic properties, with high Curie temperatures, the highest saturation magnetizations, high permeability, low losses and are relatively strong . Fe₆₅Co₃₅ alloy has saturation magnetization as high as 23.5 kG. It has been considered as one of the prominent candidate materials for the applications in magnetic write head [1]. Alloys based on the near-equiatomic FeCo offer exceptional magnetic properties. The equiatomic alloy was 'invented' in 1929 , it offers a saturation hardly lower than that of the maximum obtained for Fe-0.35Co, with higher permeability and a lower coercivity than the latter. However, this alloy remained without industrial application, mainly because of its extreme brittleness. FeCo alloys as soft magnetic materials are known to exhibit very high magnetic moments. FeCo intermetallic alloys are well known to possess a unique combination of high saturation magnetization, high Curie temperature, low magneto crystalline anisotropy and good strength. They are ideally suited for applications requiring high flux densities. Intense research and development efforts over the years resulted in significant improvements in mechanical properties and better understanding of phase transformations in FeCo alloys. However, the high cost of the alloys has prevented their widespread applications. Emerging needs for soft magnetic materials to operate at high temperatures have caused renewed interest in FeCo alloys. Mechanical alloying of the FeCo equiatomic-magnetic alloy from elemental powders has been studied. (X = 0.2, 0.25, 0.3, 0.35, 0.4 ,0.45 and 0.5) powders were prepared by mechanical alloying after 15, 20, 25 and 30 hours. Magnetic properties were investigated based on microstructure. The saturation magnetization of the mixtures of Fe and Co increases with milling time, indicating an increasing homogeneity in composition and the phase formation. It is found that the saturation magnetization is also dependent on the Co content, which reaches the highest value of 266 emu/g at .The powders were characterized using scanning electron microscopy (SEM), x-ray diffraction (XRD) and .(vibrating sample magnetometer (VSM

کلمات کلیدی:

.mechanical alloying, FeCo, magnetic properties, data storage, radar

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