

Allotropic transformation of cobalt in magnetic induction melted

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Abstract: In contrast to the abundance of studies in Fe -Al and Fe-Co, those in the Fe-Al-Co ternary system are scarce. Consequently, the phase separation and phase diagram of this system remain still ambiguous. Ternary Fe_{0.6}Al_{1-x}Co_x (x values in a molar ratio of 0.05, 0.1, 0.15, and 0.2) have been elaborated by high frequency magnetic induction fusion, in order to study the effect of cobalt ternary addition on the structural behavior such as phase separation, thermal and mechanical properties of Fe-based alloy system, by means of x-ray diffraction, thermal analysis (DSC) and Vickers microhardness. An unexpected allotropic phase transformation from stable HCP to metastable FCC Cobalt has been observed in all alloys.

Keywords : Fe-Al-Co, phase transformation, phase separation, lattice parameter.