Etude des propriétés mécaniques et magnétiques des alliages Fe70Al30-xSixélaboré par arc melting

M. CHETTAH

Soutenue en: 2019

Abstract: This study investigates the effect of Al substitution by Si on the structural, mechanical (Vickers HV hardness) and magnetic (hysteresis loop) properties of the Fe70Al30-xSix alloys developed by Arc Melting.Results show that the increase in Si content gives rise to the ordered phase DO3 (FeAl0.7Si0.3) starting from the composition Fe70Al15Si15; this last transition is accompanied by a drop in micro hardness HV and a remarkable variation in structural parameters such as relaxation of the crystals. Also, the substitution of Al by Si atomes decreases the cell parameter.Our choice of process and alloy is based on economic considerations (low cost) to understand the phase transitions in these alloys that are typical ones.

Keywords : Fe-Al-Si alloys, Arc melting, Order-disorder transitions, solid solution bcc-Fe, Ordered phase DO3 (Fe3Al0.7Si0.3), micro-hardness HV, Hysteresis cycle, Coercive field, Remanent magnetization, Saturation magnetization