

Structural and hyperfine comparative study of ball-milled and arc-melted Fe₅₀ Cr₅₀ alloys

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Resumo

In this work we make a structural and hyperfine comparative study of the Fe₅₀ Cr₅₀ stoichiometric alloy obtained for two different techniques, mechanical alloying and arc-melting. Both alloys were heated to 650 °C for 7 days, quenched into ice water and then mechanically alloyed for different milling times. Before heat treatment the two alloys exhibit Fe-Cr BCC structure and ferromagnetic behavior similar, after treatment, in the alloy obtained by mechanical alloying, the BCC structure is completely transformed into the ordered structure σ Fe-Cr, whereas that in the alloy obtained by melted this transformation is partial. The mechanical alloying realized in the last stage affect notoriously the structure σ Fe-Cr, for 2 hours of milling the structure is completely disordered, subsequently transformed into BCC Fe-Cr phase, and disappears at 16 hours of milling.