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Structural evolution of the mechanically alloyed Fe62Nb8B30powder mixtures

A. HAMOUDA, S. Alleg, S. Azzaza, R. Bensalem, J. J. Sunõl

Abstract : Fe62Nb8B30 amorphous alloy was prepared by mechanical alloying in a planetary ball mill from pure elemental powders. Structural properties of the milled powders were investigated by X-ray diffraction. The mixing of Nb and B leads to the formation of a bcc Nb(B) solid solution after 1 h of milling. A highly disordered Fe(Nb, B) structure in addition to a small amount of the un-reacted ?-Fe and the bcc Nb(B) solid solution are obtained after 25 h of milling. The amorphous state is reached onfurther milling (up to 125 h).

Keywords : nanostructures, powder metallurgy