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Microstructure Characterization of the Ball Milled Fe50Al30Ni20 (%.wt) Powder

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Abstract : B2-structured FeAl was synthesized by an abrupt reaction during mechanical alloying (MA) of the elemental powders of Fe, Al and Ni. The structural, microstructural and morphological changes occurring in the studied material during MA were investigated by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Two crystalline phases were found, the major one corresponding to FeAl bcc phase with a crystallite size less than 10 nm, a lattice strain up to 1.6% and a dislocation density of about 2.3 1016m-2. The other phase in low proportion was corresponding to Fe (Al,Ni) solid solution. SEM images showed an irregular morphology of powder particles.

Keywords : mechanical alloying, ternary composition, dislocation density, structural properties
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