Nanocomposites and nanomaterials

Proprieties of FeSiB nanopowders alloys prepared by mechanical alloying

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Nanopowders of $Fe_{75}Si_{15}B_{10}$ (% at) was prepared by mechanical alloying from elemental powder mixture [1]. Structural, microstructural and thermal were investigated as function of milling times. X-ray diffraction results show the formation of Fe_2B after 5 h of milling, and Silicon diffraction peaks disappeared after 50 h of milling. Rietveld [2] refinement of XDR patterns reveals the presence of 74 % Fe(Si, B) solid solution and 26 % Fe_2B boride with cristallite size about 13 nm and 6 nm, respectively. Differential scanning calorimetry (DSC) measurements on FeSiB alloy present an exothermic peak at 600 °C, which is associated a mixture of highly disordered of the α-Fe(Si, B) solid solution and Fe_2B boride.

1. *Alleg S., Ibrir M., Fenineche N.E., Azzaza S., Bensalem R., Suñol J.J.* Magnetic and structural characterization of the mechanically alloyed Fe75Si15B10 powders// J. of Alloys and Comp. 2010. -494, N 1-2. –P. 109-115.
2. *Lutterotti L.* MAUD CPD Newsletter (IUCr) 2000. 24.