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Synthesis and characterization of nanocristalline Fe75Si25Alloy prepared by high energy ball mill

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Abstract : echanical alloying is a powder metallurgy processing technique involving cold welding, fracturing, and rewilding of powder particle in a high energy. It has been used to obtain nanocrystalline alloy. Fe -25wt% Si alloys were synthesized using a planetary ball mill (Retsch PM400). Xray diffraction was used to identify and characterise various phase during the milling process. It is shown that the FeSi solid solution was formed after 4 hours milling. The study state grain size is about 10 nm. Many nanostructures magnetic materials have exhibited excellent soft magnetic properties, which suit so many applications. We used the electromagnetic methods and Xray (like a reference methods), to characterize the variation of structure and their influence.

Keywords : Fe-Si powder; Mechanical alloying; nanomaterials ; X ray Diffraction