

# Élaboration et caractérisation des matériaux nanostructures à base de Fe et Ni

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**Abstract:** The aims of this work is to understand the influence of the elaboration method , mill type, milling time and concentration on the structural, microstructural and magnetic properties of Fe<sub>80</sub>Ni<sub>20</sub> nanostructured alloy. The production of the Fe<sub>80</sub>Ni<sub>20</sub> nanostructured alloy was carried out by the mechanical alloying technique of iron and nickel powders mixture. The elements produced (elaborated) were characterized by X-ray diffraction techniques (DRX), Scanning Electron Microscope (SEM) and Vibrating Sample Magnetometer (VSM). The X-ray diffraction study confirmed the formation of the Fe-Ni alloy after 600 min of milling with an average crystallite size of 13 nm, while the analysis of the magnetization curves of the Fe-Ni alloys, revealed original magnetic properties: super paramagnetic behavior, and especially saturation magnetization and significant coercivity.

**Keywords :** elaboration method, properties of Fe<sub>80</sub>Ni<sub>20</sub>, nanostructured alloy