

# Micro-Structure Characterization by MicroMagnetic Methods

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**Abstract :** The quality control of industrial components requires adaptation and the development of new material characterization and particular non destructive testing techniques. To characterize a steel, it would be useful to know its chemical composition, physico-chemical constitution, metallurgical state (annealed,hammered) and others parameters (superficial and chemical processing ...).The testing method using Barkhausen noise (B.N.) is a particular method, which can be applied on ferromagnetic materials. It is a magnetic non destructive evaluation(NDE) method and can provide very important information on the material microstructure. The using of the NDT method gives lot information about these nanostructures in particular the magnetic NDT techniques. In this paper, we examine the contribution of micromagnetic techniques in the characterisation of nanostructure materials. Nanocrystalline Fe(1-x) Cox , Fe ,Fe-Co-Cu mixtures have been prepared by mechanical alloying using a planetary ball mill under several milling conditions. Data analysis showed that the technique of the corrective field, the residual magnetisation, saturation moment and the eddy current was in relation with time milling of these powders (in our case Fe Ni) .

**Keywords :** NDT, Barkhausen noise, FFT, remanence, corecitivity, micro defect. nanostructure