

# Effect of Cu/Ni Ratio on the Chemical composition, Magnetic behaviour, and Structural properties of a FeCuNi based alloy

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**Abstract:** The aim of this project is to study and understand the influence of copper and nickel concentration on the magnetic, morphological and structural properties of the Fe<sub>70</sub>Cu<sub>30-x</sub>Ni<sub>x</sub> alloy. The alloy was elaborated by mixing iron, nickel and copper powders by the mechanical alloying technique for 10 hours of milling. The elements were characterised by different techniques: X-ray diffraction (XRD), Scanning Electron Microscope (SEM) and Vibrating Sample Magnetometer (VSM). The X-ray diffraction study shows that the crystallite size decreases with increasing Ni. When it come to the magnetic properties, the coercivity  $H_c$  and the saturation moment  $M_s$  rise from 83 Oe, 121.5 emu/g to 156 Oe, 140 emu/g respectively.

**Keywords :** Fe<sub>70</sub>Cu<sub>30-x</sub>Ni<sub>x</sub>, Scanning Electron Microscope (SEM), X-ray diffraction