Microstructural and magnetic characterization of Cu-Ni nanocrystalline powders.

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Abstract : Cu50Ni50 nanocrystalline powders have been prepared by mechanical alloying from pure elemental Ni and Cu powders in a planetary ball mill, at room temperature, under argon atmosphere. Morphological, structural, microstructural and magnetic properties of the ball milled powders were characterized by scanning electron microscopy, X-ray diffraction and vibrating sample magnetometer. The total mixing of the elemental powders gives rise to the formation of Ni(Cu) and Cu(Ni) solid solutions. Both the saturation magnetization and the coercivity decrease from 53emu/g and 39.4Oe, respectively, for pure Ni to about 12.65emu/g and 19.5Oe after 30 h of milling.

Keywords : Cu50Ni50 nanocrystalline powders, Mechanical Alloying, Microstructural and magnetic properties.