The crystal and magnetic properties of some Fe-Nb-B-Ni bulk alloys

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The crystal and magnetic properties of $(Fe_{80}Nb_6B_{14})_{1-x}Ni_x$ (x=0.1, 0.2 and 0.4) bulk alloys prepared by making use of mould casting technique [1] has been studied by X-ray diffraction, magnetostatic and Mössbauer effect methods. Structural and magnetic properties of investigated bulk alloys were compared with polycrystalline $Fe_{1-x}Ni_x$ (x= 0.1, 0.2 and 0.4) alloys. The measurements showed that the crystal and magnetic nonhomogeneity for bulk alloys are higher than in polycrystalline compounds what confirms many magnetic transformations above temperature 500 K and wide magnetic hyperfine field distribution from 0T to 36T. The mean diameters of crystallites for $(Fe_{80}Nb_6B_{14})_{1-x}Ni_x$ alloys was calculated from X-ray line broadening and were bigger then 10 nm. The mean magnetic moment of alloys and average magnetic hyperfine fields decreases with increasing of nickel concentration in investigated compounds.

References:

[1] A.Chrobak, M.Karolus, G.Haneczok, Sol. St. Phen., 163 (2010) 233-238.