THE INFLUENCE OF MECHANICAL ALLOYING ON THE STRUCTURAL AND PHYSICAL PROPERTIES OF YNi_4B INTERMETALLIC COMPOUND

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9.7 cm

We have investigated the influence of mechanical milling on structural changes (by means of X-ray diffraction, transmission electron microscopy and thermal analysis) and magnetic properties (with aid of magnetization and ac-susceptibility measurements) of the YNi_4B intermetallic compound. Magnetic measurements have shown that originally prepared polycrystalline sample exhibits properties of a superconducting material with the transition temperature $T_c = 13$ K. The great decrease of the intensity and broadening of the diffraction lines have been detected after milling as a consequence of amorphisation of the samples. The superconducting properties deteriorated upon milling and no superconductivity was found for the amorphous phase. On the other hand no tendency towards the saturation of magnetization could be observed after milling. The high-field susceptibility estimated from the linear part of magnetization for milled samples was in the range 1-4$\times10^{-7}$ m^{3}kg^{-1} . Such a large value of the high-field susceptibility can be attributed to the itinerant character of the milled samples.

13.4 cm

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