

High hard magnetic properties and cellular structure of nanocomposite magnet $\text{Nd}_{4.5}\text{Fe}_{73.8}\text{B}_{18.5}\text{Cr}_{0.5}\text{Co}_{1.5}\text{Nb}_1\text{Cu}_{0.2}$

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Abstract: The formation of special nanostructure, cellular structure, in $\text{Nd}_{4.5}\text{Fe}_{73.8}\text{B}_{18.5}\text{Cr}_{0.5}\text{Co}_{1.5}\text{Nb}_1\text{Cu}_{0.2}$ nanocomposite magnet has been observed by means of SEM for the first time. Ultrafine structure of cellules with thickness of 20-25 nm and length in range of 200-300 nm leads to high shape anisotropy of the materials. Therefore, high hard magnetic properties were obtained with $(\text{BH})_{\text{max}}$ up to 17.3 MG Oe in ribbons with very high remanence of 13.5 kG. The role of Cr and Co in the formation and refinement of cellular structure is proposed. Effect of heat treatment on hard magnetic properties is discussed in detail. © 2006 Elsevier B.V. All rights reserved.

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