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Some New Results by Using the Transmission Electron Microscopes to Study the Alloy Nd-Fe-Co-Al. V. Vong, L.T. Hung, N.H. Dan, M. Hietschold, Laboratory of Electron Microscopy-Vietnamese Academy of Science and Technology, 18 Hoangquocviet Rd., Caugiay-Hanoi Vietnam.

The Nd-Fe-Al bulk amorphous hard magnetic alloy discovered by Inoue et al.[1996] with $R_c \sim 102 \text{ K.s}^{-1}$, $H_c \sim 300 \text{ kA/m}$. This kind of materials have attracted many researchers by virtue of both the application potential and the natural of the hard magnetic mechanism. The Co, B improve GFA, H_c , $(BH)_{\text{max}}$ and TC of these alloys (N. X. Phuc et al.). The high H_c , T_c and $(BH)_{\text{max}}$ in these alloys were supposed that is due to single domain- like structures formed by nanosized clusters of nanocrystallites. $\text{Nd}_{55-x}\text{Co}_x\text{Fe}_{30}\text{Al}_{10}\text{B}_5$ ($x = 0,5,10,15$ and 20) and $\text{Nd}_{40-x}\text{Co}_{15}\text{Fe}_{30}\text{Al}_{10}\text{B}_{x+5}$ ($x=0,5$ and 10) rods with dimensions of $1 \times 10 \times 30 \text{ mm}$ fabricated by copper mold suction-casting method in an arc-melting furnace. $\text{Nd}_{35-x}\text{Fe}_{30+x}\text{Co}_{20}\text{Al}_{10}\text{B}_5$ ($x = 0,10,20$ and 30) and $\text{Nd}_{25}\text{Co}_{30}\text{Fe}_{30}\text{Al}_{10}\text{B}_5$ were prepared by melt-spinning method with quenching rate of $v=30\text{m/s}$ and $v=10, 15, 20$ and 25m/s , respectively. We achieved the Nd-Fe-Al based alloys and then the materials were studied by transmission electron microscopes (TEM,HREM). The results show that the prepared materials have nano-structure and nano-size. The characterizations as well as high T_c , H_c and $(BH)_{\text{max}}$...of the prepared materials were investigated. Many authors supposed that the nanosized clusters of this material can be improved the materials, especially magnetic property. In the work we proved this one. With the method for preparation of the sample can create the changing of the material structure.