

Influence of Cu content in $\text{Fe}_{73.5+x}\text{Cu}_{1-x}\text{Nb}_3\text{Si}_{13.5}\text{B}_9$ ($x=0, 0.2, 0.4, 0.6, 0.8, 1$) alloys

Dongsheng Sun¹, Seongmin Hong², Lan Jin¹, CheolGi Kim^{*1}, and ChongOh Kim¹

¹ Department of Materials Science and engineering, Chungnam National University, 220 Gung-Dong, Yu-Seong Gu Daejeon, 305-764, Korea

² Research Center for Advanced Magnetic Materials, Chungnam National University, 220 Gung-Dong, Yu-Seong Gu, Daejeon, 305-764, Korea

*Corresponding author: e-mail: cgkim@cnu.ac.kr, Phone: +82 42 821 6229, Fax: +82 42 822 6272

Nanocrystalline Fe-Si-B alloy with a small addition of Nb and Cu has been patented under the trade name FINEMET[1], which show ultrasoft magnetic properties. A typical example is $\text{Fe}_{73.5}\text{Cu}_1\text{Nb}_3\text{Si}_{13.5}\text{B}_9$. The formation of this nanocrystalline structure is ascribed to the addition of Cu and Nb. Amorphous ribbons of nominal composition $\text{Fe}_{73.5+x}\text{Cu}_{1-x}\text{Nb}_3\text{Si}_{13.5}\text{B}_9$ ($x=0, 0.2, 0.4, 0.6, 0.8, 1$) prepared by single roll melt-spun method in an argon atmosphere. In order to investigate the effect of Cu content on the magnetic properties, we will do these work as follows: Differential thermal analysis (DTA) was used to examine the crystallization temperatures of as-quenched amorphous ribbons. The structure of the ribbons was measured by X-Ray diffraction (XRD). The hysteresis loops were measured by vibrating sample magnetometer (VSM), and B-H loop analyser was used to examine the AC response.

References

- [1] Y. Yoshizawa, S. Oguma, and K. Yamaguchi, J. Appl. Phys. 64, 6044 (1988).