Mössbauer studies of nanocrystalline $Fe_{83}B_9Nb_7Cu_1$ alloy by flash annealing

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Abstract — **Melt-spun $Fe_{83}B_9Nb_7Cu_1$ alloy with ultrathin ribbon has been studied with Mössbauer spectroscopy and X-ray diffraction. The enhanced magnetic property of the flash-annealed alloy was attributed to the reduced α-Fe phase grain size to 6 nm and the higher effective permeability and smaller magnetic core loss at 1 MHz than conventional annealed alloys. The occupied area of the nanocrystalline phase at the optimum 773 K is about 73% whereas that for conventional annealing temperature at 893 K is about 71%. The flash annealing technique was effective in improving the high-frequency soft magnetic property of nanocrystalline $Fe_{83}B_9Nb_7Cu_1$ alloy.**