FORC analysis of soft/semi-hard magnetic $Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9/Co_{72.5}Si_{12.5}B_{15}$ bilayer ribbons

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Hysteresis behavior and interphase interactions were studied in soft/semi-hard magnetic bilayer $Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9/Co_{72.5}Si_{12.5}B_{15}$. Rapidly solidified amorphous ribbons were prepared by modified double-nozzle planar flow casting method. Subsequently, specimens were isothermally annealed for 180 seconds at 843K in the vacuum furnace, leading to formation of nano/microcrystalline structure. Interphase interactions were characterized using the First Order Reversal Curves (FORC) analysis. Switching field distribution (SFD), calculated from the individual FORCs, showed correlation between intensity of the interaction fields and magnetic state of the semi-hard phase at various reversal fields. FORC distribution unveiled positive coupling within semi-hard magnetic microcrystalline grains of $Co_{72.5}Si_{12.5}B_{15}$ layer. The effects of the magnetostatic interaction between semi-hard and soft magnetic layers will be discussed.

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