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Enhanced coercivity in melt-spun Sm-Co-Fe-Cu ribbons after low temperature aging[1] D. SULTANA, M. MARINESCU, Y. ZHANG, G.C. HADJIPANAYIS, Department of Physics & Astronomy, University of Delaware, 223 Sharp Lab., Newark, DE 19716, MAGNETICS LAB. TEAM — We have studied systematically the influence of the microstructure refinement on the change of coercivity in melt-spun Sm $(Co_{0.45}Cu_{0.4}Fe_{0.15})_5$ alloys after thermal aging. The specimens have been prepared in the form of ribbons with a thickness in the range of 35 - 80 μm for values of the quenching wheel speed between 5-25 m/s. X-ray diffraction spectra of the as-spun ribbons showed a single phase 1:5 structure. The as-spun ribbons had a coercivity $H_c = 8$ kOe. The as-spun ribbons have been subjected to low temperature aging between 350-400 °C for different periods of time, in Ar atmosphere. Our results showed that the highest coercivity of 44 kOe was obtained in a sample aged at 400 ^{o}C for 133 h. Microstructural investigations by transmission electron microscopy reveal that the average grain size of the specimens with the enhanced coercivity is about 500 nm. In order to have an insight into the mechanism of the coercivity enhancement, we are investigating the microchemistry at the grain boundaries by energy dispersive X-ray analysis and measuring the change in the Curie temperature through thermomagnetic measurements.

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