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Effect of Grain Size on Spinodal Decomposition and Magnetic Properties in Melt-Spun Alnico Alloys GEORGE HADJIPANAYIS, University of Delaware, BIANCA FRINCU, KONRAD LÖWE, TU Darmstadt, XIAOCAO HU, University of Delaware, OLIVER GUTFLEISCH, TU Darmstadt — The low coercivity of Alnico magnets, which develops upon spinodal decomposition, limits their use for high temperature applications. The aim of this work is to investigate the effect of grain size on the spinodal decomposition in Alnico melt-spun alloys and hopefully be able to tailor the spinodal structures by varying the grain size and processing routes to include magnetic annealing that may lead to higher coercivity. The grain size of the samples was varied by changing the wheel speed from 5-60 m/s. Spinodal decomposition was induced by subjecting the samples to an annealing heat treatment at temperatures in the range of 600-900 C The spinodal structures were observed in micron size grains with a spinodal size in the range 45-80 nm with the larger size corresponding to the higher wheel speed samples. The coercivity was also found to depend strongly on the size of spinodal structures with the highest value obtained in the sample with the finer spinodal size. We are currently continuing our studies in ribbons with submicron size grains and the results will be reported.

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