An original route for the preparation of hard FePt

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Abstract: The preparation of FePt hard magnetic foils by an original procedure is described in this paper. The process associates cyclic co-deformation of Fe and Pt foils down to the nanometer scale (total thickness of multilayer ?? 100 ?m) followed by heat treatment in the temperature range 450-550?C. The formation of the high-anisotropy $L1_0$ FePt phase results from controlled diffusion and an ordering phase transformation. Coercivities as high as 0.9 T were measured in a VSM at room temperature following annealing at 450?C for 48 h. The coercivity of this sample was decreased by half when measured at 600 K while its energy product decreased from 100 kJ/m^3 at 300 K to 25 kJ/m^3 at 600 K.

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Index Keywords: Coercive force; Cold rolling; Deformation; Diffusion; Heat treatment; Magnetic anisotropy; Magnetic materials; Multilayers; Nanostructured materials; Phase transitions; Magnetic foils; Iron alloys

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