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Impact of Boron Additions on the A1 to $L1_0$Phase Transformation in FePt Alloy Films B. WANG, K. BARMAK, Department of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA 15213 — The combination of high magnetocrystalline anisotropy energy density and good corrosion resistance has resulted in significant interest in $L1_0$ ordered alloys such as FePt for ultrahigh density, heat assisted magnetic recording (HAMR) media, with areal storage densities of $\geq$1Tb/in^2. When deposited at room temperature, these FePt forms in the chemically-disordered A1 state, requiring a post-deposition anneal to form the ordered $L1_0$ phase. Previous work has shown that the composition of FePt films has a significant impact on the kinetics and thermodynamics of the A1 to $L1_0$ phase transformation. In this paper, we report on the impact of ternary additions of B to FePt on the thermodynamic and kinetic parameters of the transformation. We also compare and contrast the impact of B additions with those of ternary additions of Cu and Ni. It is shown that the introduction of B into Pt-rich FePt films lowers the activation energy and the kinetic ordering temperature for the A1 to $L1_0$ phase transformation. However, this impact becomes negligible when B is introduced into Fe-rich FePt films.

B. Wang
Carnegie Mellon University

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