

Abstract Submitted
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Texture development and magnetic properties of Ru-doped FePt films¹ ZHEN LI, YUCHENG SUI, ROGER KIRBY, DAVID SELLMYER, Department of Physics and Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, Nebraska 68588-0111 — L1₀ ordered FePt films are promising candidates for ultra-high density recording media due to their high magneto-crystalline anisotropy when grown with (001) texture. In this paper, the effects of Ru doping on the FePt L1₀ phase formation and development of (001) texture are studied systematically. Ru doping is realized by preparing Fe/Pt/Ru multilayers by magnetron sputtering on SiO₂ substrates, with subsequent annealing at 650 °C for 5 minutes in forming gas or hydrogen gas. It appears that hydrogen gas annealing leads to improved (001) texture. For small Ru alloying (less than 5 at. %), the L1₀ texture and degree of chemical ordering remain the same. X-ray diffraction analysis shows that the (001) and (002) peaks shift slightly to larger angles, indicating that the Ru is dissolved in the FePt L1₀ phase. Increasing the Ru concentration beyond 5 at. % resulted in an increasing (111) texture and a steady decrease of both coercivity and saturation magnetization. The effects of Ru on the magnetization and the magnitude of the coercivity have been studied. The mechanism by which Ru doping influences the texture development also will be presented in this work.

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