

Abstract Submitted
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Control of Size and Magnetic Properties of L1₀ FePt islands by DC sputtering¹ XIAOCAO HU, Department of Materials Science and Engineering, University of DE, Newark, DE, 19716, USA, OZAN AKDOGAN, WANFENG LI, GEORGE HADJIPANAYIS, Department of Physics and Astronomy, University of DE, Newark, DE, 19716, USA — FePt particles with the tetragonal L1₀ structure are attractive for high density recording media. In this study, we have fabricated well-ordered and separated L1₀ FePt islands on MgO (100) substrates by DC sputtering at temperatures varying from room temperature to 700 °C. The dependence of particle size, degree of ordering and magnetic properties on sputtering time (5-20s), power (5-20W) and substrate temperature (300-1000K) were investigated. Electron diffraction patterns from TEM showed that the islands had the L1₀ tetragonal structure. TEM data revealed that a higher substrate temperature significantly increased the size of the islands from 2 to 20 nm whereas a higher sputtering power and longer sputtering times did not change the island size much but made the islands more connected with each other. Larger size islands and inter-connected islands showed a higher degree of ordering with an ordering parameter of 0.8 achieved at 600 °C. The magnetic properties are currently being measured and the results will be reported.

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