

Abstract Submitted
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CoPt Nanowires by Electrodeposition¹ HAFSA KHURSHID, Y. HUANG, G.C. HADJIPANAYIS, Department of Physics, University of Delaware, Newark, DE, 19716 — CoPt nanoparticles with L1₀ structure have been studied as a promising material for high density magnetic recording due to the high anisotropy value of the L1₀ phase ($K=2 \times 10^7$ ergs/cc). In this study, we prepared CoPt nanowires (up to 200nm in diameter and 100 micrometer in length) embedded in anodized alumina templates by electrodeposition. The pH values have been varied from 3 to 6 by adding diluted NaOH into the deposition bath. The wires were then annealed in a high vacuum furnace at a temperature range between 650°C to 750 ° C in order to transform their structure from the disordered fcc phase to the ordered L1₀ phase. A higher pH value leads to a higher coercivity and smoother loop which can be attributed to a more uniform CoPt composition through out the wires. HRTEM data of as-made samples shows that the long wires consist of both tiny nanoparticles (1-2 nm) and elongated nanorods having a single crystal fcc structure. The microstructural data is consistent with the magnetic measurements, showing a slightly preferred orientation perpendicular to the long axis of the wires with $H_c= 5$ kOe and 5.5 kOe along and perpendicular to the direction of the wires, respectively.

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