The effect of non-symmetric ac electrodeposition in electrolytes with various PH on the crystal structure and magnetic properties of Co nanowires

S R Hosseini, M Almasi Kashi, A A Ramazani and F Eshaghi

Department of Physics, University of Kashan, Kashan, Iran
E-mail: almac@kashanu.ac.ir

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Abstract
Co nanowires were fabricated onto the nanoporous aluminum oxide arrays using ac electrodeposition technique. The influence of frequency and pH on the magnetic properties and crystal structure of symmetric (18-18 V) and non-symmetric (18-12 V) electrodeposited Co nanowires was investigated. A direct relation was seen between saturation magnetization, squareness and coercivity of the samples prepared with various deposition frequencies and electrolyte acidities. Coercivity of Co nanowire arrays prepared by non-symmetric anodization voltage changed between 600 to 700 Oe while it was varied from 1280 to 1630 Oe for those fabricated by symmetric deposition voltages. The easy axis was perpendicular and parallel to the wires axis in the Co nanowires arrays prepared by non-symmetric and symmetric electrodeposition voltage, respectively.

Keywords: Co nanowires, crystal structure, magnetic properties, hysteresis loop

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