Electrodeposition of Pt-Ni nanowires using various alumina templates and characterization of their magnetic properties

D. Hložná,¹ O. Shylenko,¹ E. Čižmár,¹ A. Kovalčíková,² and V. Komanický¹

¹Institute of Physics, P. J. Šafárik University, Košice, Slovakia
²Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

High aspect ratio porous aluminum oxide membranes of various pore diameter and interpore distance were used as templates for the synthesis of electrodeposited magnetic Pt-Ni nanowire arrays. The pulsed electrodeposition potential sequence consisted of 1000 cycles comprising deposition, discharge and rest pulse, which results in PtNi₃ nanowire composition and length of around 1 µm. The morphology and composition of Pt–Ni nanowires were determined by scanning electron microscopy and energy dispersive X–ray spectroscopy. The temperature dependence of susceptibility was measured in zero–field cooled (ZFC) and field–cooled (FC) mode in the temperature range from 2 K to 300 K. The position of maximum in ZFC magnetic moment was taken as the blocking temperature $T_B \sim 5$ K.

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