

Nickel/alumina nanocomposites by AC electrochemical processing

A. I. Vorobyova ¹,

E. A. Outkina ²,

A. A. Khodin (Foreign) ³

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1, 2 Belarussian State University of Informatics and Radioelectronics,
Minsk, Belarus

3 Foreign (Institute of Physics, National Academy of Sciences of
Belarus, Minsk, Belarus)

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Abstract: Nanowire/pillar composite fabricated by alternating current electrochemical deposition of nickel into/onto thin porous anodic alumina (PAA) is investigated for magnetosensitive medium applications. Magnetization and current transport features of Ni nanowires/porous matrix composite in the current-perpendicular-to-plane mode are considered. Fabrication processing features, SEM characterization results are presented. PAA/Ni nanocomposite with Ni nanoparticles of 15–25 nm characteristic size is formed at initial stages of deposition. Continuous Ni nanowires/nanotubes composites are formed over the whole alumina pores depth after ~10-min deposition. XRD analysis confirms the polycrystalline nature of Ni nanowires with [111] preferential orientation.

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