MAGNETIC AND MAGNETOSTRANSPORT PROPERTIES OF SINGLE AND MULTILAYERED MAGNETIC NANOWIRES

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Nowadays, there is an increasing demand for new types of materials with different structures and improved physical properties to be used in miniaturized devices. Recently, the nanowire arrays have been studied extensively because of their specific physical properties, with huge potential for multiple applications [1]. The multilayered nanowires, in particular, are very interesting for their d.c. magnetoresistive effect, especially in connection with the spin-valves applications [2].

Results on different magnetic nanowires as single or multilayered structures, with different compositions (NiFe/Cu, Co/Cu, NiFe/Cu/Co, CoFeB/Cu, CoNiP/Cu, etc.), prepared by electrodeposition, will be presented. The differences between the magnetic crystalline (NiFe, Ni, Fe, Co) and amorphous (CoNiP, NiP [3], CoNiB, etc.) nanowires formation and properties will be presented. The influence of the electrodeposition conditions (pH of the deposition bath, deposition voltage/current, deposition time, bath composition, additives) on the morphology and magnetic/magnetostransport properties of single and multilayered magnetic nanowires arrays will be discussed in detail. The influence of the nanopores distribution and size, as well as the influence of the non-magnetic layer, on the magnetic interactions between nanowires or/and at the interface between different layers in multilayered structures will de presented, too.

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