Nanochemistry and biotechnology

Bioapplication of FeNi nanotubes

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Nanomedicine is the medical application of nanotechnology and today it needs special chemical or physical techniques to provide novel methods of treatment on the molecular and cellular-scale [1]. Metallic nanostructures have some advantages to be considered as a tool for bioapplications, such as biodetection, study of microrheological processes, targeted drug delivery etc. Ones of the most interesting objects for biomedical applications are magnetic nanostructures, such as nanowires and nanotubes [2],

In this work FeNi nanotubes have been synthesized by electrochemical method using polyethylene terephthalate templates [3] and detailed study of their structural and magnetic characteristics was carried out. Dependencies of composition, wall thickness and degree of structural order on deposition potential were shown and the effect of these parameters on magnetic properties have been defined. In comparison with well-established nanowires, we demonstrate the advantages of nanotubes: homogeneous magnetic field, lower density and larger specific surface area. Moreover, we show a simple way of FeNi nanotubes preparation for targeted delivery of drugs and proteins.

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