

Structural studies of Fe_{100-x}Co_x nanotubes obtained by template method

Hollow nanostructures based on the Fe_{100-x}Co_x alloy were synthesized in the pores of polymer template matrices based on PET using the electrochemical deposition method. Morphology, elemental composition, and structural features were characterized by scanning electron microscopy, energy dispersive analysis, and X-ray diffractometry. The study of the internal magnetic texture was carried out using Mossbauer spectroscopy. The dependence of the change in structural and magnetic properties from the atomic content of components in nanotube structure is revealed. It is established that the synthesized nanostructures are hollow Fe_{100-x}Co_x nanotubes with a body-centered cubic crystal structure. The decrease in the unit cell parameter with increasing cobalt concentration is due to the difference in the radii of Fe (1.227 Å) and Co (1.191 Å) atoms. It is established that a random distribution of magnetic moments directions of Fe atoms is observed for Fe₁₀₀Co₀ nanotubes. And magnetic texture along the nanotube axis is observed for Fe_{100-x}Co_x nanotubes, with an increase in Co atoms concentration.

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