

ABSTRACT

Diploma work: 94 pages, 19 figures, 7 tables, 64 literare sources.

Aim of work: to investigate the influence of intermediate layers of Ag and Cu at temperature intervals of phase transformations in film compositions Fe/Pt.

Investigation methods: X-ray diffraction analysis, electrical resistivity measurements (four-probe method), method SQUID magnetometry.

Object of work: nanoscaled film compositions Pt(10 nm)/Fe(10 nm), Pt(10 nm)/Cu(4 nm)/Fe(10 nm) and Pt(10 nm)/Ag(4 nm)/Fe(10 nm) on substrates of SiO₂(100 nm)/Si(001), obtained by magnetron sputtering.

Scientific novelt: discovered that with the introduction of additional layers of alloying elements – Ag and Cu – it is possible to reduce the temperature of the phase transformation $A1\text{-FePt} \rightarrow L1_0\text{-FePt}$ compared with the two-layer composition Pt(10 nm)/Fe(10 nm). The introduction of a intermediate layer of Ag is an effective means of increasing the magnetic anisotropy of the film. The explanation of these phenomena lies in the mismatch of the lattice parameters and thermal expansion coefficients of the layers.

Practical importance: received results are important for practical application of thin-film structures based on Fe/Pt as materials for high-density magnetic recording storage.

NANOSCALED FILM COMPOSITION, ULTRAHIGH-DENSITY MAGNETIC
RECORDING, PHASE $L1_0\text{-FePt}$ PHASE TRANSFORMATION