

ABSTRACT

Master's thesis: 86 pages, 18 drawings, 2 tables, 62 literary sources.

Aim of this work: investigation of Au intermediate layer effect on the low-temperature FePt homogenization.

Investigation methods: secondary neutral mass spectrometry (SNMS), x-ray diffraction (XRD) techniques and magnetic characterization using superconducting quantum interference device-vibrating sample magnetometry (SQUID-VSM).

The object of this research: structural and phase transformation in nanoscaled film composition Pt(15 nm)/Au(10 nm)/Fe(15 nm) obtained by magnetron sputtering on Al₂O₃ substrates.

Scientific novelty of this research:

1) acceleration of the low-temperature interdiffusion process thus enhancing the compound formation,

2) appearance of superlattice diffraction peaks, indicating that the ordering process took place already during the low-temperature heat treatments,

3) the “motion” of the Au layer to the substrate,

4) an increase of the magnetic coercivity of the film.

Practical value: these results are important for applying in high-density magnetic recording branch.

NANOSCALED FILMS FEPT, MAGNETRON SPUTTERING, LOW-TEMPERATURE HOMOGENIZATION, GRAIN BOUNDARY DIFFUSION