

ABSTRACT

Attestation bachelor work: 89 pages, 36 images, 5 tables, 46 literature sources.

Aim of work: to investigate the H₂ (3 vol.%) presence in heat treatment atmosphere effect on structural and phase transformation in nanoscaled film compositions [FePt(15 nm)/Au(7,5 nm)/FePt(15 nm)]_{2x}.

Investigation methods: magnetron sputtering, thermal treatment (annealing), X-ray analysis (using a X-ray diffractometer equipped with a 2-dimensional (2D) detector).

Object of work: laws of structural and phase transformations and ordering processes in the nanoscaled [FePt(15 nm)/Au(7,5 nm)/FePt(15 nm)]_{2x} film compositions.

Scientific novelty: the temperature of *A1*-FePt → *L1₀*-FePt phase transformation onset is 500°C and is independent of the heat treatment atmosphere. The absence of H₂ heat treatment atmosphere increases the level of *L1₀*-FePt phase ordering and tetragonal distortion of its lattice. High temperature annealing in pure Ar atmosphere also leads to the formation of *L1₀*-FePt grains pronounced (001) texture. It is founded that after annealing in Ar + H₂ atmosphere coercivity is higher than after annealing in Ar.

Practical importance: received results practical importance for new materials development for high-density magnetic recording storage.

NANOSCALED FILM COMPOSITION, ULTRAHIGH-DENSITY MAGNETIC
RECORDING, CHEMICAL ORDERING, *L1₀*-FePt PHASE