

Abstract

Diploma work: 126 pages, 35 drawings, 5 tables, 56 literary sources.

Work purpose: study of changes in mechanical stress with annealing temperature in nanoscale films cobalt-antimony and their thermal stability.

Research methods: heat treatment, X-ray phase analysis, resistometry, scanning electron microscopy.

Research subject: CoSb_{3,59} (30 nm) and CoSb_{4,16} (30 nm) nanoscale films after deposition and heat treatment in vacuum.

Object of study: phase formation processes and mechanical stresses in CoSb_{3,59} (30 nm) and CoSb_{4,16} (30 nm) nanoscale films.

Scientific novelty:

1) Established that in CoSb_{3,59} (30 nm) and CoSb_{4,16} (30 nm) nanoscale films after deposition on substrates SiO₂(100 nm)/Si(001) at 200°C observed double phase.

2) Thermal stability preserved in films to 300°C.

3) When annealing temperatures above 300°C in the films we can see sublimation of free crystal antimony and after annealing above 600°C there is only a high-resistance phase CoSb₃.

Practical value: The results are more practical importance for the development of new materials, looking as good thermoelectric converters.

NANOSCALE FILM COMPOSITIONS CoSb; THERMOELECTRICITY;
DIMENSIONLESS COEFFICIENT OF THERMOELECTRICAL EFFICIENCY