

## ABSTRACT

Diploma work: 97 s., 15 tab., 57 fig., 59 sources.

BIOCOMPATIBILITY, FUNCTIONAL MATERIALS, Hf-Nb ALLOYS,  
MARTENSITIC TRANSFORMATION, SHAPE-MEMORY EFFECT

The objects of study are Hf-Nb-based alloys with four concentrations – Hf<sub>50</sub>Nb<sub>50</sub>, Hf<sub>75</sub>Nb<sub>25</sub>, Hf<sub>80</sub>Nb<sub>20</sub>, Hf<sub>85</sub>Nb<sub>15</sub> (at. %).

The aim of this work was to investigate the Hf-Nb system on the presence of shape-memory effect and to find the characteristic temperature points of the martensitic transformation.

The researching methods are a microstructure analysis of the surface relief, determination of the martensitic temperature points by means of three-point bending method and powder diffraction analysis. Microstructure analysis of the Hf-Nb system alloys was performed. The received microstructures shows, that only Hf<sub>75</sub>Nb<sub>25</sub> alloy has a martensitic structure. It is determined, that Hf<sub>50</sub>Nb<sub>50</sub> alloy is mainly composed of a  $\beta$ -phase. By the method of three-point bending it was confirmed, that the Hf<sub>75</sub>Nb<sub>25</sub> alloy demonstrates a shape-memory effect.

Relying on the results of performed research, functional materials based on following systems can be confirmed technologically perspective.