

## ABSTRACT

The work contains 119 pages, 42 figures, 20 tables, 54 references to the literature data.

The aim is to obtain composite materials of the TiAl-TiB<sub>2</sub> system and to study the kinetics of sintering, and the amount of reinforcing additive on the mechanical properties and structure of the resulting composites.

Research methods:

- a) preparation and synthesis of TiAl composite from TiH<sub>2</sub> and Al;
- b) formation a mixture of powders TiAl and TiB<sub>2</sub>;
- c) electron beam sintering;
- d) mechanical processing of samples;
- f) study the microstructure
- g) X-ray phase analysis.

Object of study – composite TiAl + 2% TiB<sub>2</sub>, 4%, 6%, 8%.

The work carried out experimental studies of microstructure, X-ray diffraction analysis, microhardness and compression strength have been performed.

Established that the structure of the composite resulting is a matrix of titanium aluminide, inclusions of TiB, and a small amount of TiB<sub>2</sub> and TiAl<sub>2</sub>. The increase in the amount of TiB<sub>2</sub> reinforcing component slightly increases hardness and strength, and results in an increase in porosity from 2% to 15% due to a reduction in the overall diffusion coefficient. Increasing the aging time contributes to the reduction of porosity, the formation of a homogeneous structure, which also increases mechanical properties. But this time of sintering is not quite enough to get a non-porous press.

Keywords: ALUMINIDE TITAN, DIBORIDE TITAN, PRESSING, SINTERING, SYNTHESIS, X-RAY PHASE ANALYSIS, CERAMICS, ELECTRON BEAM SINTERING