

## **ABSTRACT**

The work contains 88 p., 21 fig., 16 tab., 52 sources.

Object of study is composite materials based on iron with reinforcing additives of titanium diboride.

The aim is to study the impact of the amount of (TiB<sub>2</sub>) reinforcing phase additives on the structure and mechanical properties of the composite obtained by using electron - beam melting.

The paper studied influence of fast heating and short-term exposure by electron beam heating on the formation of structure and properties of Fe - TiB<sub>2</sub> composites.

The restructuring and changing of mechanical properties of obtained composites was investigated depending on the number of reinforcing additives.

It was established that small additions of titanium diboride significantly change microstructure and properties of traditional iron powders. Due to titanium diboride reinforcement of iron separates refractory TiB - phase, which helps for metal matrix hardening.

The results show that titanium diboride reinforcement of iron matrix contributes to obtaining composite with the required mechanical properties (high hardness, strength, durability).

**Keywords: COMPOSITE MATERIALS, COMPOSITE, IRON, TITANIUM DIBORIDE, ELECTRON – BEAM MELTING, STRUCTURE, MECHANICAL PROPERTIES**