CONCLUSIONS

In the course of the thesis, the research methods were mastered, namely: the preparation of samples, the investigation of the structure by means of an electron microscope, the investigtion of the phase composition and the stress-strain state of the phase components by X-ray methods, and mastered the methods for studying hardness and crack resistance.

Based on the obtained results, conclusions and recommendations on the use of alloys of the Mo-Si-B system were formulated.

1. It is established that as the rate of crystallization increases, the degree of elongation of the grains of the boride phases of the composite increases twofold, and their arrangement varies from chaotic to directed in the direction of growth. The formation of lower molybdenum borides was detected, which is explained by the violation of the ratio between the concentrations of the Mo and B atoms in the melt due to faster evaporation of the latter.

2. It was revealed that the level of composite stresses increases with increasing crystallization rate, compressive stresses in the matrix phase, and tensile stresses in the inclusions.

3. It has been established that the mechanical properties increase with increasing crystallization rate, which is in satisfactory agreement with the regularities in the reduction in the grain size, their orientation, and in the change in the stress-deformed state of the phase constituents of the composite material and is explained by the mechanism of grain-boundary strengthening.

Therefore, based on the materials and technologies considered in the course of the thesis, the requirements for materials of gas turbine blades, can be recommended for use and more detailed investigation of refractory alloys of the Mo-Si-B system.