

## CONCLUSIONS

In the work, composite materials were obtained by impregnating a porous frame made of  $B_4C$  particles with AK12 and Al alloy.

In order to provide wetting of boron carbide with AK12 aluminum alloy, a boron carbide powder was cladded with nickel and composites based on it were obtained.

It was established that the nickel film without heat treatment weakly holds on the surface of boron carbide. In order to eliminate this, annealing of the coated powder was carried out, which greatly increases the adhesion of the nickel film to  $B_4C$  powder. It is shown that carrying out such operations provides wetting of boron carbide with AK12 aluminum alloy.

The composite was obtained by infiltration of boron carbide overheated to a temperature of 1100 °C with an AK12 alloy. It is established that in addition to the newly formed phase of SiC, the material retains Si, which negatively affects the mechanical characteristics of the composite.

Composite materials were obtained by impregnation of a porous frame of boron carbide with pure aluminum at a temperature of 1100 °C. The following phases were identified: for samples impregnated with aluminum: Al,  $AlB_2$ ,  $B_4C$ ; when holding 1 minutes: Al,  $B_4C$  and  $Al_3BC$ ; with 5 minutes holding: Al,  $Al_3BC$ ,  $B_4C$ ,  $AlB_{12}C_2$ ; when holding 10 minutes: Al,  $AlB_{12}C_2$ ,  $AlB_2$ ,  $B_4C$ ,  $AlB_{12}$  and  $\alpha-AlB_{12}$ . It is established that increasing the time of holding boron carbide in the liquid phase, the compressive strength of the composites obtained increases from 219 MPa to 242 MPa.

The analysis of the area and volume of the laboratory was conducted, microclimate analysis was carried out, hazardous and dangerous factors were determined, fire protection and environmental protection measures were developed.

In the work, the planned estimated cost of this research work is calculated taking into account all kinds of definite resources. The necessary number of workers and management personnel, the size of their wage fund is substantiated. Marketing analysis has been carried out to identify the market opportunity to use the results of the master's thesis.