

## CONCLUSIONS

During the thesis was mastered basic methods of conducting researches namely, sample making, research structures using optical and electron microscope and mastered research methodology hardness.

Based on the literature review was formulated conclusions and recommendations on the application of copper-based materials.

1. Today, there is a problem of depletion of mountain deposits because of an increase in the number of industrial capacities and copper production. This is the reason for the development of new technologies for the production of solid products with minimal material losses.

2. Traditional technologies, such as: rolling and sheet stamping, drawing and casting have a list of limitations and drawbacks, the main one of which is that each of these technologies is used exclusively to obtain a limited list of products: rolling - to get tapes, drawing - for rods and pipes, casting - for obtaining products of complex shape.

Although with the help of them you can get details of almost any dimensions and properties, but a significant disadvantage of each of the above processes is a long technological cycle.

3. One of the most promising methods for manufacturing copper products is electron beam melting. Despite the small dimensions of the parts for sintering, the advantages of this method are the ease of maintenance of the installation, the high purity of the samples and the ability to control almost the entire process with the help of a personal computer in the form of changes in various process parameters. However, the main advantage of this method is the speed of production of finished products.

It is established that, with a exposure time of up to 20 seconds, the porosity of the samples decreases, and the microhardness and, accordingly, other mechanical properties increase. With a further increase in the exposure time, the physical and mechanical properties of the material deteriorate because of an increase in thermal energy of the body and an increase in the volume fraction of closed pores.

Based on the materials and technologies considered in the course of this thesis, it can be argued that electron beam sintering is a promising technology for the manufacture of sintered products.