CONCLUSIONS

In this work was researched the low temperature ceramics composition of Li_2O-Al_2O_3-SiO_2-TiO_2, its properties: density, volume shrinkage, phase composition was explored.

The task was to obtain radioceramics with a low temperature of sintering in comparison with existing ceramics, and in the work was investigated and received ceramics with a temperature of sintering 1250 °C:

1 – 51% SiO_2 –39%Al_2O_3 –8% Li_2O –2% TiO_2;

2 – 55% SiO_2 –35%Al_2O_3 –8% Li_2O –2% TiO_2;

3 – 59% SiO_2 –31%Al_2O_3 –8% Li_2O –2% TiO_2;

4 – 63% SiO_2 –27%Al_2O_3 –8% Li_2O –2% TiO_2

The samples were tested on the X-ray diffraction analysis and compered, depending on quantity of the aluminium oxide nanopowders added and its effect on the formation of the microstructure of the ceramics.

The results of the influence of aluminum oxide nanopowders on the formation of the microstructure of ceramics were confirmed by electron microscopy.

The preferable results of density and phase composition were obtained in ceramics 63% SiO_2 –27%Al_2O_3 –8% Li_2O –2% TiO_2 with temperature of sintering 1250 °C and isothermal aging 3 hours for pressed samples (interval of pressure 50-100 MPa). Phase composition analysis confirmed presence of spodumene in the structure of ceramic.

Obtained ceramic may be used for manufacturing radio-transparent fairings, that comply with strict requirements for stable radio-technical characteristics up to 1200 °C, impact resistance, erosion resistance to dust and gases on supersonic speeds, high strength and relatively low density.