CONCLUSIONS

1. The possibility of the formation of high entropy AlCoNiFeCrTiVh coatings, where x = 0; 0.5; 1; 1.5 by electron–beam deposition and determined their structure, phase and chemical composition and microhardness.

2. Established that AlCoNiFeCrTiVh coating microstructure where the mole is $0 \leq h \leq 1,5$ phase, consisting of BCC–solid solutions and intermetallic compounds. That correlates with the terms of the formation of the phase composition HEAs (enthalpy <22, which leads to the formation of intermetallic components with solid solution substitution BCC structure, the formation of which is caused by the low value of the concentration of valence electrons 6,33–6,66).

3. It is show that the addition of vanadium of 0.5 and 1 mol AlCoNiFeCrTi coating leads to the formation of the bcc-solid solution and two intermetallic compounds. AlCoNiFeCrTi coatings include a second bcc–phase and ат intermetallic compound. Further increase of the V content leads to the change in the chemical composition of phases and increase of intermetallic component.

4. It is established that the addition of 0.5 mol vanadium alloy AlCrNiFeCoTi to lead to a reduced lattice constant bcc phase due to a decrease in the concentration of Al and those with large atomic radius, followed by a gradual increase in lattice constant due to increase the concentration of vanadium atomic radius greater than that of Co, Fe, Cr, Ni.

5. Increase of vanadium from 0 to 1,5mol leads to the increasing of micro-hardness of the alloys from 8.37 GPa to 10.97 GPa. Ductility characteristic decreases from 0.58 to 0.46 and the boundary of fluidity ($\sigma_{0,2}$) increases from 1,65 to 2,11. It can be explained by the fact that with the increasing of the intermetallic components appearance, which have different content in matrix with bcc-solid solution and also it is a strengthening phase.

6. It is also shown that during testing of the crack toughness at loading from 2 N to 10 N, crack formation does not take place, it shows that the coating material is able to resist the fragile breaking and to stop formation of cracks.

7. Under safety analysis laboratory space in volume, microclimate and the dangers it calculated the necessary lighting in the laboratory, determine the conditions of electrical safety, fire safety and the necessary perevirchi calculations found purpose local ventilation and safety in an emergency.

8. In the economic section was calculated the estimated cost of the planned research, taking into account all costs and made scientific and technical justification for the relevance and feasibility of research.

9. In the development section of the startup project, a marketing analysis was conducted to identify the market opportunity to use the results of the master's thesis, and found that multicomponent high-entropy AlNiFeCoCrTi, AlNiFeCoCrTiV coverage to date is a promising material, the production of which can be implemented in about a year with the development of technology with the appropriate raw material base.