CONCLUSIONS

As a result of the thesis, the powder soft magnetic material based on iron alloyed with 5% silicon was obtained. The influence of technological regimes on the structure, chemical and phase composition, hardness and magnetic properties of the material were studied. According to the investigation, I can give such conclusions:

- it was established that the addition of silicon to iron powder leads to an increase in total porosity by 3-5% across the range of compaction pressures.
- the influence of porosity on the magnetic properties of the material was examined. Reducing porosity to 10-12% leads to higher magnetic characteristics – relative saturation magnetization to 100-120 G cm3/g, coercive force to 280-320 A/m.
- it was determined that the recompaction of samples at pressure of 700 MPa after annealing aligns density of the samples pre-compressed at different pressures, their porosity is7.5-10%.
- the dominance of sintering temperature on porosity Fe-Si materials was examined. We established that the porosity minimum for the samples compressed at pressure of 700 MPa after sintering is about 4.5% for the temperature of 1300 ^{0}C.
- the investigation of the magnetic characteristics of the materials sintered at different temperatures showed that the materials obtained at 1300 ^{0}C (being measured at indoor temperature) have the higher values of magnetic properties: their relative saturation magnetization is 160-170 G cm3/g and coercive force is about 260-280 A/m.
- scientific and technical relevance and economic feasibility of the work are validated.
- the measures to ensure healthy working conditions and principles of safety in an emergency are elaborated.