

## ABSTRACT

The master thesis consists of: 114 pages, 19 figures, 40 tables, 33 references to literature sources.

### FE-SI ALLOY, MAGNETIC PROPERTIES, SOFT – MAGNETIC MATERIALS AND SILICONIZING

The aim of this work is to study the influence of technological regimes on the structure and magnetic properties of powder materials of iron-silicon system.

The influence of technological regimes on the structure, chemical and phase composition, hardness and magnetic properties of the material were studied. The influence of pressure and temperature of sintering on Fe-Si materials porosity were established.

The investigation of the magnetic characteristics of the materials sintered at different temperatures showed that the materials obtained at 1300 °C (being measured at indoor temperature) have higher values of magnetic properties: their relative saturation magnetization is 160–170 G cm<sup>3</sup>/g and coercive force is about 260–280 A/m.

The process of siliconizing of Fe-Si powder materials was examined and the influence of Fe-Si backfill composition on the structure, magnetic properties, and electrical resistivity in the constant and variable magnetic fields was studied. The perspectiveness of using SiO<sub>2</sub> – 98% + Si 2% backfill for obtaining materials with high values of saturation magnetization and at the same time with low magnetic loss at alternating magnetization was shown.