

CONCLUSIONS

In this work there have been investigated phase compound of Ferrum-Nickel ore of the Poburg occurrence, waste of metallurgic (charge №1) and abrasive (charge №2) production.

The main elements of charge № 1 are Magnesium oxide (MgO), magnesiowustite(FeO, 4MgO, 6O) and quartz (SiO₃). After the reduction clean components of metal, namely Magnesium, Ferrum and Delta-Ferrum had been allocated, which indicates a reduction reaction. In the charge № 2 there were found that compound as corundum (Al₂O₃), fayalite(Ferrum orthosilicate Fe₂SiO) and muasanit (Silicon SiC). Annealing caused small allocation of Delta-Ferrum.

There was identified granulometric compound of the raw stuff and change of element contents of the main components, primary waste of № 1 are Ferrum, Chrome, Silicon and Magnesium. Within decreasing of average particle size Ferrum content is reducing from 65-70% to 30%, and contents of Silicon and Chrome grow up. In the charge № 2 main elements are Aluminium, Ferrum, Silicon, Calcium and Titan. Also Nickel, Zirconium and Wolfram are there in very small amount.

Main components of the ore are Ferrum oxides Fe₂O₃, Fe₃O₄ and SiO₂. Nickel oxides have not been found which can be caused by their low contents or by their being in the complex oxide NiFe₃O₄(NiO*Fe₂O₃). Annealing of the ore within 900C-600C temperatures causes increasing content of martensite(Fe₃O₄) because of reduction the Fe₂O₃ oxide.

There was studied granulometric contents of the ore and its influence on degree of enrichment within magnet separation. There was shown than within using for magnet separation the magnet field with tension $21,4968 \cdot 10^3$ A/m fraction content practically does not cause any influence to ore enrichment degree. At the same time using the magnet field with tension less than $7,4044 \cdot 10^3$ A/m causes decreasing enrichment degree because increasing influence of particle friction.

There was studied the process of enrichment the ore because of reduction by Hydrogen and combine reductor. There was found the limiting mechanism of reduction, in which quality within Hydrogen reduction it needs to be considered the

diffusion processes in solid phase, which accompany the reduction process. There was found blocking action of SiO_2 and Carbon impurities for the case of combined reduction with 900C temperature, as an effect of studying the ore reduction of contents of metal oxides processes.

Fe-Ni alloys got in the work have been used in quality of ligature as source of Nickel for smelting self-fluxing alloys. In quality of another components of the alloy there were used Ferrum alloys, cast iron and Copper-Phosphorus alloy with content during the State Standart.