PRODUCTION OF IRON OXIDE NANOPOWDERS BY RADIATION-CHEMICAL METHOD

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Were continued the studies of nanopowders (NP) of iron oxide produced by radiation-chemical method [1] at irradiation of iron sulfate solutions in water and iron nitrate in isopropyl alcohol on electron accelerator URT-0,5 [2].

With an increase in the concentration of iron sulfate in the solution, the specific surface area of the NP decreases, and the yield increases. For iron nitrate, with an increase in its concentration in solution, both the yield of NP and the specific surface area grow under irradiation under the same conditions (absorbed dose of 2.3 MGp at an accelerator frequency of 10 Hz).

Since the particles produced from the iron nitrate solutions are amorphous, they were annealed, followed by X-ray phase analysis. It has been found that these are hematite, Fe_2O_3 particles (unlike maghemite C, γ- $Fe_{21.33}O_{32}$ particles from iron sulfate). The specific surface area of the particles increases with the annealing temperature (from 2.4 nm at 400 ° C to > > 200 nm at 1200 ° C).

The produced NPs can be used to create promising upconversion materials for medicine based on them.

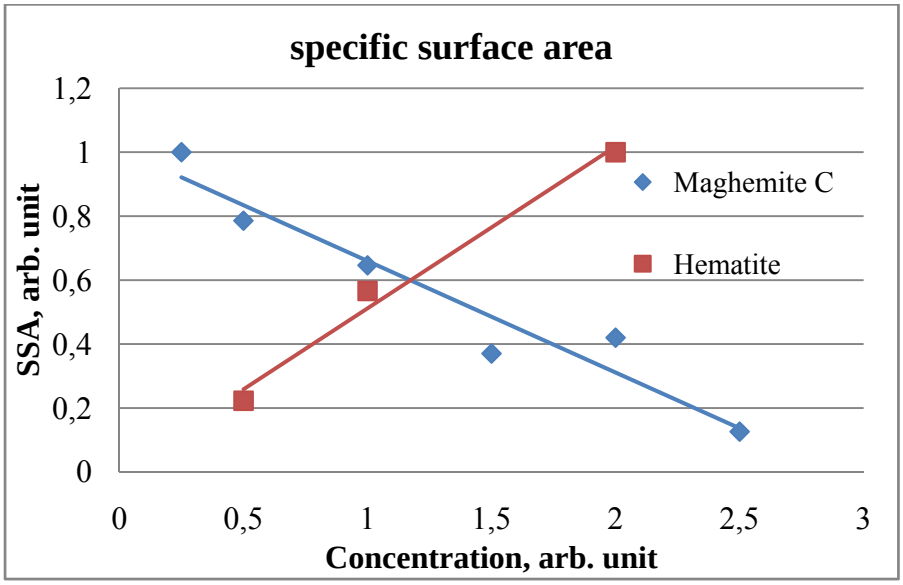

Fig.1. Specific surface of NP FeO at change of concentration in solution.

REFERENCES

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