

"Nanotechnology and nanomaterials"

Ultrasonic synthesis nanostructures magnetite

L.A. Frolova, Tsepich E.G., Shilo A.N., Voronova N.A.

¹ *Department of Inorganic Materials Technology and Ecology ,Ukrainian State Chemical Technology University Ukraine, pr Gagarina, 8, Dnepropetrovsk-49005
E-mail: domosedii@i.ua*

One promising area in materials science is the creation of nanostructures multilayer magnetic materials. The combination of a magnetic core and a solid, chemically inert shell gives the material properties of polyfunctional. There are problems in obtaining magnetite with certain technological properties. These include the receipt of a given phase, granulometric composition, defining the technical characteristics [1-2]. In this paper, microspheres, which are the cores of the particles obtained by precipitation in a solution iron sulfate with sodium hydroxide under the influence of ultrasound. In experiments used sound intensity of 20-100 W/cm³; processing time 5-45 min.

Research has shown that the phase composition of the product largely depends on the pH of the solution. With the increase in pH from 6 to 12, with the same parameters of synthesis is obtained a sequence of phase formation lepidocrocite-goethite-magnetite. In the future, process influenced by temperature, the higher the temperature, the wider the area of education magnetite. When using ultrasound remain the general laws of formation of magnetite. The experiment revealed that the change in frequency ultrasound has no significant effect on the formation of magnetite. The best results were achieved with a maximum intensity of sound 100 W/cm³. Decrease the density of sound stream does not significantly affect speed of the process formation of magnetite, but significantly affects the size of the obtained final particles, as well as the degree of conversion, which changes proportionally. Thereby, ultrasound helps us to obtain magnetite without oxidizing agent, and increases the monodispersity of the particles. It can reduce by 2-3 times the size of the magnetite particles (20 nm).

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