

SECTION 13.

CHEMISTRY, CHEMICAL ENGINEERING AND BIOENGINEERING

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PHYSICO-CHEMICAL CHARACTERISTICS OF NICKEL FERRIT

Complex oxide nanomaterials with spinel structure are a class of chemical compounds consisting of spinels, ferrites and chromites (AB_2O_4), as well as garnets ($A_3Fe_5O_{12}$), where A and B are ions of di- and tri-charged metals. They are characterized by high thermal and chemical stability, and also have diverse physical properties, such as magnetic and electrical conductivity, developed surface area, adsorption and catalytic properties, etc. This makes them potentially important materials for various industrial applications, including catalysis, optical sensors and ferromagnets [1-3].

In this work, nickel ferrite was synthesized by the citrate sol-gel method. The obtained samples, after washing and drying, were subjected to X-ray fluorescence spectral analysis, which was performed using an energy-dispersive X-ray fluorescence spectrometer "ELVAX" Model SER-01. The results were processed using the ElvaX Software ver. 4.1.8 program using the fundamental parameters method (determination accuracy $\pm 0.1\%$).

Conclusions. According to the data of X-ray fluorescence spectral analysis, it was found that nickel ferrite has the following average composition: 16.7% Nickel, 41.1% Iron, and the rest is Oxygen and impurities of other elements. Thus, the formula of the synthesized nickel ferrite is: NiFe_2O_4 , which is in good agreement with the literature data.

References:

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3. Ali Z. & Luma A. & Rajaa M. (2022) Synthesis of Inverse Spinel Nickel Ferrite Like-Broccoli Nanoparticle and Thermodynamic Study of Photo-decolorization of Alkali Blue 4B dye. *Journal of Nanostructures*, (12). 697-710. <https://doi.org/10.22052/JNS.2022.03.022>