SYNTHESIS OF ORGANOMINERAL SORBENT BY MODIFYING DGK+GIPAN WITH KHOVDAK BENTONITE

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Organomineral sorbents are prepared using inorganic and organic raw materials in different proportions. Enriched forms of bentonites are used for synthesis. For this, bentonite mineral samples were cleaned of water-soluble salts and sand by washing with distilled water. The enriched mass of bentonite was separated from the liquid by centrifugation, and then the bentonite was dried at 105ºC. Modification technology and cation exchange processes are as follows: enriched bentonite with a particle size of not less than 0.5 mm is filled with 0.1 M cation exchange solution in a ratio of 1:22 (volume) and stirred at 55°C for 2 hours. After this time, the bentonite is filtered and washed from Cl- (checked by adding $AgNO_3$ solution), then placed in a drying cabinet and dried at 100-105ºC for 2 hours. NaCl solution was used as cation exchange solutions.

Dried bentonite is mixed with an aqueous solution of GIPAN (hydrolyzed polyacrylonitrile) and DGK (diglycidylcarbamide) with a concentration of 0.3 mol/l (at high concentrations, the surfactant forms a thick gel-like liquid, which makes it difficult to work with the solution) and 600 speed/ at min from 20-60ºC for 1-6 hours with constant stirring, the amount of modifier varied from 5 to 30%. The sorption properties of these organic modifiers have been studied by a number of scientists [1-3].

As a result of the experiments, the optimal amount of organic matter was determined to be no more than 15% of the weight of sodium montmorillonite in suspension for DGK, and no more than 10% for GIPAN. Perhaps, this amount of organic modifiers is primarily related to the cation exchange capacity (KAH) of bentonite and the molecular weights of these organic substances (Mr (GIPAN) = 394 g/mol and Mr (DGK) = 280 g/mol) . Accordingly, the amount of consumption for the DGK modifier with a molecular weight of 160 g / mol should be approximately the same as in the case of GIPAN. However, since this low molecular weight surfactant cannot form a stable foam, it is not possible to quantify it using the above method. Therefore, the quantitative characteristics of the modification process were evaluated by analyzing the results of thermogravimetric analysis. The synthesized

organomineral sorbent is tentatively named GIPAN+DGK:Bentonite (hydrolyzed polyacrylonitrile and diglycidylurea modifier).

In the process of mixing the organogyl suspension and as a result of the adsorption effect, it was found that amine molecules are absorbed on the interface surface, as a result of which the bentonite aggregates are further distributed, as well as the penetration of amines causes a decrease in the hardness of bentonite. newly formed surfaces. Water is the most surfactant for bentonite, which facilitates the process of reducing the strength and dispersion of bentonite by adsorption [1].

The main method of studying the crystal structure of organomineral sorbents is X-ray diffraction analysis and electron microdiffraction [2]. The values of the "b" parameter of the silicate layers of montmorillonite were measured with an accuracy of 0.002 Å. In each preparation, the "b" parameter was determined for all microparticles with sufficiently clear diffraction patterns. Electron microscopic images of orgomineral sorbents based on bentonite samples are shown in Figure 2.8.

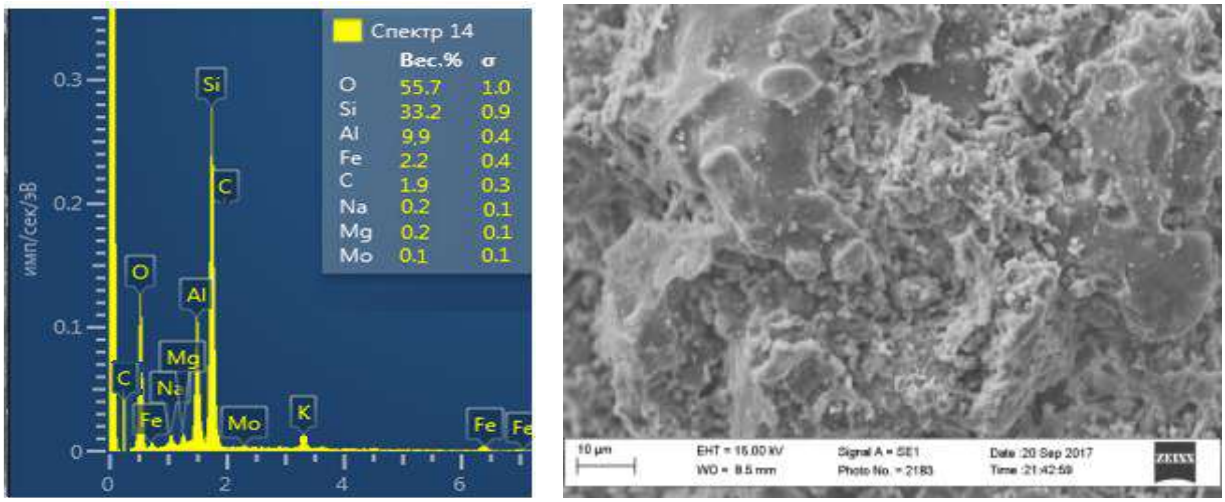

Figure 1. Electron microscopic image of organomineral sorbents based on GIPAN+DGK:Bentonite

Electron microscopic analysis of GIPAN:Bentonite shows that this sample is mainly represented by individual aggregates of bentonite particles having the shape of elongated polygons. It was found that an increase in molecular weight increases the degree of formation of associations of modifying cations with a double thickness sufficient to cover both basalt surfaces. Instead of the hydrate-ion layers of the outer surfaces of diglycidylurea montmorillonite crystals, which is a polymer modifier, associations of modifier cations are observed in one layer thickness. At the same time, an increase in the size of the modifier molecules contributes to an increase in the degree of three-dimensional order in packing silicate layers. Under the electron

microscope, it can be seen that the large GIPAN, DGK, and Bentonite particles are mostly rectangular in size and about 1 μm in size. These assumptions are fully consistent with the results of X-ray phase analysis. As can be seen from the X-ray diffraction pattern, the interplanar distance from the d001 plane of the montmorillonite layers increased from 12.4 Å to 25.9 and 21 Å for GIPAN+DGK:Bentonite (Figure 1).

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