MINERAL COMPOSITION AND PROPERTIES OF ASKAMAR BENTONITES

M.A.Mamadjonova
D.S.Salihanova
O.S.Karimov
Namangan institute of engineering technology

Abstract: Detailed classification of clay minerals, composition and structure of clays, clay minerals are traditionally classified as "silicates". As the main raw material in laboratory experiments, bentonite clay minerals with different quality indicators in the country were used. Before conducting the experiments, the physicochemical and mineralogical parameters of these bentonite clay minerals were analyzed.

Keywords: Bentonite, montmorillonite, silicon (IV) oxide, dispersion, adsorption, minerals.

Today, the rapid development of chemical, food and other industrial enterprises requires improving product quality, along with increasing competition. At the same time, scientists are conducting research to reduce emissions into the environment, as well as to ensure the safety of food products.

A detailed classification of clay minerals, the composition and structure of clays, and the traditional classification of clay minerals as “silicates” are given in detail in [1].The main chemical components of layered silicates are silicon (IV) oxide SiO2 (30-70%), aluminum (III) oxide Al_2O_3 (10-40%) and water H_2O (5-10%).

In fact, the composition of real clay minerals may differ from the above idealized formulas. In addition, clays typically contain mixtures of various carbonates, oxides of gypsum, iron, and other metals, as well as plant and animal residues [2].ON-group valence oscillations in montmorillonite occur in the IR spectrum in the region of 3630 cm^{-1} [3]. The concentration of the Si-ON group on the surface of montmorillonite is 245 μmol / g, = Al- (Fe) -OH-group-130 μmol / g [4].When obtaining clay adsorbents based on local raw materials, it is advisable to use rapid, modern and, of course, high-precision analysis methods to determine the various physicochemical parameters of raw materials and finished products.

As the main raw material in laboratory experiments, bentonite clay minerals with different quality indicators in the country were used.

Prior to the experiments, the physicochemical and mineralogical parameters of these bentonite clay minerals were analyzed. Table 1 shows their chemical composition.

Table 1.

Chemical composition of local clay minerals

Name of bentonite	**iO₂**	**iO₂**	**l₂O₃**	**e₂O₃**	**gO**	**aO**	**a₂O**	**₂O**	**₂O₅**	**O₃**	**eO**	**i.v.**
Askamar (black)	6,7	,33	3,4	,1	,24	,35	,25	,63	,25	,72		0,1
Askamar (white)	5,7	,30	4,2	,7	,35	,40	,45	,55	,40	,65		0,3
Navbahor alkaline bentonite	7,9	,35	3,69	,10	,84	,48	,53	,75	,43	,75		6,17

Navbahor carbonate polygorskit	6,7		,63		,74	0,1		,60	,99		,41	4,33
Navbahor alkaline-earth bentonite	6,2	,61	3,56	,50	,76	,69	,98	,20	,42	,49		4,06

Alkaline bentonites occur in gray, greenish-gray, creamy forms.

It soaks slowly but strongly in water. The mineral composition is mainly 80% montmorillonite. Carbonate polygorskite clays are light gray, almost white. Carbonate polygorskite clays are light gray, almost white. It has a shell fracture, does not decompose in water, contains polygorskyt, bentonite, calcite minerals as additives. Askamar bentonites occur in nature in white and black forms. It also bends slowly but strongly in the water. The mineral composition is 75% montmorilonite. In order to study the mineralogical composition of bentonite, its X-ray analysis was performed. X-ray analysis was carried out on a Dron-4.0 device with CuK_α– ва CoK_α radiation, Ni-filter.

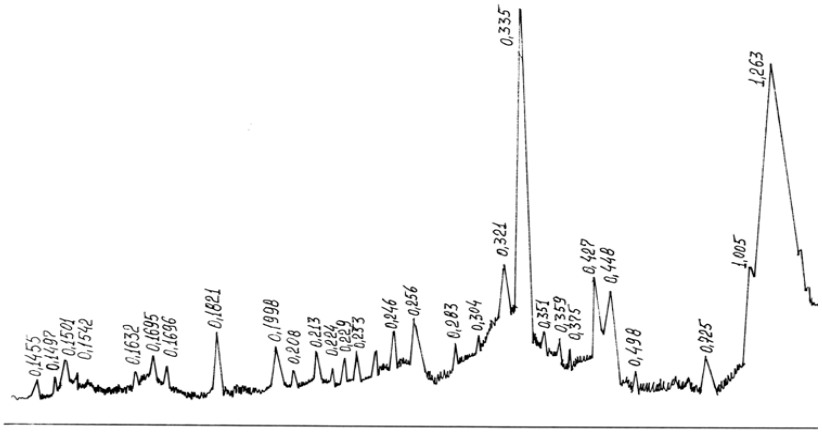

Figure 3.1. Roentgenograms of Askamar white Bentonite

The spatial composition of Askamar bentonite is montmorilonite, viz

d = 0.44; 0.32; 0.256; 0.246; 0.167; 0.149 nm. that is, d = 1.26; Polygorskite lines at 1.05 nm, d = 0.427; 0.335; 0.199 indicates the presence of 0.182 nm quartz. It also shows that Askamar bentonite belongs to the high clay type of montmorillonite, i.e. it forms baydelite at d = 0.725 and 0.169 nm. The chemical composition of bentonite also shows that it contains 15% alumina.

Table 3.2 shows the dispersion composition of bentonite samples (%).

Table 3.2

Dispersion analysis of local clay minerals

The name of the clay mineral	Fraction size, mm		
	0,06	0,06-0,0015	0.0015mm and smaller
Askamar	0,6	2,9	96,5
Navbahar alkaline bentonite	0,7	2,8	96,6
Dexkanabad	0,15	21,7	78,2
Kattakurgan	2,8	4,7	92,5

The bentonite mineral of montmorillonite, which has a large number of finely dispersed fractions and a unique structure, demonstrates qualitative aspects: high adsorption properties and the ability to form a stable suspension.

Conclusion

There is a lot of information about acid activation. But the norm of acid for bentonites obtained from different deposits, the conditions of its activation will be different. In particular, the selection of organic acids is important to determine the optimal norms that preserve the structural properties of the clay mineral. It should be noted that the determination of the optimal concentration of organic acid also depends on the initial parameters of bentonite. With this in mind, acid activation was performed under laboratory conditions. Askamar bentonite was used as the object.

Reference

1. Ponomarev, V. V. Study of the structure and adsorption properties of natural and modified bentonites / V. V. Ponomarev, V. G. Bakun, S. A. Kononenko, A. P. Savostyanov // Proceedings of higher educational institutions. North Caucasian region. Technical science series. - 2008. -No. 3. - pp. 94-97.
2. Dadashev, R. H. Thermodynamics of surface phenomena. / R. H. Dadashev. -Great Abington: Cambridge international science publishing, 2008. – 240-244 p.
3. Dadashev, R.Kh. Measurement of surface tension by the hanging drop method on the DSA-100 tensiometer / R. Kh. Dadashev, RS Dzhambulatov, D. Z Elimkhanov // Sbornik Tr. KNII RAS. - Grozny, 2012. - No. 5 - P. 3-7.
4. Alchagirov, B. B. Automated experimental setup for determining rapid changes in surface tension of liquid metal melts and contact angles of wetting of solid surfaces by them / B. B. Alchagirov, F. F. Dyshekova, Z. A. Kokov // Instruments. - 2017. - No. 2 (200). - S. 19-28.