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01.00.00 FIZIKA-MATEMATIKA FANLARI
ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ
PHYSICAL AND MATHEMATICAL SCIENCES

02.00.00 KIMYO FANLARI
ХИМИЧЕСКИЕ НАУКИ
CHEMICAL SCIENCES

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02.00.00 KIMYO FANLARI ХИМИЧЕСКИЕ НАУКИ CHEMICAL SCIENCES

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OBTAINING AND STUDYING THE PROPERTIES OF NEW POROUS MATERIALS BASED ON AN INTERPOLYMER MATRIX AND PHOSPHOGYPSUM

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Annotation. The article describes the stages of obtaining new porous materials (PM) based on chemical production wastes (phosphogypsum) and interpolymer complexes (IPC), and investigated their water permeability. It is noted that phosphogypsum, which is part of the PM, is a product of Ammophos-Maxam JSC in Almalyk, Uzbekistan, MFS - Chirchik-Maxam JSC and CMC - Namangan cellulose production association. It is said that the characteristics of the obtained PMs have been studied in various fields.

Key words: phosphogypsum, KFS, CMC, IPC, PM.

Introduction. Modification methods are used to improve the properties of interpolymer complexes and expand their use. To improve the complex properties of porous materials (PM) made of IPCs, they are modified by adding various fillers. At the same time, the physical and mechanical properties of KM change for the better: strength, hardness, heat resistance, resistance to water and aggressive substances in it, as well as a number of other important properties.

It is reported in the literature that the properties of polymer-polymer complexes (PPCs) can be controlled by changing the nature of intermolecular bonds of interacting components [1,2]. It was also reported that the equilibrium interaction of the starting materials leads to the formation of IPCs, and an increase in the amount of one of the starting materials leads to the formation of interpolymer complexes (IPCs).

In scientific research, a mixture of urea-formaldehyde oligomer (MFO) and the Na salt of carboxymethylcellulose (CMC) was used in IPC. The efficiency of using filled PM is further increased by introducing various industrial waste as a filler. Therefore, in our research, we used a secondary product of the chemical plant for the production of superphosphate of JSC “Samarkand-chemistry” in Samarkand - calcium phosphogypsum sulfate ($CaSO4$), which has been accumulating for many years [3,4].

The phosphogypsum used in our research is a product of the JSC "Samarkand -chemistry" in Samarkand. Currently, the amount of phosphogypsum accumulated at the JSC landfills has exceeded 10 million tons, and this amount is growing every year. Phosphogypsum (TU U 24.1-31980517-002 : 2005). The total moisture retention at phosphogypsum content is up to 45%, so phosphogypsum was heated to 1500 ° C for 1 hour before use, crushed, and then crushed. In

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addition, we used sand with a particle size of 0.2-0.25 mm. By mixing the PKI and fillers together, we formed the PM and poured the samples into molds. Because it helps them to study their chemical and physico-mechanical properties [5,6].

It should be noted that the maximum yield of the IPC corresponds to the MFIs (for all MFIs references): Na-CMC = 0.1: 0.15. We used the IPC with the IFS: CMC = 0.15: 0.1, which is an excessive MFI. The absence of Na-CMC in the mixture leads to polycondensation of MFOs, which is explained by the thickening of the mixture, the transition of MFOs to a three-dimensional state. This means that MFO polymers are part of the IPC and do not participate in other polycondensation reactions, which allows the formation of insoluble crosslinked polymers. Provides additional mechanical strength and control of the porosity of the KM by increasing water resistance.

Numerous experiments conducted on samples with modified phosphogypsum without changing the ratio of the main components concluded that its content is 20-25 mv. PM, which includes phosphogypsum, has the best set of properties. It follows that the use of phosphogypsum in PM increases its strength, but reduces porosity, therefore, the introduction of phosphogypsum in a certain amount is required [8,9].

Methods. Infrared spectroscopic (IR) analysis. IR spectra (v) were recorded on a 200-4000 cm-1 MIRacle 105 JR (SHIMADZU) frequency spectrometer and MIRacle 105 JR (SHIMADZU) electronic spectrophotometers.

Thermogravimetric analysis. Investigation of the process of thermal destruction of raw materials and PPK samples obtained on the Derivatoraph equipment according to standard methods in the temperature range 200-5000C (galvanometer weight 0.1 g, sensitivity TGA8000 STA8000, TGA4000 and STA6000). The linear heating rate was 10 degrees/min.

Chemical stability and durability. To determine the chemical stability, PPK samples were placed in containers with 20% NaCl and an "aggressive medium" consisting of mixtures of solutions of Ca(HCO3)2 salts.

X-ray phase analysis. The degree of crystallinity of the obtained materials was studied on the DRON-2.0 device with a CU-anti-cathode by X-ray phase analysis. To calculate the reflexes of the distances between the planes, we used an X-ray image using a well-known technique. The relative acceleration of radiographs (I/I1) and the reflection of strongly pronounced reflexes as a percentage were determined.

The measures taken to reform agriculture, develop farms, create production and market infrastructure made it possible to form a real class of landowners in the village, increase agricultural production and increase the incomes of the rural population. In addition to maintaining the current reclamation condition of irrigated lands, it is important to provide crops with the necessary amount of irrigation water during the growing season. At the same time, the correct organization of irrigation, that is, the correct choice of irrigation methods and techniques from a material and economic point of view, allows you to preserve crop yields and soil reclamation[10].

The quality of crop irrigation is often assessed by the fact that the irrigated areas have the same humidity. There is a lot of research on these issues. Irrigation techniques and technologies that distribute water evenly are now outdated.

The proposed method is focused on interpolymer complexes (IPK) and chemical meliorants based on phosphogypsum of chemical plants (A). IPK has a feature, with the exception of other founders. The expansion of the field of application sets the task for the IPK to create new modified formulations that are performed at the expense of relatively inexpensive

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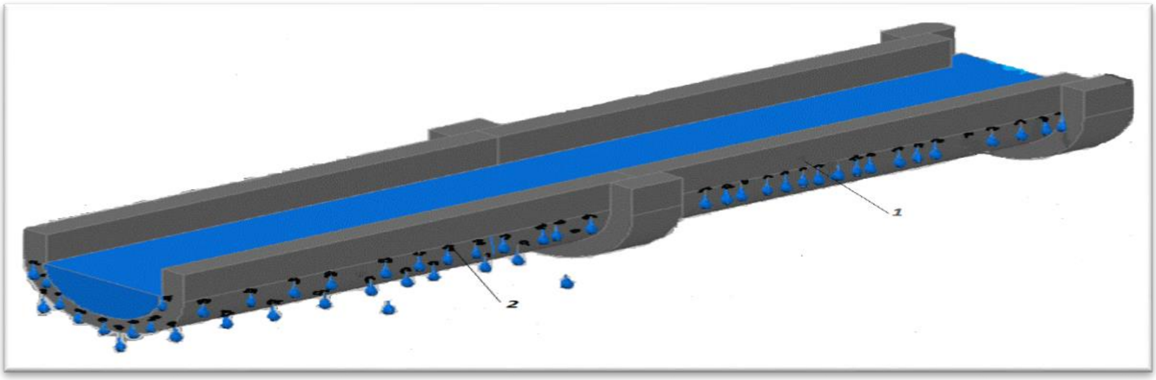
components[11].

Discussion. All technical solutions and research are designed to accelerate technological processes, prevent problems in agriculture and water management, and protect the environment. The results of the technical and economic indicators of the IPK allowed us to develop a technical solution that allows us to achieve high performance when using chemical industry waste as a filler. For this purpose, waste from JSC "Samarkand - chemistry" in Samarkand - phosphogypsum was used. This involves solving two tasks: - creation of polymers with different structures; -Development of new technologies for the replacement of polyethylene pipes in drip irrigation from IPK.



The results of the research and their analysis revealed the key factors influencing the effectiveness of porous composite materials. This includes:

1. The properties of the dispersed medium and the ratio of the components are interrelated. Rational selection of components (taking into account the exact content of minerals in the filler) leads to a more efficient ratio of components than stoicheometry. This corresponds to the maximum number of semi-complexes (or the sum of interpolymer complexes) formed in a real environment.

2. The procedure for adding fillers (F) and preparing IPCs for interpolymer complexes is defined. This includes adding individual components, shortening the interval, but maximizing efficiency if the connections of the middle and first components are maintained with the required minimum interval. This is achieved by simultaneously adding additional components to an aqueous solution to achieve a more precise mineral environment.

To control the properties of the obtained GM: - linear polymer-polymer (semi-electrolyte complexes of PEC); It is recommended to use linear polymer-compact particles of IPK. The second component is used in two ways: sand and F.

The developed porous compositions allow solving the following problematic tasks: - to create a film insulation coating on the soil surface or in ground-based surface structures, ditches or irrigation channels, trenches, etc. a filter screen; - protection of roads from sand, reducing the movement of quarries, excavations, sand dunes, combating water and wind erosion of the soil; - Development of materials for drip irrigation.

Thus, a new type of composite materials was developed. In practice, it has been theoretically proven that PKI and aggregates (sand and F) form complex structures.

In the current market economy, we can achieve the desired results by using this IPC and KM based on it in relatively cheap and economical ways of using water. For example, in the

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case of surface irrigation, which is the simplest irrigation method, it is recommended to reduce the irrigation rate by laying a screen to a certain length of the field and creating a screen that prevents absorption. If in this way it is possible to save water on the slope of the slope, then, in addition, it will be possible to control soil moisture, that is, to keep it at a distance to the desired

depth. The advantage of this method is that it is cheaper, and its constituent elements are produced in the production of phosphorus fertilizers.

Review and conclusion.

1. By studying the interaction of water-soluble interpolymer complexes with dispersed fillers - phosphogypsum and sand, methods for obtaining composite materials from them have been developed. It has been established that interactions between the interpolymer complex and phosphogypsum occur due to hydrogen bonds, and the amino groups of MFO and phosphorous groups of phosphogypsum participate in the formation of hydrogen bonds. A scheme for balancing association reactions in the formation of GM as a result of the interaction of MFOs, phosphogypsum and sand particles is proposed.

2. IC spectroscopy and X-ray phase analysis, optical microscopy methods for determining the composition of interpolymer complexes and dispersed fillers, description of the effect on the micro- and macrostructure of the obtained IPC. Optimal conditions for obtaining the specified properties and structural PM based on water-soluble interpolymer complexes have been found.

3. The possibility of controlling the complex of physico-chemical properties of PM obtained on the basis of dispersed fillers Na - CMC and MFO is shown. It was found that the nature and amount of filler included in the samples play an important role in this. It is shown that finely dispersed phosphogypsum and sand are involved in the formation of the structure and properties of PM. It is the reactivity of water-soluble functional groups that plays an important role in their structuring.

4. Some important patterns of the structure of composite materials have been identified, depending on the factors forming the basic structure. The optimal filler filling level at a specific surface area of 0.2-0.3 m2/g is defined as 2-3. It was found that the saturation of PM increases by

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10-20% compared to urea, the appearance and characteristics of the contact zone, which improves the characteristics of the material, "binds" the modified components.

5. The assessment of the chemical resistance of PM in NaCl solution and in "aggressive environments" was carried out. It has been shown that it is possible to effectively modify PM,

improving the physical and mechanical characteristics, directing them by adding active fillers to the curing systems.

6. The effect of dispersed fillers on the thermal resistance of GM is described. It is shown that the specific coefficient of interaction with the filling surface of the interpolymer matrix increases the thermal resistance of the filled materials, as well as the resistance to thermal oxidation and destruction.

7. It has been established that the developed interpolymer materials can be obtained as a suffocating hydrogel and an anti-filtration screen with an excess of Na-CMC, and porous materials with dispersed fillers with an excess of MFOs.

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