

TECHNOLOGY OF SYNTHESIS OF COMPLEX GENERATING IONITES BASED ON LOCAL RAW MATERIALS

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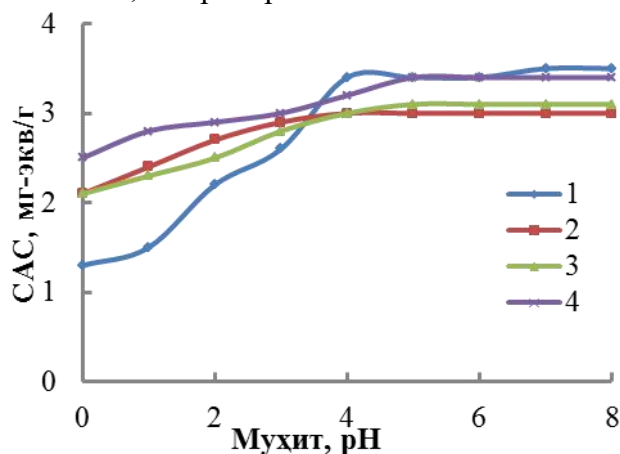
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Abstract. Since the independence of our republic, extensive measures have been taken to organize scientific research in the direction of developing new types of products in the chemical industry and to supply the local market with chemical reagents that can replace imports, and certain results have been achieved. In this regard, it is possible to emphasize the research of ionites synthesized on the basis of local raw materials, containing sulfur, nitrogen, oxygen and phosphorus donor atoms, effectively sorbing ions of precious metals from solutions, thermally and chemically stable, mechanically strong, and forming complexes.

Key words: capacity, sorption, measurements, environmental pH, a complex compound.

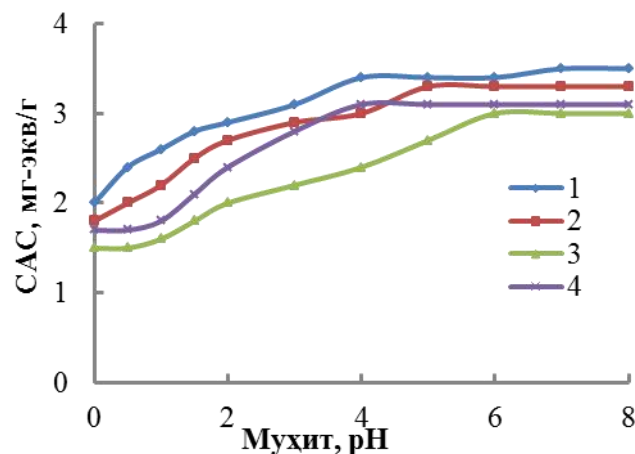
Introduction. Today, synthesizing new types of ionites, determining the sorption properties of metal ions, and using them to create a technology for extracting precious metal ions from solutions are urgent tasks. In carrying out research on the creation of complex-forming ionites, synthesis of ionites containing sulfur, nitrogen, oxygen and phosphorus donor atoms based on local raw materials, capable of forming complexes with various metal ions in the solution, and using them to effectively concentrate the ions of rare and non-ferrous metals and the development of separation methods is one of the urgent problems. Therefore, the physico-chemical properties of ionites based on DGT+PEPA, DMT+M and DGT+M synthesized in this study were studied [1,2].

The results of studying the sorption capacity of ionites showed that the formation of copper (II) complexes reaches the maximum value when $rN=3-5$ (Figures 7 and 8). When the environment is more alkaline, in addition to the formation of a complex compound, hydroxide and basic salts are formed, and precipitation of ionite into the solid phase was observed.



1) Cu^{2+} (—●—); 2) Zn^{2+} (—■—); 3) Cd^{2+} (—▲—); Pb^{2+} (—×—).

Figure 7. Dependence of ionite sorption capacity based on DGT+PEPA on



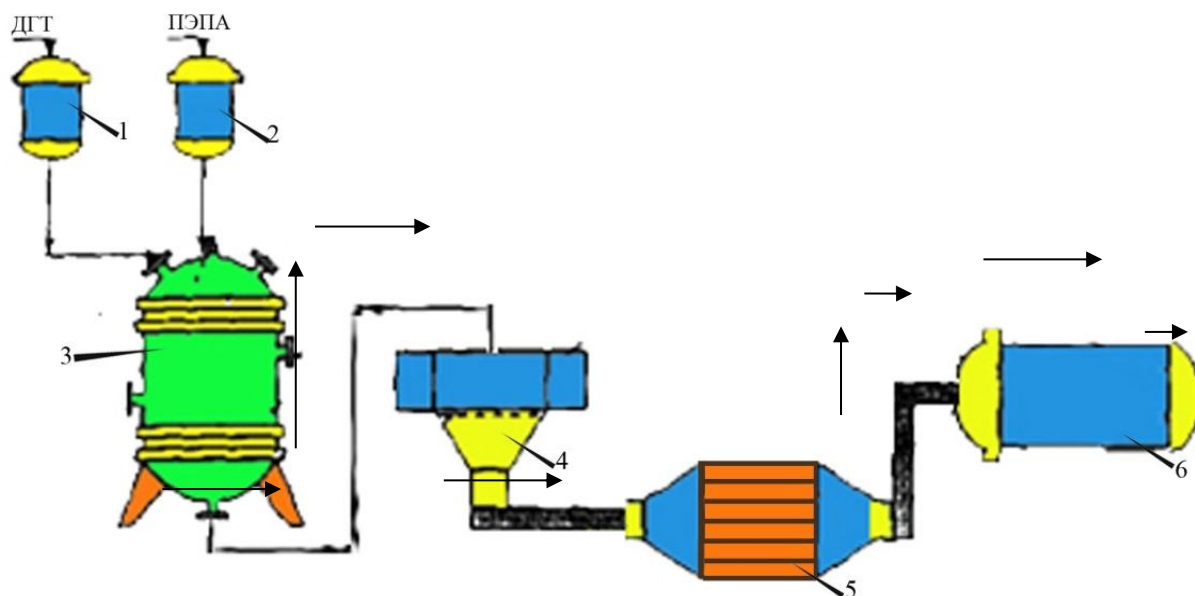
1) Cu^{2+} (—●—); 2) Zn^{2+} (—■—);
3) Cd^{2+} (—▲—); Pb^{2+} (—×—).

Figure 8. Dependence of ionite sorption capacity

environmental pH**based on DGT+M on environmental pH**

Measurements were conducted in static conditions. When determining the exchange capacity for metal ions, copper (0.05 n, pH=3.5-3.8), nickel (0.1 n, pH=6.5), cobalt (0.1 n, pH=5.5), zinc (0.1 n, pH=5.5), cadmium (0.1 n, pH=5.5) sulfate solutions were used. The amount of metal cations in the initial and equilibrium solutions was determined using trilonometric titration (Cd^{2+} , Zn^{2+}), photocolometry (Cu^{2+} , Co^{2+} , Ni^{2+}) and atomic absorption spectrometry (Au^{3+} , Ag^{+}). Duration of contact time of solutions with ions is 1 day, solutions rN i was determined by potentiometric method.

Technological processes for the production of new complex-forming ionites and ionizing resins have been developed at TKTITI



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Capacity for 1-2 primary raw materials; 3rd reactor; 4-grinding screen and cleaning device; 5-multi-shelf dryer; 6. Capacity for finished product.

Figure 12. Technological scheme of obtaining TEP-1 complex-forming ionite

Synthesis of TEP-1 complex-forming ionite is planned to be carried out according to the above technological scheme (Fig. 12).

Also, the technical and economic efficiency of using TFP-1 complex-forming ionite in various branches of production was developed. This ionite has been proven to be cost-effective compared to other industrial polycondensation ionites, mainly because it is obtained from cheap local raw materials.

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