DETERMINING THE SWELLING PROPERTIES OF SORBENTS

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Annotation.

The article discusses the results of the analysis to determine the degree of swelling of the composite polymer sorbent. Determination of the degree of swelling of sorbents was carried out according to standard procedures. A high swelling rate was achieved with polyaniline and polyacrylic acid.

Key words:

Polyaniline, polycaproamide, polyacryl acid, sorbent, swelling, polymer, composition.

Introduction.

Recently, the requirements for composite polymer materials are growing, especially on the basis of which raw materials for many industries are produced in our country on a large scale. One of these areas is the production of sorbents based on CMP. The production of sorbents based on composite polymer materials offers several advantages. For example, the convenience of such sorbents is that they can be reused. Also, such sorbents have a high degree of resistance to the external environment and aggressive conditions. One of the most important features is that their swelling rate is very high compared to other sorbents. Such properties of sorbents are very important. These features can be explained by the analysis results in Figure 1.

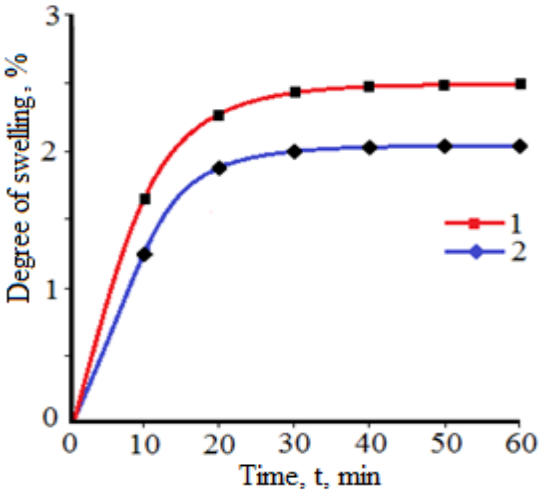

Fig. 1. Swelling curves of the PANI-PAC (1) and PANI-PCA (2) complexes

To determine the sorption properties of the obtained complexes PANI-PAC and PANI-PCA, we studied the swelling capacity of PPC. The swelling capacity of the PPC was investigated as a function of time.

Figure 1 shows that the complex swelling rate of the PANI-PAC complex after 10 minutes is 1,75%, the PANI-PCA complex – 1,25%; after 20 minutes PANI-PAC 22,25%, PANI-PCA 1,8%; after 30 minutes PANI-PAC 2,5%, PANI-PCA 2%; in 40 minutes PANI-PAC increased by 2,55%,

PANI-PCA by 2,05%; As a result of the analysis obtained after 50 minutes, it can be seen from the figure that the swelling rate of the two sorbents did not change, that is, PANI-PAC did not change by 2,55%, and PANI-PCA did not change by 2,05%.

This can be explained by the fact that the sorbent has reached a high swelling point. PANI-PAC has a higher swelling rate than the PANI-PCA complex. When swelling is carried out for up to 50 minutes, the degree of swelling increases, after 50 minutes, the swelling remains unchanged. Unlike known mineral sorbents, PPC-based sorbents swell during sorption processes, i.e. their volume and structure undergo significant changes. The free volume available in the swollen sorbent in any liquid is of a fluctuation nature.

Conclusion.

Sorbents based on composite polymer materials have been manufactured. The degree of swelling of composite polymer sorbents has been determined. An optimal formulation has been developed to improve their swelling rate.

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