
TECHNOLOGICAL ASPECTS OF OBTAINING AND PROPERTIES OF POLYMER HYDROGELS AND BIOFILM MODIFIED WITH THE HUMIC ACIDS OF BROWN COAL

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The article studies the properties and technological features of obtaining of the polymer hydrogels (based on gelatin) and the biofilms (based on polyvinyl alcohol and hydroxypropyl methylcellulose) modified with humic acids.

Practical aspects of the use of brown coal derivatives in the form of humic acids for the modification of bioplastics and polymeric hydrogels have been considered. The high prospects and efficiency of the use of humic acids in the modification processes of polymeric materials of various origins have been proved. It was noted that humic acids have a specific effect on the formation of an ordered structure in polymers, which is due to the different specific characteristics of humic substances: the degree of metamorphism of the original coal, the yield of volatile substances and the oxygen content. As a result of the research, polymer hydrogels based on gelatin with a high degree of swelling were obtained, as well as packaging biofilms based on polyvinyl alcohol and hydroxypropyl methylcellulose with antibacterial properties. It was established that the modification of gelatin-based polymer hydrogels with humic acids makes it possible to obtain a polymer hydrogels with an increased degree of swelling and to impart antibacterial properties to them. This is confirmed by the data of the indicator "time to the mold formation".

It has been shown that the modification of biofilms based on hydroxypropyl methylcellulose with humic acids makes it possible to obtain strong water-soluble films with antibacterial properties for use as packaging materials for dry food products with a prolonged shelf life. The article also presents the developed technological schemes for obtaining the mentioned materials. A preliminary assessment is given of the economic efficiency of the developed materials modified with humic acids, which proves their sufficient profitability.

Keywords: humic acids, modification, polymer hydrogels, biofilms, economic efficiency.

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