

STUDY OF THERMOSENSITIVE GEL-SOL GELATIN-ALGINATE HYDROGELS

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Polymer hydrogels are widely used in a number of industries, as well as in medicine to obtain artificial organs, coatings, bases for therapeutic systems, etc. Polymers intended for medical purposes have special requirements: biocompatibility, non-toxicity, stability, ability to withstand sterilization.

The modern trend in the development of biologically active polymers and materials based on them is the technology of creating effective systems for transdermal delivery of drugs and active substances into the human body. Transdermal delivery systems based on biologically active polymer materials cause increased interest in the introduction of drugs through the skin, for local therapeutic action on the affected skin with systemic local delivery of drugs, and they are also widely used in the direction of biologically active materials in the form of polymer hydrogels of various types.

In the work, a study of gel formation processes and peculiarities of the rheological properties of hydrogels based on gelatin was carried out in order to obtain modern hydrogels with an antibacterial effect.

Effective biologically active polymer thermosensitive gel-sol hydrogels based on gelatin and sodium alginate, modified with different content of humic acids, were obtained and studied. Modification of biopolymer hydrogels based on gelatin with humic acids allows obtaining biologically active polymer hydrogel materials with an increased degree of swelling.

It is important to note that the use of developed biologically active polymer heat-sensitive gel-sol hydrogels based on gelatin and sodium alginate, modified with humic acids, allows to significantly improve the level of transdermal transition of aminocaproic acid: from 19 – 20 % for dry aminocaproic acid and basic heat-sensitive gel-sol hydrogel gel based on gelatin and sodium alginate up to 27 – 28 % for 2,5 % by weight.

The content of humic acids and 46 – 49 % for 5 % wt. humic acids. In fact, thanks to the use of developed biologically active polymeric thermosensitive gel-sol hydrogels based on gelatin and sodium alginate, modified with humic acids, it becomes possible to obtain highly effective hemostatic materials.