

DEVELOPMENT OF SOFT DOSAGE FORM BASED ON POLYMERS OF ACRYLIC ACID IN COMBINATION WITH ANTIMICROBIAL AGENTS DERIVED FROM NITROFURANS

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Introduction. In the pharmaceutical industry, one of the most promising polymers for the production of gels is carbopol - derivatives of acrylic acid. High molecular weight polymeric derivatives of acrylic acid are white loose hygroscopic powders. When mixed with water swell to form an acidic environment, after neutralization form stable gels.

The aim of the study was to select of excipients to create a gel with nitrofurantoin derivatives.

Materials and research methods. The most common brands in Ukraine used in the pharmaceutical industry: Carbopol™, Pemulen™ i Noveon™ Polycarbophil European production, as well as domestic brands Arespol and Mars. Carbopol of different brands and their gels are characterized by different range of concentrations, degree of purification, rate of gelation, transparency, resistance to electrolytes, temperature and mechanical impact.

Results. Carbopoles are chemically weak acids, and easily converted to salts. Aqueous dispersions of acryl polymers at a concentration of 1 % have a pH value of from 2.5 to 3.5. The pH value depends on the number of carboxyl groups, so with increasing concentration of the polymer in the dispersion, the pH value decreases.

In the development of compositions and technology of new drugs, as well as in the production of existing used a wide range of carbomers with different properties that allow to obtain dosage forms with specified characteristics. They are obtained synthetically by polymerization in various solvents. Density is 1.39–1.41 kg / m³, particle size 2–7 μm. The viscosity of 1 % of aqueous gels averages 45–77 Pa, and the theoretical molecular weight is in the range from seven hundred thousand to four billion. The individual particles of acryl polymers are a complex of polymer chains woven into a three-dimensional porous structure. Identification of carbopol is carried out by various methods. According to Eur. Ph. 8.0 the authenticity of acryl polymers is established by the method of absorption spectrophotometry in the infrared region of the spectrum. The main bands of the spectrum are recorded at 2960 cm⁻¹, 1720 cm⁻¹, 1455 cm⁻¹, 1415 cm⁻¹, 1250 cm⁻¹, 1175 cm⁻¹ and 800 cm⁻¹. The most intense of them is at 1720 cm⁻¹. Confirmation of reliability is the formation of a gel by adding to 1 % dispersion of the polymer monomolar sodium hydroxide solution to pH 7.5.

Conclusions. Based on the data obtained during the development of the composition and technology of gels with furazolidone, carbopol ETD 2020 was chosen as the most optimal gelling agent, based on which the optimal sections of furazolidone gels were obtained. Gels based on carbopol ETD 2020, introduced at a concentration of 1 % are characterized as structured systems with optimal rheological characteristics, with high rates of release of the active substance from the dosage form. As an excipient for plasticizing the base and preventing drying, glycerin was administered at a concentration of 5–10 %.