

MODERN CHROMATOGRAPHIC METHODS (GLC, HPLC) TO IDENTIFY MEDICINES

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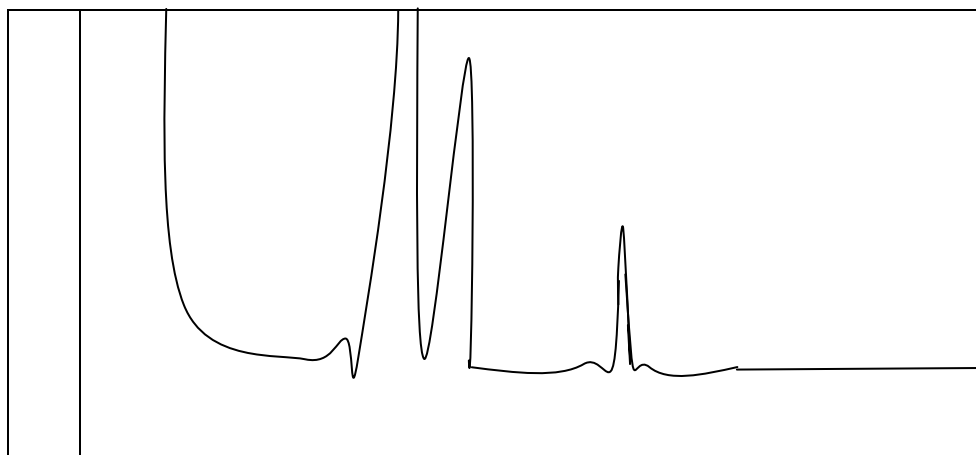
Introduction. Chromatographic methods are of great interest in a modern pharmaceutical analysis as they are able to solve the problem of separating mixtures of various ingredients – from the most simple to the most complex organic compounds. The main methods of analysis are high performance liquid chromatography (HPLC) and gas liquid chromatography (GLC). These types of chromatography have been found as methods that are used extensively in the areas such as chemistry, petrochemistry, biotechnology, medicine, production of medicines and many others.

Aim. Separating and analyzing mixtures of substances, as well as the study of physical-chemical properties of substances. Analysis of the drug "Septotele" in the form of pellets. Identification and quantitative analysis of Menthol and Thymol by using GLC and HPLC in this medicine.

Materials and methods. Peaks were recorded on the gas chromatograph the GC Chromos-1000 Laboratory with a flame ionization detector (FID). Column: SPB 5 capillary (30 m x 0.25 mm, 0.25 μ m). Column temperature: 120 °C. Gas-carrier: Nitrogen rate: 1.8 ml/min, split flow of 55:1. Mode of chromatograph: the module detectors: PID 1/2; Working detectors: PID-1; Analysis time: 0:12:00; Detector temperature - 230°C; Evaporator temperature – 200 °C. Standards: 1. The Menthol reference substance; 2. Reference substance of Imol; 3. Camphor (D-camphor) in order to prepare the internal standard solution and the standard solution for introduction. Reagents: 1. Chloroform; 2. Demineralized water; 3. Anhydrous Na₂SO₄.

Results and discussion.

CHROMATOGRAM



INDICATORS	METHODS	STANDARDS
Menthol	GLC	match the pattern
Thymol	GLC	match the pattern
The mass of the pellets	GFH, HPLC	1.200 g. each pellet
Uniformity of mass	GLC	±10%
Microbiological purity	GLC, Titration	3g. category
Melting point of Menthol	chemical thermometer	42-45 °C in crystalline form
Quantitative analysis - Menthol - Thymol	GLC, HPLC, Titration	Not less than 1.0 mg / Ms. the weight of pellets Not less than 0.5 mg / Ms. the weight of pellets
The presence of Benzalkonium chloride in pellets	GLC, HPLC, Titration	1.0 mg/ Ms. the weight of the pellets 15%
Dissolution "Septolete"	HPLC, GFH	No more than 60 minutes in water at the temperature, 37±1 °C

Preparation of the tested solution:

We weigh the amount of powder from the pellets, which corresponds to the 10 pellets, transfer to a separatory funnel (capacity=250 ml) and mix well with 100 ml of water. Then we extracted it 3 times, using every time 70 ml of chloroform (each time shake for 5 minutes), filtered the chloroform layer through anhydrous Na₂SO₄ into a flask of rotating evaporator. Then the chloroform was removed by distillate to dryness. The dry residue was quantitatively transferred to volumetric flask of 100 ml and was filled with chloroform to mark. Standard solution for introduction: compound of a standard solution and internal standard solution in 1:1 (V/V). The retention time of the peaks of Menthol and Thymol on the chromatogram corresponds to the retention time of the peaks in the chromatogram that were obtained from the standard solutions for introduction.

Conclusions. Modern chromatographic methods are used to analyze small quantities of a mixture of the substance which are chemically similar to each other. By using HPLC and GLC methods we were able to identify the active ingredients of the drug "Septolete", analyze Menthol and Thymol in this medicine, set their physical-chemical properties. We found the presence of Benzalkonium chloride in the pellets and prepared standard solutions for introductions. We also determined physico-chemical properties of standard solutions for introductions. Thus, GLC and HPLC are effective and reliable modern chromatographic methods in the analytical analysis which are used to identify medicines.