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DIFFERENT CHEMICAL ANALYSIS METHODS OF EXTRACTING AROMATIC ESSENTIAL OILS BASED ON LOCAL RAW MATERIALS

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Annotation: *Modern physical methods of separation of essential oil as a multi component mixture are used to reliably determine the properties of optical isomers. One of them is preparative gas chromatography - a modern instrumental method of separation, identification and quantitative analysis of mixtures, which allows you to isolate volatile substances directly from the original mixture.*

Keywords: *the column, optimal concentration, experimental thyrotoxicosis, essential oil.*

Аннотация: *Современные физические методы разделения эфирного масла как многокомпонентной смеси используются для надежного определения свойств оптических изомеров. Один из них - препаративная газовая хроматография - современный инструментальный метод разделения, идентификации и количественного анализа смесей, позволяющий выделить летучие вещества непосредственно из исходной смеси.*

Ключевые слова: *колонка, оптимальная концентрация, экспериментальный тиреотоксикоз, эфирное масло.*

INTRODUCTION

The advantage of this approach is that the section near the evaporator has the largest grain size and helps to reduce the flow resistance at the beginning of the column. The third section with the smallest grain size is the main one and provides the necessary separation efficiency.

Using preparative chromatography, it is possible to separate azeotropic mixtures and isomers with close boiling points, isolate individual components for further research, prepare high-purity reagents, and obtain purified samples that can be used as standards [1, 2].

DISCUSSION AND RESULTS

A series of experiments established the dependence of the number of theoretical plates for limonene p and the duration of separation of t on the mass ratio of TN sections. The experiment was performed on the column described above. The speed of the carrier gas is set at -5 100 cm / min. The sample volume was 500 µl.

It shows an increase in the efficiency of the column with an increase in the number of the third section with a grain size of 0.56...1.0 mm. This increases the duration of separation.

Taking into account the values of column efficiency and analysis duration, the optimal quantitative ratio of TN sections corresponding to experience 2 was determined.

The next stage of research determined the gradient of the amount of NF application. NF is applied to TN in the range of 15 ... 25 % relative to the mass of the latter. Since in preparative chromatography, a -5 large sample volume of up to 1 cm is introduced into the column, large concentrations of NF deposition are used.

Thus, a series of studies was conducted to determine the optimal concentration of NF. The amount of NF relative to TN was changed in the range from 15 to 25 %, the efficiency of p and the duration of separation of t was determined.

According to the research results, it is determined that it is more effective to reduce the concentration of NF at the height of the column, starting with the introduction of the sample. The maximum efficiency of the column is provided by the following: the first section of the TN is marked with the maximum possible amount of NF, which represented 25% of the mass of the TN. This helps to avoid overloading the column and increases its capacity with the possibility of introducing a larger sample volume. The high content of NF in the initial section of the column completely dissolves the introduced sample, thereby establishing an equilibrium of liquid and vapor concentrations. The third section of TN, the mass part of which is the largest, is divided into two: the third and fourth-to ensure a gradual reduction in the number of SF. On the fourth section of the TN, at the end of the column, the minimum amount of NF is applied-15 %.

According to the obtained mathematical dependence, it is established that when nitrogen is supplied at a speed of 85...90 cm / min the number of theoretical plates for limonene reaches a maximum value of 580-588 t. t.

The obtained samples of essential oil are light-moving yellow liquids with a characteristic pleasant smell. The essential oil of European zyuznik has a pronounced floral smell with a slight aroma of menthol and bergamot. The essential oil of zyuznik high shows a faint floral smell. The content of essential oil in the plant raw materials of high zyuznik (Lycopus exaltatus L.) and European zyuznik (Lycopus europaeus L.) was 0.9% and 0.7%, respectively, during the flowering period of plants; 0.7% and 0.5% per 100 g of air-dry raw materials, respectively, during the growing season.

Taking into account the boiling point value of individual aromatic components of essential oil and the maximum permissible operating temperature values of PEG-6000, the use of programming the temperature of the column thermostat within 150...190 °C with a heating interval of 5 °C was selected and experimentally confirmed.

The optimal temperature of the evaporator is set to a temperature range of 180.250 °C, which provides a evaporation rate at which losses during sample insertion and thermal degradation or changes in the structure of aromatic components are excluded.

In general, the determination of the direction of the pharmacological and possibly toxic effects of the essential oils of European zyuznik and high zyuznik suggests further research.

The content of essential oil in wild plants of the Astrakhan region, European zyuznik and high zyuznik, is higher when the plant is collected in the flowering phase.When determining the chemical composition of essential oils by chromatography-mass spectrometry, 31 and 12 components were identified in the grass of European zyuznik (Lycopus europaeus L.) and high zyuznik (Lycopus exaltatus L.), respectively. European zyuznik and high zyuznik are of interest as raw materials for the pharmaceutical, perfume and cosmetics industry and aromatherapy.

Thus, the amount of sample required for effective separation and separation of aromatic components is 0.5... 0.6 cm.

To capture the aromatic components of the separated oil, special collections were used at the outlet of the preparation column, which are containers with an inert nozzle. The collections were cooled with refrigerants.

Studies of the effect of sample volume on the effectiveness of the preparation column for limonene have shown that with increasing sample volume, the number of theoretical plates of the column decreases, and, accordingly, its effectiveness.

The essential oil sample was dissolved in benzene to a concentration of 0.1% by volume. For chromatography, a column was used-MDN-1 (methylsilicon, solid-bonded) 30 m, diameter 0.25 mm. Chromatography mode: injector-180 ° C; detector-200°C; interface-210°C; carrier gas-helium (99.99999%), 1 ml / min with a flow division of 20:1; thermostat-60°C 1 min, 2 deg / min-up to 70°C, 5 deg / min - up to 90°C, 10 deg/min - up to 180°C, 20 deg/min-up to 280°C, then the isotherm 1 min. The quantitative content of the essential oil components was calculated from the areas of the gas chromatographic peaks without the use of correction factors. The

components were identified by comparing the values of linear retention indices, retention times, and total mass spectra of the components with a library of chromatography-mass spectrometric data of pure volatile substances of plant origin.

The selection of optimal parameters for separation of essential oils by preparative chromatography carried out in the course of experiments allowed to increase the separation efficiency up to 570..600 theoretical plates. Based on this result, a method has been developed for isolating aromatic components with a low content in the original essential oil. This allowed us to identify the aromatic components of dill and cumin essential oils to establish their optical activity, organoleptic properties, degree of purity and prospects in creating traditional aromas and refined, original aromatic compositions.

However, the biotechnology of rose essential oil that meets international standards has not yet been developed. It was found that the oil content in the rose cell culture is much lower than in intact petals, and the composition of extracted oils differs from the rose oil of plants [2]. In the 80-90-ies of the last century, the possibility of obtaining natural scented substances using microbial cultures was shown in Uzbekistan. Among the studied representatives of the microcosm, we can distinguish a group of producers of alcohols and esters with the smell of roses, including different taxa of organisms.

CONCLUSION

Scientific and technical justification of technologies in Uzbekistan for microbial synthesis of aroma products using new types of essential oil biotechnological raw materials suggests that potential consumers of oil can be small, medium and large enterprises of the perfume and cosmetic, pharmaceutical and food industries.

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