

## Methods for Determining Menthol as Main Component of Pepper Mint (*Mentha Piperita.L*)

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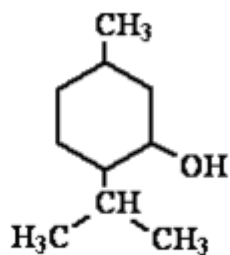
### **Abstract:**

Today, one of the urgent tasks of modern chemistry is to expand the methods of obtaining essential oils, as well as the main components, from medicinal plant raw materials, which are common plants of the local flora. Although progress has been made in the fields of synthesis of chemical preparations and their application, the need for natural medicines and preparations from plants has also not lost its importance. One of the local plants rich in essential oil in this article is considered pepper mint (*Mentha piperita.L*) highlighted the methods of detection of menthol, which is considered one of the main components in the composition of essential oil, isolated in plant raw materials.

**Keywords:** Menthol, prismatic, alcohol, essential oil, phthalic anhydride.

### **Introduction**

*Mentha piperita.L* is a plant of medicinal importance belonging to the family Lamiaceae (African Pharmacopoeia, 1985; Indian wealth, 1962) and *Mentha spicata. L* (Mint) is widely known as ,mint. Mint provides 0.1-1% volatile oil (Leung, 1980), its composition consists mainly of menthol (29-48%), Mentone (20-31%), mentofuran (6.8%) and menthyl acetate (3-10%) [3].



**Mentol**

Menthol-crystals are colorless, powder-like, form prismatic or needle-like shiny crystals, menthol distilled with water vapor is volatile at normal temperature and has a strong odor .

Slightly soluble in water, but easily soluble in glycerin, alcohol , diethyl ether, acetic acid, which are considered organic solvents. Forms eutetic mixtures with phenol, resorcin, thymol[3].

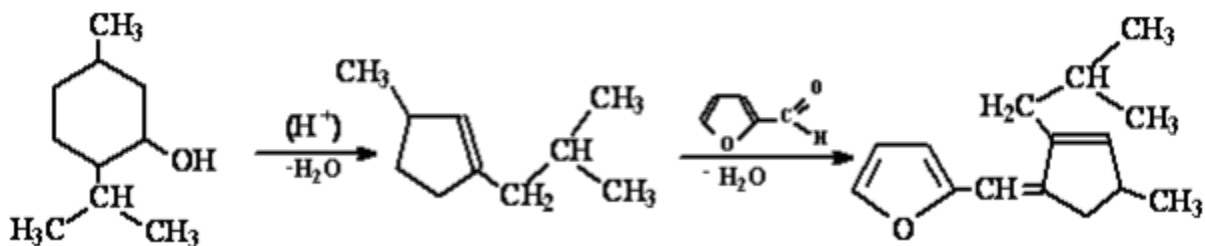
### Literature analysis and methods

The following techniques are used to identify menthol, which is the most abundant in the content of essential oil extracted from the raw materials of the pepper mint plant.

#### 1. Determination by physical constants.

It is determined by measuring the value of the specific light deflection indicators of the essential oil solution. In the process, a 10% alcohol solution of mint leaf extract should have an optical rotation angle of around  $-0.20 + 0.20$  [4].

2. Condensation with Furfurol. The reaction is based on oxidation and based on the interaction of the active methylene group of menthol with aromatic aldehydes:

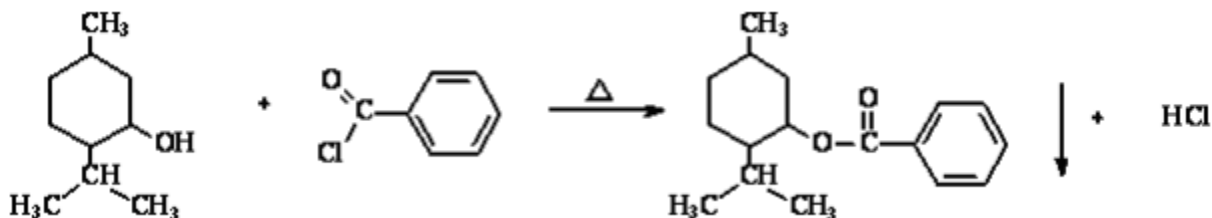


Execution technique. 20 ml of ethanol is poured over 0.1 g of crushed mint leaves. To 3 ml of 10% alcohol solution of extract from mint leaves

2-3 ml of the alcohol solution of furfural is added and the reaction medium is

4-5 drops of concentrated sulfuric acid are added. Carefully heated, a purple solution is formed [4].

3. Determination by reaction with benzoyl chloride. The method of identification is based on the melting temperature of the condensation product of the substance under investigation with benzoyl chloride:

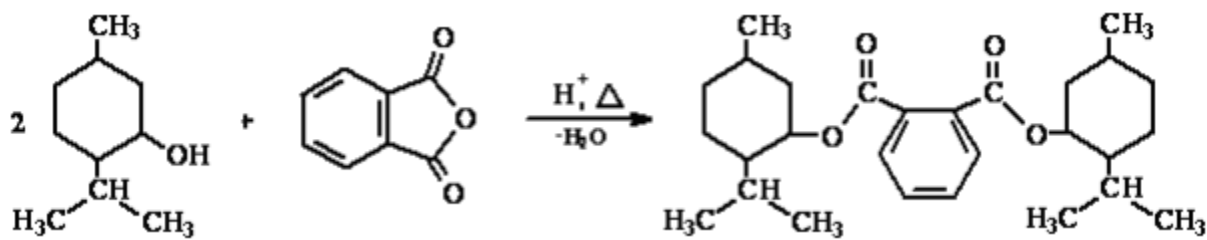


Execution technique. 20 ml of ethanol is poured over 0.1 g of crushed mint leaves. From a 10% alcohol solution of the extract from mint leaves, up to 3 ml of a 1.0 ml of anhydrous pyridine is added and 0.5 ml of benzoyl chloride is added and heated in a water bath for 10 minutes and then cooled. After the addition of 7.0 ml of water, a white precipitate falls.[4]

## Results and discussion

We Pepper Mint (*Mentha piperita*.L) used the process of condensation of the composition with phthalic anhydride under laboratory conditions for the purpose of identifying menthol as the main monocomponent. This process is based on the formation of colored condensation products of menthol with phthalic anhydride in the presence of concentrated sulfuric acid, which we carried out in the following sequence.

Samples of plant raw materials were harvested in October 2023. Then the leaves, flowers were carefully separated from the stem, cleaned and dried at room temperature for a week. The specimens were brought to the state of the tolkans, thoroughly appetizing their flowers and leaves separately. From 0.1 gr of crushed mint leaves, essential oils are separated by distillation with water vapor and 20 ml of ethanol is poured on top. 4 slices of phthalic anhydride and 3 drops of concentrated sulfuric acid were dripped into 3 ml of 10% alcohol solution of the extract from mint leaves. The mixture was heated slowly



## Conclusion

Pepper mint (*Mentha piperita*.L) samples of raw materials were prepared from the ground surface of the plant, and essential oils were extracted from its composition by steam distillation. In the essential oil of the extracted pepper mint plant, phthalic anhydride and sulfuric acid were used to identify menthol, which is known as the main monocomponent.

During laboratory work, menthol was found to produce a yellow-red solution in the presence of phthalic anhydride and sulfuric acid.

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