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OF  
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Technology

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AROMATIC WATERS

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Lecture: 5

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# Outline

- Definition
- Therapeutic use
- Types
- Preparations
- formulations



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# Definition

**The British Pharmacopoeia (BP)** defines aromatic waters as clear, saturated aqueous solutions of volatile oils or other aromatic or volatile substance

Aromatic waters are prepared from several volatile substances, including :

- peppermint oil
- rose oil
- orange flower oil
- spearmint oil
- anise oil
- wintergreen oil
- camphor
- chloroform.



# *Therapeutic Uses of aromatic waters:*

- Aromatic water provide pleasantly flavored medium for administration of water-soluble drugs & for the liquid phase of emulsions & suspensions.
- They can be used as an excipient or bases or vehicles for formulation of other pharmaceutical preparations.



# Aromatic waters may be used for some therapeutic purposes like:

Camphor water has been used as the vehicle in ophthalmic solutions owing to its ability to contribute refreshing and stimulating effect to the preparation.

Rose water has an antioxidant activity. The Rose water cleanses tones and protects skin from harmful environmental impacts.

Chloroform water has been used as preservative apart from its flavoring nature.

Peppermint water: used as carminative, flavoring.

Hamamelis water is used as astringent in after shave lotions & other cosmetic products

# Properties

An odor and taste like the oils or substances from which they are prepared.

They should always be clear and free from fibers, particles and sediment.

They should not be used after being stored for more than a few weeks.

They should be free from foreign odor.

Aromatic water have low therapeutic effect.



# Types of aromatic water

Aromatic waters can be categorized in two types as:

## 1. Simple aromatic waters:

They contain purified water as a solvent but do not contain alcohol and are mainly used as vehicles.

- Prepared by diluting the concentrated with 39 times its volume of e.g. Chloroform water.
- Dilution method is an attempt to obviate the difficulties in the clarification of aromatic water. So the formula have been developed for concentrates which are designed to be diluted with an appropriate volume of water.

## 2. Concentrated Aromatic Waters:

They contain alcohol as solvent for the volatile constituents.

- When we need to prepare concentrates; we use alcohol or solubilizing agent. An alcoholic solution of essential oil mixed with water & talc (5%). The mixture is agitated & after several hours, it is filtered. The concentrates contain between 50-55% v/v alcohols.
- One volume of concentrate is diluted with 39 volumes of water producing aromatic water which contain less than 1.5% alcohol.

e.g. Camphor Water BP, Concentrated Peppermint Water BP, Concentrated Caraway Water BPC, Concentrated Cinnamon Water, Concentrated Dill Water B, Concentrated Anise Water B etc.

**Disadvantages** : Aqueous preparations that contain small amount of alcohol are prone (subjected) to alteration in flavor & aroma as consequence of oxidative degradation of the alcohol.

# *Essential oils*

Are concentrated hydrophobic liquid containing volatile aroma compounds from plants or are complex mixtures of hydrocarbons (terpenes) & aroma carrier ((alcohol, ether, aldehyde & ketone)).

Essential oils are also known as volatile oils. The hydrocarbon fraction of many essential oil is made up of terpenes. These components of the oil are the least water soluble.

Most of the insoluble matter removed in the clarification process. The other substances are aroma carrier.

Terpenes oil are commercially available, they are prepared by fractional distillation &/or extraction.

They are concentrated products which therefore are stronger in aroma & more soluble in water.

# Methods of preparation

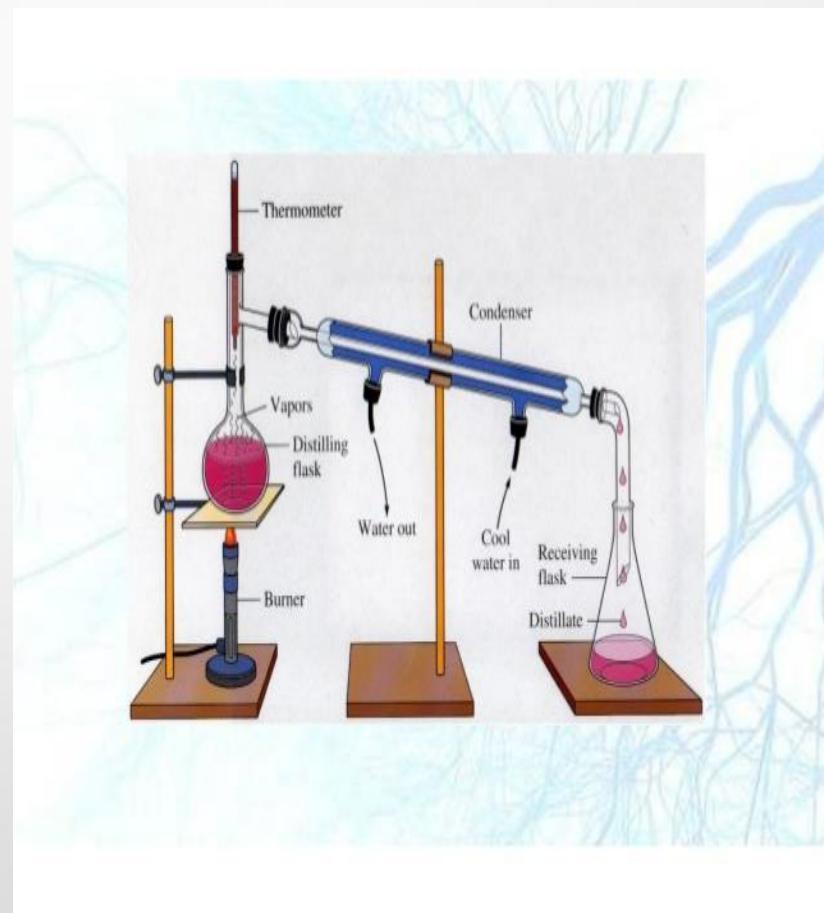
**Distillation Method**

**Solution Method**

**Alternative Solution Method**

# I. Distillation

- Most aromatic waters can prepare by distillation; however it is not practically or economically feasible to use this method in most cases.
- Distil the odoriferous drug, in a suitable still, with a sufficient quantity of purified water or dilute alcohol until the specified volume of aromatic water has been collected. Set aside for 12 hours, separate the undissolved portion of the distillate, filter if necessary.



- This is the common method of preparation of aromatic waters although it is slow and expensive one.
- e.g. Strong Rose Water, Orange Flower Water and Hamamelis Water are prepared by this method.
- These waters have active volatile constituents in small quantities so it may be necessary to repeat the distillation process several times.

## II. Solution Method:

This method is simpler, quicker and more economical as compared to distillation method.

In this method, aromatic water is prepared by intermittently shaking 2 ml (if liquid) or 2 g (if solid) of the volatile substance with 1000 ml of purified water in suitable container for a period of 15 minutes. After the period of agitation the mixture is set aside for 12 hours or longer to permit the excess oil and the solid substance to settle. Without further agitation the mixture is passed through a wetted filter paper and purified water added as needed to bring the volume of the filtrate up to the prescribed quantity.

# Why wetted filter paper?

- To prevent the passage of excess oil into the filtrate.
- To eliminate absorption of the dissolved aromatics by the filter.

# Disadvantages of this method

1. Despite repeated filtration, it is difficult to obtain a clear preparation owing to the formation of extremely fine particles. This may be obviated by using boiling purified water.
2. The time consumed by this process is very long.

- e.g. Chloroform water is prepared by this method without clarification problems.

### 3. Alternative Method

- This method has been developed to overcome difficulties in the simple solution method (clarification and amount of time consumed)
- In this method, the volatile oil or suitably comminuted aromatic solid is thoroughly incorporated with 15 g of powdered talc or enough kieselghur or pulp filter paper and to this mixture is added 1000 ml of purified water.
- The resulting slurry is thoroughly agitated several times for the period of 30 minutes and then filtered.

# Talc powder

- It is inert insoluble substance used in alternate method because it function as filter aid (it adsorbs the excess amount of oil that cause turbidity ) and as distributing agent (it can break up aromatic substance into fine particles so the surface area exposed to the solvent increase so the solubility will increase.)

**Filter aid** (facilitate the clarification of the solution ), so the time saving factor is an important advantage of this method.

**Disadvantage** of this method is that the purified talc pass through filter paper, because purified talc is subdivided too finely & it is difficult to obtain good purified talc free from soluble & finely divided extraneous matter.

- Many aromatic waters has been prepared from essential oil e.g. peppermint water.

# Stability of Aromatic waters

- Aromatic waters are not permanently stable preparations.
- Generally instability in aromatic waters can be attributed to improper storage of the product. Some problems that affect the stability of aromatic waters:
  - 1-many aromatic waters support the growth of molds, since they contain distilled water & no preservative are added to aromatic waters.
  - 2-Excessive exposure to light & to change in temperature cause aromatic waters to lose some of their desirable characteristics.
- Since aromatic waters are saturated solutions, lowering the temperature causes separation of the aromatic component, thus producing cloudiness.

- The aromatic may be salt-out when the aromatic water used as vehicle for drugs which are electrolytes.
- The insoluble substances may collect on the top of liquid cause burning taste to first dose.
- Chloroform water, is stored in light resistant bottle, since light may oxidize the chloroform to poison gas (Phosgene gas).

# Preservation of Aromatic Waters

- Aromatic waters should be freshly prepared and should not be prepared in larger quantities than can be used within a reasonable time
- They deteriorate when kept too long, usually through the development of micro-organisms" all traces of their agreeable odors disappear.

- To avoid as far as possible the presence of micro-organisms the water used for preparing aromatic water should be recently boiled, distilled water, as that ordinary distilled water is usually contaminated by the presence' of such micro-organisms. No preservative should be added to aromatic waters.
- If they become cloudy or otherwise deteriorate, they should be discarded. Alcohol should not be added as preservative. Moreover, aromatic water should be protected from strong light; and freezing, which hasten decomposition.

# 1. Camphor water: Aqua camphorae

Camphor water is a saturated aqueous solution of camphor.

- It is the only aromatic water prepared from a solid.

- Camphor 1 gm
- Alcohol 15 ml
- Purified water to 1000 ml
- Mitte 100 ml

# Method of preparation

1. Dissolve the camphor in the alcohol and add this alcoholic solution to the purified water in successive portions, shaking vigorously after each addition until all the camphor is dissolved.
2. Adjust to the required volume with purified water.

- Solubility of camphor in water is 1 in 800; the above aromatic water is a nearly saturated solution.
- Used as the vehicle in ophthalmic solutions owing to its ability to contribute refreshing and stimulating effect to the preparation.

## 2. Peppermint water (Aqua menthae)

- Peppermint water is a clear saturated aqueous solution of peppermint oil in distilled water

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- Peppermint oil 1.5 ml
- Talc 15g
- Purified water 1000ml

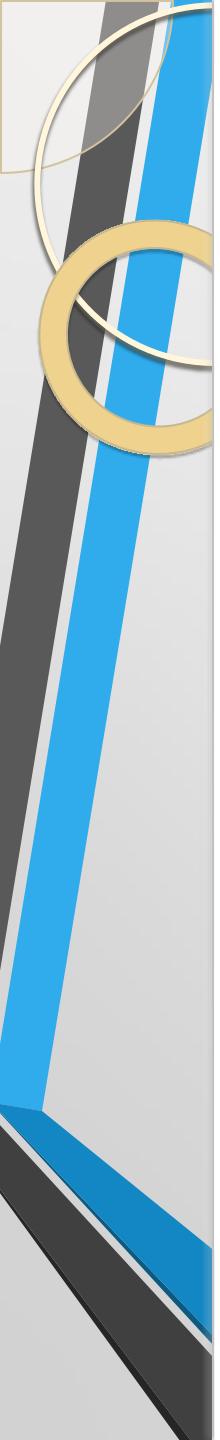
Mitte 100ml

- It is used as antispasmodic and carminative.
- It is used as ingredient in mouth washes because menthol.



# Method of Preparation

1. Triturate the peppermint oil with powder talc in a mortar till well mixed
2. Add gradually purified water in portions and triturate.
3. Transfer the content of the mortar to a suitable bottle and rinse the mortar with the remaining water adding the rinsing to the contents of the bottle.
4. Shake the bottle for 15 minutes.
5. Filter through small filterpaper.
6. Return the first portion of the filtrate and re-filter it Again.
7. If the filtrate remains turbid, re-filter it till become clear.



### 3. Chloroform Water

- Chloroform water is a saturated aqueous solution of chloroform. Concentration of chloroform in chloroform water is 0.5 % v/v (double strength chloroform water).

# Method of Preparation

- It is not prepared according to the general methods for preparing aromatic waters.
- There is no clarification problem involved and a slight excess of chloroform must remain in the bottle.
- A saturated solution is prepared and maintained by adding excess of chloroform given quantity of purified water, i.e. 0.5 ml chloroform to 100 ml purified water, shaking vigorously taking care that a slight excess of chloroform is always present.

# Storage

In light-resistant bottles, i.e. amber coloured since light causes chloroform to be oxidized to the poisonous gas " phosgene " as follows



Used as flavoring, vehicle, antiseptic and preservative.

