Aromatic waters:

Aromatic water is also called *medicated water*, defined in the USP as clear, saturated aqueous solutions of volatile oils (e.g. rose oil, Peppermint oil) or other aromatic or volatile substances e.g. camphor. Aromatic water provide pleasantly flavored medium for administration of water soluble drugs & for the liquid phase of emulsions & suspensions.

Aromatic waters are not therapeutically potent because of very small proportion of active ingredient present in them. (Because of there are very small amount of volatile substance present in water).

These are to be free from:

1. Smoke like odor and other odors.
2. Must have odor and taste similar to those oil or drugs from which they are prepared.

Aromatic waters are consisting of two Components:

1. Volatile oil *(solid as camphor water, Gas as cherry water, Liquid such as Chloroform water)*

2. 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 water).

   E.g. Chloroform water.

2. **Concentrated aromatic waters:** They contain alcohol as solvent for the volatile constituents or surface active agent e.g. Camphor Water BP, Concentrated Peppermint Water BP.
Aromatic water (preparation & stability):

Methods of preparation of aromatic waters are:

1- Distillation method
2- Solution method
3- Alternative Solution method.

This is the three general procedures for preparation of aromatic waters. In addition we have formulas for concentrates & dilute of concentrate. Formulas for concentrating aromatic principles containing either alcohol or surface active agent (solubilizing agents) have been developed.

1- Distillation: most aromatic waters can prepare by distillation, however it is not practically or economically feasible to use this method in most cases?? Due to other methods with lower cost & with little apparatus.

Stronger rose water, orange flower water, hamamelis water are examples on aromatic waters that should prepared by this method. These aromatic waters are prepared directly from fresh plant material & cannot be prepared by any method other than distillation. This method consist of placing the odoriferous portion of the plant in suitable still with sufficient purified water & then distilling most of water & carefully the excess oil separate from distillate & then the aqueous phase which may be need further clarification is the product. This method is slow and expensive one. Some time on the label of aromatic waters prepared by distillation, we see one or more (X) mark .each X mean one distillation. Why do this?? This do to get a saturated solution, if it is not obtained from first distillation (These waters have active volatile constituents in small quantities so it may be necessary to repeat the distillation process several times).
**2-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. The mixture set aside for 12 hours in order to ensure saturation then it is filtered through wetted filter paper. Why wetted filter paper??

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

In this method a large excess of solute is used 2ml or 2gm per liter in order obtained maximum rate of solution. So this process is very simple process but it is not used in very wide.

This method has disadvantages:

1- In spite of 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. Only one example which can be prepared by solution method is chloroform water. **Chloroform water** is prepared by this method without clarification problems.

**3-Alternate solution:** This method has been developed to overcome difficulties in the simple solution method (clarification & amount of time consumed). In this method, the volatile material or suitably comminuted aromatic solid mixed with 15 gm of powdered talc (inert). To this mixture is added 1000 ml of purified water, The resulting slurry is thoroughly agitated several times for the period of 30 minutes before filtration. Talc and other inert material act as both filter aid & distribution agents. **distribution agents** (serve to accelerate the rate of solution by adsorbing & facilitating the breaking
up of the aromatic substance into fine particles. Thus increase the surface area exposed to the solvent action), \textit{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.

\textbf{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.

\textbf{When we needed into prepares concentrates}, we use \textit{alcohol} or \textit{solubilizing agent}. An alcoholic solution of essential oil mixed with water & talc. The mixture is agitated & after several hours, it is filter. 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.

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

\textbf{The other method of prepare concentrates} is by using surface active agent (S.A.A) for example poly sorbate 80(tween 80). In this case tween 80 act to solubilize aromatic principle by micelles formation. This S.A.A. process is not a good method because the PH for preparation is less than of aromatic water & this process result in foam during shaking & this S.A.A. help in growth of M.O & have undesirable taste.
**Essential oils:** are concentrated hydrophobic liquid containing volatile aroma compounds from plants or are complex mixtures of hydrocarbons (terpen) & 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 terpens. These components of the oil are the least water soluble consequently constituent most of the insoluble matter removed in the clarification process. The other substances are aroma carrier. Terpenless 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. Also they may be more stable than the natural essential oil. Their use in the preparation of aromatic waters should result in less difficulty in clarification but the greater cost. Ex. clove oil.

**Therapeutic Uses of aromatic waters:**

Aromatic waters are pharmaceutical aid and used principally for perfuming and flavoring the formulation. They can be used as an excipients or bases or vehicles for formulation of other pharmaceutical preparations. Aromatic waters may be used for some special purposes like:

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

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

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

(d) Peppermint water: used as carminative.
**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 and no preservative are added to aromatic waters.
2. Excessive exposure to light and change in temperature cause aromatic waters to lose some of their desirable characteristics.

- 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 oxidized of chloroform to poison gas (Phosgene gas).

**Preservation of Aromatic Waters:**

Protect from excessive light and heat. Deterioration may due to volatilization, Decomposition or mold growth producing cloudy preparation or disagreeable odor.

- If they become cloudy or otherwise deteriorate; they should be discarded.

**Aqueous Pharmaceutical Solutions:**

**1-Douches:**

- Douche is an aqueous solution, which is directed against a part or into a cavity of the body.
- It functions as a cleansing or antiseptic agent.
Ex. Eye douches are used to remove foreign particles, Pharyngeal douches, nasal and vaginal douches.

2-Enemas:
These preparations are rectal injections employed to evacuate the bowel.

3-Gargles: Gargles are aqueous solutions frequently containing antiseptics, antibiotics and/or anesthetics used for treating the pharynx (throat) and nasopharynx by forcing air from the lungs through the gargoyle, which is held in the throat; subsequently, the gargle is expectorated.

Many gargles must be diluted with water prior to use. Although mouthwashes are considered as a separate class of pharmaceuticals many are used as gargles, either as is, or diluted with water.

4-Mouthwashes
Mouthwashes can be used for therapeutic & cosmetic purposes:
- Therapeutic mouthwashes can be formulated to reduce plaque, gingivitis, dental caries and stomatitis.
- Cosmetic mouthwashes may be formulated to reduce bad breath through the use of antimicrobial and/or flavoring agents.

5-Nasal Solutions
Nasal solutions are usually aqueous solutions designed to be administered to the nasal passages in drops or sprays.
- Ephedrine Sulfate or Naphazoline Hydrochloride Nasal Solution USP is administered for their local effect to reduce nasal congestion.
- Commercial nasal preparations include antibiotics, antihistamines and drugs for asthma prophylaxis.
- Current studies indicate that nasal sprays are deposited in the pharynx with the patient in an upright position.
Drops spread more extensively than the spray and three drops cover most of the walls of the nasal cavity, with the patient in a supine position and head tilted back and turned left and right.

6-Sprays
Sprays are solutions of drugs in aqueous vehicles and are applied to the mucous membrane of the nose and throat by means of an atomizer or nebulizer.

The spray device should produce relatively coarse droplets if the action of the drug is to be restricted to the upper respiratory tract. Fine droplets tend to penetrate further into the respiratory tract than is desirable. They are used for the treatment of allergy and/or vasodilatation (congestion) that occur with common cold.

7-Otic Solutions:
- The main classes of drugs used for topical administration to the ear include local anesthetics, e.g.: benzocaine; antibiotics e.g.; neomycin; and anti-inflammatory agents, e.g.; cortisone.
- These preparations include the main types of solvents used, namely glycerin or water.
- The viscous glycerin vehicle permits the drug to remain in the ear for a long time.
- Anhydrous glycerin, being hygroscopic, tends to remove moisture from surrounding tissues, thus reducing swelling.
- Viscous liquids like glycerin or propylene glycol either are used alone or in combination with a surfactant to aid in the removal of cerumen (ear wax).
- In order to provide sufficient time for aqueous preparations to act, it is necessary for the patient to remain on his side for a few minutes so the drops do not run out of the ear.
The end