

Lab. 3 Pharmaceutical Technology

Elixir and spirit

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ELIXIRS

They are **clear, sweetened hydroalcoholic** (**contain water, alcohol, and sugar**) solutions intended for **oral use**, and are usually **flavored to enhance their palatability**.

Medically they are classified to:

1. **Non medicated elixirs**: these employed as **vehicles** for medicinal substances. Ex **elixir of glycerin**.
2. **Medicated elixirs**: these contain ingredients giving them **therapeutic value**.

NOTES:

The **proportion of alcohol (reach up to 40%)** present in elixirs varies widely since the individual components of the elixirs have **different water and alcohol solubility characteristics**

(Each elixir require a specific blend of alcohol and water to maintain all of components in solution).

In addition of alcohol and water other ingredients may be used in elixirs such as:

- **Glycerin** and **propylene glycol** which used as **adjunct solvents**.
 - **Sucrose** , **saccharine**, and **sorbitol** as **sweetening agent**
 - **Flavouring materials** to increase their **palatability**.
 - **Colouring agents** to enhance their **appearance**.
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- ❑ Elixirs containing over **10-12% of alcohol** are usually **self preserving**.
 - ❑ Elixirs should be **stored in tight, light resistant containers and protected from excessive heat** because of their usual content of volatile oil and alcohol.

Difference between elixirs and syrups:

1. Elixirs are usually **less sweet and less viscous** than syrups because they contain a lower proportion of sugar and consequently are **less effective than syrups in masking the taste** of medicinal substances, hence **required flavoring agent**.
2. Elixirs are **better than aqueous syrups to maintain both water soluble and alcohol soluble components in solution** because of their hydroalcoholic character.
3. From manufacturing stand point, elixirs are **preferred over syrup** due to their **stability and ease of preparation** (by simple solution).

Preparation of elixir:

1. Elixirs are usually prepared by simple solution method with agitation and / or by the admixture of two or more liquid ingredients.
2. Alcohol soluble and water soluble components are generally dissolved separately in alcohol and purified water, respectively. Then the aqueous solution is added to alcoholic solution rather than the reverse, in order to maintain the highest possible alcoholic strength at all times so that minimal separation of alcohol-soluble components occurs.
3. When the two solutions are completely mixed the mixture is made to volume with specified solvent or vehicle.

Directions :

In preparation of elixirs frequently the final mixture will not be clear (cloud) due to separation of some flavouring oils by reduced alcoholic concentrations.

If this occurs the elixir is usually permitted to stand for a prescribed number of hours, to ensure the saturation of hydroalcoholic solvents and to permit the oil globules to coalesce so that they are more easily removed by filtration.

Phenobarbital elixir USP

Rx

Phenobarbital 4 g

Tr. of orange peel 30 ml

Solution of amaranth 10 ml

Alcohol 125 ml

Glycerin 450 ml

Syrup 250 ml

D.W Q.S 1000 ml

Method:

1. Dissolve the phenobarbital in alcohol 2. Add the tincture of orange peel ,glycerin, syrup, amaranth solution and add sufficient water to produce 1000 ml ,mix well and filter.

Directions:

- The phenobarbital elixir used as **sedative and hypnotic**.
- Glycerin used as **thickening agent** ,also increase the solubility of phenobarbital.
- Tr. of orange peel used as **flavouring agent**.
- Solution of amaranth used as **colouring agent**.
- Syrup used as **sweetening agent**.

Pediatric paracetamol elixir BP

Rx

Paracetamol 120 mg

Alcohol 0.5 ml

Chloroform spirit 0.1 ml

Propylene glycol 0.5 ml

Conc. rose berry juice 0.125 ml

Amaranth solution 0.01 ml

Invert syrup 1.375

Glycerol Q.S 5ml

Method:

1. Dissolve paracetamol in alcohol.
2. Add chloroform spirit ,propylene glycol, juice, amaranth solution, invert syrup.
3. Complete the volume by addition of glycerol.

Spirits:

Are alcoholic or hydro alcoholic solutions of volatile principle, mostly volatile oils.

Spirits could be classified according to their uses:

1. **Therapeutic spirits:** which contain therapeutic volatile substances.

2. **Flavouring spirits:** which contain flavouring volatile substances.

» Spirits were prepared by distillation, but nowadays they are prepared by dissolving the volatile substances in alcohol.

» The amount of volatile substance in spirits varies greatly and no fixed percentage can be given, but in all cases, volatile substances in the spirits are more than that of aromatic water (clear aqueous solution saturated with volatile oils (e.g. rose oil, Peppermint oil), or other aromatic or volatile substances eg. camphor).

» Amount of alcohol differ from one spirit to another, the lowest amount of alcohol found in internal spirits as (aromatic spirit of ammonia) which contain 62-68% alcohol while (camphor spirit) which is used externally contain 80-87%.

» Spirits when taken orally, they are generally mixed with portion of water to reduce the pungency effect.

» In preparation of spirits we must keep in mind that the oil dissolved in alcohol is precipitated causing turbidity when the solutions are mixed with water other than specified in the formula, so all equipment should be dry and filter paper should be moisten with alcohol.

» Spirits should be stored in light resistant containers and in cool place to prevent evaporation of alcohol and volatilization of volatile substance or active ingredients and to limit oxidative changes.

Methods of preparation of spirits

1. Simple solution method
2. Maceration
3. Chemical reaction
4. Distillation

Spirits of orange BP

Rx

Oil of orange 200 ml

Oil of lemon 50 ml

Oil of coriander 20 ml

Oil of anise 5 ml

Alcohol Q.S 1000 ml



Method:

According to simple solution method, mix oils with sufficient alcohol to make the product measure 1000 ml.

Note:

Anise oil use as **carminative and mild expectorant** (as cough mixtures and lozenges)

Compound spirit of cardamom BP

Rx

Oil of cardamom 20 ml

Oil of orange 20 ml

Oil of cinnamon 2 ml

Oil of clove 1 ml

Anethol 1 ml

Oil of caraway 0.2 ml

Alcohol Q.S 200 ml

Method:

Mix the oils and anethol with sufficient alcohol to make the product measure 200 ml.

Notes:

✓ **Caraway oil** used as **antispasmodic agent**, mainly in children mixtures.

✓ **Cinnamon oil** used as **carminative and flavouring agent**.

✓ **Cardamom** used as **carminative and flavouring agent**.

✓ **Anethol used** as mild expectorant in cough mixtures and lozenges, also as **flavouring agent**.



Aromatic spirit of ammonia

Rx

Ammonium carbonate 34 g

Dilute solution of ammonia 90 ml

Oil of lemon 10 ml

Oil of lavender 1 ml

Oil of Myristica 1 ml

Alcohol 700 ml

D.W Q.S 1000 ml

Method:

Dissolve the solid agent in dilute solution of ammonia with little amount of water , while the oil dissolved in alcohol also with little amount of water, and then add the aqueous solution into alcoholic one after filtering each one.

Note:

In preparation of aromatic spirit of ammonia we make filtration due to the presence of water with alcohol that lead to precipitation of volatile oil

Uses of official spirits:

1. Carminative
2. Antacid
3. Mild reflex circulatory stimulant
4. Flavouring agent

Comparison between elixirs and spirit

Elixir	Spirit
1. Contain sweetening agent	1. Not contain
2. More viscous	2. Less viscous
3. No need preservative	3. Not need
4. Water and alcohol are usually the primary solvent	4. Alcohol is usually the primary solvent
5. For internal use only	5. Used internally and externally
6. Concentration of alcohol is up to 40%	6. Higher alcohol concentration

Thank you