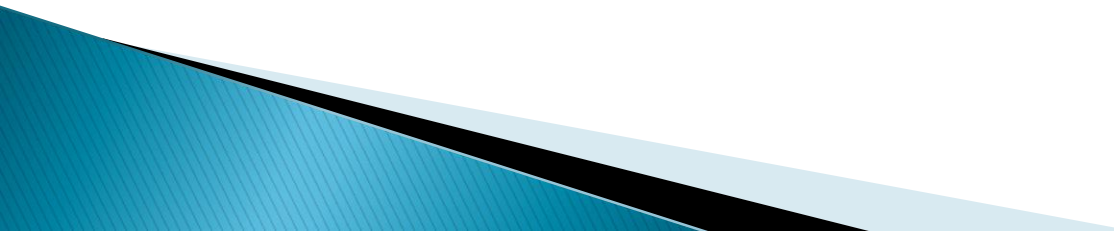


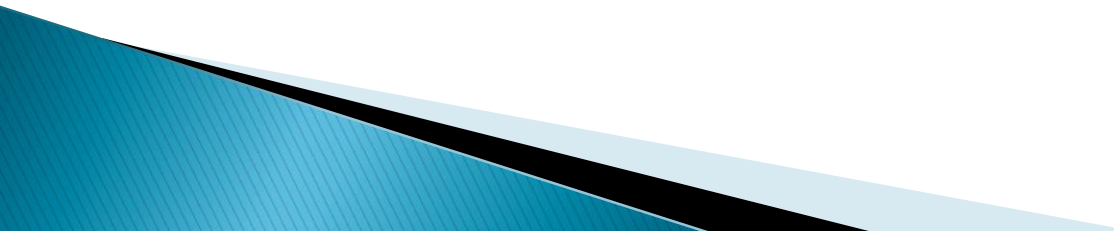
# Pharmaceutical Technology

## Elixirs

### Lecture 14



# Elixirs

- ▶ Elixirs are clear, sweetened, hydroalcoholic solutions for oral use, and are usually flavored to enhance their palatability.
  - ▶ Non-medicated elixirs are employed as vehicles and
  - ▶ medicated elixirs for the therapeutic effect of the medicinal substances they contain.
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# What are the differences between elixirs and syrups?

Compared with syrups, elixirs are usually

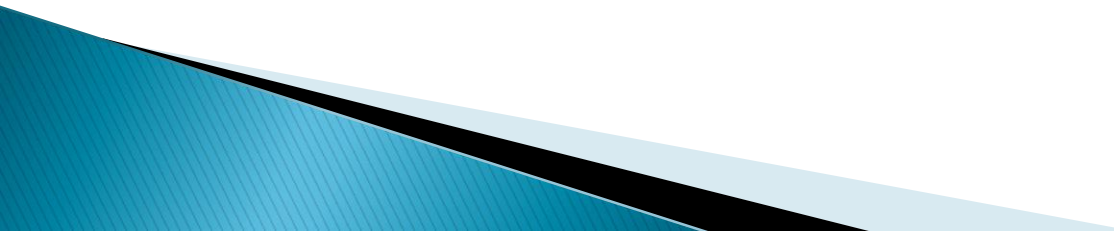
- ▶ Less sweet and less viscous because they contain a lower proportion of sugar and consequently are
- ▶ Less effective in masking the taste of medicinal substances.

# What are the differences between elixirs and syrups?

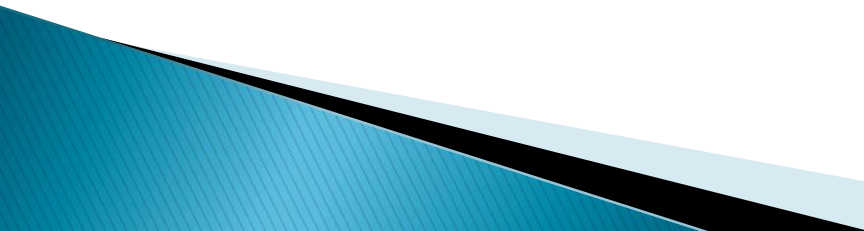
However, because of their hydroalcoholic character, elixirs are

- ▶ Better able than aqueous syrups to maintain both water-soluble and alcohol-soluble components in solution.
- ▶ Also because of their stable characteristics and ease which are prepared (by simple solution), elixirs are preferred. over syrups

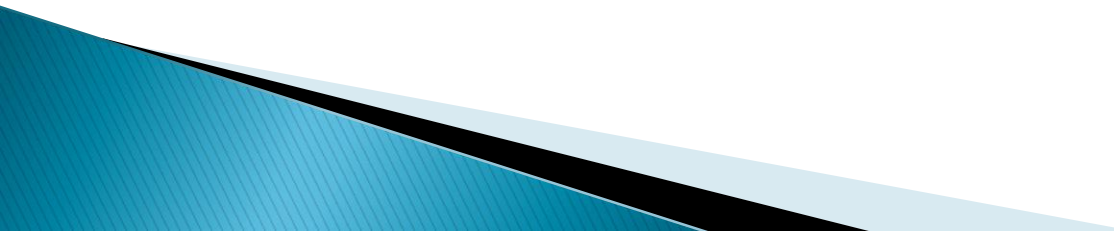
# Elixirs

- ▶ In the official elixirs, the alcohol content varies from 4 to 40 percent. Generally, there is just enough alcohol to keep volatile oil or the medicinal substances in solution.
  - ▶ In addition to alcohol and water, other solvents, such as glycerin and propylene glycol are frequently employed in elixirs as adjunct solvents.
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# Elixirs

- ▶ Although many elixirs are sweetened with sucrose or with a sucrose syrup, some utilise sorbitol, glycerin and/ or artificial sweeteners.
  - ▶ Elixirs having a high alcohol content usually utilise an artificial sweeteners, such as saccharin, which is required only in small amounts, rather than sucrose which is only slightly soluble in alcohol and requires greater quantities for equivalent sweetness.
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# Elixirs

- ▶ Elixirs containing over 10 to 12% of alcohol are usually self preserving and do not require the addition of an antimicrobial agent or their preservation.
  - ▶ All elixirs contain flavoring materials to increase their palatability and most have coloring agent to enhance their appearance.
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- ▶ **Disadvantage of elixirs**

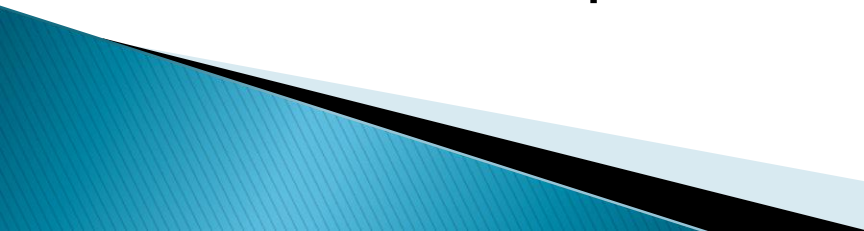
A disadvantage of elixirs for children and for adult who choose to avoid alcohol is their alcohol content.

- ▶ **Storage of elixir**

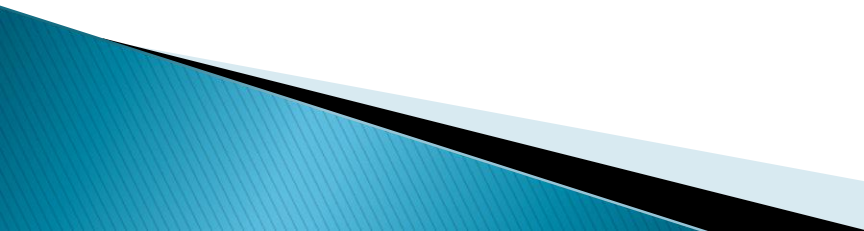
Because of their usual content of volatile oils and alcohol, elixirs should be stored in tight, light resistant containers and protect from excessive heat.



# Preparation of elixirs

- ▶ Elixirs are usually prepared by simple solution with agitation and/ or by the admixture of two or more liquid ingredients.
  - ▶ Alcohol-soluble and water-soluble component are generally dissolved separately in alcohol and in purified water, respectively. Then
  - ▶ The aqueous solution is added to the alcoholic solution, rather than the reverse, in order to maintain the highest possible strength at all times so that minimal separation of the alcohol-soluble components occurs.
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# Preparation of elixirs

- ▶ When the two solutions are completely mixed the mixture is made to volume with the specific solvent or vehicle.
  - ▶ Frequently the final mixture will not be clear, but cloudy, due principally to the separation of some of the flavoring oils by the reduced alcoholic concentration.
  - ▶ If this occurs, the elixir is usually permitted to stand for prescribed number of hours, to ensure the saturation of the hydroalcoholic solvent and to permit the oil globules to coalesce so that they may be more easily removed by filtration.
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# Preparation of elixirs

- ▶ Talc, a frequent filter aid in the preparation of elixirs, has the ability to absorb the excessive amounts of oils and therefore assist in their removal from the solution.
- ▶ The presence of glycerin, syrup, sorbitol and propylene glycol in elixirs generally contributes to the solvent effect of the hydroalcoholic vehicle, assists in the dissolution of the solute, and enhances the stability of the preparation. However, the presence of these materials adds to the viscosity of the elixir and slow the rate of their filtration.

# Classification of elixirs

- ▶ Non medicated elixirs

Which is used as vehicles in preparing medicated elixir either by

1. The addition of a therapeutic agent to a pleasant tasting vehicle
2. The dilution of an existing medicated elixir

# Examples of non medicated elixirs

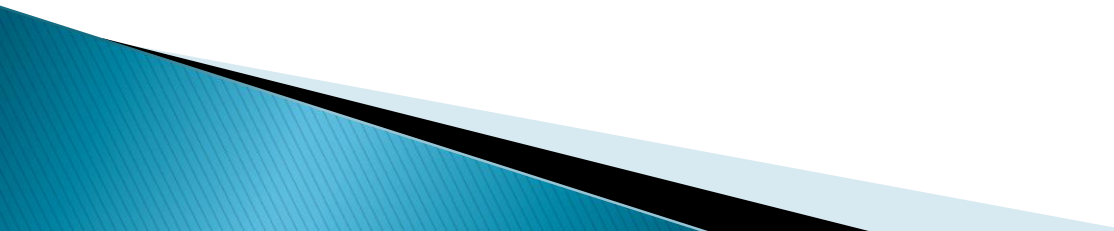
The three most commonly used non medicated elixirs were:

1. Aromatic elixir
2. Compound benzaldehyde elixir
3. Iso-alchohic elixir

# Aromatic elixir, USP

- ▶ Is the most widely used
- ▶ It is a rather simple preparation. Yet it is a difficult to prepare it in small quantities.
- ▶ It consists of compound orange spirit, syrup, alcohol, water, and talc.
- ▶ The difficulty arises from
  - ▶ 1. the loss in volume resulting from repeated filtration about 10–20% of volume loss due to this step.
  - ▶ 2. the slowness in filtration result from the syrups being added before preparation is filtered. This ingredient, plus the talc, make it nearly impossible to get a good rate of filtration.

# Suggestions

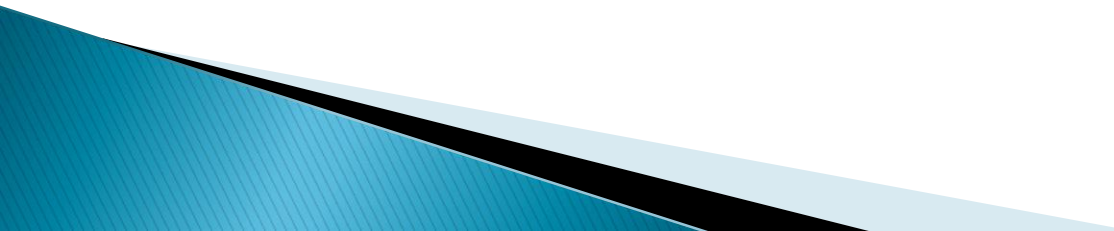
- ▶ Dissolving the sugar in the filtrate to increase the rate of filtration
  - ▶ The use of terpeneless oils (water-soluble) to avoid the difficulty occur (cloudiness) which is due to the insolubility in water of the oils present in compound orange spirit.
  - ▶ Both of these suggestions make it possible for elixir to be made more rapidly.
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# Content of sugar and alcohol in Aromatic elixir

- ▶ The sugar content of aromatic elixir is about 31 percent, or less than half that of syrup.
- ▶ The alcohol content is from 21 to 23 percent by volume.
- ▶ **Compound benzaldehyde elixir, NF**
- ▶ Is prepared by simple solution and is used when a bitter almond-like flavor is desired



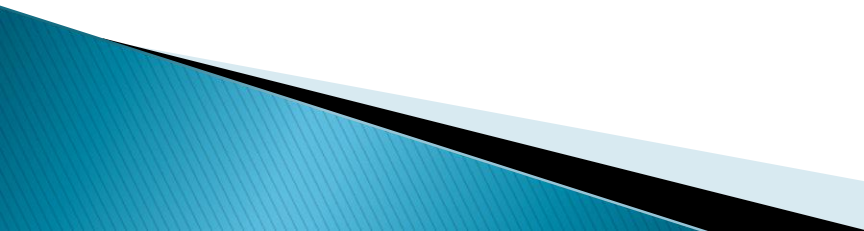
# Iso-Alcoholic Elixir, NF

- ▶ It is composed of two separate parts, low alcoholic elixir with an alcohol content of from 8 to 10 percent, and high alcoholic elixir with an alcohol content of from 73 to 78 percent.
  - ▶ By mixing two solutions, the final product may be obtained which has an alcoholic content within the ranges required for elixirs.
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# Medicated Elixirs

- ▶ Medicated elixirs which have therapeutic action, some times used as the vehicle for other drug e.g. Phenobarbital elixir.
- ▶ Medicated elixirs can be described by further classifying them according to their therapeutic activity.
  - ▶ 1. Antihistamine elixirs
  - ▶ 2. Sedatives and Hypnotics elixirs
  - ▶ 3. Expectorants and cough preparation
  - ▶ 4. Miscellaneous medicated elixirs

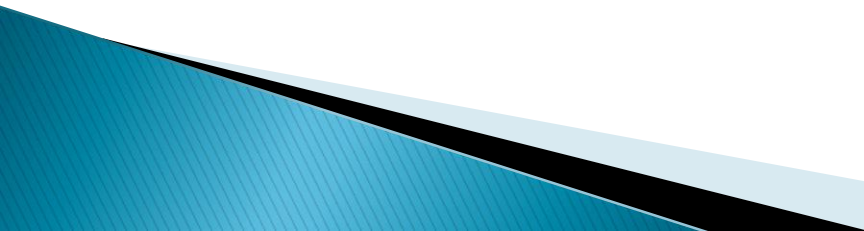
# Antihistamine Elixirs

- ▶ This is the largest group of elixirs having a definite therapeutic action.
  - ▶ Antihistamines are useful primarily in the symptomatic relief of certain allergic disorders.
  - ▶ In their action, they suppress symptoms caused by histamine, one of the chemical agents released during the antigen–antibody reaction of the allergic response.
  - ▶ Examples: 1. Diphenhydramine HCl Elixir  
2. Chlorpheniramine HCl Elixir
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# Sedative and Hypnotics

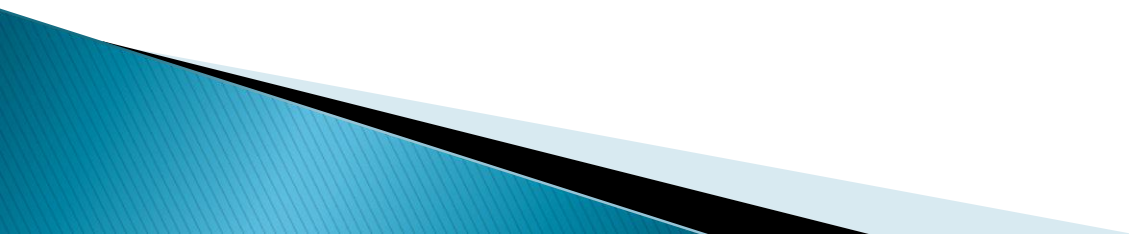
- ▶ This is the second largest group of elixirs  
e.g. Phenobarbital Elixir
  - ▶ Barbiturate in general used in low dosage as sedatives and in higher dosage as hypnotics.
  - ▶ They are either long acting sedation, intermediate sedation or short-acting sedation or duration.
  - ▶ Phenobarbital is used for long-acting sedation.
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# Phenobarbital elixir

- ▶ In Phenobarbital elixir, the active ingredient first is dissolved in alcohol before adding the other liquids. While phenobarbital dissolves readily in alcohol and will remain in solution when the alcohol content is lowered.
  - ▶ Mixer of alcohol, water, and glycerin is used in this elixir. The presence of the glycerin prevents the phenobarbital from precipitating.
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# Role of glycerin in phenobarbital elixir

- ▶ Glycerin and glycerin water solutions are poor solvents for phenobarbital. But the solubility of phenobarbital in alcohol is enhanced by the addition of glycerin.
- ▶ **Expectorants and cough preparations**  
Terpin Hydrate Elixir, NF.



# Miscellaneous Elixirs

1. Digoxin Elixir USP, is used as a cardiotonic.
  2. Acetaminophen Elixir, NF, which is used as analgesic.
  3. Dexamethasone Elixir, NF, contains a synthetic adrenocorticosteroid and is used in the treatment of rheumatoid arthritis and other conditions for which corticosteroid therapy is indicated.
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