

## *Elixirs*

They are clear, sweetened hydroalcoholic solutions intended for oral use and are usually flavored to enhance their palatability.

They are of two types:

- Nonmedicated elixirs which are employed as vehicles
- Medicated elixirs which are used for the therapeutic effect of the medicinal substances they contain.

### *Comparison between syrups and elixirs:*

1. Elixirs are usually less sweet and less viscous because they contain a lower proportion of sugar.
2. Elixirs are better able than aqueous syrups to maintain both water soluble and alcohol soluble components in solution.
3. Elixirs is preferred because of the ease with which they are prepared.

The proportion of alcohol in elixirs varies widely because the individual components of the elixirs have different water and alcohol solubility characteristics. Each elixir requires a specific blend of alcohol and water to maintain all of the components in solution. Naturally, for elixirs containing agents with poor water solubility, the proportion of alcohol required is greater than for elixirs prepared from components having good water solubility. In addition to alcohol and water, other solvents, such as glycerin and propylene glycol, are frequently employed in elixirs as adjunctive solvents.

Elixirs having a high alcoholic content usually use an artificial sweetener, 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.

Elixirs also contain flavoring agents and colorants, elixirs containing more than 10% to 12% of alcohol are self-preserving.

### Preparation of elixirs:

Elixirs are usually prepared by simple solution with agitation and/or by admixture of two or more liquid ingredients.

- Alcohol-soluble and water-soluble components are generally dissolved separately in alcohol and in purified water, respectively.
- The aqueous solution is added to the alcoholic solution, rather than the reverse, to maintain the highest possible alcoholic strength at all times so that minimal separation of the alcohol-soluble components occurs.
- When the two solutions are completely mixed, the mixture is made to the volume with the specified solvent or vehicle.

Frequently, the final mixture will be cloudy, principally because of separation of some of the flavoring oils by the reduced alcoholic concentration. If this occurs, the elixir is usually permitted to stand for a prescribed number of hours to ensure saturation of the hydroalcoholic solvent and to permit the oil globules to coalesce so that they may be more easily removed by filtration.

Talc, a frequent filter aid in the preparation of elixirs, absorbs the excessive amounts of oils and therefore assists 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.
- enhances the stability of the preparation.

However, the presence of these materials adds to the viscosity of the elixir and slows the rate of filtration.

### Non medicated elixirs:

Non medicated elixir is useful in the extemporaneous filling of prescriptions involving

- (a) The addition of a therapeutic agent to a pleasant-tasting vehicle.
- (b) Dilution of an existing medicated elixir.

In selecting a liquid vehicle for a drug substance, solubility and stability of the drug substance in water and alcohol is an important factor.

If a hydroalcoholic vehicle is selected, the proportion of alcohol should be only slightly above the amount needed to effect and maintain the drug's solution. During dilution of an existing medicated elixir, the nonmedicated elixir that has been selected as the diluent should have approximately the same alcoholic concentration as the elixir being diluted.

### *Medicated elixirs:*

Most official and commercial elixirs contain a single therapeutic agent. The main advantage of having only a single therapeutic agent is that the dosage of that single drug may be increased or decreased by simply taking more or less of the elixir, whereas when two or more therapeutic agents are present in the same preparation, it is impossible to increase or decrease the dose of one without an automatic and corresponding adjustment in the dose of the other, which may not be desired.

Examples of medicated elixirs:

- Antihistamine elixirs.
- Barbiturate sedative and hypnotic elixirs.
- Phenobarbital elixir.
- Digoxin elixir.

## **Spirits**

Spirits are alcoholic or hydroalcoholic solutions of volatile substances, generally, the alcoholic concentration of spirits is rather high, usually over 60%.

Because of the greater solubility of aromatic or volatile substances in alcohol than in water, spirits can contain a greater concentration of these materials than the corresponding aromatic waters.

When mixed with water or with an aqueous preparation, the volatile substances present in spirits generally separate from the solution and form a milky preparation.

Spirits may be used:

- As flavoring agents, they are used to impart the flavor of their solute to other pharmaceutical preparations.
- For medicinal purposes, spirits maybe taken orally, applied externally, or used by inhalation, depending upon the particular preparation. When taken orally, they are generally mixed with a portion of water to reduce the pungency of the spirit.

Depending on the materials, spirits may be prepared by simple solution, solution by maceration, or distillation. The spirits most recently official in the USP–NF are aromatic ammonia spirit, camphor spirit, compound orange spirit, and peppermint spirit.

## **Aromatic Waters**

Aromatic waters are clear, aqueous solutions saturated with volatile oils or other aromatic or volatile substances. Aromatic waters are no longer in widespread use.

In years past, aromatic waters were prepared from a number of volatile substances, including orange flower oil, peppermint oil, rose oil, anise oil, spearmint oil, wintergreen oil, camphor, and chloroform. Naturally, the odors and tastes of aromatic waters are of the volatile substances from which they are prepared.

Most of the aromatic substances in the preparation of aromatic waters have very low solubility in water, and even though the water may be saturated, its concentration of aromatic material is still rather small. Aromatic waters may be used for perfuming and/or flavoring.

### **Tinctures**

Tinctures are alcoholic or hydroalcoholic solutions prepared from vegetable materials or from chemical substances.

They vary in:

- Method of preparation.
- Strength of active ingredients.
- Alcoholic content.
- Intended use in medicine or pharmacy.

Depending on the preparation, tinctures contain alcohol in amounts ranging from approximately 15% to 80%. Alcohol has two functions which include:

- Protects against microbial growth.
- Keeps the alcohol- soluble extractives in solution.

Tinctures cannot be mixed successfully with liquids too diverse in solvent character because the solute may precipitate. For example, compound benzoin tincture, prepared with alcohol, contains alcohol-soluble principles that are immediately precipitated from solution upon addition of water.

Because of the alcoholic content, tinctures must be tightly stoppered and not exposed to excessive temperatures. Also, because many of the constituents found in tinctures undergo a photochemical change upon exposure to light, many tinctures must be stored in light-resistant containers and protected from sunlight.