



Lecture-16

Solutions using mixed solvent systems

Spirits, Elixirs, and Extracted Products

Why using mixed solvent systems?

- When substances to be included in liquid dosage forms for oral administration are **not water soluble** or when **they exhibit chemical instability in water**.
- One must either prepare suspensions or utilize non aqueous solvents alone or with a minimum amount of water.

Spirits

- Spirits are alcoholic or hydroalcoholic solutions of volatile substances.
- Generally, the alcohol concentration of spirits is rather high, usually over 60%.
- Because of the greater solubility of aromatic substances in alcohol than in water, spirits can contain a greater concentration of these materials than corresponding aromatic waters.
- The amount of volatile materials in spirits varies greatly and no fixed percentage can be given.
- The alcohol content varies. The lowest percentage is in Aromatic Ammonia Spirit (62 to 68 percent). The highest is in Camphor Spirit (80 to 87 percent).

Spirits

- When mixed with water or with an aqueous preparation, the volatile substances present in spirits generally separate from solution and form a milky preparation. In order to avoid this turbidity,
 - 1. Water except as specified in the formula, should be avoided.
 - 2. Graduates and other equipment used should be dry.
 - 3. Filter paper should be moistened with alcohol.

Methods used to prepare Spirits

- The introduction of spirit into pharmacy and medicine was brought about by the development of distillation procedures
- Depending on the materials utilized, spirits may be prepared by
 - 1. Simple solution
 - 2. Solution by maceration
 - 3. Distillation
 - 4. Chemical reaction

Uses of Spirits

- Spirits may be used pharmaceutically as flavoring agent and medicinally for the therapeutic value of aromatic solute.
- As flavoring agents they are used to impart the flavor of their solute to other pharmaceutical preparations.
- For medicinal purposes, spirits may be 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.

Official Spirits

- The spirits most recently official in the USP/ NF were
 1. Aromatic ammonia spirit
 2. Camphor spirits
 3. Compound orange spirit
 4. Peppermint spirit

There is no classification of spirits because

1. There are small number of spirits
2. some have therapeutic effect, other are used as flavor.
3. Each spirit has its own method for preparation.

Aromatic Ammonia Spirit, NF

- Aromatic ammonia spirit acts as
 1. a carminative due to the volatile oils present.
 2. antacid.
 3. a mild reflex circulatory stimulant due to the liberation of ammonia (NH_3) from the ammonium carbonate which the spirit contains so it is used in cases of fainting.

Camphor Spirit, NF

- Camphor spirit, NF like aromatic ammonia spirit, is well known to the lay public. It is referred to as Tincture of camphor and also as camphor.
- This preparation is a simple solution of 10 percent camphor in alcohol. It is rarely used internally, but its external use is very common. Usually it is applied to “cold sores” and similar ailments.

Compound Orange spirit, USP

- It is a blend of several oils and is readily prepared by simple solution.
- It is an important ingredient of aromatic elixir.

Peppermint Spirit, NF

- It is used as a carminative and flavor.
 - Given orally in small doses, usually 1ml, this spirit is an effective carminative, and it is used extensively for that purpose.
 - Its preparation as follows
 1. The leaves are macerated in water to remove tannins and other water soluble materials.
 2. The aqueous extract is discarded, and the leaves are expressed and
 3. macerated in alcohol. The alcohol dissolves the chlorophyll giving the product a bright green color.
 4. To this alcoholic solution 10% of volatile oil is added.
- The leaves used do not impart any medicinal action to the preparation. This action comes from the volatile oil added to the alcohol.

Home works

- Compare between spirit and aromatic water
- Comparison should include general points about composition, uses, methods of preparation, concentration of volatile principles , etc.

References

- Lewis W. Dittert, “American pharmacy”, Lippincott. company, 1974.
- Ansel's Pharmaceutical dosage forms and drug delivery systems, 10th edition. Lyod V. Allen, Howard C. Ansel, Sinko, by Lippincott Williams & Wilkins, a Wolters Kluwer business, Lippincott Williams & Wilkins. Philadelphia. 2014.