Pharmaceutical technology

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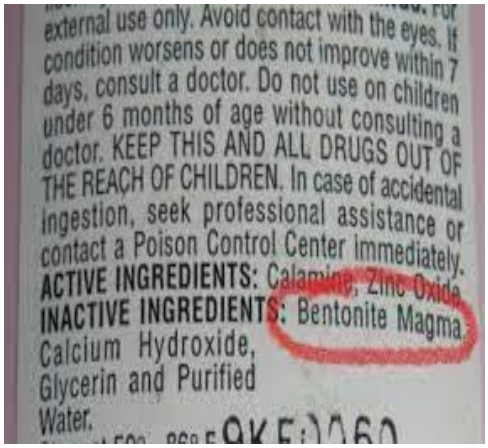

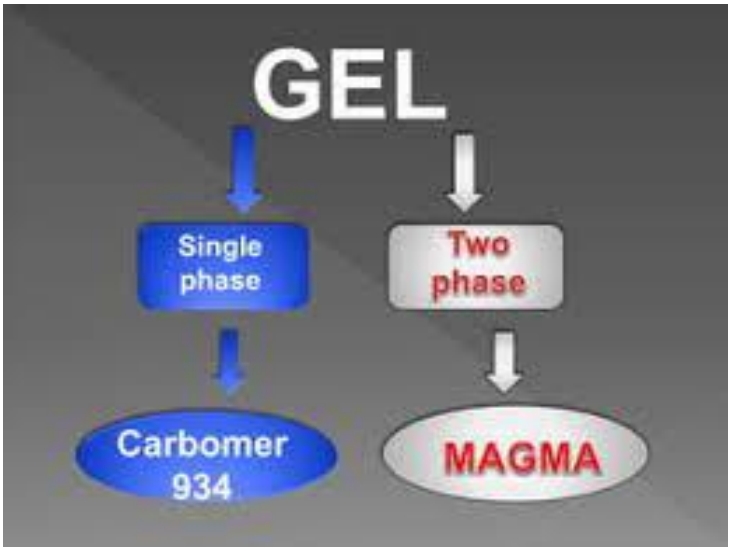

What are Magmas?

Magmas are insoluble inorganic drugs which are in the form of aqueous suspensions. These magmas are two phase systems with particles of **large size or small floccules**. Magmas are different from gels in which larger suspended particles are present.

Examples of Magmas

Below are the few examples of magmas, they are;

- Bentonite Magma
- Magnesia Magma
- Bismuth Magma

Formulation of Magmas

The magmas are prepared by simple hydration or via a chemical reaction between the components.

The general formulation of magmas includes;

1. Active Pharmaceutical Ingredient: Active pharmaceutical ingredient or drug is the main component of a pharmaceutical preparation. Its therapeutic activity relieves the symptoms of the disease.

2. Vehicle: It used to dissolve the active pharmaceutical ingredient or drug and other components of the formulation. **Ex:** Water (Universal solvent)

3. Adsorbent: It absorbs the major fluid components in the formulation, and makes them easy to incorporate in solid dosage form. **Ex:** Bentonite

4. Astringent: The astringent acts as a constricting agent by shrinking the body tissues. It also serves as, antibacterial agent. **Ex:** Bismuth Subnitrate, Magnesium sulfate

5. Buffer: It is used to maintain the pH of the formulation. **Ex:** Ammonium Carbonate, Sodium Hydroxide (strong alkalinizer).

6. Preservatives: It prevents microbial growth and maintains the stability of the formulation. **Ex:** Ammonia.

1. Bentonite Magma, USP

The formulation of bentonite magma according to the USP is;

- Bentonite - 50g
- Purified water - Quantity sufficient to make 1000 ml

2. Bismuth magma

The formulation of bismuth magma according to national formulary is;

- Bismuth subnitrate - 80g
- Ammonium carbonate - 10g
- Nitric acid - 120ml
- Strong Ammonium solution - Quantity sufficient
- Purified water - Quantity sufficient to make 1000 ml

3. Milk of Magnesia, USP, and BP

The formulation of milk of magnesia magma according to USP and BP is;

- Magnesium sulfate - 300g
- Sodium hydroxide - 100g
- Purified water - Quantity sufficient to make 1000 ml

Advantages of Magmas

Magmas comes with few advantages over the other pharmaceutical preparations. They may include;

- Easy to administer
- More quickly effective than solid dosage form
- Eliminate the use of suspending agent except for dihydroxyaluminum aminoacetate magma

Disadvantages of Magmas

- Should not be freezed as it is an aqueous suspension.

In addition, magnesia magma intoxication is an adverse effect caused due to the parenteral administration of the magnesia magma. This includes;

- Flushing
- Sweating
- Hypotension
- Depressed reflexes
- Flaccid paralysis
- Hypothermia
- Circulatory collapse
- Cardiac and central nervous system depression

Uses or Applications of Magmas

The above discussed magmas can be used as;

- **Bentonite Magma, USP:** It can be used as a suspending agent for the insoluble medicines used in the preparation of magmas.
- **Bismuth Magma:** The bismuth magmas are prepared using the formulation described in National Formulary. The bismuth magma can be used as: Astringent, adsorbent and protective in the treatment of diarrhea, intestinal inflammation, and ulceration.
- **Milk of Magnesia, USP, BP:** One of the uses of Milk of magnesia magmas is that it can be used as mild cathartic. Its use should be watched because its effect can be minimized by the occasional use of calcium carbonate. Thus can be used as; Mild cathartic and non systemic gastric antacid.

Pharmaceutical Jellies

Jellies are semisolid gels of intertwining hydrophilic polymers that form a structurally coherent matrix and contain a high proportion of liquid, usually water, hydrogen bonded and associated with the hydrophilic polymer chains. Adding a thickening agent to an aqueous solution of a drug substance forms a jelly. The thickening agent could be natural gums, such as alginates, tragacanth, and pectin or synthetic derivatives of natural substances such as sodium carboxymethyl cellulose (CMC) and methyl cellulose (MC). The resultant product is usually a clear and uniform semisolid. Jellies, being aqueous, are prone to bacterial growth. Thus, anti-microbials are usually added as preservatives.

What are Jellies?

Jellies are transparent or translucent, non-greasy, semisolid preparation generally applied externally. They are prepared by using gums such as tragacanth, pectin, sodium alginates, methylcellulose and sodium carboxymethyl cellulose.

Types of Jellies

They are of three types: Medicated jellies, Lubricant jelly, and Miscellaneous jellies.

1. Medicated Jellies

These are mainly used on mucous membrane and skin for their spermicidal, local anesthetics and antiseptic products. These jellies contain sufficient water. After evaporation of water these jellies provide a cooling effect and residual film gives protection. Ex: Ephedrine sulfate jelly - used to arrest bleeding from the nose, pramoxine HCl - a local anesthetic that relieves discomfort of pruritus and hemorrhoids, and phenylmercuric nitrate - as spermicidal contraceptive.

2. Lubricant Jellies

Diagnostic equipment were lubricated through these jellies such as surgical gloves, cystoscopes, fingerstalls, catheters, rectal thermometers, etc..These jellies should be thin, transparent and water soluble. These jellies should be sterile because these are lubricants for articles to be inserted into sterile regions of the body such as urinary bladder, etc. Ex: For analgesic investigations a local anesthetic may be included as in Lignocaine Gel.

3. Miscellaneous Jellies

The following are more specialized jellies:

- **Patch testing:** These are mainly used as a vehicle for allergens that are applied on to check the sensitivity. The residual film is formed on drying, that helps to keep the patches separate and avoid confusing results.

- **Electro-cardiography:** These jellies are applied on the electrode to decrease the electrical resistance between the electrode and patients skin. These jellies contain sodium chloride, pumice powder and glycerine. Glycerine acts as a humectant and sodium chloride acts as a good conductor of electricity.

Formulation of Jellies

Jellies have many formulation ingredients and these are listed below.

1. Gelling Agent: These are hydrocolloids, which form a gel-like matrix. It dissolves in liquid phase and forms a weak cohesive internal structure. Ex: Sodium alginate, pectin, tragacanth, gelatin, xanthan gum, cellulose derivatives, agar, Carrageenans.

2. Sweeteners: Sweeteners mask the bitter taste of medicated ingredients in jellies. Ex: Sucrose, dextrose, mannitol, saccharin, sucralose, sorbitol.

3. Coloring agents: Colorants are used for the following reasons: To provide aesthetic appearance to dosage forms, to increase patient acceptance, to maintain color uniformity of the dosage form, Help in product recognition and differentiation.

4. Flavoring Agents: Flavoring agents were added to mask the unpleasant taste. Ex: Orange, lemon, cherry, Vanilla, chocolate, Orange, anise, lemon, Grape, berry, Honey, chocolate, raspberry.

5. Preservatives: Jellies are prone to microbial attack. Preservation is must in order to avoid at all any incompatibilities between gelling agents & to retain the shelf life of product. Ex: Methyl Paraben, Propyl Paraben, Benzoic Acid, Benzalkonium Chloride, Chlorhexidine acetate.

6. Stabilizers: Stabilizers are used to maintain desirable properties of the product. It is used to prevent the drying of jellies. Ex: Propylene glycol and Sorbitol.

7. Chelating Agents: Chelating Agents are used to avoid any reactivity between base or medicament with heavy metals. Ex: EDTA.

Preparation of Jellies

Preparation of jellies involves the addition of thickening agents such as tragacanth, carboxymethylcellulose, etc. to an aqueous solution of the drug. The mass obtained is triturated in a mortar until a uniform product is formed.

Uses or Applications of Jellies

Here are the applications of Jellies.

- These are chiefly used on mucous membranes and skin for their spermicidal, local anesthetics, and antiseptic properties.
- These jellies contain sufficient water. After evaporation of water, jellies provide a local cooling effect and residual film gives protection.