

Lab. 1

Pharmaceutical Technology

Solution

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Solutions: are liquid pharmaceutical preparation contain one or more chemical substance dissolved in one or more suitable solvent to produce **single phase system**.

Preparation methods of solutions

1. Simple solution method

2. Chemical reactions

3. Simple solution with sterilizations such as ophthalmic solution, **anticoagulant** (heparin) ,**irrigating solution** (sterile or nonpyrogenic isotonic solutions, made under sterile conditions. They are generally used for washing, irrigation and rinsing purposes as DW and **sodium hypochlorite** (NaOCl) has antimicrobial activity and ability to dissolve organic matter), **physiological solution** as 0.9% NaCl and ringer solution.

4. Extraction.

Problems that may occur during preparation of solutions and the ways for overcome them:

1. To increase the rate of **solubility** of substances, we can reduce the particle size by using **mortar and pestle**.
2. If we have **two solvents** in the same prescriptions, we dissolve the solid substance in the solvent that have more ability to dissolve it (e.g. **alcohol, water**).
3. If we have material that has **very fine particle**, we must not use stirrer in dissolving it because particles will adhere around stirrer, so we use **circulating of the beaker** for ingredient instead of stirrer.
4. If there is **liberation of any gas** , the container must be opened , without using stopper , until liberation of gas.
5. Some times we need to **increase the solubility** by certain method ex. pH , complexation.

General procedure of the preparation of simple solution:

1-Weigh the solid ingredient and put it in beaker

2-Subtract the volume of liquid ingredients (if present from $\frac{3}{4}$ of the final volume of prescription.

3-dissolve the solid ingredients in the remaining amount of the vehicle

4-Add the liquid ingredient

5-Convert the content of the beaker into the measuring cylinder and complete the volume up to the required amount by addition of the vehicle

6-transfer the content of the measuring cylinder to a wide mouth bottle and put suitable label (label of external use is pink ,while label for internal use is white)

Carminative mixture for infants

Rx

Sodium bicarbonate 0.06 g

Aromatic spirit of ammonia 0.06 ml

Compound tincture of cardamom 0.12 ml

Glycerin 0.3 ml

Peppermint water Q.S 4 ml

Ft. mist.

Mitte 40 ml

sig. fl.ʒi t.i.d. p.c.

Calculations

Factor = $40/4 = 10$

Sod. bicar. = $0.06 \times 10 = 0.6 \text{ gm}$

Ar.sp .of ammonia = $0.06 \times 10 = 0.6 \text{ ml}$

Comp. tr. of cardamom = $0.12 \times 10 = 1.2 \text{ ml}$

Glycerin = $0.3 \text{ ml} \times 10 = 3 \text{ ml}$

Peppermint water = $4 \times 10 = 40 \text{ ml}$

$40 \times \frac{3}{4} = 30 \text{ ml}$

$30 \text{ ml} - (0.6 + 1.2 + 3 \text{ ml}) = 25.2 \text{ ml}$ (starting volume of peppermint water)

Procedure

1. Dissolve 0.6 g sod. bicarb in 25.2 ml of pepp. water in beaker.
2. Add 0.6 ml of Ar. spirit of ammonia ,1.2 ml of comp. tr. cardamom and 3 ml of glycerin to the content of the beaker .
3. Convert the content of the beaker into measuring cylinder and complete the volume up to 40 ml by addition of pepp. water .
4. Transfer the content of the measuring cylinder to a wide mouth bottle and put a suitable label.

Note:-

Glycerin act as soothing and sweetening agent

Notes:

1. ft. = fiat= make
2. mist = mistura = mix
3. Mitte = send meaning "give the patient the following amount".
4. sig. = write on label
5. fl. = fluid
6. p.c = post cibum = after meals.
7. ss = semis = one half

Carminative mixture for adult (H.W)

Rx

Sodium bicarbonate gr vii

Aromatic spirit of ammonia ℥ xv

Compound tincture of cardamom ℥ x

Strong tincture of ginger ℥ i

Peppermint water Q.S fʒ

Fit. mist

Mitt fʒ iv

Sig. fʒ ss t.i.d p.c.

- ➔ Sodium bicarb .act as gastric **antacid**.
- ➔ Aromatic spirit act as **carminative agent**.
- ➔ Comp.tr. of cardamom act as **flavoring agent**
- ➔ Tr. of ginger act as flavoring and **antispasmodic agent**.
- ➔ Pepp. water act as flavoring and **carminative agent**
,also it is **diluting agent** used as solvent.

Note: Strong tr. of ginger which is used in carminative mixture of adult must not added for infant because it is strong for use to infant.

Aqueous iodine solution (lugols sol)

Rx

Iodine 50 g

Potassium iodide 100 g

Purified water Q.S 1000 ml

Sig 0.3 ml diluted with milk or water t.i.d

Procedure

Dissolve KI in about 200-300 ml of distilled water. Add iodine 50 g and heat gently with constant mixing until iodine is dissolved. Dilute to 1000 ml with Purified water. Store in amber glass-stoppered bottle in the dark place.

Notes:

- Lugals sol. used internally in treatment of **thyrotoxicosis** (preoperative treatment) and in **hypothyroidism**
- We dissolve the **iodine in KI** instead of water because the iodine has **more solubility in KI than in water.**

Diluted iodine solution

Rx

Iodine 0.5g

KI 1g

DW QS 100ml

Dissolve 1g KI in 20ml DW

Dissolve 0.5g iodine in KI solution

Complete to 100ml with DW

Report requirements

1. Name of experiment
2. Date
3. Name of students
4. materials and equipment
5. Calculations
6. Procedure of preparation
7. The medical uses
8. Role each ingredient in Rx

Common systems of measurements and intersystem conversion:

1. The International System of Units (SI) is the official system for weights and measures as stated in the United States Pharmacopeia—National Formulary.

2. The apothecaries' system of measurement is the traditional system of pharmacy, and although it is now largely of historic significance, components of this system are occasionally found on prescriptions.

3. The avoirdupois system is the common system of commerce, employed along with the SI in the United States.

Apothecaries' Fluid Measure

60 minims (℥) = 1 fluidrachm or fluidram (f℥ or ℥)^a
8 fluidrachms (480 minims) = 1 fluidounce (f℥ or ℥)^a
16 fluidounces = 1 pint (pt)
2 pints (32 fluidounces) = 1 quart (qt)
4 quarts (8 pints) = 1 gallon (gal)

Apothecaries' Measure of Weight

20 grains (gr) = 1 scruple (ʒ)
3 scruples (60 grains) = 1 drachm or dram (ʒ)
8 drachms (480 grains) = 1 ounce (℥)
12 ounces (5760 grains) = 1 pound (℔)

Avoirdupois Measure of Weight

437½ or 437.5 grain (gr) = 1 ounce (oz.)
16 ounces (7000 grains) = 1 pound (lb.)

Thank you