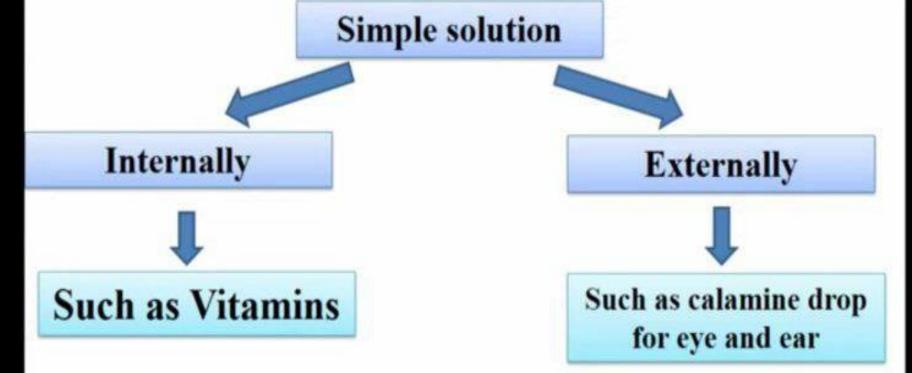# *Pharmaceutical Calculation*
Lab - 5 -

Preparation of Simple Solution

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Definition of Solution

- A *solution* is a <u>homogeneous</u> mixture composed of only one phase. In such a mixture, a solute is a substance dissolved in another substance, known as a solvent.

- Simple solution = solute + solvent

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        ┌─────────────────────┐
        │   Simple solution   │
        └─────────────────────┘
           ↙              ↘
┌──────────────────┐   ┌──────────────────┐
│    Internally    │   │    Externally    │
└──────────────────┘   └──────────────────┘
         ↓                      ↓
┌──────────────────┐   ┌──────────────────┐
│ Such as Vitamins │   │ Such as calamine │
│                  │   │ drop for eye and │
│                  │   │       ear        │
└──────────────────┘   └──────────────────┘
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- There is 2 types of solvents: aqueous(water) and non-aqueous solvent (any solvent other than water ex.ethanol)

- Solutions are used for their therapeutic effect internally or externally

Simple Solutions Preparation method:

1. Weigh the solids and place them in beaker
2. Subtract the amount of liquid ingredients from the final volume and measure 3/4 (three quarters) of the remaining amount and dissolve the solid ingredients in this amount of liquid
3. Add the liquid ingredients
4. Transfer the contents of the beaker into a measuring cylinder and complete the volume to the final required volume.
5. Transfer the mixture to a suitable "Dispensing bottle". And attach a label with the following instructions:

Medication Labelling

- Name of patient
- Name of Phsyician
- Rx Date
- Use of drug
- Special warnings (ex. For external use only)

FOR EXTERNAL USE ONLY

Rx NaCl   0.9 gm

      Amaranth solution   2 ml

      D.W.   q.s   100ml

      Mitte 50 mL

$$\frac{0.9\,g}{100\,mL} = \frac{X}{50\,mL} \rightarrow X = 0.45 \text{ g of NaCl}$$

$$\frac{2\,mL}{100\,mL} = \frac{X}{50\,mL} \rightarrow X = 1 \text{ mL of amaranth solution}$$

$$50\text{mL} \times 3/4 = 37.5\,mL$$

$$37.5 \text{ mL} - 1 \text{ mL(Amaranth solution)} = 36.5 \text{ mL}$$

Procedure:

1. Weigh 0.45gm of NaCl and put it in a beaker.

2. Dissolve the NaCl in 36.5ml of D.W.

3. Add 1ml of amaranth solution to the mixure.

4. Convert the content of the beaker into measuring cylinder and complete the volume to 50ml by D.W.

5. Transfer the content of the measuring cylinder into a wide mouth bottle and put the suitable label.

Examples

Rx

Glucose	10%
NaCl	3%
KCl	2%
D.W.	q.s. 30ml

Calculations:

$$\frac{10\ g}{100\ mL} = \frac{X}{30\ mL} \rightarrow X = 3 \text{ g of glucose}$$

$$\frac{3g}{100\ mL} = \frac{X}{30\ mL} \rightarrow X = 0.9 \text{ g of NaCl}$$

$$\frac{2\ g}{100\ mL} = \frac{X}{30\ mL} \rightarrow X = 0.6 \text{ g of KCl}$$

$30 \text{ mL} \times 3/4 = 22.5 \text{ mL of D.W (to be added first)}$

Procedure

1. Weigh 3gm of glucose and 0.9 g of NaCl and 0.6 g of KCl by using balance then put it in a beaker.

2. Dissolve the active ingredient in 22.5mL of D.W.

3. Convert the content of the beaker into a measuring cylinder and complete the volume to 30ml by D.W.

4. Transfer the content of the measuring cylinder into wide mouth bottle and put a suitable label.

Ex.: In a certain preparation 40ml of glycerin was used to prepare 250ml solution. What is the % v/v of glycerin in this solution?

- $\dfrac{40\ mL}{250\ mL} = \dfrac{X}{100\%}$ → X = 16% v/v

Thank You For Listening