

Solutions

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

General procedure for preparation of simple solution

- .weigh the solid ingredient and put it in a beaker-1
- subtract the volume of liquid ingredient (if present) in the formula-2
.from 3/4 of the final volume of prescription
- .dissolve the solid ingredients in the remaining amount of vehicle-3
.add the liquid ingredient-4
- convert the content of the beaker into the measuring cylinder and-5
complete the volume up to the required amount by the addition of the
.vehicle
- transfere the content of the measuring cylinder to a wide mouth-6
bottle and put suitable label (label of external use is pink, while label
for internal use is white)

Standard solutions (stock solutions)

Are solutions of known concentration (i.e its concentration exactly measured) these are strong solutions from which weaker solutions are
.prepared

Types of solutions

- solutions of liquid in liquid, such as (alcohol in water)-1
- solutions of gas in liquid, such as (ammonia solution)-2
- solutions of solid in liquid, such as (Nacl in water)-3

Classification of solutions according to the method of preparation

- .solutions prepared by simple solution method-1
- .solutions prepared by chemical reaction-2

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solutions prepared by simple solution with sterilization such as-3
.ophthalmic solution, anticoagulant, irrigating sol., physiologic sol
.solutions prepared by extraction-4

Types of solution dosage forms (according to their :composition)

syrops (aqueous solution containing sugar)-1
elixirs (combination of water and alcohol)-2
spirits (solution of aromatic materials if the solvent is alcohol)-3
aromatic waters (solution of aromatic material if the solvent is-4
aqueous)
tinctures or fluid extracts (solutions prepared by extracting active-5
constituent from crude drugs depending on their method of
preparation and their concentration)
injections and ophthalmic solutions (solutions prepared to be sterile-6
and pyrogen-free)

:Note

During preparation of pharmaceutical solutions some problem arises,
:these problems can be controlled by the followings
To increase the solubility of substances, we can reduce the particle -1
size by using mortar and pestle (example: crystal form, large
.particles)
If we have two solvents in the same prescription; we dissolve the -2
solid substance in the solvent that have more ability to dissolve it
. (alcohol, water)
If we have material that has very fine particle size we must not use -3
stirrer in dissolving it because particles will adhere around stirrer, so
.we use circulating of the beaker instead of stirrer
.If there is liberation of any gas, the container must be opened -4
sometimes we need to increase the solubility by certain method -5
. (ex: PH, complexation)

Carminative mixture for infants

		Rx
Sodium bicarbonate		0.06 g
Aromatic spirit of ammonia		0.06 ml
Compound tincture of cardamom		0.12 ml
Glycerine		0.3 ml
Peppermint water	Q.S	4 ml

Ft.mist

Mitt. 40 ml

Sig. t.i.d pc

Calculations

$$\text{Factor} = 40/4 = 10$$

$$\text{Sod. Bicarb.} = 0.06 \times 10 = 0.6\text{g}$$

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

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

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

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

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

$$30\text{ml} - (3\text{ml} + 1.2\text{ml} + 0.6\text{ml}) = 25.2\text{ ml}$$

Procedure

1. Dissolve 0.6g sod.bicarb. in 25.2ml of pepp.water in a beaker -1
2. Add 0.6ml ar.sp. of ammonia , 1.2ml of comp.tr.of cardamom then -2
3. add 3ml of glycerine to the content of the beaker
4. convert the content of the beaker into the measuring cylinder and -3
5. complete the volume up to 40ml by the addition of pepp. Water
6. transfere the content of the measuring cylinder to a wide mouth bottle-4
7. and put a suitable label

:Note

.Glycerine acts as soothing and sweetening agent

Carminative mixture for adult

		Rx
Sodium bicarbonate		gr vii
Aromatic spirit of ammonia		ʒ xv
Compound tincture of cardamon		ʒ x
Strong tincture of ginger		ʒ i
Peppermint water	Q.s	fʒ i

.Ft. mist

Mitt. fʒ iv

.Sig. fʒ ss t.i.d p.c

:Procedure

.The same steps for preparation of mist. Carminative of infant

:Notes

- .Sodium bicarb. act as gastric antiacide ●
- .Aromatic spirit act as carminative agent ●
- .Comp.card.tr act as flavouring agent ●
- .Tr. Of ginger act as flavouring and antispasmodic agent ●
- Pepp. Water act as flavouring and carminative agent, also it is ●
.diluting agent used as solvent
- 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 sol. (Lugals sol.)

		Rx
Iodine		50 g
Potassium iodide		100 g
Purified water	Q.s	1000 ml

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.Sig. 0.3 ml diluted with milk or water three times daily

:Procedure

- .dissolve iodine in concentrated KI sol-1
- .shake well until iodine dissolved-2
- .complete the volume with purified water to 1000 ml-3

: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 solution than in water

Weak iodine sol. (tr.iodine)

		.Rx
Iodine		25 g
K.iodide		15 g
Dis.water		25 ml
Alcohol 90%	Q.s	1000 ml

.Sig. b.i.d used externally

:Procedure

The same method as Lugals sol. except completing the volume with
.alcohol 90% to 1000 ml

:.Strong iodine sol

		.Rx
Iodine		100 g
K.iodide		60 g
D.W		100 ml

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Alcohol 90% Q.s 1000ml

:Note

.Weak and strong iodine sol. used as antiseptic

-Mandles paint –throat paint

	.Rx
KI	25 g
Alcohol 90%	40 ml
Water	25 ml
Iodine	12.5 g
Peppermint oil	4 ml
Glycerol Q.s	1000 ml

:Procedure

- .dissolve 25 g of KI in 25 ml of water-1
- .dissolve 12.5 g of iodine in the KI sol-2
- dissolve 4 ml of peppermint oil in 40 ml of 90% alcohol , and transfer-3
- .it to the iodine sol. Then mix
- .complete the volume to 1000 ml by glycerine-4

:Note

- .Throat paint used for tonsillitis and pharyngitis ●
- .Iodine used as antiseptic ●
- .Glycerol used as preservative ●
- .Pepp. Oil used as flavouring agent ●

Sol.I and Sol.II

Sol. I	sodium thiosulphate 15-20%
Sol. II	tartaric acid 3-5%

.Sig. apply sol. I then after two minute apply sol. II on the skin

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:Procedure

.By simple sol. Method

:Notes

.This prescription used as antifungal ●
We can not mix sol. I and sol. II in the same bottle due to the ●
chemical reaction between them which we use it to precipitate the
.sulphur in the infected area of skin as antifungal