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# Practical of General Chemistry

Department :- Radiology Techniques

Class:1st year

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- Exp:. 5
- Name of experiment :. Preparation of Standard Solution
- Purpose of experiment: To determine the concentrations of unknown substances (or samples)

## Theory

Standard solution: is a solution that contains a certain volume of it on a known weight of the solute, or in other words a standard solution is a solution of known concentration prepared by dissolving a known weight of the solute to be measured in a known volume of solvent (e.g. distilled water (D.W)).

## Tools and materials

1) Beaker.

2) Funnel flask.

3) Volumetric flask.

4) Balance.

## Procedure

### 1- the theoretical side :

a) Use the law of molar concentration (M) to find the required weight in grams of a solute.

$$M = \frac{Wt.}{M.wt. * V(L)}$$

Where:

M: Molar concentration (mole/L).

Wt.: The weight of the solute in grams (g).

M.Wt: The molecular weight (g/mole).

V: Volume of the solvent (L)

b) Use the law of molecular weight by the sum of the atomic weights of the elements used in this experiment.

M.Wt.= ΣA.Wt

Where:

A.wt: Atomic weight

c) Converting a unit of volume from milliliters (ml) to liters (L).

$$V(L) = \frac{V\ (ml)}{1000}$$

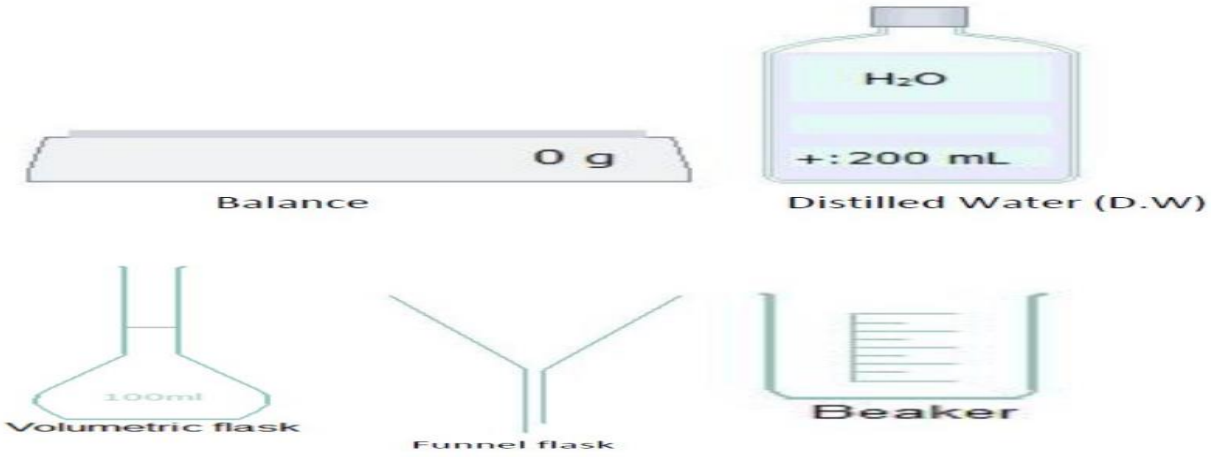
## 2- The practical side:

a) Weigh of solute required by the sensitive balance.

b) Put the solute in the beaker, then add the solvent and mix it well by stirrer.

c) Transfer the contents of the beaker to the volumetric flask, and then fill the volumetric flask with water to the marker.

d) Shake the bottle well to ensure that the dissolution process takes place well.




# 1- Preparation of sodium hydroxide(NaOH)




## Calculations:

$$M = \frac{mole}{V_L} \qquad mole = \frac{w.t}{M.w.t}$$

$$M = \frac{w.t}{M.w.t \ X \ V_L} \Rightarrow 1 = \frac{w.t}{40 \ X \ 1}$$

$$w.t = 40\ g$$

## Procedure

1) Weigh accurately 40 gm NaOH.
(Weigh using standard methods of weighing)
2) Dissolve in sufficient distilled water in 500ml beaker.
3) Transfer NaOH solution to a 1 liter volumetric flask.
4) Adjust the volume in 1 liter volumetric flask up to mark.

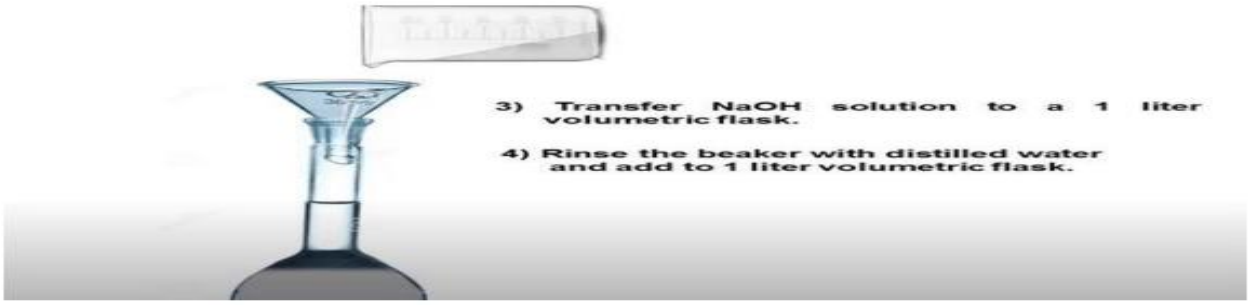
## Procedure

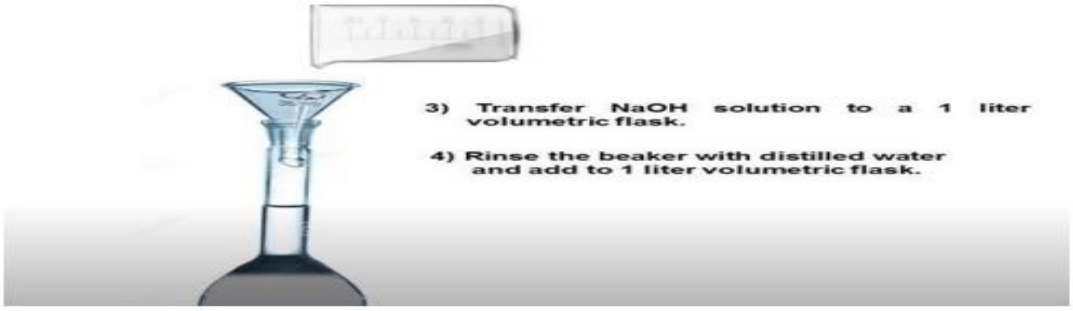
1) Weigh accurately 40 gm NaOH.
i) Place empty beaker on balance.

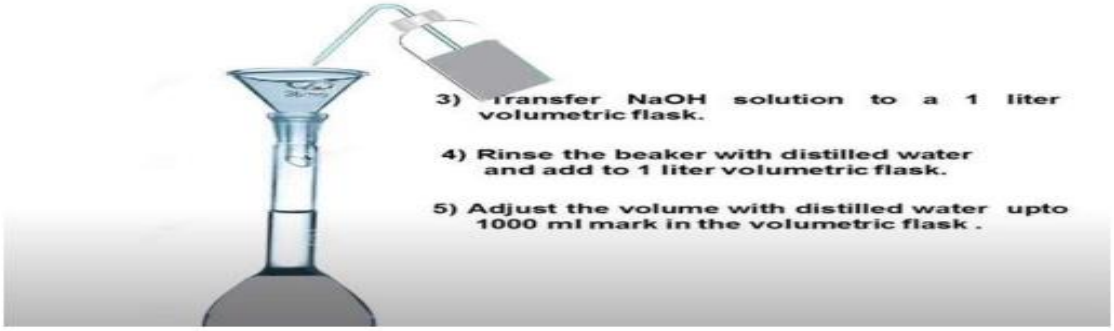

ii) Press Tare button to make weight "0.0000"gm.
iii) Add and Weight NaOH accurately"40.000"gm.

## Procedure

2) Dissolve previously weighed 40gm NaOH in sufficient distilled water in beaker.




## 2-Preparation of hydrochloric acid solution(HCL)




## Calculations:

Prepare of 2M of HCL in 250 ml