Plant Physiology

Plant physiology:- Is the study of the function or physiology of plants fundamental processes such as photosynthesis and respiration.

Lab (1)

Preparation the solution

Solution:- is a mixture, typically consists of the dissolved material called the **solute** and the dissolving agent called the **solvent**

Ex:- sugar (solute) dissolved in water (solvent).

Type of solution (upon concentration):-

Molar solution:- an aqueous solution that contain 1 mole (gram-molecular weight) of solute in 1 liter of the solution.

Molarity(molar concentration): the number of moles of solute per liter of solution.

Normality:- a measure of concentration equal to the gram equivalent weight per liter of solution.

$$N = M \times \text{electron exchanged}$$

These solution complete to final volume of (1) liter.

$M = \dfrac{Wt}{M.wt} \times \dfrac{1000}{V}$	$N = \dfrac{Wt}{Eq.wt} \times \dfrac{1000}{V}$

m.wt : molecular weight

v : volume (ml)

$$eq.wt = \dfrac{m.wt}{n}$$

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Equivalent weight: the weight of a compound that contains one equivalent of a proton (for acid) or one equivalent of an hydroxide (for base).

N= equivalent number

$\{ Hcl , NaoH \}$ n = 1 , $\{ Ca(oh)_2 , H_2SO_4 \}$ n = 2

$\{ Fe(oH)_3, H_3PO_4 \}$ n = 3

$Nacl \rightarrow$ n = 1

$Cacl_2 \rightarrow$ n = 2

$Fecl_3 \rightarrow$ n = 3

Percentage solution (%) :- based on percent and they are the easiest to calculate because they don't depend a knowledge of molecular weight.

Weighting sol. (w/w) :- prepared by dissolving a weight of solute in a weight of solvent.

Volumetric sol. (v/v) :- prepared by dissolving a volume of solute in a volume of solvent.

Weight-volumetric sol. (w/v) :- prepared by dissolving a weight of solute in a volume of solvent.

These solution complete to final volume of (100 ml) .

Dilution law :-

$$C_1 V_1 = C_2 V_2$$

C = concentration

V = volume

Million solution ....(ppm) part per million

$(1/1000000)$ or (10^{-6}) ....this unite using for very tiny compounds (hormones, enzymes, gases, vitamins)

How to prepare a solution :-

$Wt = M \times M.wt \times \dfrac{V}{1000}$	$Wt = N \times eq.wt \times \dfrac{V}{1000}$

Examples :-

Q :- prepare a solution of Hcl & NaoH with concentration (2M)

(M.wt Hcl = 36.5) (M.wt NaoH = 40).

Q :- How to prepare Hcl a solution of $Ca(oH)_2$. the concentration (2N) . (M.wt = 111).

Q :- prepare a (2%) solution of methylene blue

-Weighting 2gm of methylene blue , adding a volume of distiller water , mix well then complete the volume to 100ml.

Q :- how to prepare a solution 10% of H_2SO_4 in water.

- Taken a 10ml of H_2SO_4 then adding a volume of distilled water to it, mix well then complete volume to 100ml.