YAKEEN NEET 2.0

2026

Some Basic Concept of Chemistry

Physical Chemistry | Lecture -13

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Topics to be covered

1. Revision of Last Class
2. N factor calculation
3. Law of equivalence
4. Trick
5. Magarmach Practice Questions (MPQ) & Home work from modules

Rules to Attend Class

1. Always sit in a peaceful environment with headphone and be ready with your copy and pen.
2. Never ever attend a class from in between or don't join a live class in the middle of the chapter.
3. Make sure to revise the last class before attending the next class & always complete your Magarmach Practice Questions.
4. Never ever engage in chat whether live or recorded on the topic which is not being discussed in current class as by doing so u can be blocked by the admin team or your subscription can be cancelled.

Rules to Attend Class

5. Try to make maximum notes during the class if something is left then u can use the notes pdf after the class to complete the remaining class.
6. Always ask your doubts in doubt section to get answer from faculty. Before asking any doubt please check whether same doubt has been asked by someone or not.

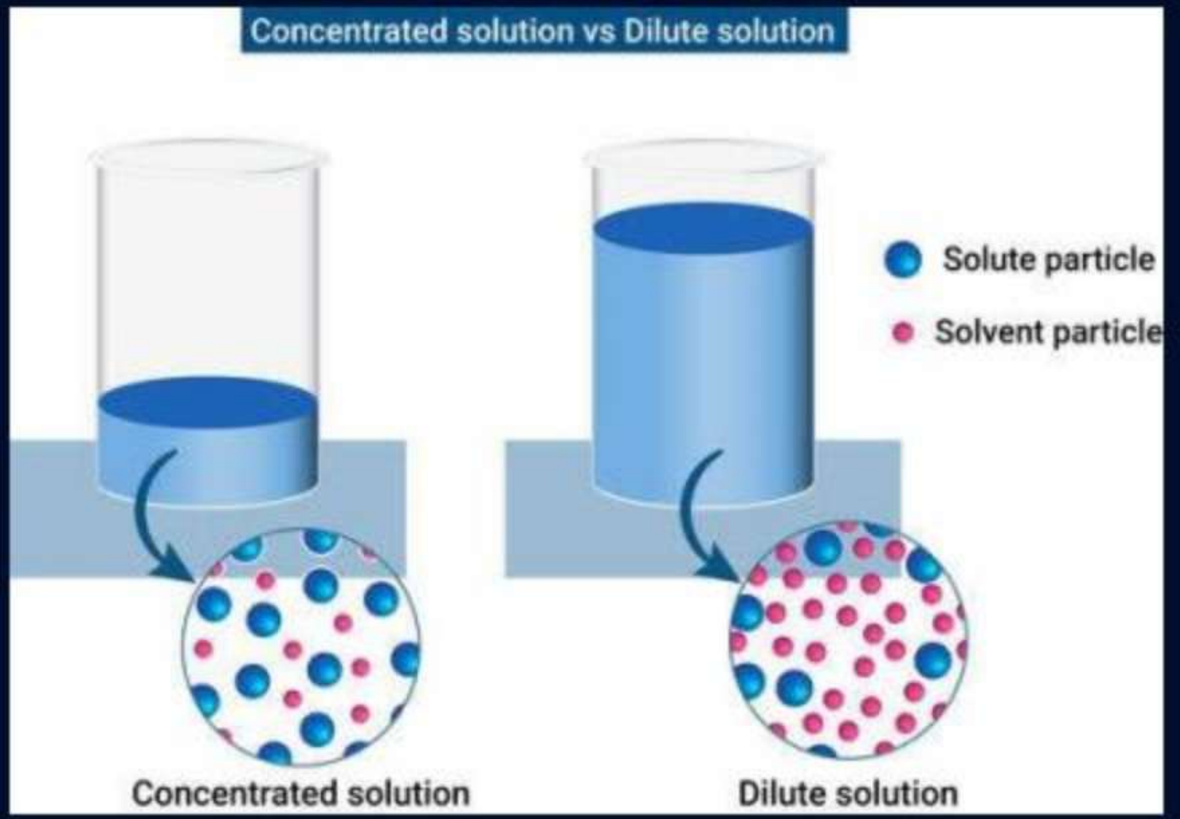

There is one big flaw in your Preparation that's name is Backlog ? What do we say to Backlog ?
NOT TODAY !!!

Revision of Last class

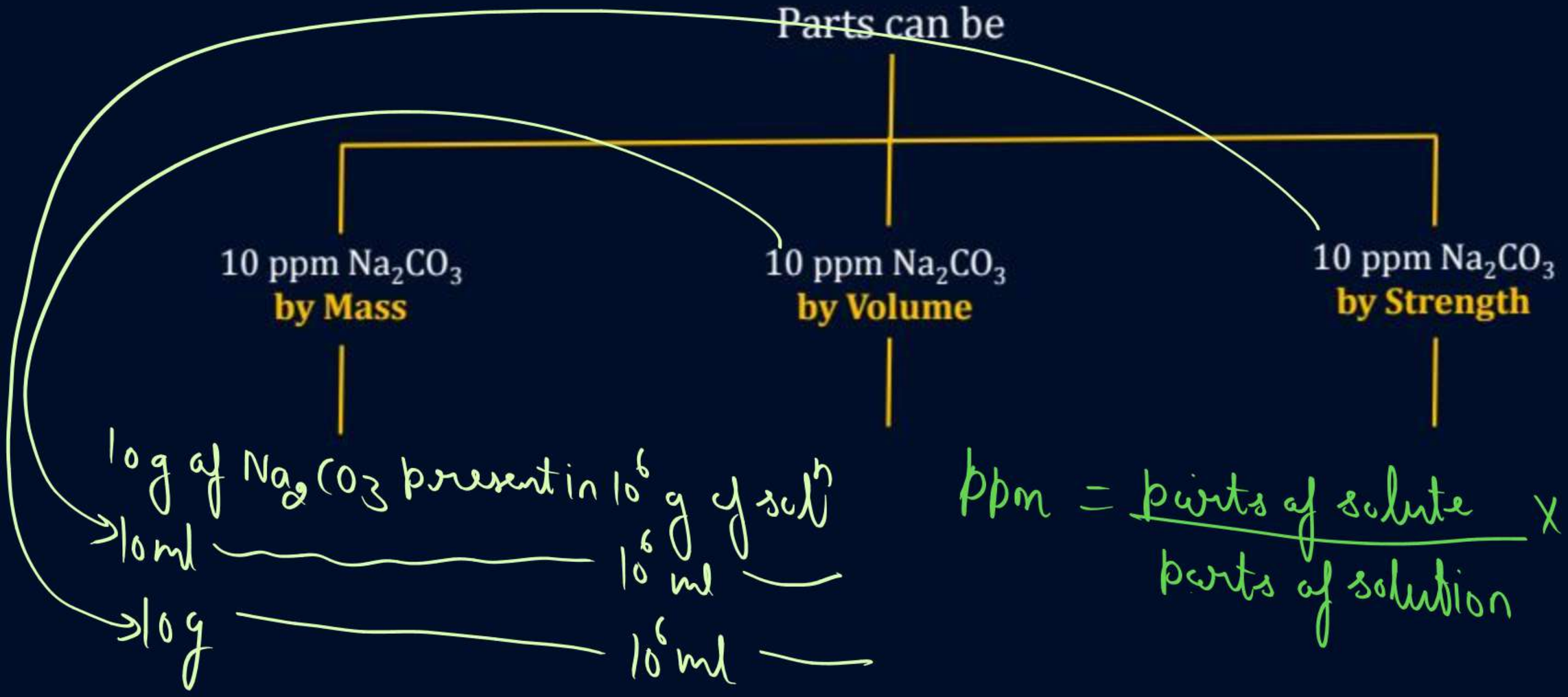
$$m = \frac{\chi_B \times 1000}{\chi_A \times M_A}$$

$$M = \frac{\chi_B \times n_A}{\chi_A \times V(L)}$$

$$M_1V_1 = M_2V_2$$



ppm



$$ppm = \frac{\text{parts of solute}}{\text{parts of solution}} \times 10^6$$

Equivalent Mass

Eq. mass → mass

- react → 1 g of Hydrogen or 8 g of oxygen or 35.5 g of chlorine
- produce
- displace

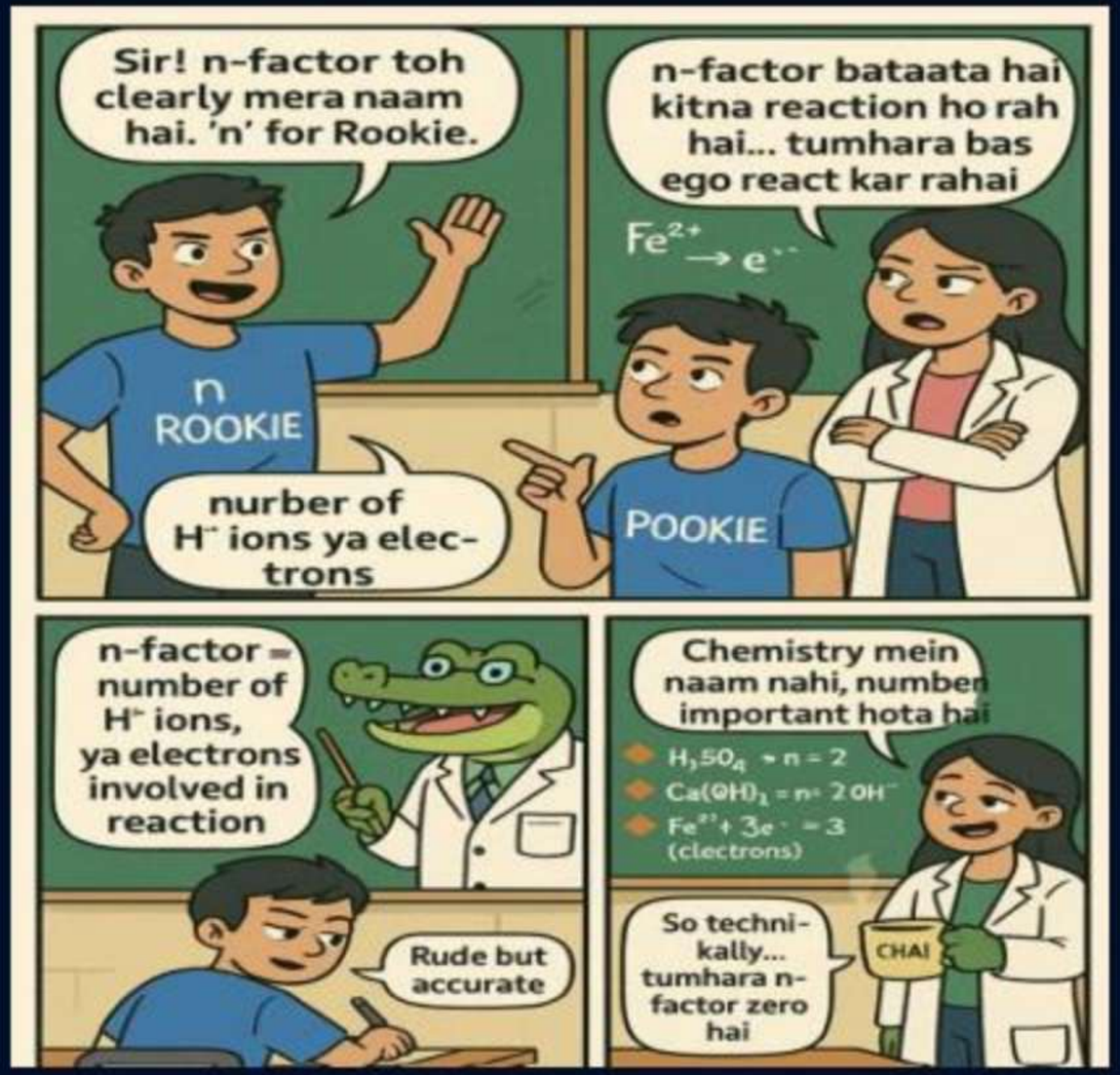
Formula of Equivalent mass

Equivalent mass or Equivalent weight $(E) = \frac{\text{Gr. M.M. } (M)}{n_{\text{factor}} \text{ or Valence factor}}$

n_{factor} ↓

different for different things

Find n-factor or Valence factor for Different Substance



For Acids n-factor = Basicity → no. of H^+ ions given by 1 molecule of acid in water.

$1\,HCl + H_2O \longrightarrow \underset{\text{or } 1\,H_3O^+}{1\,H^+} + 1\,Cl^-$

$n_f = 1$

$1\,HNO_3 + H_2O \longrightarrow 1\,H^+ + NO_3^-$

$n_f = 1$

$1\,H_2SO_4 + H_2O \rightleftharpoons 2\,H^+ + 1\,SO_4^{2-}$

$n_f = 2$

Acid	n-Factor
$HCl, HNO_3, H_3PO_2, H_3BO_3$ or $B(OH)_3$	1
H_2SO_4, H_3PO_3	2
H_3PO_4	3

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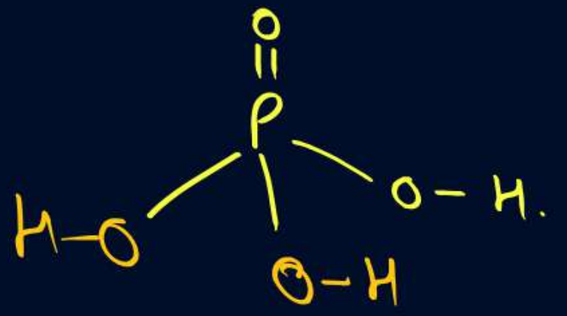
H_3PO_2, H_3PO_3, H_3PO_4 $\Rightarrow$ n_{factor} = no. of oxygen atom − 1

n_f = 1 2 3



H_3PO_4

Protic acid → acid which gives its own H^+ ion in water

for ex : HCl, HNO_3, H_2SO_4, H_3PO_2, H_3PO_3, H_3PO_4

Aprotic acid ⇒ ——— donot ———

for ex : H_3BO_3 or $B(OH)_3$ (Boric acid)

$$B(OH)_3 + H_2O \longrightarrow B(OH)_4^- + H^+ \text{ from water}$$

($H_2O \rightarrow H^+ + OH^-$)

	$HOCl$	$HClO_2$	$HClO_3$	$HClO_4$	$HBrO_3$	HIO_3
Q =						
n_f	1	1	1	1	1	1

Q. $H_3PO_4 + NaOH \rightarrow NaH_2PO_4 + H_2O$

$n_f = 1$

Q. $H_2SO_4 + 2NaOH \longrightarrow Na_2SO_4 + 2H_2O$

$n_f = 2$

Q. $H_3PO_4 + 2NaOH \rightarrow Na_2HPO_4 + H_2O$

$n_f = 2$

Q. $H_2SO_4 + NaOH \longrightarrow NaHSO_4 + H_2O$

$n_f = 1$

Q. $H_3PO_4 + 3NaOH \rightarrow Na_3PO_4 + 3H_2O$

$n_f = 3$

For Bases n-factor = Acidity

⇒ no. of OH^- given by 1 molecule of base in water

$B(OH)_3$

Base	n-Factor
NaOH	1
$Mg(OH)_2$	2
$Al(OH)_3$	3

For ions n-factor = |Charge on ion|

|2| or |-2| = 2

|+1| or |-1| = 1

|+3| or |-3| = 3

Ion	n-Factor
H^+, Cl^-	1
SO_4^{2-}, Mg^{2+}	2
PO_4^{3-}, Al^{3+}	3

For elements n-Factor = |valency|

Element	n-Factor
Ist → Li, Na, K, Rb, Cs, Fr (H)	1
Halogens → F, Cl, Br, I, At	1
IInd → Be, Mg, Ca, Sr, Ba, Ra	2
16th group → O, S, Se, Te, Po	2
13th grp → B, Al, Ga, In, Tl	3
14th grp → C, Si, Ge, Sn, Pb	4

^1H

Eq. mass of H $= \frac{G.A.M.}{n_{factor}} = \frac{1}{1} = 1g$

Eq. mass of H^+ $= \frac{G.F.M.}{n_f} = \frac{1}{1} = 1g$

Eq. mass of H^- $= \frac{1}{1} = 1g$

Eq. mass of H_2 $= \frac{G.M.M.}{n_f} = \frac{2}{2} = 1g$

^{16}O

Eq. mass of O $= \frac{GAM}{n_f} = \frac{16}{2} = 8\,g$

Eq. mass of O^{2-} $= \frac{16}{|-2|} = \frac{16}{2} = 8g$

Eq. mass of O_2 $= \frac{GMM}{n_f} = \frac{32}{4} = 8g$

$35.5\,Cl$

Eq. mass of Cl = $\frac{35.5}{1} = 35.5$

Eq. mass of Cl^- = $\frac{35.5}{1-11} = 35.5\,g$

Eq. mass of Cl_2 = $\frac{71}{2} = 35.5\,g$

For ionic compounds n-Factor = |Charge on cation or anion |

$NaCl \longrightarrow 1Na^{+} + 1Cl^{-}$

$n_f = |+1 \text{ or } -1| = 1$

$CaCO_3 \longrightarrow 1Ca^{2+} + 1CO_3^{2-}$

$n_f = |+2 \text{ or } -2| = 2$

$Ca_3(PO_4)_2 \longrightarrow 3Ca^{2+} + 2PO_4^{3-}$

$n_f = |+6 \text{ or } -6| = 6$

$$1C + 1O_2 \longrightarrow 1CO_2$$

$$12g \quad 32g$$

(3g) $8 \times \frac{12}{32}$ $8g$

4

QUESTION – (AIIMS 2015)

Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is:

A. 8 g/mol

B. 16 g/mol

C. 64.8 g/mol

D. 32 g/mol

$S + Cl_2 \rightarrow SCl_2$

$32g \leftarrow 71g$

$35.5 \times 32 \leftarrow 35.5g$

$\frac{}{71}$

2

16g

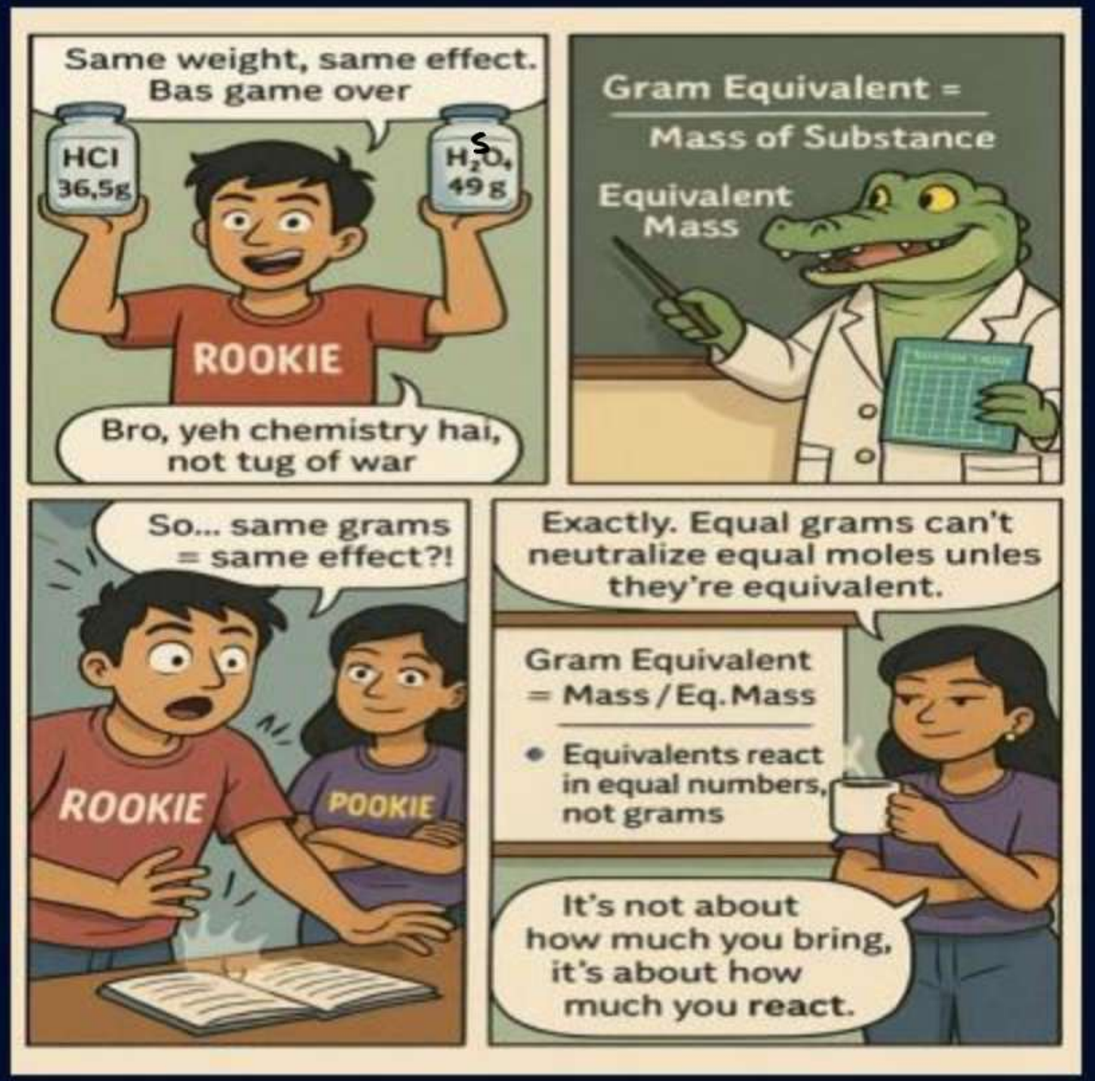
$2S + Cl_2 \rightarrow S_2Cl_2$

$64g \leftarrow 71g \rightarrow 135g$

$32g \leftarrow 35.5g \rightarrow 67.5g$

Gram Equivalent

$$g\ eq = \frac{\text{weight (w)}}{\text{eq wt. (E)}}$$



Question

^{32}S, ^{16}O, ^{27}Al, $^{35.5}Cl$, ^{23}Na, H

Find no. of gram equivalents in

		n_f	eq mass	$g\cdot eq = \frac{wt.}{eq.wt.}$
1	192 g of SO_4^{2-}	2	$\frac{96}{2} = 48$	$\frac{192}{48} = 4$
2	65 g of Al^{3+}	3	$\frac{27}{3} = 9$	$\frac{65}{9}$
3	106.5g of Cl^-	1	$\frac{35.5}{1} = 35.5$	$\frac{106.5}{35.5} = 3$
4	117 g of Na^+Cl^-	1	$\frac{58.5}{1} = 58.5$	$\frac{117}{58.5} = 2$
5	294 g of H_2SO_4	2	$\frac{98}{2} = 49$	$\frac{294}{49} = 6$

Normality (N)

1 L solution ⟶ gram eq. of solute (no. of)

$$N = \frac{\text{g. eq. of solute}}{V(L)}$$

Unit of N = g eq/L or Normal or N

5 L → 15 g. eq solute

1 L → $\frac{15}{5} = 3N$

Question

Find normality if 80g of NaOH dissolved in 500 ml of solution (eq. mass of NaOH = 40g)

$$N = \frac{g\ eq}{V(L)} = \frac{\overset{2}{\cancel{80}} \times \overset{2}{\cancel{1000}}}{\cancel{40} \times \cancel{500}} = 4N$$

Question

Solute

If 98 g of H_2SO_4 is present in 250 ml of solution. Find normality (N) (Molar mass of H_2SO_4 = 98g)

Ans $N = \frac{g\,eq}{V(L)} = \frac{98 \times 2 \times 1000}{98 \times 250} = 8N$

Relation Between Normality (N) and Molarity (M)

$$N = \frac{g\ eq}{V(L)}$$

$$N = \frac{wt.}{Eq\ wt. \times V(L)}$$

$$= \frac{wt.}{GMM \times V(L)} \times n_f$$

$$= \frac{moles}{V(L)} \times n_f$$

mIIT

$$N = M \times n_f$$

$$N \text{ a } M \text{ a } N$$

Effect of Temperature on Concentration Terms

#IIT

Concentration terms involving mass does not change with temp and conc. Terms involving volume change with temperature.

Conc. terms Changes with Temp.	Conc. terms which do not Change with temp
M, N, % by Volume, % by strength	m, χ_B, χ_A, % by mass

$$M = \frac{n_B}{V(L)} \qquad N = \frac{g.eq}{V(L)}$$

$$m = \frac{n_B}{w_A(kg)}$$

Lakshya → result Celebration → Srinagar → 5m NaOH soln.

↓

Delhi

↓

5m NaOH soln.

Subha → ⟶ Srinagar → 5M NaOH soln.

↓

Delhi → ~~5M NaOH soln.~~

Question

Assertion: Molarity of a solution does not depend upon temperature whereas molality depends.

Reason: Molarity and molality both depend only on the number of moles of solute particles.

1. If both assertion and reason are ture and reason is the correct explanation of assertion.
2. If both assertion and reason are ture and reason is not the correct explanation of assertion.
3. If assertion is true but reason is false.
4. If both assertion and reason are false

Q Which is better method to represent Concentration.
1M or 1m & why?

Ans 1M → 1 mole solute in 1 L of soln → Changes with Temp

1m → ——— 1 Kg of solvent → do not Change with Temp

↓

Better method of Concentration.

Q. 1M or 1m which is more Conc. & why?

Ans @ aq. sol^{n} → d of sol^{n} = 1 g/ml

1M → 1 mole solute → 1000ml of sol^{n}.

mass of solution = 1000g

1m → 1 mole solute → 1000g of solvent

Let mass of sol^{n} > 1000g = 1200g

1M more Conc. than 1m

Concentrated

solute ↑ Conc. ↑

solute ↓ Conc. ↓

(b) non aq soln

d soln < 1 g/ml
= 0.9 g/ml

1 M → 1 mole solute → 900 g solution
1000 ml solute

1 m → 1 mole solute → 1000 g aq solution
1000 g solvent

1 M more Conc. than 1 m

d soln > 1 g/ml
= 1.1 g/ml

1 M → 1100 g solution.

1 m → > 1000 g solution.

if solution mass > 1100 g → 1 M more Conc.
if solution mass < 1100 g → 1 m more Conc.

Mummy
↓
250gr
↓
10g salt
jyada

Sister
↓
500g
↓
10g salt
Bahut kam

Join this official telegram group to get extra questions for revision.

THANK YOU