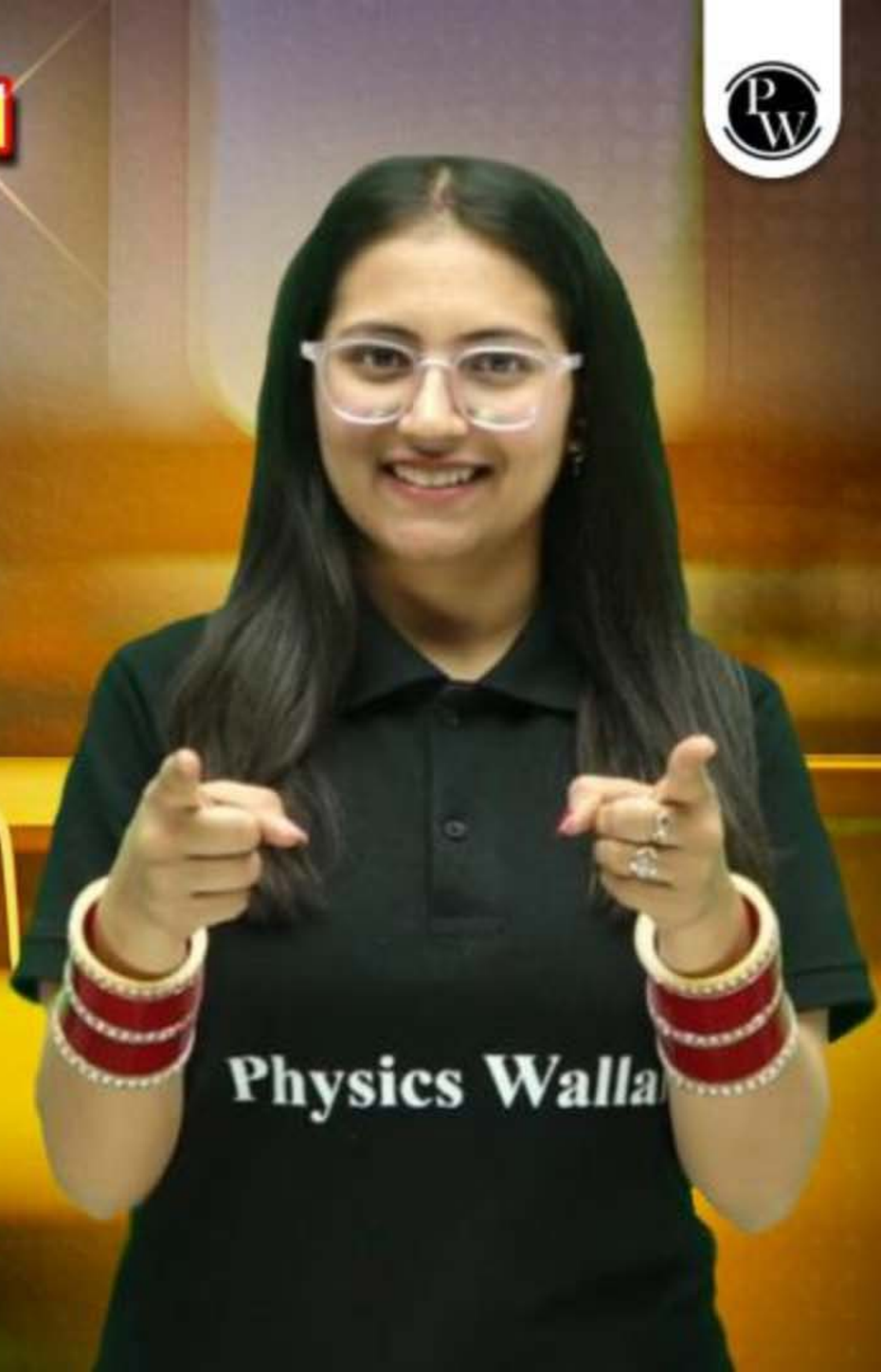
RADIANT 2026

Chemistry

The Language of Chemistry

Lecture - 04

By- Bharti Ma'am

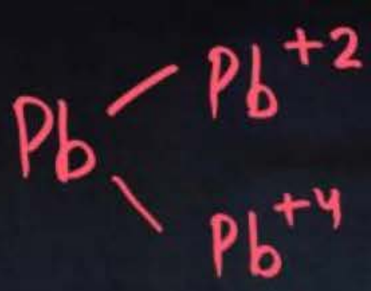


Topics

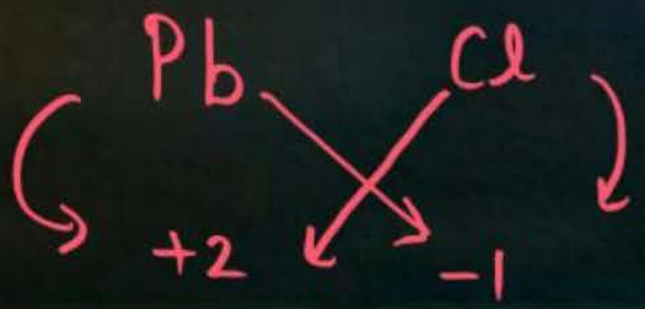
1. Chemical Name
2. Chemical Reaction
3. Balancing of Chemical Equation
4. Que

5) Chemical Equation

Chemical Naming

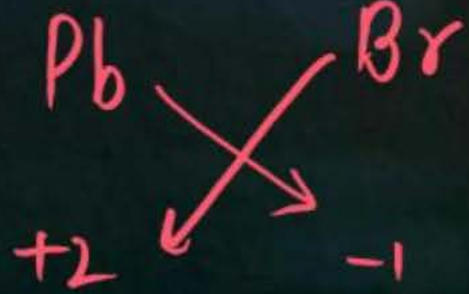


1. **Lead [II] chloride**



$PbCl_2$

2. **Lead [II] bromide**

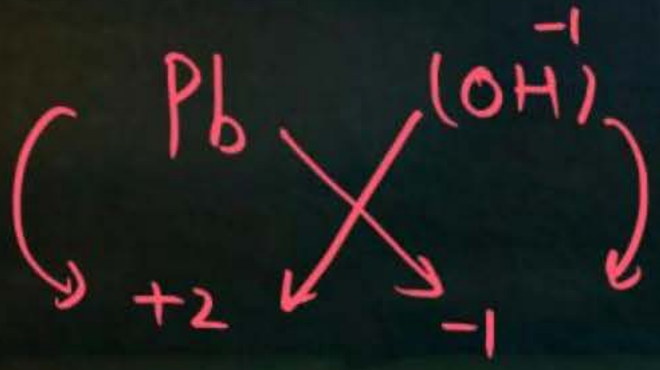


$PbBr_2$

Chemical Naming

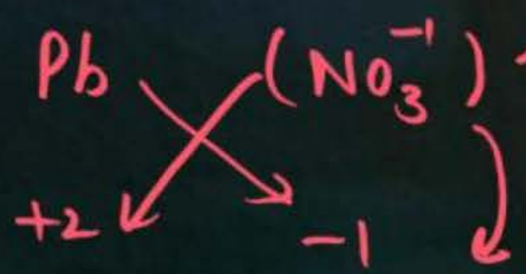
$\bar{O}H$ (Hydroxide) → Polyatomic ion

3. **Lead [II] hydroxide**



$Pb(OH)_2$

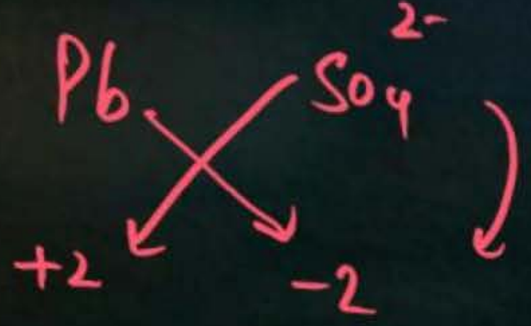
4. **Lead [II] nitrate**



$Pb(NO_3)_2$

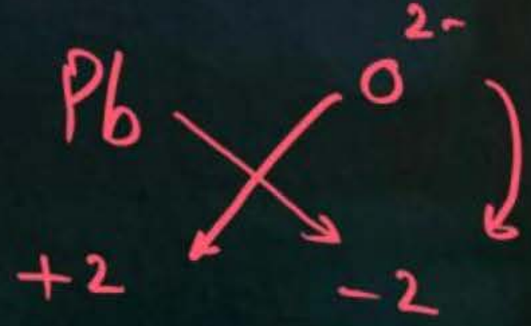
Chemical Naming

5. **Lead [II] sulphate** → Max no. of oxy atom



$PbSO_4$

6. **Lead [II] oxide**

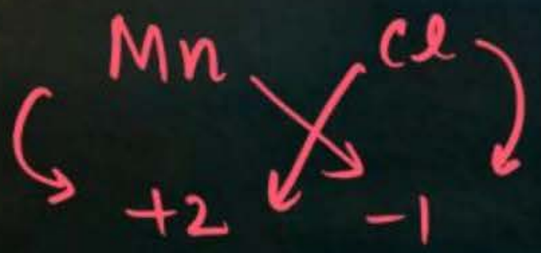


PbO

Chemical Naming

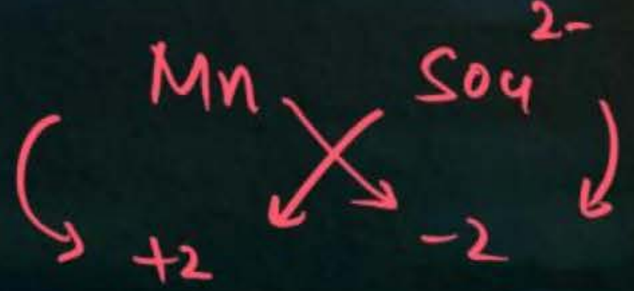
Mn = Metal Mn^{+2} gmp.

7. Manganese chloride



$MnCl_2$

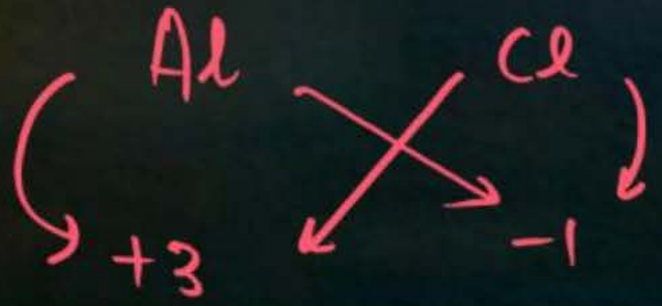
8. Manganese sulphate



$MnSO_4$

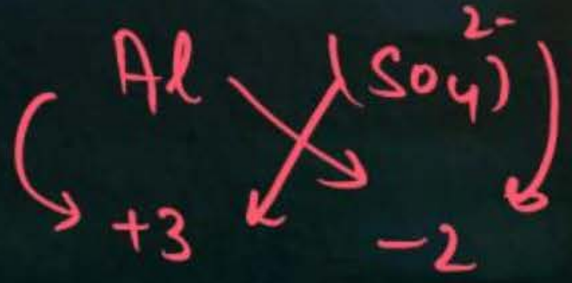
Chemical Naming

9. **Aluminium chloride**



$AlCl_3$

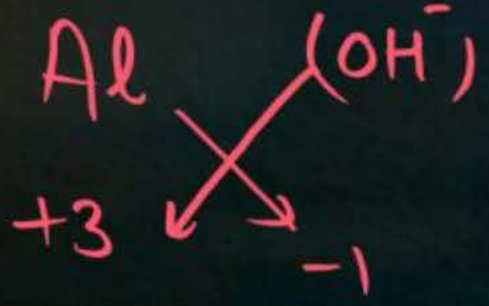
10. **Aluminium sulphate** (Polyatomic Ion)



$Al_2(SO_4)_3$

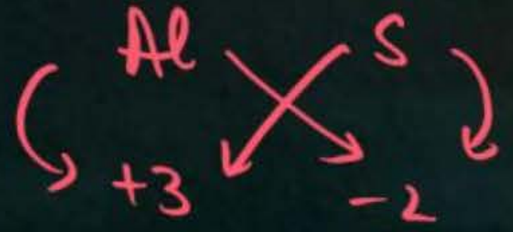
Chemical Naming

11. Aluminium hydroxide



$Al(OH)_3$

12. Aluminium sulphide (No oxy atom)



Al_2S_3

S^{2-}

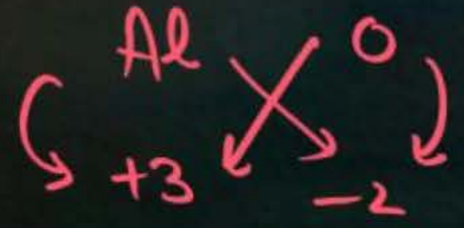
Chemical Naming

Mn^{+2} ✓

Cr = Metal

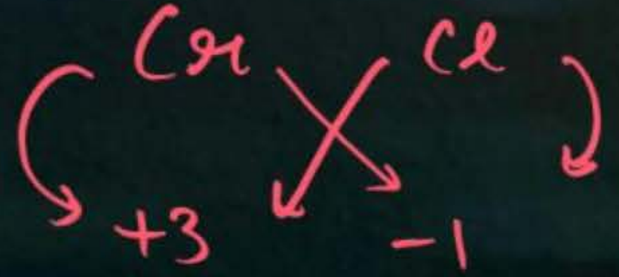
↳ Cr^{+3} ✓

13. Aluminium oxide



Al_2O_3

14. Chromium chloride

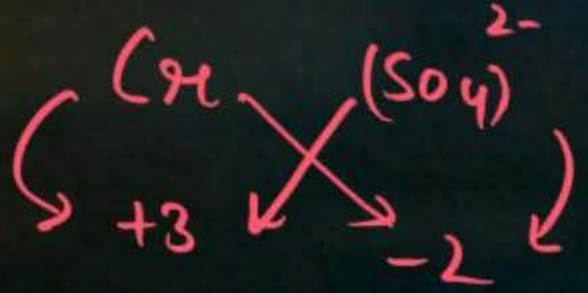


$CrCl_3$

Chemical Naming

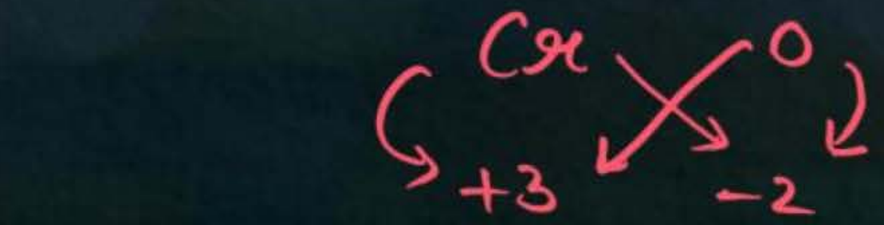
Cr^{+3} ⟶

15. Chromium sulphate



$Cr_2(SO_4)_3$

16. Chromium oxide



Cr_2O_3 ✓

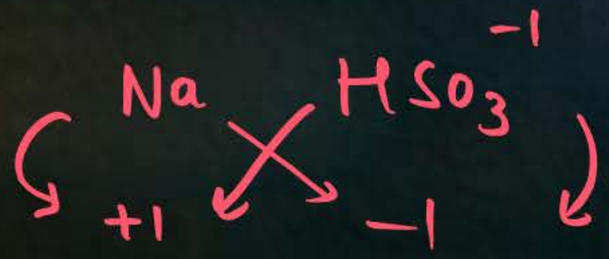
Chemical Naming

Hydrogen sulphate = HSO_4^-

Hydrogen Sulphite = HSO_3^-

17. Sodium hydrogen sulphite

↳ one oxy less



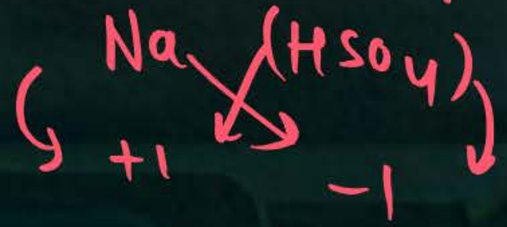
$NaHSO_3$

18. Sodium hydrogen sulphate

↳ Max. oxy.

HSO_4^-

Polyatomic



$NaHSO_4$

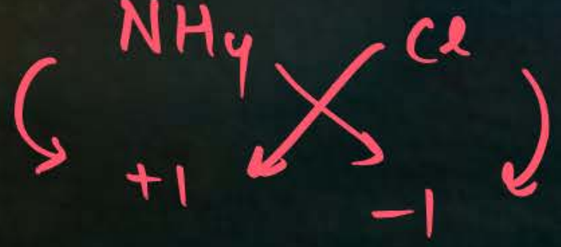
Chemical Naming

↳ Polyatomic Ion

Ammonia = NH_3 ✓
gas

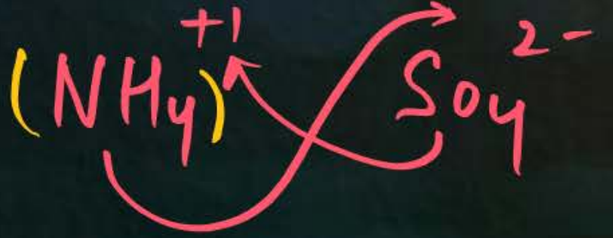
Ammonium (Cation) = NH_4^+ ✓

19. Ammonium chloride



NH_4Cl

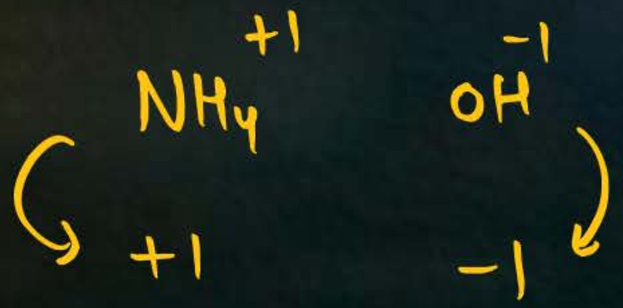
20. Ammonium sulphate



$(NH_4)_2SO_4$

Chemical Naming

21. Ammonium hydroxide



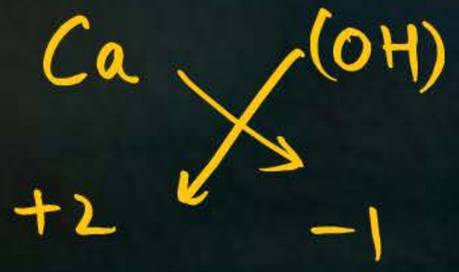
NH_4OH

22. Calcium chloride

$CaCl_2$

Chemical Naming

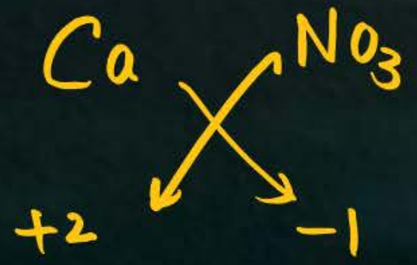
23. Calcium hydroxide



$Ca(OH)_2$

24. Calcium nitrate

→ Polyatomic Ion (NO_3^{-1})



$Ca(NO_3)_2$

Chemical Equation

Carbon + oxygen → Carbon dioxide

A + B → AB

A chemical equation is the symbolic representation of a chemical reaction using the symbols and formulae of the substances involved in the reaction.

Example: Burning of coal in air is a chemical reaction in which a new substance, carbon dioxide, is formed.

Chemical Reaction: Carbon + oxygen ⟶ Carbondioxide

Chemical Equation: $C + O_2 \longrightarrow CO_2$

Word equation:

$$\text{Carbon} + \text{Oxygen} \xrightarrow{\text{Heat}} \text{Carbon dioxide}$$

Chemical equation:

$$C + O_2 \xrightarrow{\text{Heat}} CO_2$$

(symbol)

$A + B \longrightarrow AB$

(Reactant) (Product)

A chemical equation tells us what substances are involved in a given reaction (Reactants) and what are the substances formed as a result of the reaction (Products).

New Substance → product

Example: $\underbrace{CuSO_4 + 2NaOH}_{\text{Reactants}} \longrightarrow \underbrace{Cu(OH)_2 + Na_2SO_4}_{\text{Products}}$

Skeleton equation

= (unbalanced Chemical Equation)

R·H·S ≠ L·H·S

It is an equation that represents a chemical change but is unbalanced. In other words, the total number of atoms of each element on the two sides are not equal.

$KNO_2 \longrightarrow KNO_2 + O_2$

Product

K=1
O=4 ✗

Reactant

K=1

O=2 ✗

No. of atoms of Reactant ≠ No. of atoms of product

Unbalanced chemical Eqⁿ

$H_2 + Cl_2 \longrightarrow HCl$

Reactant

Product

H = 2

Cl = 2

H = 1

Cl = 1

R·H·S ≠ L·H·S

Unbalanced Chemical Eqn

$H_2 + O_2 \longrightarrow H_2O$

Reactant

Product

H = 2

O = 2

H = 2

O = 1

R.H.S ≠ L.H.S

Balanced equation

$R \cdot H \cdot S = L \cdot H \cdot S$

It is an equation which the total number of atoms of each element in the reactants, on the left side of the equation, is the same as the number of atoms in the products formed, on the side of the equation.

Example: $CaCO_3 \longrightarrow CaO + CO_2$

Ca = 1
C = 1
O = 3

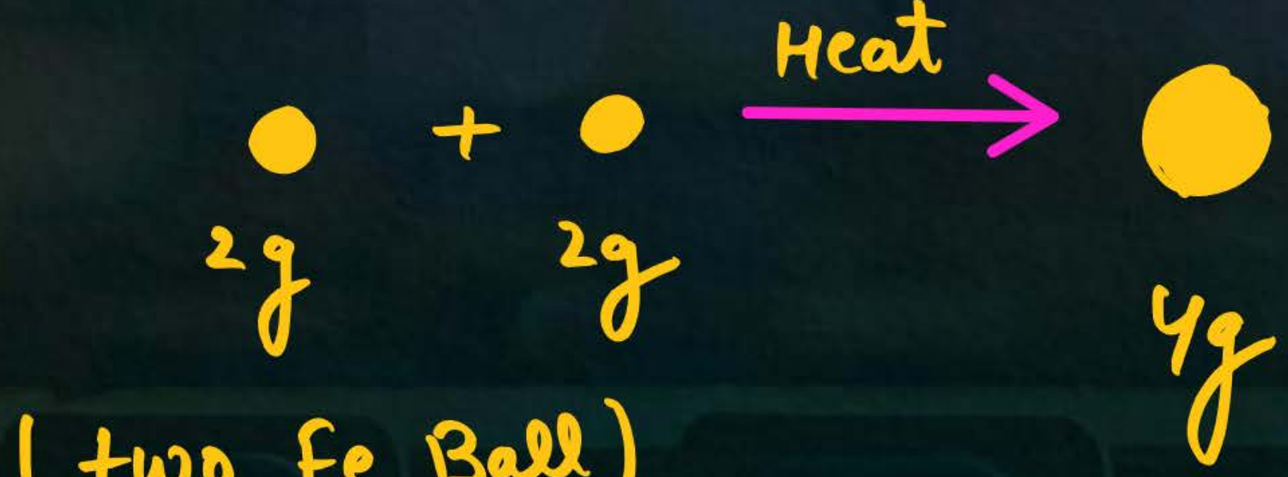
Ca = 1
C = 1 ✓
O = 3

(Balanced Eq^n)

No. of atom of Reactant = No. of Atoms of Product

Why Balancing?

Law of Chemical Combination!



→ law of Conservation of Mass

Why should an equation be balanced

v.Imp

An equation must be balanced in order to comply with the "Law of Conservation of Matter". Which state that matter is neither created nor destroyed in the course of a chemical reaction. An unbalanced equation would imply that atoms have been created or destroyed.

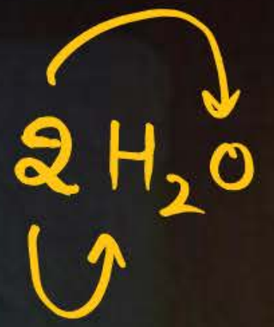
Mass

Mass

(2 Mark)

1.)

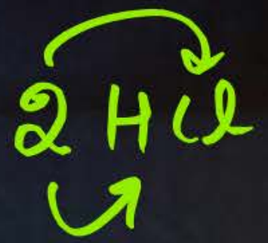
$$2H_2 + O_2 \longrightarrow 2H_2O$$



Reactant	Product
H = 2	H = 2 X 2
O = 2	O = 1

H = 4
O = 2

2.) $H_2 + Cl_2 \longrightarrow 2HCl$



H = 2

Cl = 2

Reactant

H = 2

Cl = 2

Product

H = 1 × 2 ✓

Cl = 1 × 2 ✓

3.) $N_2 + 3H_2 \longrightarrow 2NH_3$

Reactant

$N = 2$ ✓

$H = 2 \times 3 = 6$ ✓

Product

$N = 1 \times 2$

$H = 3$

$N = 2$

$H = 3 \times 2 = 6$

Balancing by hit and trial Method

$Cu + 2H_2SO_4 \rightarrow CuSO_4 + SO_2 + 2H_2O$

↳ Balanced

1. Balance the following equation.

$Cu + 2H_2SO_4 \longrightarrow CuSO_4 + SO_2 + 2H_2O$

Reactant

Cu = 1 ✓

S = 1 ×2

H = 2×2 = 4

O = 4×2 = 8

Product

Cu = 1 ✓

S = 2

H = 2 ×2 ✓

O = 7 ✓

Rule for Balancing!

1.) Try to Balance Metal first

Metal: Na, Mg, K, Cu, Fe, Cr, Mn

2.) Try to Balance Non-Metal except Hydrogen, Oxy.

(Cl, S, N, Br)

(3) last: O, H

list of Metal

K, Na, Ba, Mg, Ca,

Li, Be, Al, Fe, Cu, Mn

Ni, Ag, Au, Pt

Ba = Barium (Metal)

list of Non-Metal

O, H (Both are Non-Metal)

F, Cl, Br, I, O, S, N, P, C

Balancing by hit and trial Method

2. Balance the following skeletal equation.

$2\,Fe + 3H_2O \longrightarrow Fe_2O_3 + 3H_2$

① Metal First ✓

$3H_2O$

$H = 3 \times 2 = 6$ ✓

$O = 3$ ✓

Reactant	Product
$Fe = 1 \times 2$ ✓	$Fe = 2$ ✓
$H = 2 \times 3 = 6$	$H = 2 \times 3$ ✓ $= 6$
$O = 1 \times 3$ ✓	$O = 3$

$2Fe + 3H_2O \longrightarrow Fe_2O_3 + 3H_2$

Question

Write the balanced equation for the following chemical reactions.

(i) Hydrogen + Chlorine → Hydrogen chloride

$$H_2 + Cl_2 \longrightarrow 2HCl$$

Question

Ba^{+2} → group-2

Ba SO_4^{2-}

+2 −2

BaSO4

Write the balanced equation for the following chemical reactions.

(ii) Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride

$3\,BaCl_2 + Al_2(SO_4)_3 \longrightarrow 3\,BaSO_4 + 2\,AlCl_3$

Reactant

Product

Al (SO_4^{2-})

+3 −2

$Al_2(SO_4)_3$

Ba = 1 × 3

Al = 2

Cl = 2

S = 3

O = 4 × 3 = 12

Ba = 1 × 3 = ✓

Al = 1 × 2

S = 1 × 3 ✓

O = 4

Cl = 3 × 2 = 6

Al Cl

+3 −1

$AlCl_3$

Question

H.W

Write the balanced equation for the following chemical reactions.

(iii) Sodium + Water → Sodium hydroxide + Hydrogen gas↑

$$Na + H_2O \longrightarrow NaOH + H_2\uparrow$$


3:30
5
BHARTI MAAM
JOIN MY OFFICIAL TELEGRAM CHANNEL
Yes
No
Physics Wallah
@CHEMISTRYBYBHARTIMAAM


Thank You