RADIANT 2026

Chemistry

The Language of Chemistry

Lecture - 05

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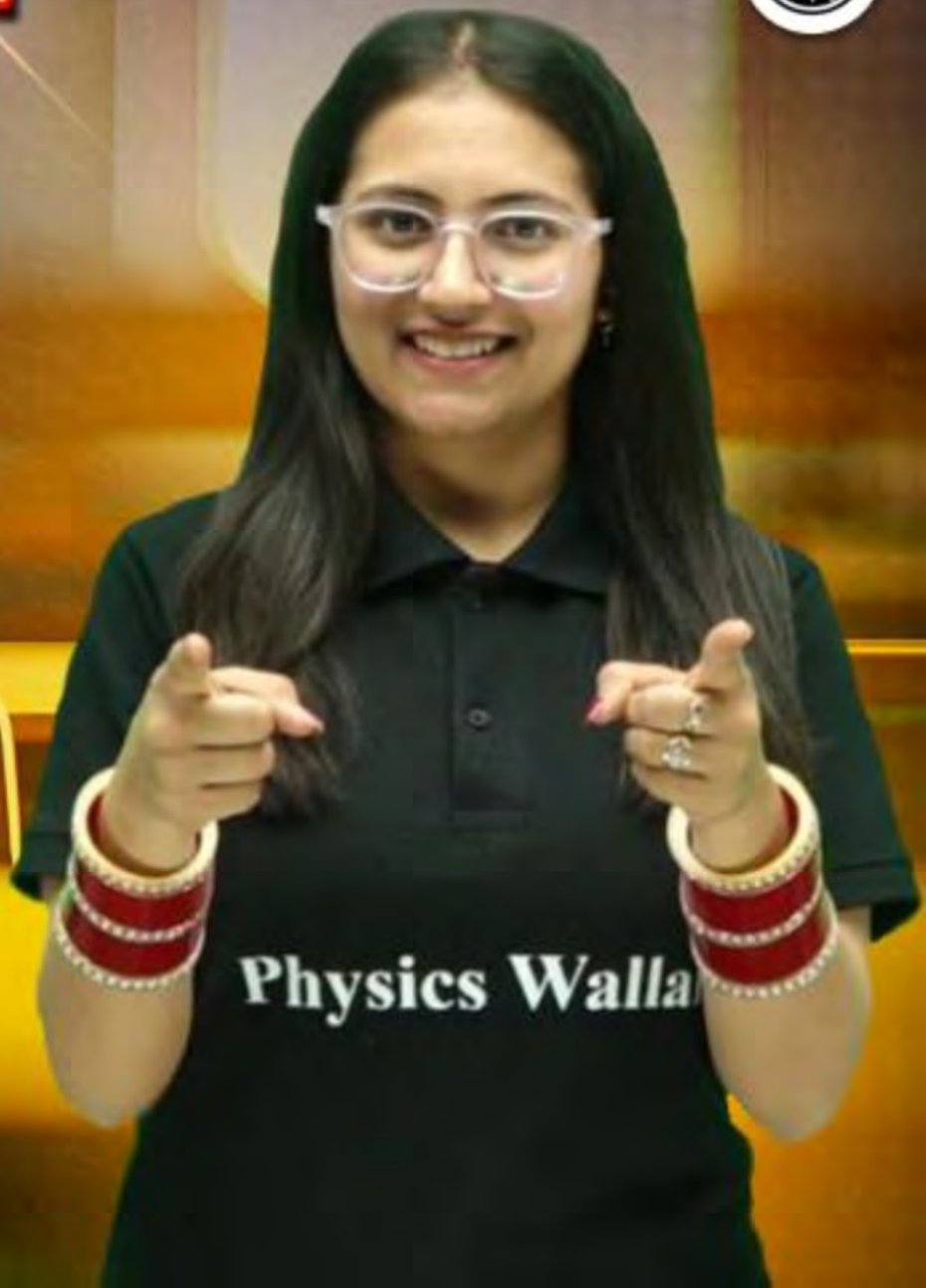


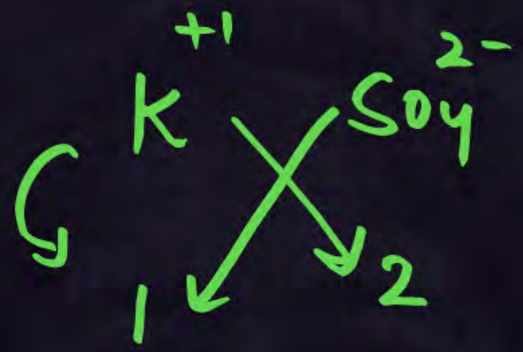
Topics *to be covered*

1. Chemical name + Blancing of Eq (Revision)
2. R.A.M
3. R.M.M
4. Que
5. Mass Number || Atomic Mass and Relative Atomic Mass || Practice question on Balancing Chemical Equation

Writing chemical Formula

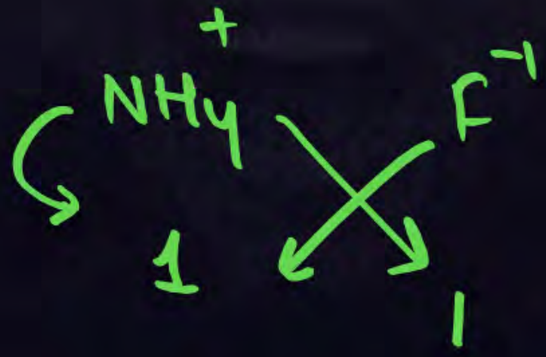
Quick-Revision

1.) Potassium Sulfate



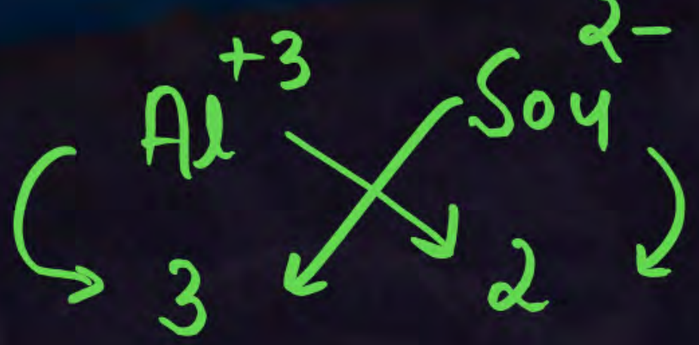
K_2SO_4

2.) Ammonium Fluoride



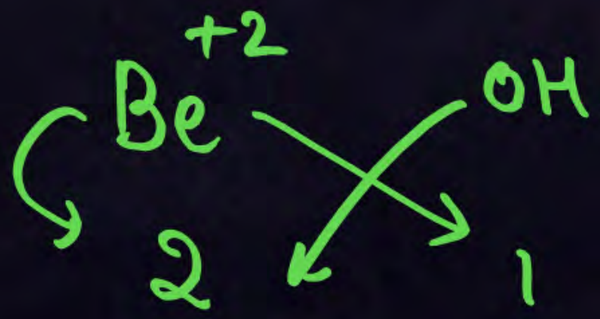
NH_4F

3.) Aluminum sulfate



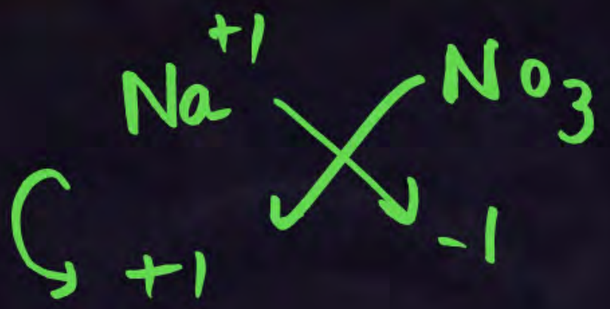
$Al_2(SO_4)_3$

4.) Beryllium Hydroxide



$Be(OH)_2$

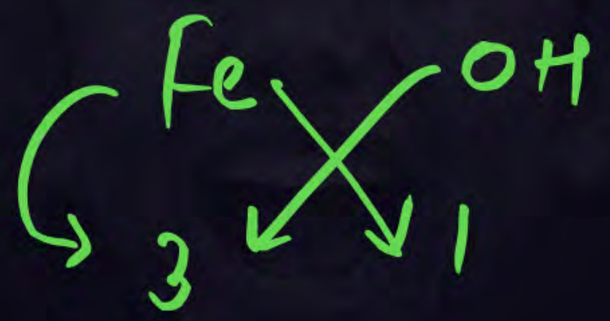
5.) Sodium Nitrate



$NaNO_3$

Fe^{+3}

6.) Ferric Hydroxide



$Fe(OH)_3$ → Polyatomic ion

7.) Rubidium sulfide

Sulfide = S^{2-}

Sulfate = SO_4^{2-}

Rb^{+1} S^{2-}

+1 2

Rb_2S

H
Li
Na
K
Rb
Cs
F

(group-1)

Rubidium (Rb)

Rb^{+1}

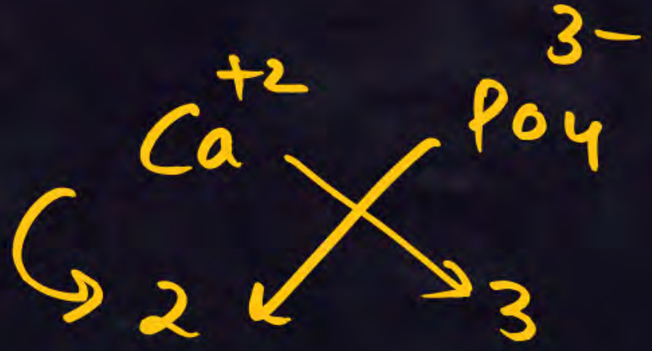
8.) Ammonium phosphate

$(NH_4)^{+1}$ PO_4^{3-}

+1 3

$(NH_4)_3PO_4$

9.) Calcium phosphate

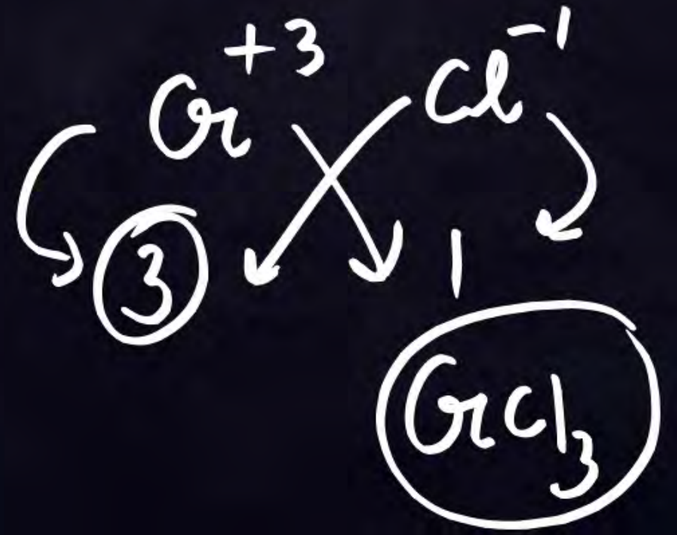


$Ca_3(PO_4)_2$

Phosphate = PO_4^{3-}

(Polyatomic ion)

10.) Chromium chloride



Balancing of chemical Equation

1.) Always try to Balance Metal first

Au, Ag, Fe, Na, K, Cu

2.) Non-Metal except (H, O)

3.) last ⇒ O, H

Question

Write the balanced equation for the following chemical reactions.

Sodium + Water → Sodium hydroxide + Hydrogen

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2$$

Na OH
+1 -1

NaOH ✓

2NaOH

2Na
2O
2H

Reactant	Product
Na = 1 ✓	Na = 1 ✓
H = 2 x 2 = 4 ✓	H = 4 ✓
O = 1 x 2 = 2	O = 1 x 2 ✓

Balanced

Question

Ba^{+2} Cl^{-1}

$BaCl_2$

Na^{+1} SO_4^{2-}

Na_2SO_4

Write a balanced chemical equation with state symbols for the following reactions.

(i) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.

$$BaCl_{2(aq)} + Na_2SO_{4(aq)} \longrightarrow BaSO_{4(s)} + 2NaCl$$

Metal: Ba, Na

(s) → solid

(g) → gas

Physical state

(l) → liq

(aq) → (H_2O)

Question

Write a balanced chemical equation with state symbols for the following reactions.

(ii) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.

$$NaOH_{(aq)} + HCl_{(aq)} \longrightarrow NaCl_{(aq)} + H_2O$$

Question

Balance the following chemical equations.

(i) $2HNO_3 + Ca(OH)_2 \longrightarrow Ca(NO_3)_2 + 2H_2O$

Balanced Chemical Eq^n

Reactant	Product
Ca = 1 ✓	Ca = 1 ✓
N = 1	N = 2 //
H = 4	H = 4
O = 8	O = 8 ✓

Question

Balance the following chemical equations.

(ii) $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O$

Balanced Eq^n

Na = 1×2

S = 1

H = 4

Na = 2

S = 1

H = 4 ✓

Question

Balance the following chemical equations.

(iii) $NaCl + AgNO_3 \longrightarrow AgCl + NaNO_3$ } Already Balanced Eqn

Na = 1	Na = 1
Ag = 1	Ag = 1
Cl = 1	Cl = 1
N = 1	N = 1
O = 3	O = 3

Question

Balance the following chemical equations.

(iv) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$

2HCl

Ba=1
Cl=2
S=1
O=4
H=2

Ba=1
Cl=1X2 ✓
S=1
O=4
H=1X2 ✓

Question

The formula of perchloric acid:

A $HClO$

B $HClO_2$

C $HClO_3$

D $HClO_4$

Question

If the formula of platinic chloride is $PtCl_4$ then the valency of platinum and chloride are respectively:

(A) +2, +1

(B) +2, –1

(C) +4, – 1

(D) – 4, +1

Question

CH_3COO^- (Anion) → Acidic Radical

The basic and acid radical in calcium acetate are respectively

Ca^{+2} (Cation) = Basic Radical

A Acetate, calcium

B Carbon, calcium

C Calcium, acetate

D Hydrogen, calcium

Question

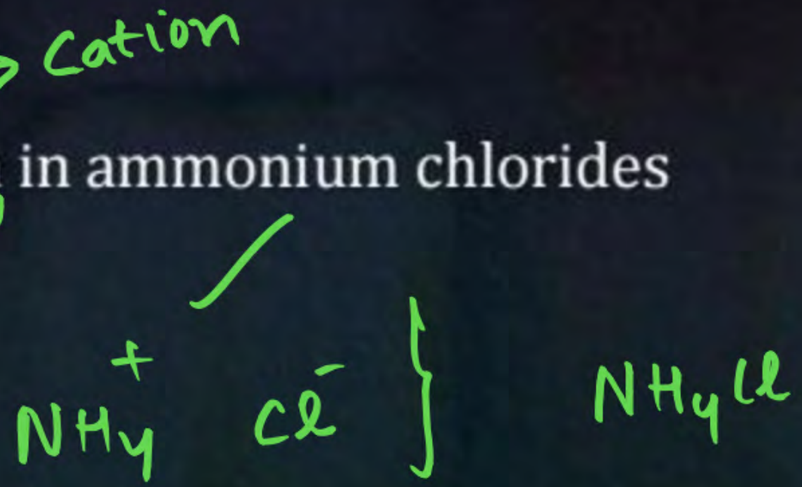
The valency of ammonium in ammonium chlorides

(A) +2

(B) +1

(C) +3

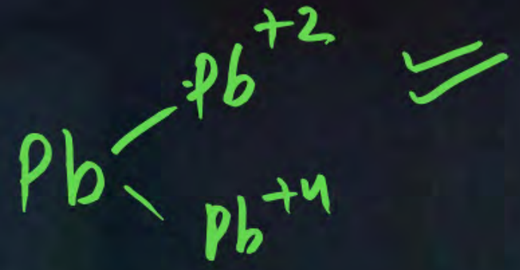
(D) +4



Question

C11)

The formula of Lead Nitrate is

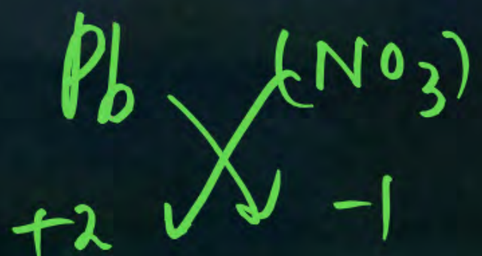


A $PbNO_3$

B $Pb(NO_3)_2$

C $Pb(NO_2)_2$

D $PbNO_2$



$Pb(NO_3)_2$

Question

Identify the balanced chemical equation from the following

A $Zn(NO_3)_2 \rightarrow ZnO + NO_2 + O_2$

B $Zn(NO_3)_2 \rightarrow 2ZnO + NO_2 + O_2$

C $2Zn(NO_3)_2 \rightarrow 2ZnO + NO_2 + O_2$

D $2Zn\,(NO_3)_2 \rightarrow 2ZnO + 4NO_2 + O_2$

Question

Identify the balanced chemical equation from the

H.W

(A) $NH_3 + Cl_2 \rightarrow NH_4Cl + N_2$

(B) $2NH_3 + Cl_2 \rightarrow NH_4Cl + N_2$

(C) $8NH_3 + 3Cl_2 \rightarrow 6NH_4Cl + N_2$

(D) $NH_3 + 3Cl \rightarrow NH_4Cl + N_2$

Question

Identify the correctly balanced chemical equation from the following

A $2Cu(NO_3)_2 \rightarrow 2CuO + 4NO_2 + O_2$

B $3Cu + 8HNO_3 \rightarrow 3Cu(NO_3)_2 + 4H_2O + 2NO$

C $Cu + 4HNO_3 \rightarrow Cu(NO_3) + 2NO + 2H_2O$

D $Cu + HNO_3 \rightarrow Cu(NO_3)_2 + 2NO + H_2O$

Question

$MnO_2 + x\ HCl \rightarrow MnCl_2 + y\ H_2O + z\ Cl_2$

In order to balance the above chemical equation, the value of x, y, z respectively are

(A) 6, 2, 2

(B) 4, 1, 2

(C) 4, 2, 1

(D) 2, 2, 1

$MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + 1Cl_2$

Mn = Metal

Question

Which of the following products are formed by heating zinc nitrate?

A ZnO

B NO_2

C O_2

D All of these

Relative Atomic Mass

The relative atomic mass or atomic weight of an element is the number of times one atom of the element is heavier than $\frac{1}{12}$ times of the mass of an atom of carbon-12. Thus:

$$\text{Relative atomic mass} = \frac{\text{Mass of 1 atom of the element}}{\frac{1}{12}\text{th the mass of one C–12 atom}}$$

Relative Atomic Mass

'Ref'

In Relation to

→ Atom ka mass

C_6^{12} C_6^{13} C_6^{14} → 'Isotope'

97%

92% Papa

Maa 87%

1.) H = 1 a.m.u

2.) Oxy. atom

3.) 'Carbon-12' 'Ref.'

Carbon = 12 a.m.u

He = 4 a.m.u

H = 1 a.m.u

Carbon-12 = 12 a·m·u

C-12

8 C-12 max

10 Carbon — 1 C-13
1 C-14

a·m·u
↳ Atomic mass unit

Relative Atomic Mass

$1\,a.m.u = \frac{1}{12}$ (Mass of one C-12)

Atomic mass is expressed in atomic mass units [a.m.u.]. Atomic mass unit is defined as 1/12 the mass of carbon atom C-12.

Thus, the mass of a hydrogen atom is 1 amu, and Those of oxygen and helium are 16 amu and 4 amu respectively.

let Mass of one C-12 atom = 12 amu

OR

12 amu = Mass of one C-12 atom

$1\,amu = \frac{1}{12}$ (Mass of one C-12 atom)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