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chapter no: 1
Chemical reaction and Equation

* Difference between chemical and Physical change?

Physical change	chemical change
i] In a physical only physical properties such as colour, Physical state density etc	i] In a chemical change the composition and chemical properties undergo a change
ii] no new substance is formed in a physical change	ii] A new substance is formed in a chemical change
iii] very little or no energy in the form of heat, light or sound is usually absorbed or given out in a physical change	iii] A chemical change is always accomplained by absorption or evolution of energy
iv A physical change is temporary change and reversible	iv] chemical change is permanant and irreversible
v. Example: Making toys with clays	v] Rusting of iron, burning of Match-Sticks.

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* What is chemical ~~change~~ reaction?
The process, in which a substance or substances undergo a chemical change to produce new substance or substances with entire new properties, are known as chemical reaction

Example:

$2H_2 + O_2 \longrightarrow 2H_2O$

{reactants} {products}

* Types of chemical reaction -

i] Combination reaction -
When two or more substances (element or compound) combine to form a single product, the reaction is called combination reaction

Example:

$PCl_3 + Cl_2 \longrightarrow PCl_5$

{phosphorous trichloride} {chlorine} {phosphorous pentachloride}

ii] Decomposition Reaction:-
A chemical reaction in which one ~~reaction~~ reactant breaks down into two or more products any reactants substance decomposed by the action of heat or by the application of electricity

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Example:

$$CaCO_3 \xrightarrow{\Delta} CaO + CO_2$$

{calcium carbonate} {calcium oxide} {carbon dioxide}

iii] Displacement Reaction :-
A chemical reaction in which a more reactive element displaces a less reactive element from its compound is called a displacement reaction

Example -

$$Zn_{(s)} + CuSO_{4\,(aq)} \longrightarrow ZnSO_{4\,(aq)} + Cu_{(s)}$$

{Zinc} {copper sulphate} {Zinc sulphate} {copper}

iv] Double - Displacement Reaction -
Double Displacement reaction are those in which two chemical substances reacts by exchanging ions to produce two new molecules

Example:

$$Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2NaCl$$

{sodium sulphate} {Barium chloride} {barium sulphate} {sodium chloride}

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* Reactivity series *

K	↑	Higher reactive metal or element
Na		
Ca		
Mg		
Al		
Zn		
Fe		
Pb		
H		
Cu		
Hg		
Ag	↓	low reactive metal or element
Au		

* Corrosion *

when a metal is attacked by substance around it such as moisture and acids. etc it said to be corrode This process is called as corrosion

Corrosion

harmful	helpful
Rusting of iron	greenish layer of $CuCO_3$ in copper vessel
	formation of aluminium oxide on aluminium vessel.

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* Prevention of corrosion *

i) Electroplating
ii)
- Cu (copper) plating
- gold plating
- Zinc plating (Galvanisation)

ii) Painting

* Rancidity *

When fats and oils are oxidised they become Rancid and their smell and taste change This change in substance is called Rancidity.

* Prevention of Rancity

i) adding antioxidents
ii) adding preservatives.
iii) filling chips packet Nitrogen gas.

* chemical balancing *

We balance the chemical equation in order to fulfil or satisfy law of conservation of Mass

eg. i) $H_2 + O_2 \longrightarrow H_2O$

	Reactants	Products
H	2×2	2×2
O	2	1×2

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

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2) $Fe + H_2O \longrightarrow Fe_2O_3 + H_2$.

	Reactants	Product.
Fe	1×2	2
H	6	$3 \times 2 = 6$
O	1×3	3

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

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

	Reactants	Product
H	$3+1=4$	$2+2=4$
O	$5+3=8$	$7+1=8$
N	$1 \times 2 = 2$	2
Ca	1	1

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

4) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + HCL$

$(a)BaCl_2 + (b)H_2SO_4 \longrightarrow (c)BaSO_4 + (d)HCL$

$a = c$

$2a = d$

$2b = d$

$b = c$

if $c = 1$

then $a = 1$

$d = 2$

$b = 1$

$BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HC.$