Types of Chemical Reactions

Quick Revision Sheet · Class 10 Chemistry

1. Combination Reaction

Definition: Two or more substances combine to form a **single product**.

General Form: A + B → AB

Examples:

- 2H2 + O2 → 2H2O (Hydrogen burns in oxygen)
- CaO + H2O → Ca(OH)2 + Heat (Quicklime + water → Slaked lime)
- C + O2 → CO2
- N2 + 3H2 → 2NH3 (Haber process)

Memory: Many become ONE.

2. Decomposition Reaction

Definition: A compound breaks into **two or more simpler substances**.

General Form: AB → A + B

Examples:

- CaCO3 →(heat)→ CaO + CO2 (Thermal)
- 2H2O →(electricity)→ 2H2 + O2 (Electrolytic)
- 2AgCl →(sunlight)→ 2Ag + Cl2 (Photolytic)
- 2Pb(NO3)2 →(heat)→ 2PbO + 4NO2 + O2

Memory: ONE becomes Many.

3. Displacement Reaction

Definition: A **more reactive element** displaces a less reactive one from its salt solution.

General Form: A + BC → AC + B

Examples:

- Zn + CuSO4 → ZnSO4 + Cu (Zn displaces Cu)
- Fe + CuSO4 → FeSO4 + Cu (Blue → Light green + Brown deposit)
- 2Al + 3H2SO4 → Al2(SO4)3 + 3H2
- Mg + 2HCl → MgCl2 + H2

Memory: More reactive = 'bully' that pushes out the weaker element.

4. Double Displacement Reaction

Definition: Two compounds exchange ions → two new compounds (often a precipitate forms).

General Form: AB + CD → AD + CB

Examples:

- Na2SO4 + BaCl2 → BaSO4 (white ppt) + 2NaCl
- AgNO3 + NaCl → AgCl (white ppt) + NaNO3
- Pb(NO3)2 + 2KI → PbI2 (yellow ppt) + 2KNO3
- NaOH + HCl → NaCl + H2O (Neutralisation)

Memory: Partners swap — like a dance!

5. Redox Reaction

Definition: Oxidation and Reduction occur simultaneously.
OIL RIG: Oxidation Is Loss, Reduction Is Gain (of electrons).
General Form: Oxidising agent + Reducing agent → Products
Examples:

- CuO + H2 → Cu + H2O (CuO reduced; H2 oxidised)
- 2Mg + O2 → 2MgO (Mg oxidised)
- Zn + CuSO4 → ZnSO4 + Cu (also redox)
- Fe2O3 + 2Al → Al2O3 + 2Fe (Thermite)

Memory: OIL RIG — remember it and never confuse oxidation with reduction!

6. Exothermic Reaction

Definition: Heat energy is **released**. Products have less energy than reactants.
General Form: Reactants → Products + Heat
Examples:

- C + O2 → CO2 + Heat (Burning coal)
- CH4 + 2O2 → CO2 + 2H2O + Heat (Natural gas)
- CaO + H2O → Ca(OH)2 + Heat
- 2H2 + O2 → 2H2O + Heat

Memory: EXOthermic = heat EXits (goes OUT).

7. Endothermic Reaction

Definition: Heat energy is **absorbed** from surroundings.
General Form: Reactants + Heat → Products
Examples:

- CaCO3 + Heat → CaO + CO2
- N2 + O2 + Heat → 2NO
- 2NH3 + Heat → N2 + 3H2
- Photosynthesis: 6CO2 + 6H2O + Light → C6H12O6 + 6O2

Memory: ENDOthermic = heat ENters (goes IN).

8. Precipitation Reaction

Definition: An **insoluble solid precipitate (↓)** forms when two aqueous solutions are mixed.
General Form: Solution A + Solution B → Precipitate↓ + Solution
Examples:

- AgNO3 + NaCl → AgCl↓ (white) + NaNO3
- Pb(NO3)2 + 2KI → PbI2↓ (yellow) + 2KNO3
- Na2SO4 + BaCl2 → BaSO4↓ (white) + 2NaCl
- CaCl2 + Na2CO3 → CaCO3↓ (white) + 2NaCl

Memory: Precipitate = solid that 'falls out' of solution (look for ↓ arrow).

Quick Summary Table

Type	Key Idea	Equation Form	Energy
Combination	Many → One	A+B→AB	Usually Exo
Decomposition	One → Many	AB→A+B	Usually Endo
Displacement	Reactive kicks out	A+BC→AC+B	Varies

Type	Key Idea	Equation Form	Energy
Double Disp.	Partners swap	AB+CD→AD+CB	Varies
Redox	e- transfer	OIL RIG	Varies
Exothermic	Releases heat	R→P+heat	Released
Endothermic	Absorbs heat	R+heat→P	Absorbed
Precipitation	Solid ↓ forms	Aq+Aq→solid	Varies

Tip: *Many reactions belong to MORE THAN ONE type. E.g. Thermite is both Displacement AND Redox. Always check all applicable types in board exams!*