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Class - 10

Chapter - 1

Chemical Reactions and Equations

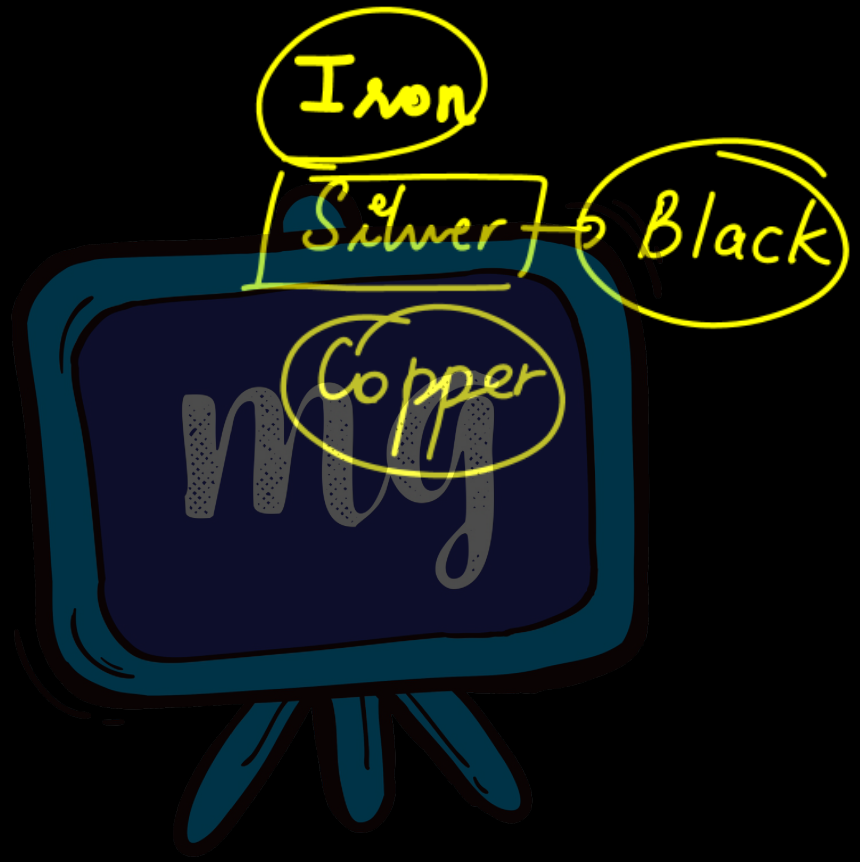
Part-6

TYPES OF CHEMICAL REACTIONS

Disha Didi (DD)

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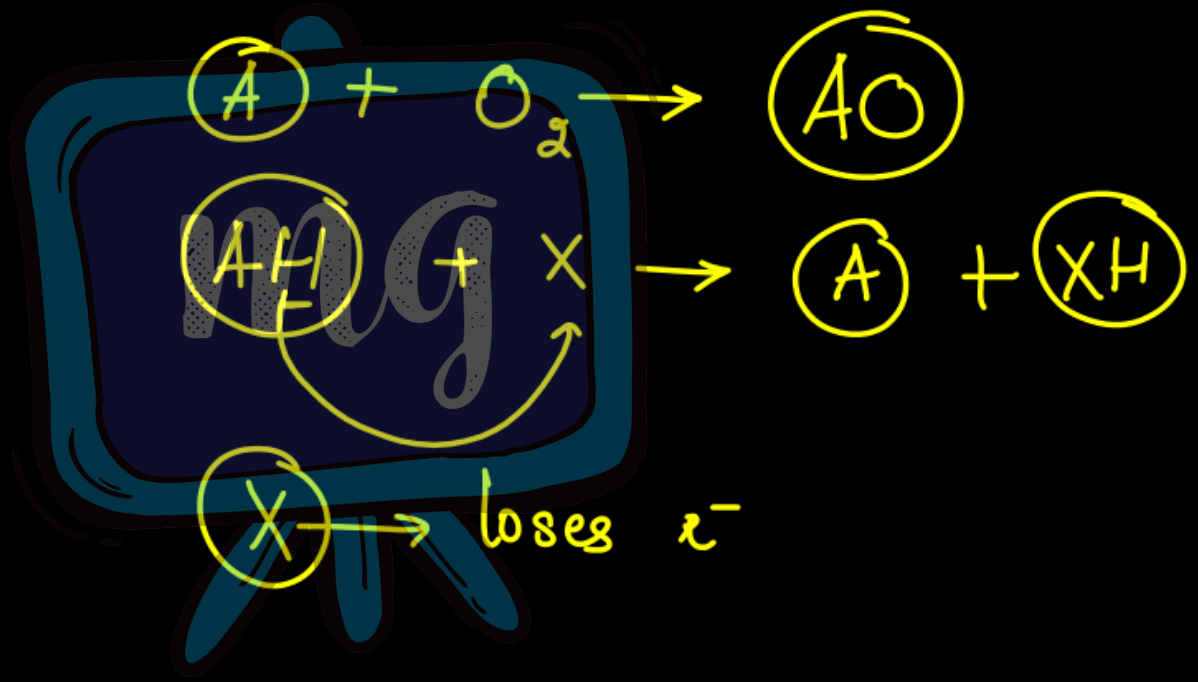
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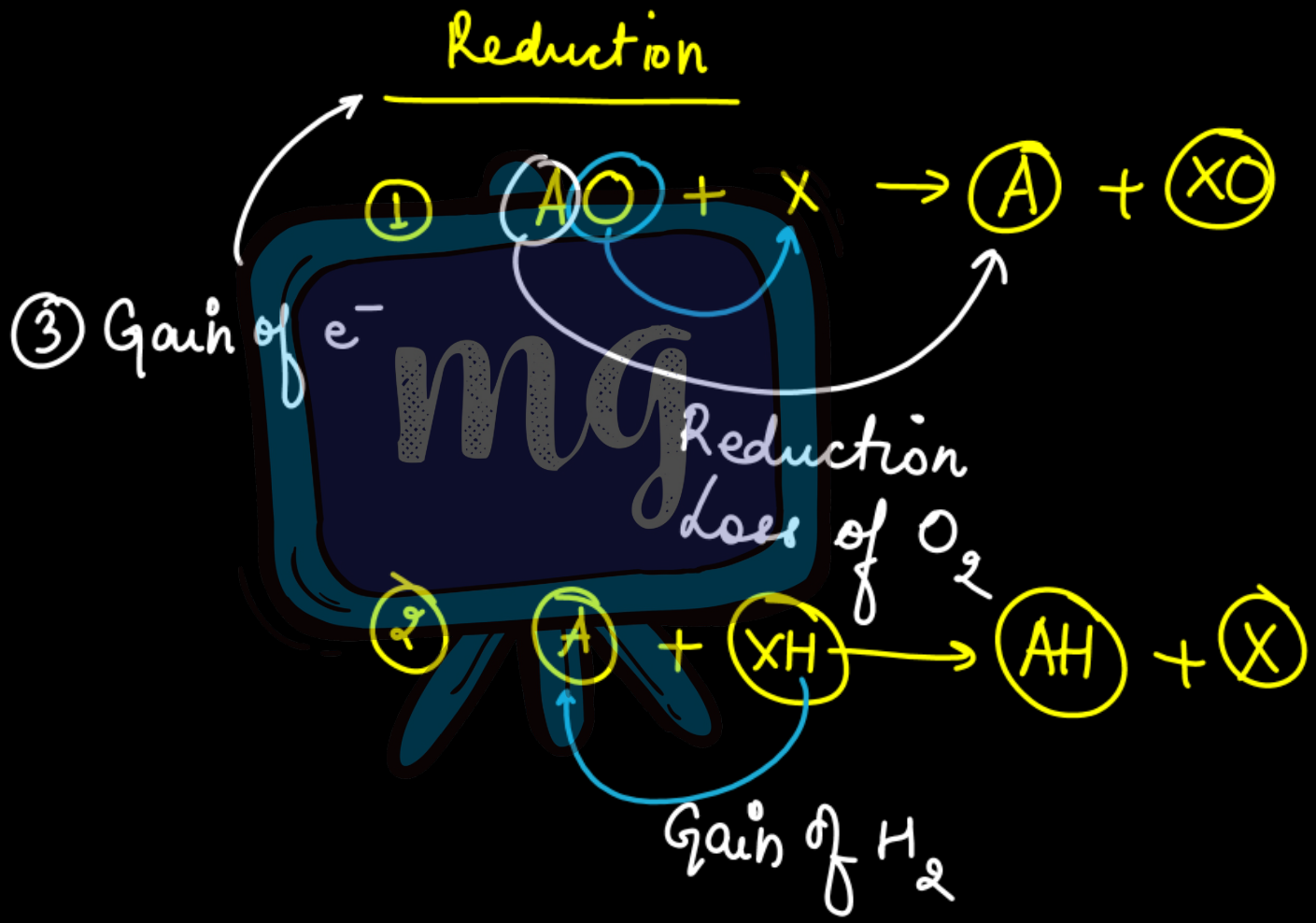
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Oxidation



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Oxidation and Reduction

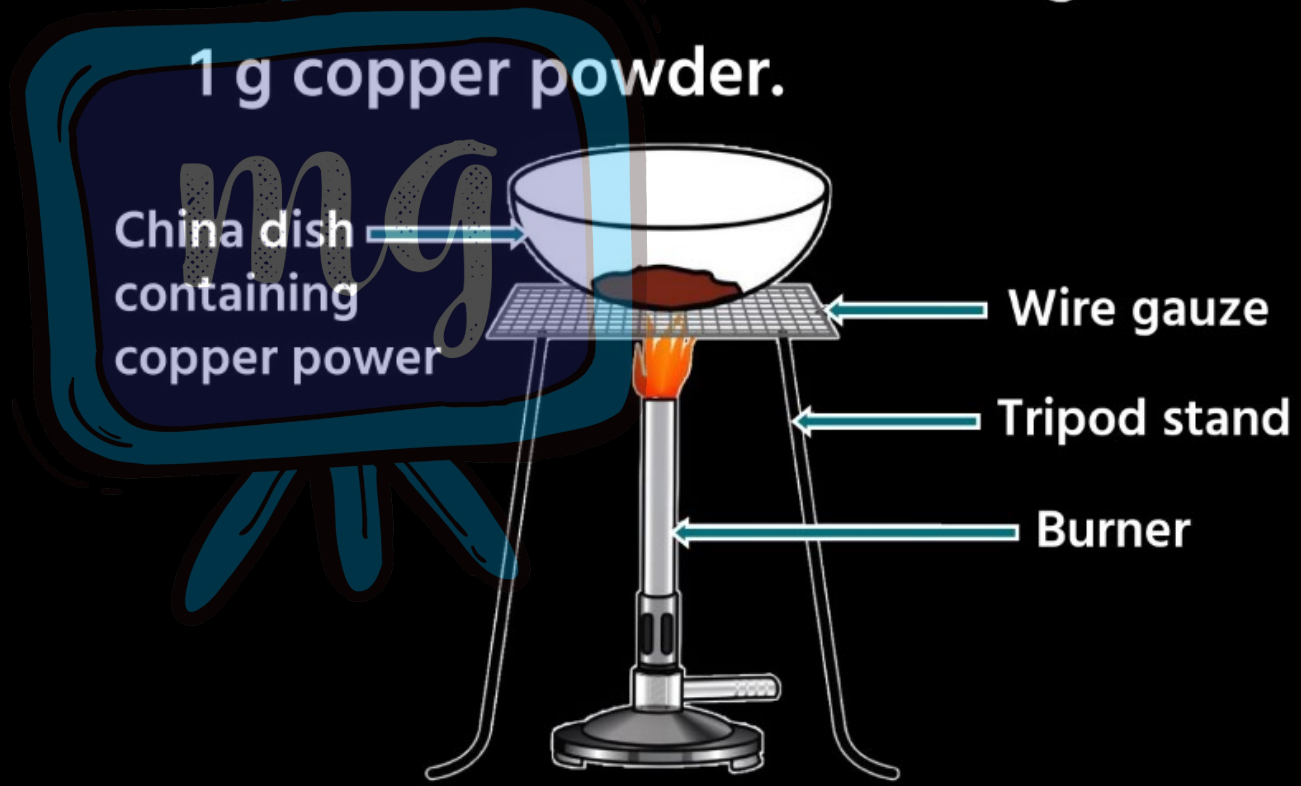
Oxidation	Reduction
Addition of Oxygen	Removal of Oxygen.
Removal of Hydrogen.	Addition of Hydrogen.
Loss of Electrons.	Gain of Electrons.

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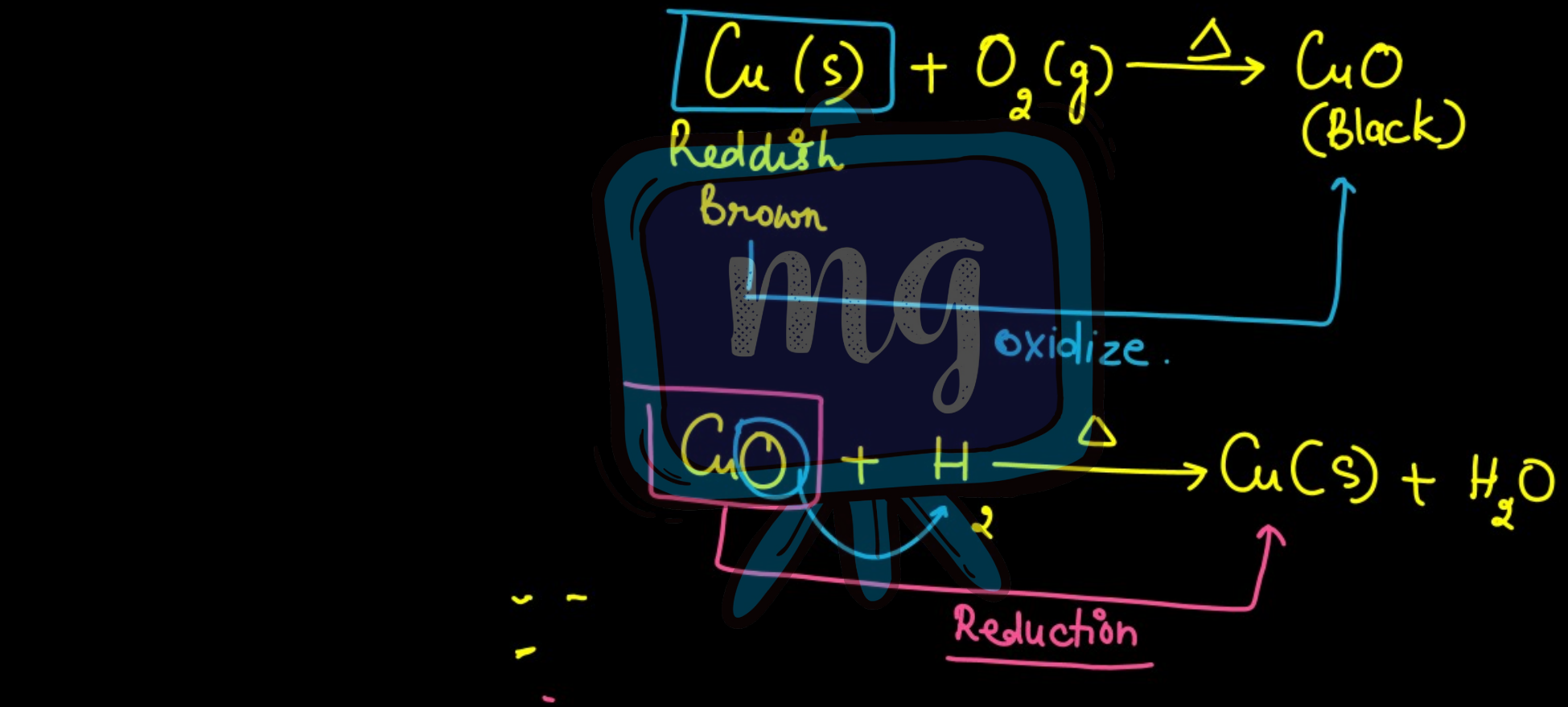
Activity -

- Heat a china dish containing about 1 g copper powder.



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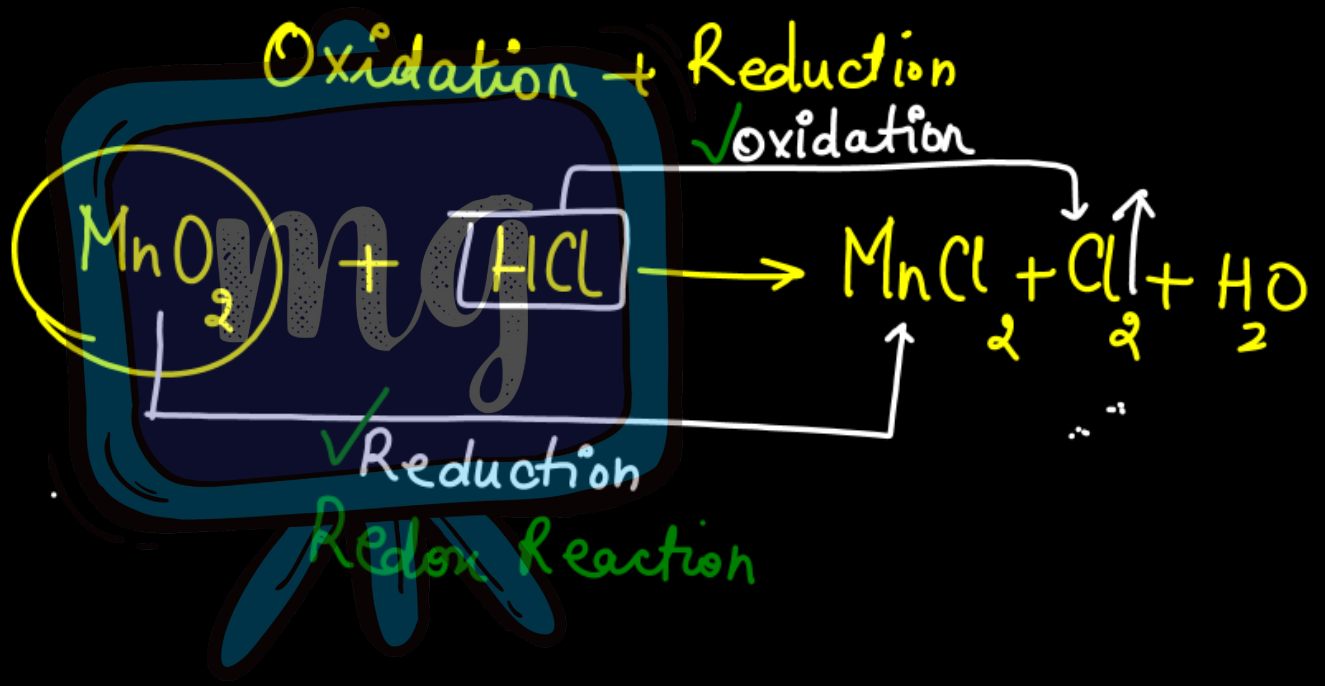


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REDOX

Oxidation + Reduction



Redox Reaction

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Observation :

- Surface of copper powder becomes coated with black copper(II) oxide.
- Copper oxide is formed.

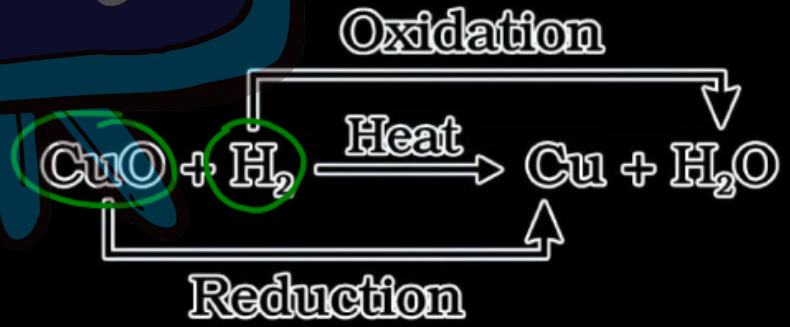
$$2Cu + O_2 \xrightarrow{\text{Heat}} 2CuO$$

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REDOX REACTION

- Involves transfer of electrons between two species.



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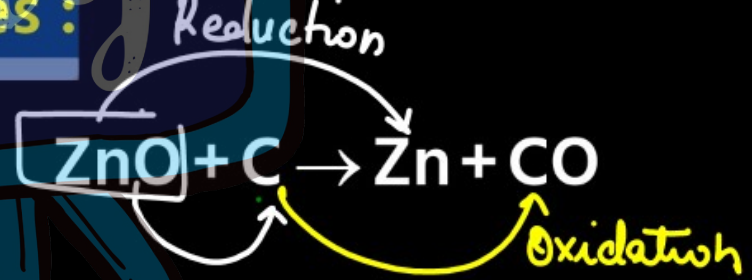
- Copper(II) oxide is losing oxygen and is being reduced.
- Hydrogen is gaining oxygen and is being oxidised.
- One reactant gets oxidised while the other gets reduced.

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- Such reactions are called oxidation-reduction reactions or redox reactions.

Examples :



- $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

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Oxidised Substance	Gains Oxygen	Reducing Agent
	Loses Hydrogen	
Reduced Substance	Addition of Hydrogen.	Oxidising Agent
	Gain of Electrons.	

Reducing Agent	Removes Oxygen
	Gives Hydrogen
Oxidising Agent	Gives Oxygen
	Removes Hydrogen

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$CuCO_3 : Cu(OH)_2$

$Fe + H_2O \rightarrow Fe_3O_4 + H_2 \uparrow (g)$

Effects of Oxidation Reactions

Corrosion

- Process in which metals are oxidized.
- Corrosive Agents
  - — Air
  - — Moisture
  - — Chemical
- Metal → Metal oxide
  Oxygen → Oxide ion

Rancidity

- Process in which oils and fats are oxidized.

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Examples of Corrosion :

1. Rusting of iron :
   - Fe_2O_3
2. Black coating on silver :
   - Ag_2S
3. Green coating on copper :
   - $Cu(OH)_2 : CuCO_3 = 1 : 1$

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Effects of Corrosion :

- Damage to ship, car bodies, bridges, iron railings.
- Corrosion of iron : a serious problem
  - Tonnes of metals wasted annually.
  - Enormous money spent to replace damaged iron.

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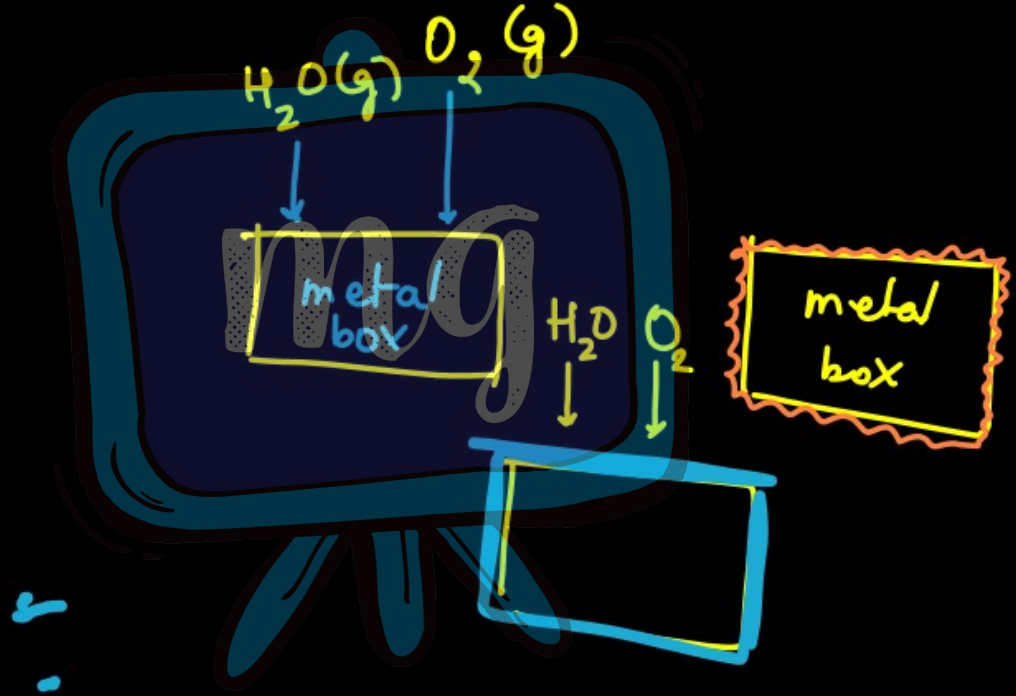
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Effects of Rancidity :

- Produce foul odor, smell and taste.
- Makes food unsuitable for consumption.

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Prevention of Corrosion :

- Painting of iron articles
- Oiling and greasing of machine parts
- Use of galvanised iron pipes for water supply.
- Coating of iron with chromium.

zinc coating

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Prevention of Rancidity :

- Store food in refrigerator.
- Store food in air-tight container.
- Addition of anti-oxidants to food.
- Flushing bags of chips with nitrogen.

Shelf life ↑

