

UNIT - VI: Corrosion

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Introduction to Corrosion

Corrosion is the deterioration of metals due to chemical or electrochemical reactions with the environment.

Factors Affecting Corrosion

- Nature of metal (reactivity, purity).
- Environmental conditions (moisture, temperature).
- Presence of electrolytes (salts, acids).

Types of Corrosion

- Chemical Corrosion: Reaction of metal with dry gases.
- Electrochemical Corrosion: Involves electron transfer reactions.
- Galvanic Corrosion: Between two dissimilar metals.
- Differential Aeration Corrosion: Due to oxygen concentration differences.

Corrosion Control

- Material Selection: Choosing corrosion-resistant metals.
- Design Aspects: Avoiding sharp corners, crevices.

Electrochemical Protection

- Sacrificial Anode Method: Attaching a more reactive metal to protect the main metal.
- Impressed Current Cathodic Protection: Applying an external current to prevent corrosion.

Surface Coating Techniques

- Metallic Coatings:
 - Anodic Coating: Zinc coating on iron (galvanization).
 - Cathodic Coating: Tin coating on iron.
- Metal Cladding: Bonding two different metals.
- Electroplating: Depositing a metal layer using electrolysis (e.g., Copper electroplating).
- Electroless Plating: Chemical deposition of metals (e.g., Nickel plating).

