

- Nernst equation- derivation, explanation, importance
- Measurement of EMF
- Primary and Secondary batteries differences.
- Advantages of using fuel cells over traditional batteries.
- Construction, working, and applications of SHE with suitable examples.
- Electrochemical series- definition, explanation and applications/ uses.
- Concentration cells- working principle.
- Hydrogen-oxygen fuel cell- working, applications.
- methanol-oxygen fuel cell- working, applications.
- Lead acid battery- working, reactions, applications.
- Nickel-Metal Hydride (NiMH) cells- working, reactions, applications.
- Working and applications of Li-ion batteries.
- Construction and working of calomel electrodes with an example.
- Determination of pH of a given unknown sample.
- Pitting corrosion- causes and mechanism.
- Factors influencing rate of corrosion.
- Wet theory of corrosion- mechanisms and effects on materials.
- Sacrificial anodic method
- Impressed current cathode method
- Theories of chemical and electrochemical corrosion
- Cathodic protection works and illustrate the impressed current method- reactions.
- Electroplating process.
- Differences between cathodic coatings and anodic coatings.
- Chemical theory of corrosion and its types with suitable examples.
- Galvanic corrosion and its mechanism
- Differential aeration corrosion mechanism with suitable examples.