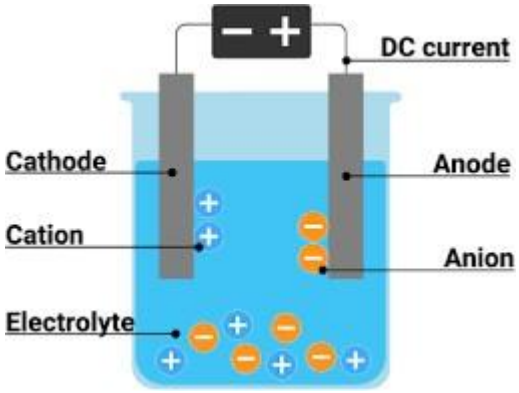
19CH201 - ENGINEERING CHEMISTRY

UNIT-1 - ELECTROCHEMISTRY

Electrolysis

It is the process of chemical decomposition(ions separation) by passing an electric current through a liquid or solution.



Electroplating

Electroplating is a process that uses an electric current to reduce dissolved metal cations (from anode) so that they form a thin coherent metal coating on an electrode (cathode). The process used in electroplating is called electrodeposition.

Electroplating of Gold:

Process:

Anode : Au

Cathode : Silver (Ag) spoon

Electrolyte : $AuCl_3$

Current density: 0.2 to 0.5 A/dm^2

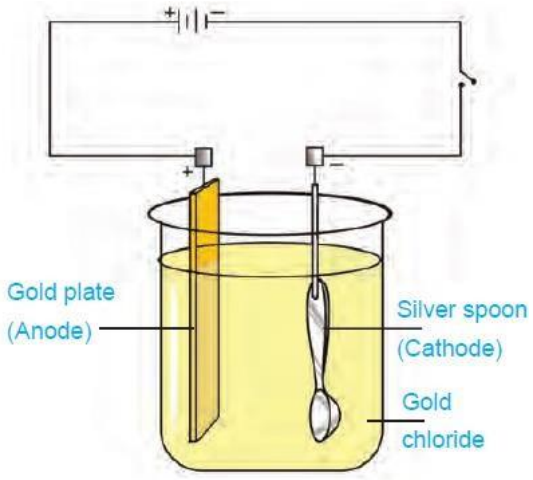
Temperature : room temperature

- Gold plating is a term that is generally used to describe a thin gold coating on an object (Silver spoon).
- In this process, the metal (gold) that has to be plated is used as the anode and the material to be plated is made the cathode (Silver spoon).
- Reactions:

  $AuCl_3$ ---------→ $Au^{3+} + 3Cl^-$
- At anode

  $Au + 3Cl^-$ --------→ $AuCl_3 + 3e^-$
- At Cathode

  $Au^{3+} + 3e$ ---------- → Au (Deposited on base metal)



- The ions of the gold are present in the electrolytic solution along with other ions that help in conducting electricity.
- The common electrolyte used in gold plating is 10% $AuCl_3$.
- When the current is applied, the metal ions in the anode get oxidized and dissolve in the electrolyte.
- These ions then get reduced at the cathode and form a thin layer on the material to be electroplated (Silver spoon).

Advantages:

- Gold plating is mainly done to improve the appearance
- Enhance the value or prevent corrosion.

- It is mostly used jewellery and also employed in the electronics industry.