

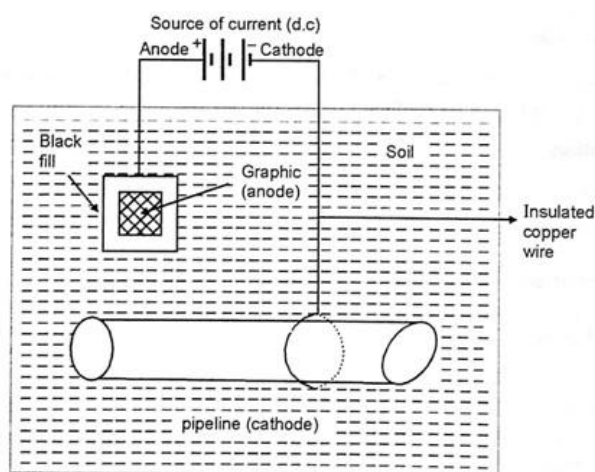


19CH101- ENGINEERING CHEMISTRY

Unit-2 CORROSION AND ITS CONTROL

IMPRESSED CURRENT CATHODIC PROTECTION

- In this method, an impressed current is applied in opposite direction to nullify the corrosion current, and convert the corroding metal from anode to cathode.
- The impressed current is slightly higher than the corrosion current. Thus the anodic corroding metal becomes cathodic and protected from corrosion.
- The impressed current is taken from a battery or rectifier on A.C. line
- The metal to be protected is made cathode by connecting to an external battery (-ve terminal)
- The anode is usually insoluble anode like graphite, stainless steel, or platinum connected to +ve terminal of the battery. Usually a sufficient D.C current is passed on to the insoluble anode kept in a black fill composed of coke or gypsum, so as to increase the electrical contact with the surrounding soil.
- In impressed current cathodic protection, electrons are supplied from an external cell, so that the object itself becomes cathodic and does not get oxidized.





Applications:

The impressed current cathodic protection is used for the protection of water tanks, water & oil pipe lines, transmission line towers etc.

Advantages

The method is mainly employed to protect large structures for long term operations.

Disadvantages

1. The method is expensive as it requires high current
2. Capital investment and maintenance costs are more
3. It is difficult to maintain uniform current over the entire metal surface as a result localized corrosion may occur.
4. The metal should not be over protected, ie, use of much high potential is avoided otherwise problems related to cathodic reactions like evolution of H₂ and formation of OH⁻ Ions takes place leading to corrosion of base metal