

6. Types of Corrosion

16 October 2023 09:38

TYPES OF CORROSION

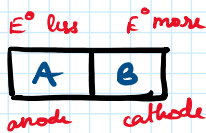
Differential metal corrosion
(or)
galvanic corrosion

Differential aeration corrosion
eg: water line corrosion,
pitting corrosion

Stress corrosion

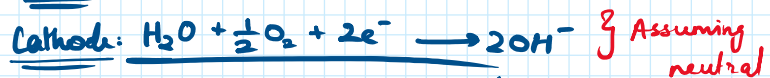
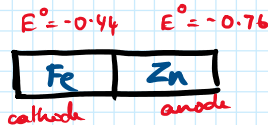
① Differential metal corrosion

- Based on E° values

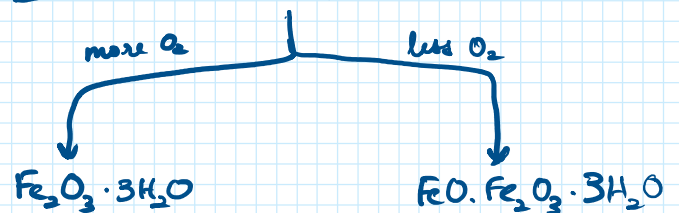
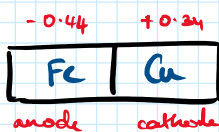


- Two dissimilar metals in contact with each other \rightarrow one acts as anode (less E°), other acts as cathode (E° more)

eg: ①



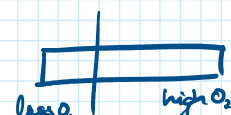
②



Important questions

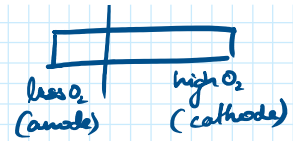
- Steel pipe connected w/ copper
- Steel bolt connected w/ copper
- Pb-Sn (alloy) soldering around copper

② Differential aeration corrosion



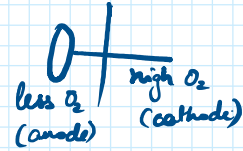
Window rod

- inside (less O_2) → Anode
- outside (more O_2) → Cathode

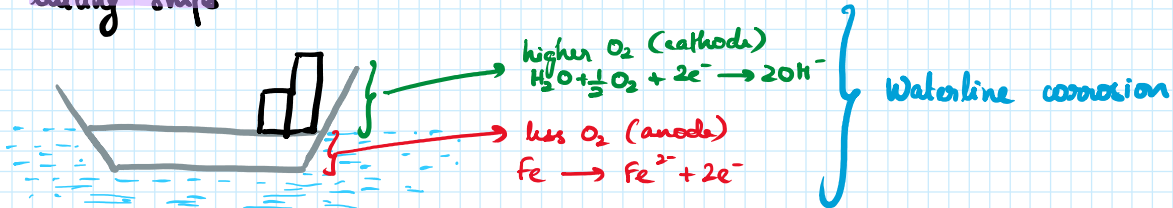


Paper pins

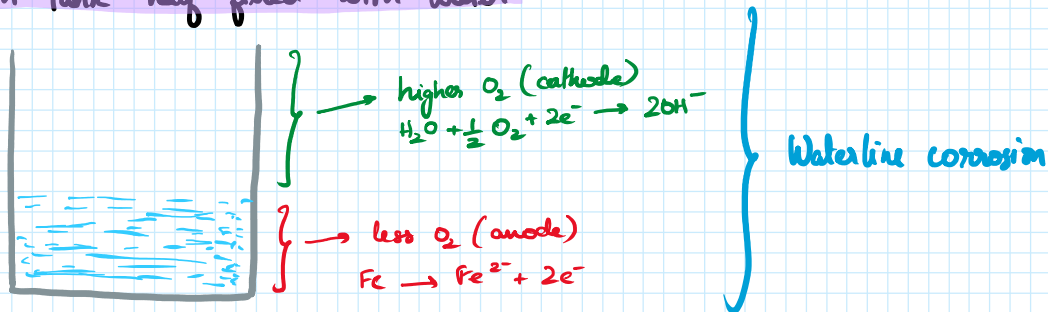
- inside (less O_2) → Anode
- outside (more O_2) → Cathode



Sailing ships

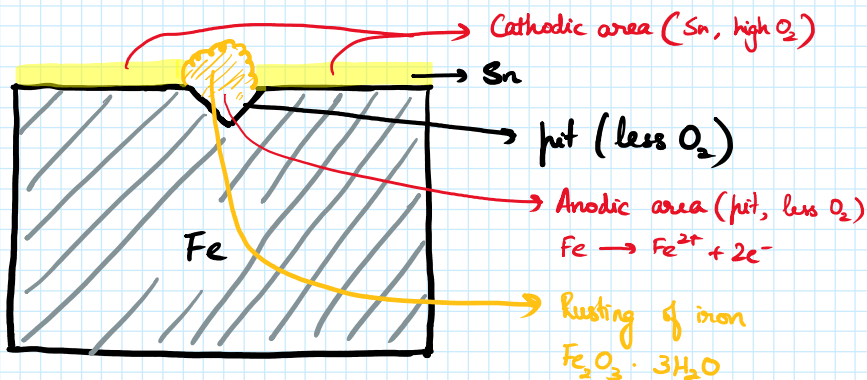
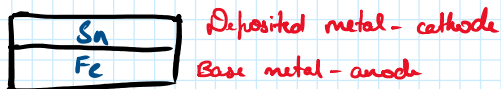


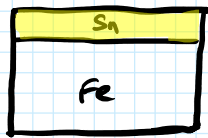
Iron tank half filled with water



Pitting corrosion

- localised accelerated corrosion
- most destructive and dangerous corrosion
- SMALL anodic area, LARGE cathodic area



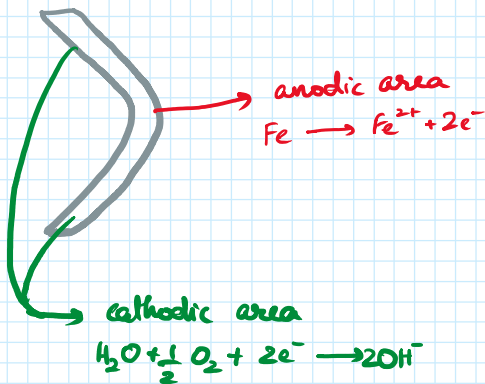


→ Peeling of ruptured Sn coating

→ Pitting corrosion (differential aeration corrosion)

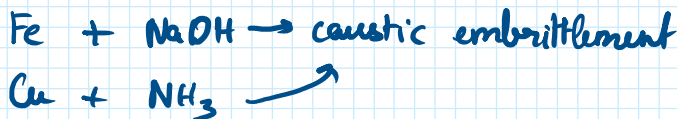
③ Stress corrosion

SCC: Stress Corrosion Cracking



• Stress from bending, hammering, riveting, pressing causes cracks in the cathodic coating, forming an anodic region

• Stress corrosion depends on
 ↳ tensile strength
 ↳ specific corrosive environment



FACTORS AFFECTING RATE OF CORROSION

- Nature of metal
- Nature of corrosive environment
- Hydrogen overvoltage
- Temperature
- pH
- Polarisation of electrodes

Nature of metal