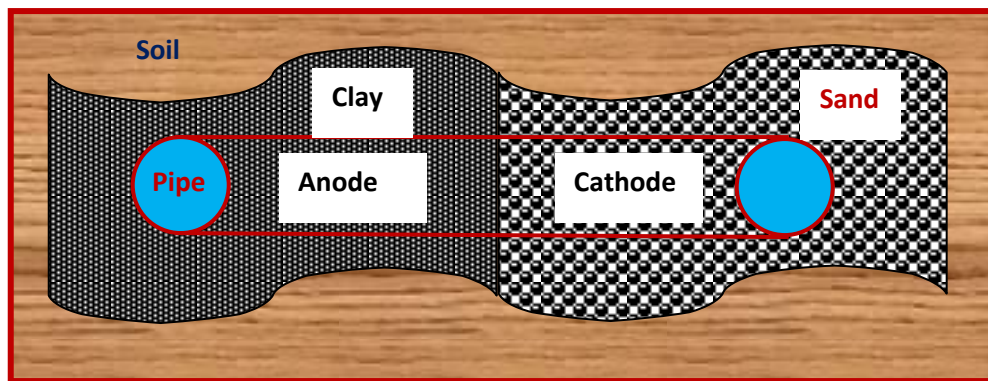


Soil Corrosion:

Soil corrosion is concentration cell corrosion occurs due to differential oxygen concentration. Buried pipelines are suffered from soil corrosion.

Consider an iron (Fe) pipeline, where one section passes through clay-based soil and the other through sand-based soil. Since clay is less aerated than sand, the section of the iron pipe in clay-based soil will act as the anode and experience corrosion.



Mechanism:

At Anode: $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$ ----- (oxidation)

At Cathode: $\frac{1}{2}\text{O}_2$ (oxidant) + $\text{H}_2\text{O} + 2\text{e}^- \rightarrow 2\text{OH}^-$ ---- (reduction)

Net reaction: $\text{Fe}^{2+} + 2\text{OH}^- \rightarrow \text{Fe}(\text{OH})_2 \rightarrow \text{Fe}(\text{OH})_3 \text{ or } \text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$

Factors affecting soil corrosion:

1. Acidity of soil
2. Degree of aeration
3. Conductivity of soil
4. Moisture and salt content of soil
5. Soil texture