Unit 5: Electrochemistry

Electricity and RedOx



Electricity

- Electricity is defined as the flow of energy through the movement of electrons
- In chemistry, movement of electrons between atoms happens when forming positive and negative ions.
 - This process of moving electrons is also referred to as oxidation and reduction.

Oxidation and Reduction - RedOx

Oxidation is the process of losing electrons

- □ When an atom **loses** electrons it forms a **positive** ion (cation)
- $\Box \quad \mathbf{Ex}: \ \mathbf{Na} \ \rightarrow \ \mathbf{Na}^{+} \ \ \mathbf{+} \ \ \mathbf{1e}^{-}$
 - The electron is shown on the right side because it comes out of Sodium in the process

Reduction is the process of gaining electrons

- □ When an atom **gains** electrons it forms a **negative** ion (anion)
- $\square \quad \textbf{Ex:} \quad \textbf{O} \quad \textbf{+} \quad 2e^{-} \quad \rightarrow \quad \textbf{O}^{2-}$
 - The electrons are shown on the left side because they are added to the oxygen in the process
- Note: # of Electrons in equation must equal # of Electrons required to change the charge.

RedOx Practice

- $\square Mg \rightarrow Mg^{2+}$ $\square Mg \rightarrow Mg^{2+} + 2e^{-}$
- $\Box F \rightarrow F^{1-}$ $\Box F + 1e^{-} \rightarrow F^{1-}$
- $\Box AI \rightarrow AI^{3+}$ $\Box AI \rightarrow AI^{3+} + 3e^{-}$
- $\Box \quad S \to S^{2-}$ $\Box \quad S + 2e^{-} \to S^{2-}$