Definitions and Concepts for Edexcel Chemistry A-level

Topic 14: Redox 2

**Anode**: Positive electrode \(\rightarrow\) site of the oxidation.

**Cathode**: Negative electrode \(\rightarrow\) site of the reduction.

**Standard hydrogen electrode**: A platinum foil immersed in 1 moldm\(^{-3}\) HCl, enclosed in a tube containing hydrogen gas at standard pressure.

**Standard cell potential (emf) \(E_{\text{cell}}\)**: Voltage measured under standard conditions when a half cell is connected to a standard hydrogen electrode. It tells us how readily a substance releases electrons relative to H\(_2\). For a spontaneous chemical reaction:

\[
E_{\text{cell}} = E_{\text{Right}} - E_{\text{left}} \quad \text{i.e. Reduction – Oxidation}
\]

The right hand cell is the one where the reduction occurs, i.e. the one with a more positive standard reduction potential. That way, the emf is positive and so \(\Delta G\) is negative (See below)

\[
\Delta G = -RT\ln K = -nF E_{\text{cell}}
\]

A strong **oxidising agent** will have a large and positive standard reduction potential.

**Standard conditions**: 298 K, 100 kPa, 1 moldm\(^{-3}\) concentration of ions.

**Salt bridge**: A porous substance soaked with a solution of an inert, strong electrolyte, e.g. a filter paper soaked in KNO\(_3\)(aq). The salt ions flow through the bridge to complete the cell and balance charges in solutions.

**Electrochemical cell**: Produces electricity from a chemical reaction (a combination of two half cells, e.g. voltaic cell).

**Storage cell**: (battery) a cell that can be recharged when the current is passed in the opposite way to the current generated by a chemical reaction in the cell.

**Fuel cell**: A cell used to harness electricity from a chemical reaction (fuel + oxygen). Chemicals are stored separately outside the cell and fed in when electricity is required.