Definitions and Concepts for Edexcel Chemistry A-level

Topic 14: Redox 2

Anode: Positive electrode → site of the oxidation.

Cathode: Negative electrode → 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_{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:

$$E_{cell} = E_{Right} - E_{left}$$ **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 ΔG is negative (See below)

$$\Delta G = -RTlnK = -nFE_{cel}$$

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.