

# Definitions and Concepts for CAIE Chemistry IGCSE

## Topic 4 Electrochemistry

Definitions in **bold** are for extended supplement only

Definitions have been taken, or modified from the CAIE Cambridge IGCSE Chemistry 0620 syllabus for 2023, 2024 and 2025.

**Anode:** The positive electrode. It is where negatively charged ions lose electrons in oxidation reactions. It is the electrode where oxygen is produced unless the solution contains halide ions - then the halogen is produced.

**Cathode:** The negative electrode. It is where positively charged ions gain electrons in reduction reactions. It is the electrode where hydrogen is produced if the metal in the electrolyte is more reactive than hydrogen.

**Chemical cell:** A cell which converts chemical energy to electrical energy. They are made up of two metal electrodes connected by an electrolyte. The cell produces a voltage until one of the reactants is used up.

**Electrode:** A solid conductive material through which electricity can flow. Positive and negative electrodes are used in electrolysis to conduct electricity.

**Electrolysis:** The decomposition of an ionic compound (molten or aqueous) using electricity. The electric current is passed through a substance causing chemical reactions at the electrodes which lead to the decomposition of the materials.

**Electrolyte:** A solution containing free ions from a molten or aqueous ionic substance. The ions are free to move to carry charge.

**Electroplating:** The process of coating a metal with a thin layer of another metal by electrolysis to improve the metal's corrosion resistance or to improve the metal's appearance.

**Fuel cell:** An electrochemical cell which continuously produces a voltage when supplied with a fuel and oxygen. The fuel donates electrons at one electrode and oxygen gains electrons at the other electrode.

**Hydrogen-oxygen fuel cell:** A fuel cell in which hydrogen and oxygen are the reactants used to produce a voltage. Water is the only product. The overall reaction for the hydrogen-oxygen fuel cell is:  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$



**Inert:** Unreactive. Inert electrodes are used in electrolysis to prevent the electrode material affecting the reactions.

**Oxidation:** The loss of electrons. Oxidation occurs at the anode where the anions lose electrons (are oxidised)

**Reduction:** The gain of electrons. Reduction occurs at the cathode where the cations gain electrons (are reduced)

