

1.11 ELECTRODE POTENTIALS AND ELECTROCHEMICAL CELLS

Electrochemical Cell

Allows ions to flow through to balance the charges

Filter paper soaked in a chemical which will not interfere with the reaction, e.g. KNO_3

Salt bridge connects the solutions

Circuits with two different metals dipped in salt solutions of their own ions and connected with a wire

Electrons flow from the more reactive metal to the less reactive metal

Redox process

Conventional representation of cells

Single line separates the different phases, double line indicates salt bridge

reduced form	oxidised form	oxidised form	reduced form
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The more negative potential is always subtracted from the more positive potential

List of standard electrode potentials

The more positive the electrode potential, the more likely the metal will be reduced

Combined and balance to form overall equation

Reversible reactions take place at each electrode

Half equations

Always written with the reduction reaction as the forward reaction, e.g.
 $\text{Zn}^{2+}_{(aq)} + 2e^- \rightleftharpoons \text{Zn}_{(s)}$

When two half cells are joined to make a cell, the metal with the more negative potential is oxidised

Cell potential (EMF or E_{cell})

Voltage between 2 cells

Measured against the standard hydrogen electrode (SHE)

SHE uses inert platinum electrode

Standard conditions

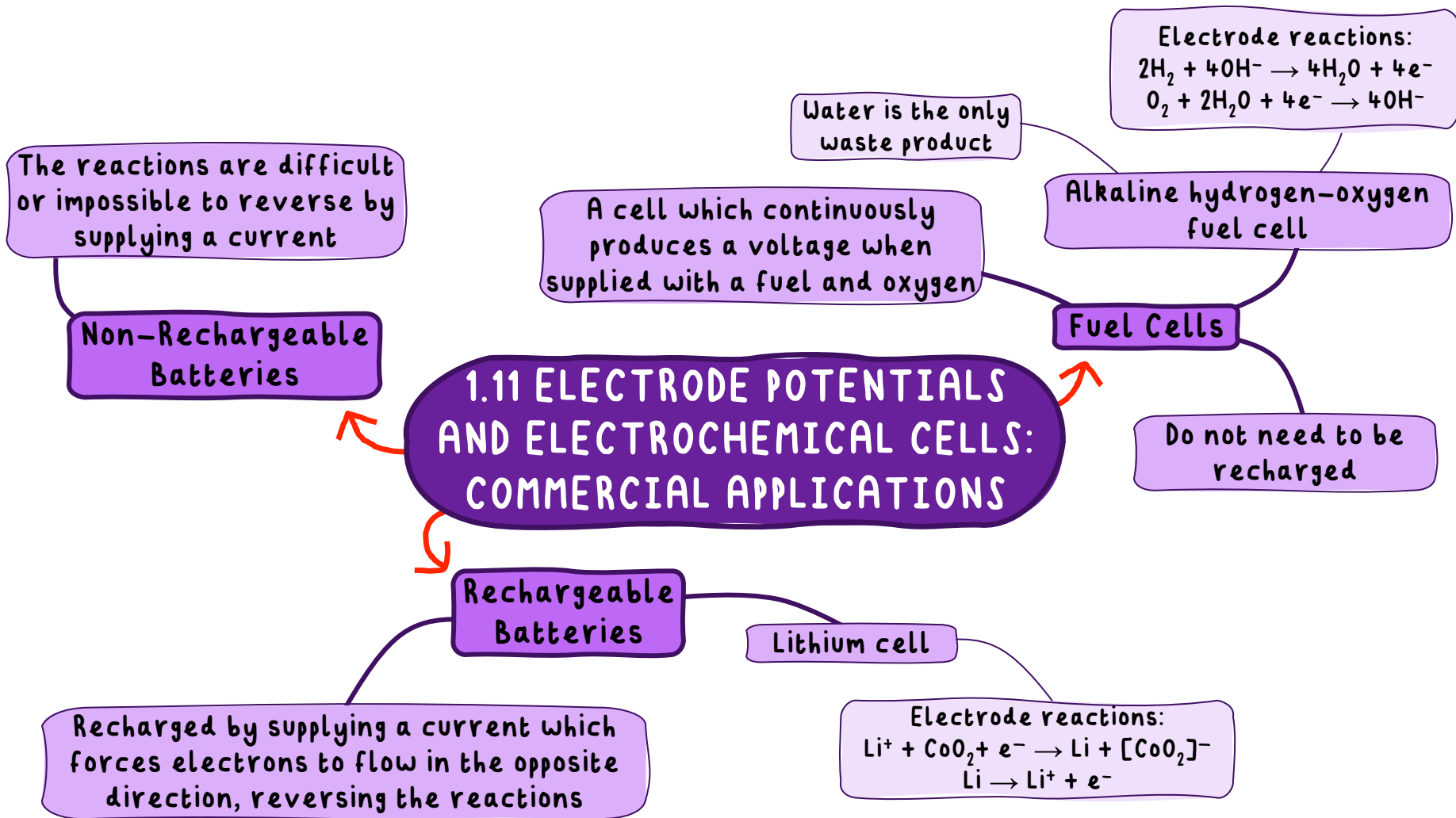
298 K, 100 kPa and all solutions of concentration 1.00 mol dm^{-3}

Electrochemical Series

Use values to calculate standard cell potential

$$E^{\ominus}_{\text{cell}} = E^{\ominus}_{\text{reduced}} - E^{\ominus}_{\text{oxidised}}$$

AQA



AQA

