

### Galvanic Cells

- Devices that spontaneously convert chemical energy into electrical energy via redox reactions

- Galvanic Oxidation at the Anode is Negative

- REDuction occurs at the CAThode (which is positive)

- Discharges & is spontaneous

-ve terminal **anode**

+ve terminal **cathode**

- 'S' shape formed on electrochemical series

### Galvanic Cell Components

- Half cells

#### Purpose Of Salt Bridge

- Anode

- To keep each half cell neutral

- Cathode

- To complete the internal circuit

- Voltmeter with connecting wires

- Salt bridge

- Solutions

- Electrodes

- Electron movement

### Electrolytes

#### Acidic

- H<sup>+</sup> ions

#### Alkaline

- OH<sup>-</sup> ions

### Primary Vs Secondary Cells

#### Primary Cells

- Can't be recharged

- Products slowly move away from electrodes or are consumed by side reactions, preventing rechargability

#### Secondary Cells

- Can be recharged

### Electrolytic Cells

- The 'reverse' of galvanic cells

- Non-spontaneous, recharges via an electrical current that is slightly higher in voltage than the cell

+ve terminal **anode** (still undergoes oxidation)

-ve terminal **cathode** (still undergoes reduction)

Electrical → chemical energy via electrolysis

'Z' shape on electrochemical series

### Battery Life Shortage Causes

- Detached products from electrode within cell

- Unwanted side reactions due to other formed chemicals

- Cell material (including electrodes) impurities

- Corrosion

- Failure of internal components

