

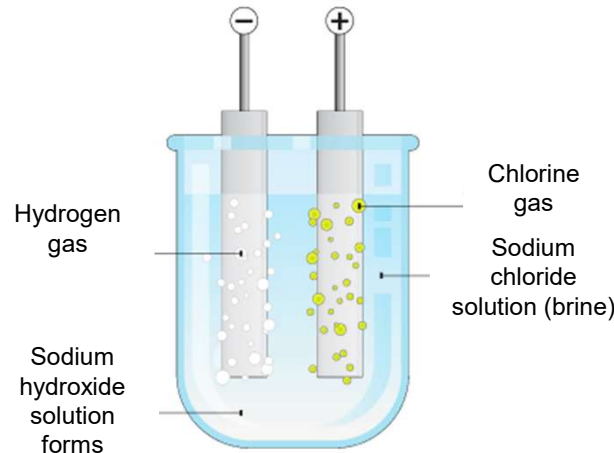
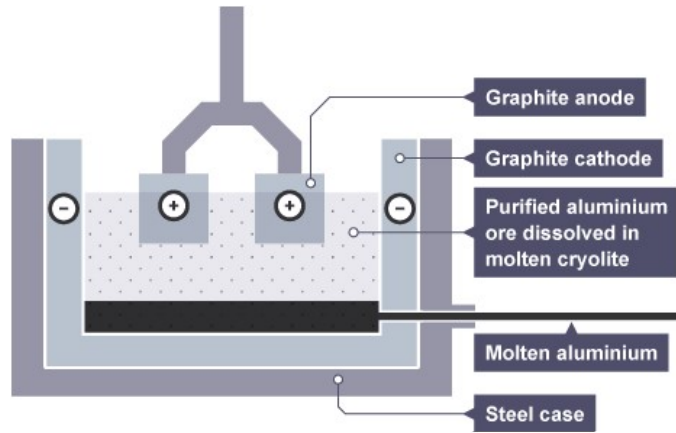
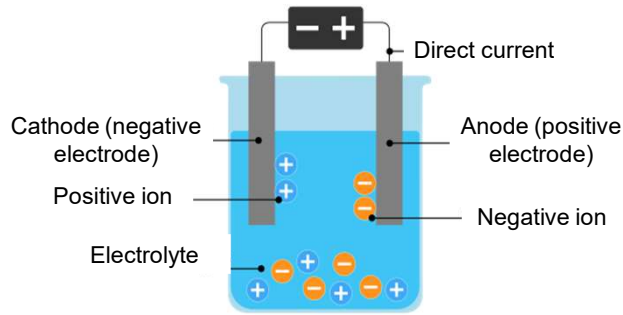
**AQA C4b Electrolysis**  
**TRIPLE CHEMISTRY**  
**RP – Electrolysis**

**Extracting Metals Using Electrolysis**

Metals can be extracted from molten or dissolved compounds using electrolysis. Aluminium is extracted in this way.

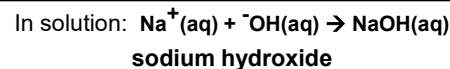
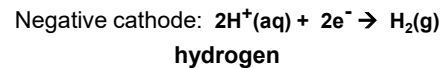
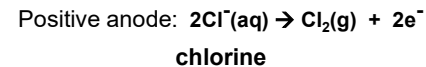
This process is used when the metal is more reactive than carbon.

It is expensive because it needs a lot of electrical energy to produce the current.



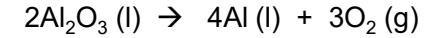
**EXAMPLE - Electrolysis of brine (NaCl in water)**

The products are H<sub>2</sub>, Cl<sub>2</sub> and NaOH

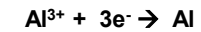


**Extracting Aluminium**

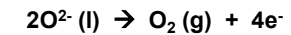
Aluminium oxide is mixed with cryolite to reduce its melting point



Aluminium forms at the negative electrode (cathode)

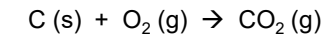


Oxygen forms at the positive electrode (anode)



**OIL RIG - Oxidation Is Loss (of electrons), Reduction Is Gain (of electrons)**

Oxygen reacts with the carbon electrodes to produce carbon dioxide, so the electrode burns away and has to be replaced



**Electrolysis of Solutions**

In water (aqueous solution):  $\text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}^+(\text{aq}) + \text{OH}^-(\text{aq})$

**at the negative electrode**

1. The metal will be produced on the electrode if it is less reactive than hydrogen, e.g. copper
2. Hydrogen will be produced if the metal is more reactive than hydrogen, e.g. sodium

**at the positive electrode**

If you have a halide ion (Cl, I, Br) then you will get chlorine, bromine or iodine formed.  
 Otherwise oxygen is formed at positive electrode from the hydroxide ion.

**Don't P.A.N.I.C.**

**Positive Anode,**

**Negative Is Cathode**

**Opposite**

**charges**

**attract**