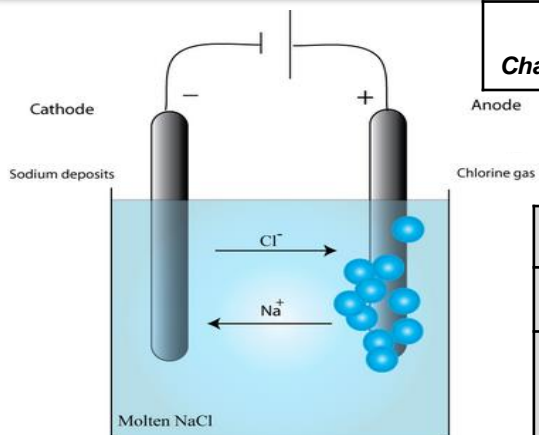


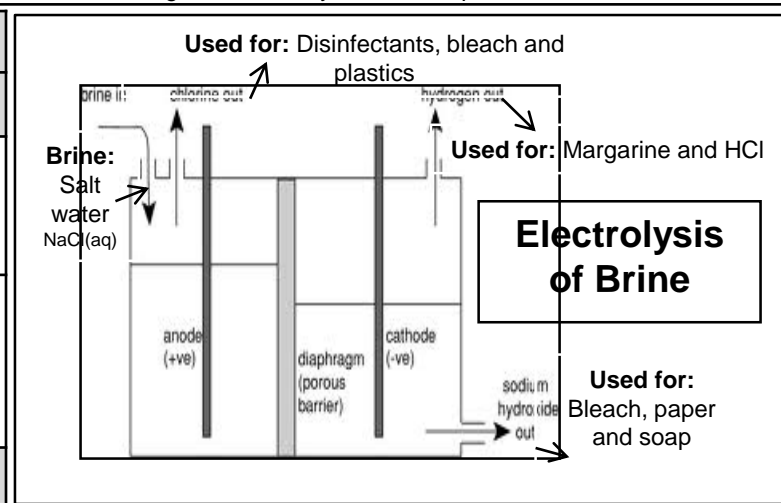
# AQA C4b Electrolysis Combined Foundation RP – Electrolysis



**Opposite  
Charges Attract**

Electrolysis		
Process of electrolysis	<b>Splitting up using electricity</b>	When an ionic compound is melted or dissolved in water, the ions are free to move These are then able to conduct electricity and are called electrolytes Passing a current through electrolytes causes the ions to move to the electrodes
Electrodes	<b>Anode &amp; Cathode</b>	The positive electrode is called the anode (+) The negative electrode is called the cathode (-)
Where do the ions go?	<b>Cations &amp; Anions</b>	<b>Cations</b> are positive ions & they move to the negative cathode <b>Anions</b> are negative ions & they move to the positive anode

Electrolysis of solutions	
In water (aqueous solution): $\text{H}_2\text{O} (\text{l}) \rightleftharpoons \text{H}^+ (\text{aq}) + \text{OH}^- (\text{aq})$	
<b>At the negative electrode</b>	1. The metal will be produced on the electrode if it is less reactive than hydrogen. 2. Hydrogen will be produced if the metal is more reactive than hydrogen.
<b>At the positive electrode</b>	If you have a halide ion ( $\text{Cl}^-$ , $\text{I}^-$ , $\text{Br}^-$ ) then you will get chlorine, bromine or iodine formed. Otherwise oxygen is formed at positive electrode from the hydroxide ion
<b>Order of discharge : Halide &gt; Hydroxide &gt; Others</b>	

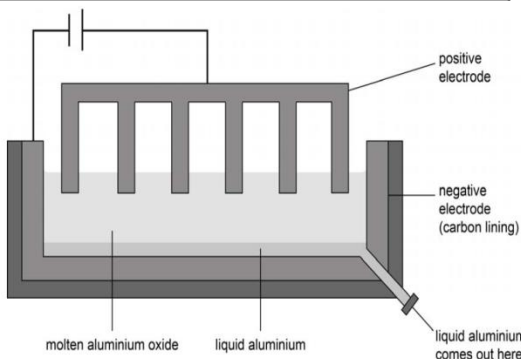


## Extracting metals using electrolysis

**Metals can be extracted from molten compounds using electrolysis.**

**This process is used when the metal is too reactive to be extracted by reduction with carbon.**

**The process is expensive due to large amounts of energy needed to produce the electrical current.  
Example: aluminium is extracted in this way.**



**Mixed with cryolite to reduce melting point**

Extracting Aluminium
<b>Aluminium Oxide → Aluminium + Oxygen</b>
$2\text{Al}_2\text{O}_3 (\text{l}) \rightarrow 4\text{Al} (\text{l}) + 3\text{O}_2 (\text{g})$
Aluminium forms at the negative electrode (cathode)
Oxygen forms at the positive electrode (anode)
<b>Oxygen reacts with the carbon electrodes to produce carbon dioxide</b>
$\text{C} (\text{s}) + \text{O}_2 (\text{g}) \rightarrow \text{CO}_2 (\text{g})$

Electrolysis of Sodium chloride solution
<b>Sodium chloride solution (brine)</b>
<b>↓</b>
<b>Hydrogen + Chlorine + Sodium hydroxide</b>
<b>Positive Anode: Chlorine gas formed</b>
<b>Negative Cathode: Hydrogen gas formed</b>
<b>In solution: Sodium Hydroxide produced</b>

**Don't P.A.N.I.C. : Positive Anode, Negative Is Cathode**