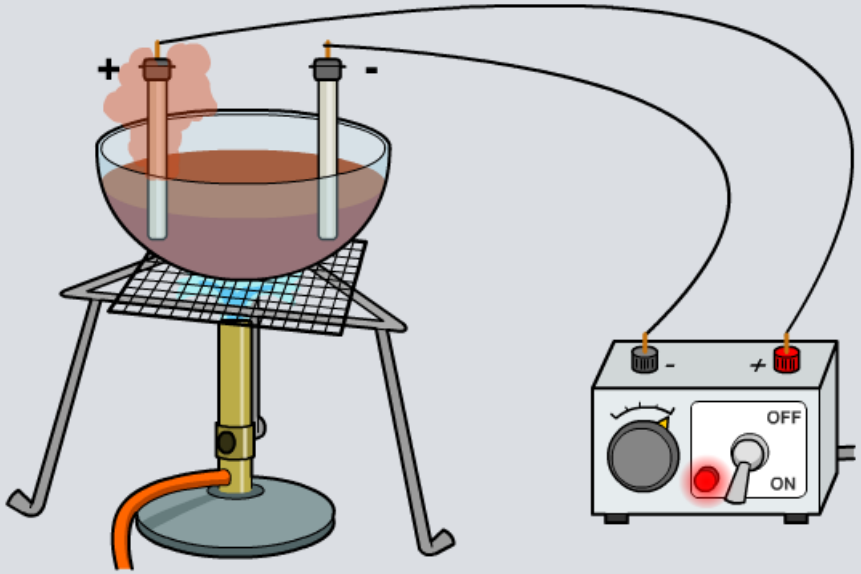
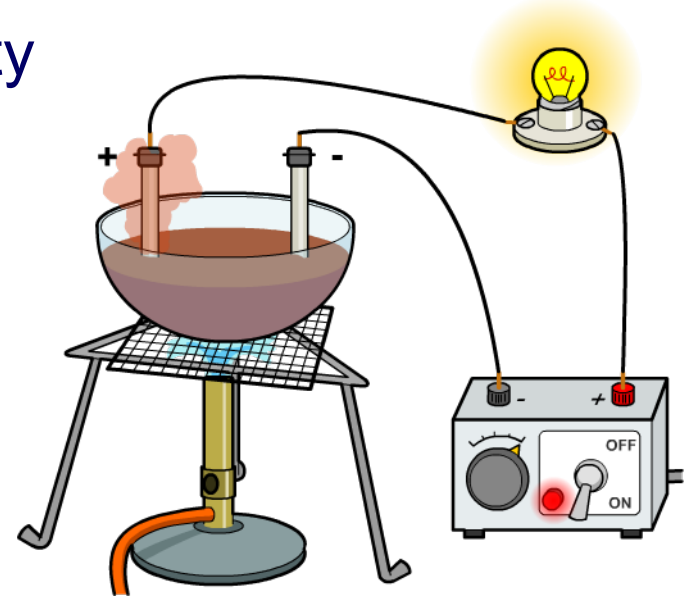
Electrolysis of Lead Bromide



What is electrolysis?

An ionic compound conducts electricity when it is molten or in solution. The current causes the ionic compound to **split up** and form new substances.



This process is called **electrolysis**, a word that comes from Greek and means "**splitting by electricity**".

Electrolysis has many uses, including:

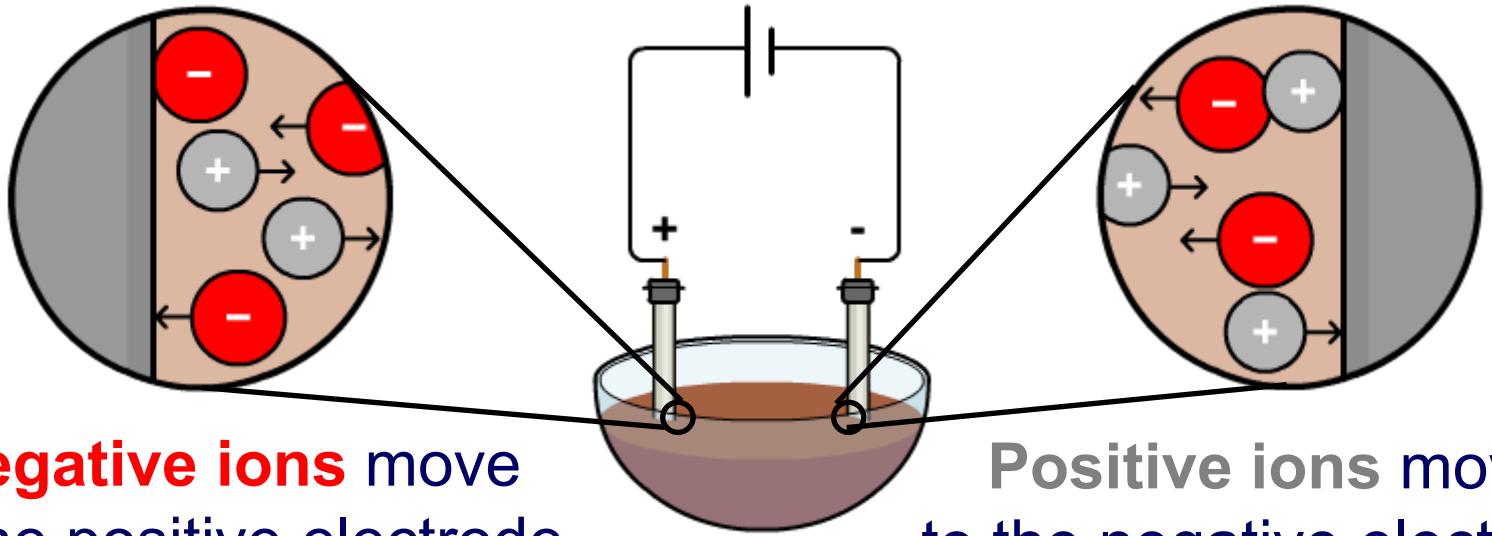
- purifying copper
- plating metals with silver and gold
- extracting reactive metals, such as aluminum
- making chlorine, hydrogen and sodium hydroxide.

What happens during electrolysis?

In electrolysis, the substance that the current passes through and splits up is called the **electrolyte**.

The electrolyte contains positive and negative **ions**.

What happens to these ions during electrolysis?



Negative ions move to the positive electrode and **lose electrons**.

This is **oxidation**.

heat

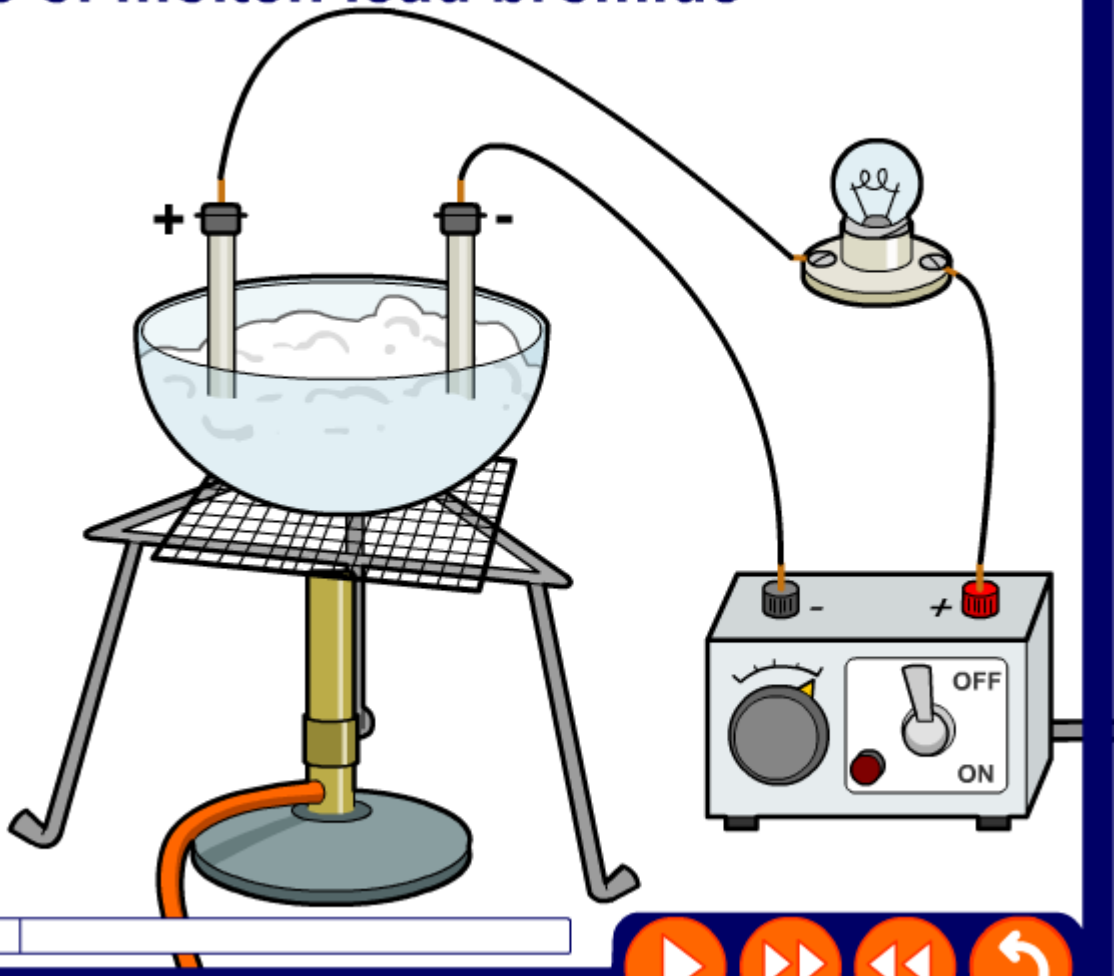
Positive ions move to the negative electrode and **gain electrons**.

This is **reduction**.

Electrolysis of molten lead bromide

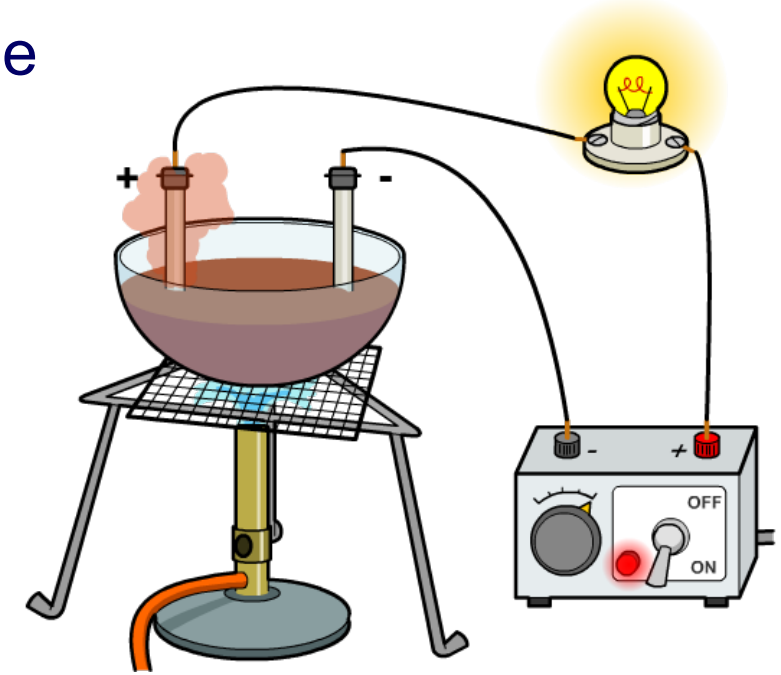
A molten ionic compound can be split into its elements by passing an electric current through it. This is called **electrolysis**.

Click "**play**" to find out what happens during the electrolysis of molten lead bromide.



Electrolysis of molten $PbBr_2$ – redox equations

What redox processes occur at the electrodes during the electrolysis of molten lead bromide ($PbBr_2$)?



At the negative electrode:

$Pb^{2+} + 2e^- \rightarrow Pb$ (reduction)

At the positive electrode:

$2Br^- \rightarrow Br_2 + 2e^-$ (oxidation)

What is the overall equation for the electrolysis of molten lead bromide?

lead **bromide** → lead **+ bromine**

$PbBr_2$ (l) → Pb (l) + Br_2 (g)

Electrolysis of molten $PbBr_2$ – summary

What are the missing words about the electrolysis of molten lead bromide?

1. A molten ionic compound conducts electricity because its ions are [?] to move.

2a. When a current is passed through a [?] ionic compound, it is split up into its elements.

2b. This process is called [?].

3. The electrolysis of molten lead bromide produces molten [?] and [?] gas.

?

C solve