AQA Chemistry GCSE

Required Practical 3 - Electrolysis

Flashcards

How do you set up a general electrolysis experiment?

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- Place the positive and negative electrodes in a beaker containing a molten or dissolved ionic compound
- Connect both electrodes to a power supply with wires

How could you investigate what happens when an aqueous solution of $CuCl_2$ is electrolysed?

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- Half fill a beaker with aqueous $CuCl_2$
- Place a lid on the beaker and insert the electrodes into the solution through holes in the lid (electrodes must not touch)
- Connect the electrodes to a low voltage power supply
- Switch the power supply on to 4V
- Turn off the power after a few minutes and record any observations

What forms at the cathode and the anode in electrolysis?

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Cathode: Metals or hydrogen

Anode: Non-metals

What would you observe at each electrode when copper chloride solution is electrolysed?

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Positive electrode: Bubbles of gas (chlorine)

Negative electrode: Electrode coated with a brown solid (copper)

What would you observe at each electrode when sodium chloride solution is electrolysed?

What would you observe at each electrode when copper chloride solution is electrolysed?

Positive electrode: Bubbles of gas (chlorine)

Negative electrode: Bubbles of gas rapidly produced (hydrogen)

Draw a diagram of the apparatus set up when copper chloride solution is electrolysed

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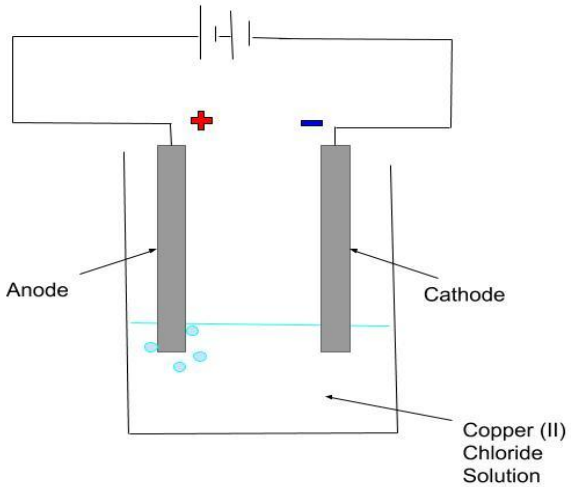

Why must the positive electrode (anode) be regularly replaced?

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The positive electrode is made of carbon and will react with oxygen to produce carbon dioxide

Write half equations for the reactions that occur at the electrodes when aqueous $CuCl_2$ is electrolysed

(higher only)

Write half equations for the reactions that occur at the electrodes when aqueous $CuCl_2$ is electrolysed (higher only)

Cathode: $Cu^{2+} + 2e^- \rightarrow Cu$

Anode: $2Cl^{2-} \rightarrow Cl_2 + 2e^-$

Write half equations for the reactions that occur at the electrodes when aqueous NaCl is electrolysed (higher only)

Write half equations for the reactions that occur at the electrodes when aqueous NaCl is electrolysed (higher only)

Cathode: $2H^+ + 2e^- \rightarrow H_2$

Anode: $2Cl^- \rightarrow Cl_2 + 2e^-$

In the electrolysis of NaCl hydrogen is produced at the cathode. Why is sodium not produced?

In the electrolysis of NaCl hydrogen is produced at the cathode. Why is sodium not produced?

Hydrogen is produced because sodium is more reactive than hydrogen.

Sodium remains in the solution.

How could you test that chlorine gas was produced at the anode?

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The gas produced will bleach damp litmus paper - it will turn white

How could you test that hydrogen gas was produced at the anode?

How could you test that hydrogen gas was produced at the anode?

The gas produced will make a squeaky pop with a lighted splint

How could you test that oxygen was produced at the anode?

How could you test that oxygen was produced at the anode?

The gas produced will relight a glowing splint