Electrolysis – 2022 GCSE Gateway Chemistry A

1. May/2022/Paper_ J248/01/No.9

During the electrolysis of molten sodium chloride, sodium and chlorine are formed.

What happens at the **positive** electrode (anode)?

A The chloride ion, Cl^-, gains an electron.

B The chloride ion, Cl^-, loses an electron.

C The sodium ion, Na^+, gains an electron.

D The sodium ion, Na^+, loses an electron.

Your answer ☐ **[1]**

2. May/2022/Paper_ J248/01/No.15

Which products are formed in the electrolysis of aqueous copper sulfate, $CuSO_4$ using inert electrodes?

A Copper and oxygen

B Copper and sulfur dioxide

C Hydrogen and oxygen

D Hydrogen and sulfur dioxide

Your answer ☐ **[1]**

3. May/2022/Paper_ J248/03/No.8

Molten sodium chloride can be electrolysed.

What is the correct half equation for the reaction at the negative electrode (cathode)?

A $2Cl^- - 2e^- \rightarrow Cl_2$

B $2H^+ + 2e^- \rightarrow H_2$

C $Na^+ + e^- \rightarrow Na$

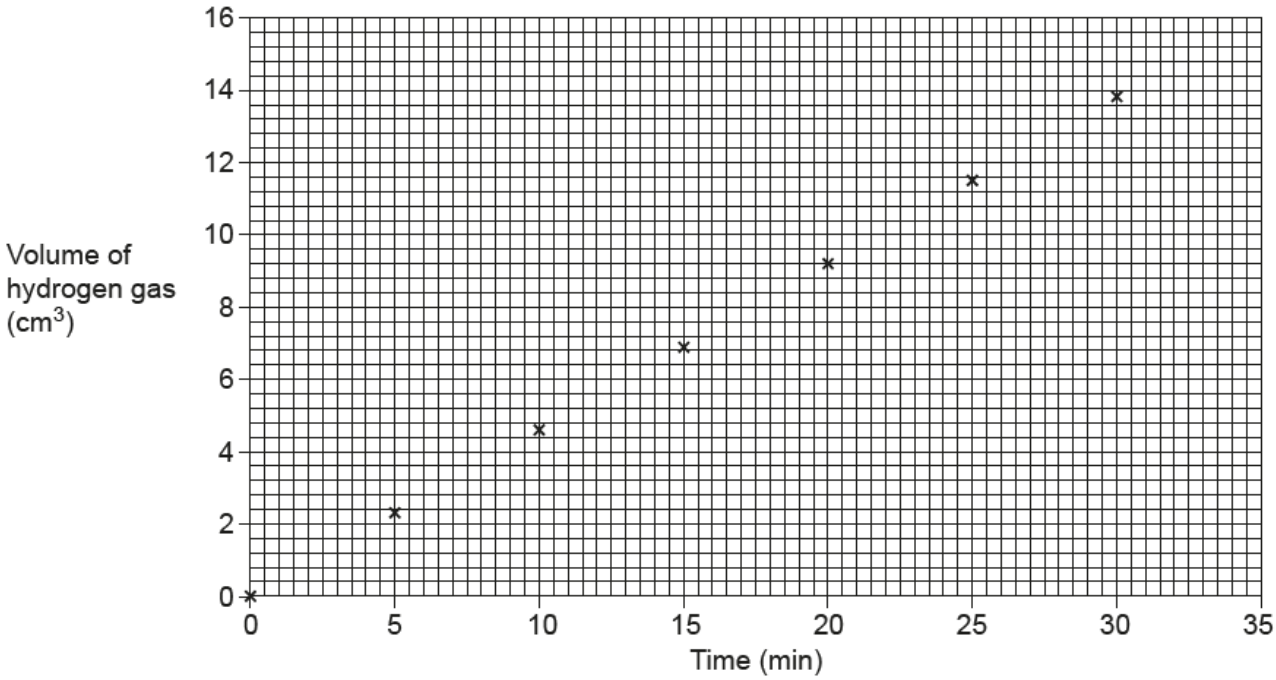
D $4OH^- - e^- \rightarrow O_2 + 2H_2O$

Your answer ☐ **[1]**

4. May/2022/Paper_ J248/03/No.19

A teacher sets up an experiment to investigate the electrolysis of aqueous sodium chloride, NaC*l*.
The teacher measures the volume of hydrogen gas given off.

The teacher plots the results on a graph.



(a) (i) Draw a line of best fit on the graph. **[1]**

(ii) What is the volume of hydrogen gas given off after 23 minutes?

Volume of hydrogen gas = ... cm^3 **[1]**

(iii) Which electrode is hydrogen gas given off at?

..... **[1]**

(iv) State the name of the product made at the other electrode.

..... **[1]**

(b) A student repeats the teacher's experiment with aqueous copper sulfate, $CuSO_4$.
The student finds that **no** hydrogen gas is given off.

Explain why hydrogen gas is given off in the electrolysis of aqueous NaC*l*, but **not** in the electrolysis of aqueous $CuSO_4$.

.....

.....

.....

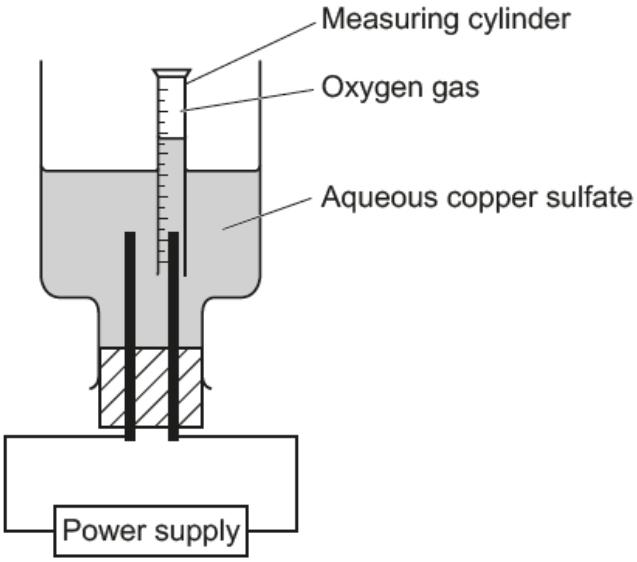
.....

.....

..... **[3]**

(c) In the electrolysis of aqueous copper sulfate, copper is also made.

The teacher sets up an experiment to measure the volume of oxygen gas made.



Explain how the student could change the experiment to measure the amount of copper formed.

.....

.....

.....

.....

..... **[3]**