

Basics of Electrolysis and Electrodes

Q1. (2018)

A)

- 6 (a) Molten zinc chloride is an electrolyte.
- (i) Which row shows the products formed at the anode and at the cathode when molten zinc chloride is electrolysed?

(1)

	product at anode	product at cathode
☐ A	oxygen	zinc
☐ B	chlorine	hydrogen
☐ C	chlorine	zinc
☐ D	oxygen	hydrogen

B)

- (ii) Which of the following is the reason why molten zinc chloride is an electrolyte?

(1)

- ☐ A it contains molecules that can move
- ☐ B it has a giant structure
- ☐ C it contains delocalised electrons
- ☐ D it contains ions that can move

Q2. (2018) – 6b

- (b) Copper sulfate solution was electrolysed using copper electrodes.
- (i) Draw a labelled diagram to show the apparatus that is used to carry out this electrolysis in the laboratory.

(2)

Q3. (2019) – 3a (ii)

- 3 (a) Water, acidified with sulfuric acid, is decomposed by electrolysis. The water is decomposed to produce hydrogen and oxygen.
- (ii) Throughout the experiment the volume of hydrogen and the volume of oxygen are measured at two-minute intervals.

The results are shown in Figure 2.

time in minutes	volume of hydrogen in cm ³	volume of oxygen in cm ³
0	0	0
2	4	2
4	8	4
6	12	6
8	16	8

Figure 2

Describe, using the data in Figure 2, what the results show about the volumes of hydrogen and of oxygen produced in this experiment.

(2)

Q4. (2019) – 3b

(b) Molten lead bromide is electrolysed.

The products of this electrolysis are

(1)

- ☐ A hydrogen and bromine
- ☐ B hydrogen and oxygen
- ☐ C lead and bromine
- ☐ D lead and oxygen

Q5. (2019) – 3c

(c) Calcium nitrate and calcium carbonate are both ionic compounds.

Calcium nitrate mixed with water behaves as an electrolyte.

Calcium carbonate mixed with water does not behave as an electrolyte.

Explain, in terms of solubility and movement of ions, this difference in behaviour.

(2)

Q6. (2020) – 2a (ii, iii)

2 Figure 3 shows the apparatus that can be used to electrolyse sodium sulfate solution using inert electrodes.

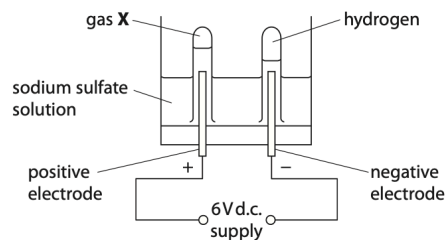


Figure 3

(a) Hydrogen is produced at the negative electrode during electrolysis.

A)

(ii) What is the name of gas X that forms at the positive electrode?

(1)

- ☐ A ammonia
- ☐ B oxygen
- ☐ C nitrogen
- ☐ D sulfur dioxide

B)

(iii) State what is meant by the term **electrolysis**.

(2)

Q7. (2021)

A)

5 This question is about electrolysis.

(a) A sample of molten potassium bromide is electrolysed.

What are the two products formed?

(1)

- ☐ A hydrogen and oxygen
- ☐ B hydrogen and bromine
- ☐ C potassium and oxygen
- ☐ D potassium and bromine

B)

(b) Zinc chloride and zinc carbonate contain ions.

Zinc chloride mixed with water can be electrolysed.

Zinc carbonate mixed with water cannot be electrolysed.

Explain this difference.

(2)

C)

(c) In the electrolysis of sodium chloride solution, bubbles of a colourless gas form at the cathode.

This gas, when mixed with air, burns with a squeaky pop.

(i) Identify this gas.

(1)

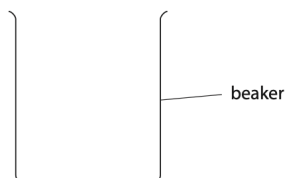
Q8. (2021) – 5d

(d) A solution of copper sulfate in a beaker is electrolysed using copper electrodes.

(i) Draw a labelled diagram to show how this experiment would be set up.

The beaker has been drawn for you.

(2)



Q7. (2022)

5 When copper sulfate solution is electrolysed using copper electrodes, the mass of each electrode changes.

(a) Draw a labelled diagram to show the apparatus that can be used to electrolyse copper sulfate solution using copper electrodes.

(2)

Q8. (2023)

- 6 A student investigates the mass of copper produced when copper chloride solution in a beaker is electrolysed using inert electrodes.

(a) Where is copper formed during the electrolysis?

(1)

- ☐ A at the anode
- ☐ B at the bottom of the beaker
- ☐ C at the cathode
- ☐ D on the surface of the electrolyte

Q9. (2024)

- 7 (a) Water, acidified with dilute sulfuric acid, was electrolysed for 10 minutes using inert electrodes.

Figure 5 shows the apparatus used.

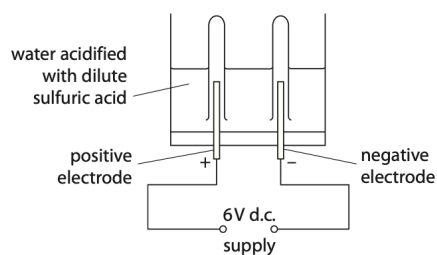


Figure 5

A)

- (i) In this electrolysis, the acidified water is an electrolyte.

Explain why acidified water is an electrolyte.

(2)

B)

- (ii) Hydrogen collects at the negative electrode and oxygen collects at the positive electrode.

Which of these shows the results after 10 minutes of this electrolysis?

(1)

