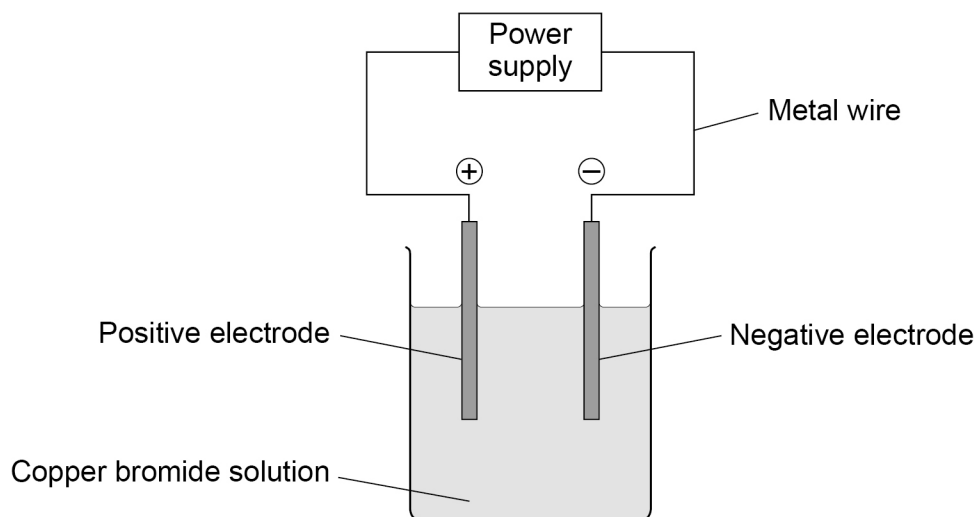


0 4

Copper bromide solution is electrolysed using inert electrodes.

Figure 11 shows the apparatus.

Figure 11



0 4 . 1

Which particles carry the electrical charge through the metal wire?

[1 mark]

Tick (✓) **one** box.

Electrons

Neutrons

Protons

Question 4 continues on the next page

Turn over ►



There are four ions in copper bromide solution:

- Cu^{2+}
- Br^-
- H^+
- OH^-

0 4 . 2 Two of these ions are formed when a water molecule breaks down.

The symbol equation when a water molecule breaks down is:



Complete the **word** equation for the breakdown of a water molecule.

[2 marks]

water \rightarrow _____ ion + _____ ion

0 4 . 3 Copper ions and bromide ions carry the electrical charge through the solution.

The formula of a copper ion is Cu^{2+}

The formula of a bromide ion is Br^-

What is the formula of copper bromide?

[1 mark]

Tick (✓) **one** box.

CuBr

Cu_2Br

CuBr_2



0 4 . 4 Explain why copper ions (Cu^{2+}) move to the negative electrode.

[2 marks]

0 4 . 5 Complete the sentence.

Choose the answer from the box.

[1 mark]

decomposed	discharged	distilled
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At the negative electrode copper metal is produced when the copper ions are _____.

0 4 . 6 What happens to the mass of the **negative** electrode during electrolysis?

[1 mark]

Tick (✓) **one** box.

Decreases	<input type="checkbox"/>
No change	<input type="checkbox"/>
Increases	<input type="checkbox"/>

Turn over ►



There are four ions in copper bromide solution:

- Cu^{2+}
- Br^-
- H^+
- OH^-

0 4 . 7

What is produced at the **positive** electrode when copper bromide solution is electrolysed?

[1 mark]

Tick (✓) **one** box.

Bromine

Hydrogen

Oxygen

9



Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	electrons		1	AO1 5.2.2.8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	(water →) hydrogen (ion) + hydroxide (ion)	allow for 1 mark hydrogen (ion) allow for 1 mark hydroxide (ion)	2	AO1 5.4.3.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	CuBr ₂		1	AO2 5.1.1.1 5.4.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	(copper ions) are positive(ly charged) (so are) attracted (to the negative electrode)		1	AO1 5.4.3.1 5.4.3.4
			1	RPA9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	discharged		1	AO1 5.4.3.1 5.4.3.4 RPA9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.6	increases		1	AO2 5.4.3.1 5.4.3.4 RPA9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	bromine		1	AO2 5.4.3.1 5.4.3.4 RPA9

Total Question 4	9
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