

Electrolysis

Mark Scheme 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Chemistry
Exam Board	AQA
Topic	5.4 Chemical Changes
Sub-Topic	Electrolysis
Difficulty Level	Bronze Level
Booklet	Mark Scheme 1

Time Allowed: 56 minutes

Score: /56

Percentage: /100

Grade Boundaries:

M1.(a)	bromine	1
	ions	1
	atoms	1
(b)	correct scale on y axis	1
	points correctly plotted using the scale $\pm \frac{1}{2}$ small square	1
	best-fit line drawn	1
(c)	value for oxygen divided by corresponding time	1
	$\times 60$	1
	$= 0.05 \text{ (cm}^3 / \text{s)}$ <i>allow 0.05 with no working shown for 3 marks</i>	1
		[9]

M2.(a) any **one** from:

- protection / improve lifespan
- improve appearance.

1

(b) (i) Bleach

1

(ii) Hydrogen is less reactive than sodium

1

(iii) 1 bonding pair of electrons 6 unbonded electrons on Cl
accept dot, cross or e or – or any combination

1

(iv) Covalent

1

(v) Hydrogen chloride has a low boiling point.

1

Hydrogen chloride is made of simple molecules.

1

(c) (i) oxygen

accept carbon dioxide

1

(ii) aluminium ions are positive

1

so are attracted (to the negative electrode)

allow opposites attract

1

(iii) Reduction

1

(iv) slide

allow move

1

(d) (i) C

1

(ii) strong covalent bonds

1

[14]

M3.(a) (i) ions cannot move

allow only conducts as a liquid

1

(ii) chlorine

1

(iii) they are positively / oppositely charged

or

they are attracted

1

(iv) 2

1

(b) (i) any **one** from:

- not all the magnesium was collected
allow some magnesium was lost
- *used less time or lower current or different battery / power pack or different balance or lower voltage*
- error in reading balance
- error in recording result

1

(ii) 1.11

correct answer with or without working gains 2 marks.

if answer incorrect, allow 1 mark for 0.99

or *for 1.13 + 1.11 + 1.09*

2

(c) (i) 25 – 25.3

correct answer with or without working gains 2 marks.

If answer incorrect, allow 1 mark for 24 / 95

2

(ii) 71

1

(d) (i) reversible reaction

1

(ii) decreases

1

[12]

M4.(a) cannot move

1

(b) (i) a positive charge

1

(ii) atoms

1

[3]

M5.(a) (i) was well qualified

1

(ii) check the results of the experiment

1

(b) (i) cannot move

1

(ii) melt it / make it a liquid

allow heat it

allow dissolve (in water) / make a solution

1

(iii) they are positive

allow opposites attract or opposite charges

1

(iv) atoms

1

[6]

M6. (a) reduction

1

(b) carbon is less reactive than aluminium

1

(c) aluminium (ions) / they are positively charged

they = aluminium ions

ignore particle names

accept aluminium (ions) / they are cations

allow aluminium (ions they have an opposite charge

1

so they are attracted **or** they move towards the negative electrode

OR

aluminium (ions) / they need to gain electrons (1)

which come from the negative electrode (1)

if no other marks awarded allow 'opposites attract' for 1 mark

1

(d) aluminium has a low density

1

aluminium is resistant to corrosion

1

(e) **advantage** less carbon dioxide is produced

1

disadvantage used aluminium cans have to be collected and transported

1

[8]

M7. (a) cannot move

1

(b) water

1

(c) (i) a positive charge

1

(ii) atoms

1

[4]