AQA GCSE Chemistry

Atomic structure and the periodic table mark scheme · goes with “Atomic structure and the periodic table · Foundation tier” · whiteboardchemistry.com/revision/gcse-chemistry/exam-questions

Mark schemes

Atomic structure and the periodic table · Foundation tier · 6 questions

Q1 · June 2024 · Paper 1 Foundation · Q1 · [9 marks]

01.1

D

[1 mark]

01.2

C

[1 mark]

01.3

sections A, B and C

[1 mark]

01.4

can be bent and shaped

good conductor of electricity

[2 marks]

01.5

allow any combination of ×, •, ○, $e^{(-)}$ for electrons

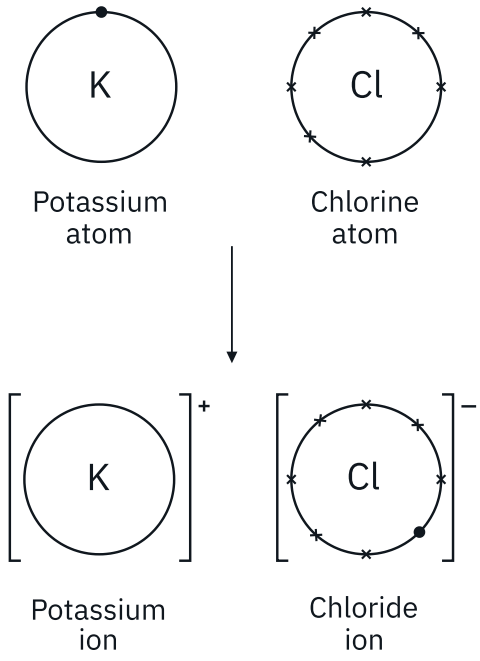
ignore any inner shells

evidence of the outer electron on the potassium atom moving to leave a potassium ion with no outer electrons

allow potassium ion with eight outer electrons

chloride ion with eight outer electrons

an answer of



scores 2 marks

[2 marks]

01.6

B

[1 mark]

01.7

A

[1 mark]

Q2 · June 2024 · Paper 1 Foundation · Q10 · Paper 1 Higher · Q3 · [8 marks]

10.1

(model A) plum pudding

allow Thomson (model)

(model B) Bohr

allow nuclear (model)

allow planetary (model)

allow Rutherford-Bohr (model)

[2 marks]

10.2

Level 2 (3–4 marks): Scientifically relevant features are identified; the way(s) in which they are similar / different is made clear and (where appropriate) the magnitude of the similarity / difference is noted.

Level 1 (1–2 marks): Relevant features are identified and differences noted.

No relevant content (0 marks)

Indicative content

Similarities

- both contain electrons
- both are neutral overall

Differences

- model A has no nucleus **or** the model used today has a nucleus
- model A has no protons **or** the model used today has protons
- model A has no neutrons **or** the model used today has neutrons
- model A has positive charge spread throughout the atom **or** model A is a ball of positive charge
- the model used today has the positive charge in the centre
- model A the electrons are distributed randomly
- the model used today has electrons in shells / energy levels
- the mass was spread throughout model A
- the mass is concentrated at the centre of the model used today
- model A does not have empty space
- model used today is mostly empty space

[4 marks]

10.3

atoms with the same number of protons

allow atoms of the same element

allow atoms with the same atomic number

ignore references to electrons

with different numbers of neutrons

[2 marks]

Q3 · June 2024 · Paper 1 Foundation · Q9 · Paper 1 Higher · Q2 · [11 marks]

09.1

allow energy level for shell

(similarity)

both have one outer (shell) electron

allow same number of outer (shell) electrons

(difference)

sodium has 3 shells but potassium has 4 shells

allow potassium has more shells

allow (different) number of shells

[2 marks]

09.2

any **two** from:

- effervescence / bubbles / fizzing
- (potassium) floats
- (potassium) moves around
- (potassium) becomes smaller
- (potassium) melts
- flame
- explosion

ignore gas produced

allow (potassium) forms a ball

ignore colour of flame

[2 marks]

09.3

blue / violet / purple

(the solution is) alkaline

allow (the solution) contains

OH^- (ions)

allow (the solution) contains hydroxide ions

allow the solution is basic

[2 marks]

09.4

all five points correctly plotted

allow a tolerance of ± ½ a small square

*allow **1** mark for three or four points correctly plotted*

[2 marks]

09.5

3.4 (mg/cm^3)

allow a value in the range 3.0 to 3.8 (mg/cm^3)

[1 mark]

09.6

chlorine and potassium bromide

[1 mark]

09.7

relative molecular mass increases and boiling point increases

[1 mark]

Q4 · June 2025 · Paper 1 Foundation · Q1 · [7 marks]

01.1

zinc bromide

[1 mark]

01.2

Symbol of element	Name of element	Number of atoms of the element in a molecule of C_2H_6O
C	**Carbon**	2
H	Hydrogen	**6**
O	Oxygen	1

[3 marks]

01.3

potassium + sulfur → potassium sulfide

allow $2K + S \rightarrow K_2S$

[1 mark]

01.4

2Al + **3**F_2 → 2AlF_3

allow multiples

*allow **1** mark for 2Al*

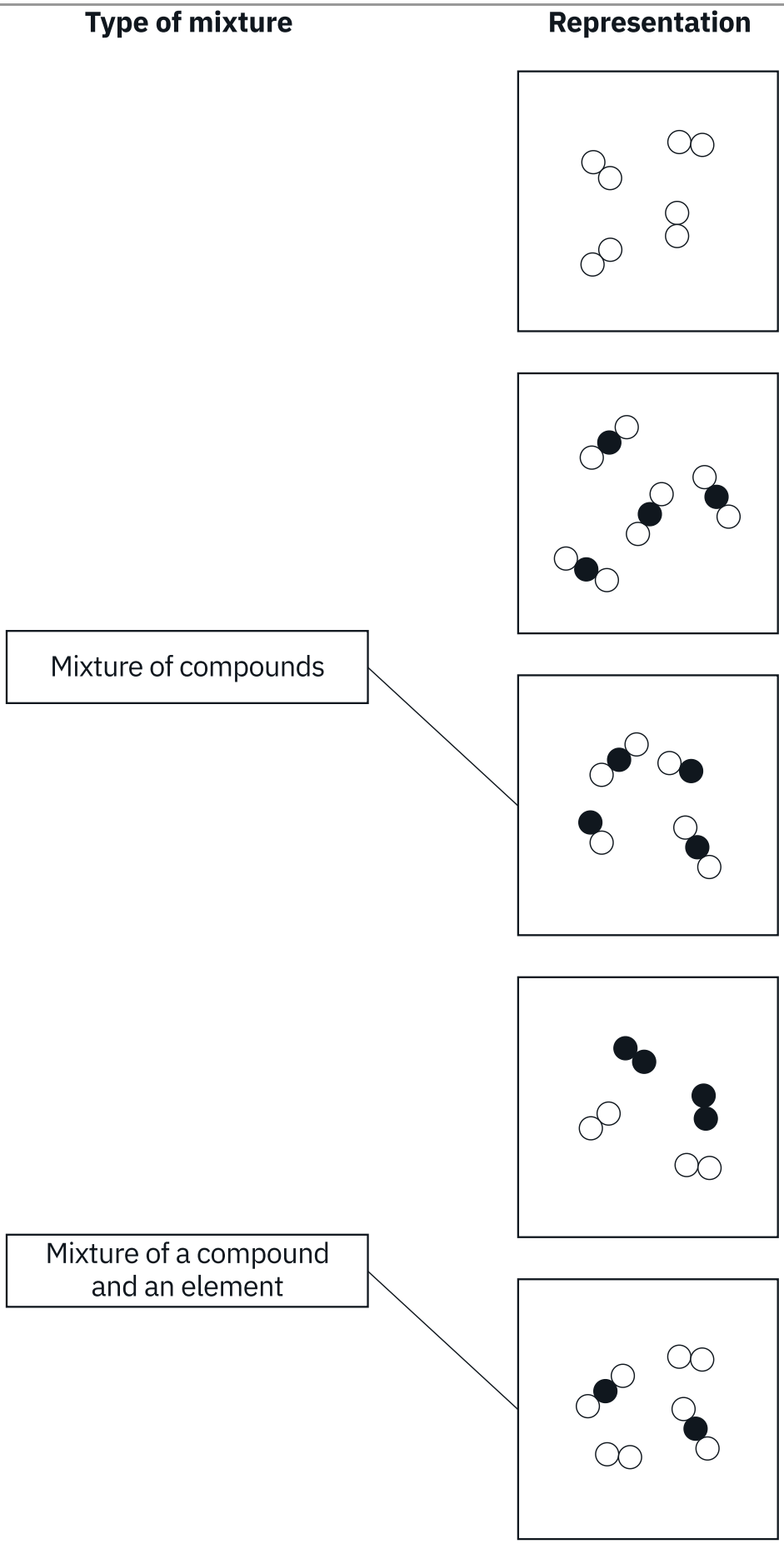
or

*allow **1** mark for* $3F_2$

[2 marks]

Q5 · June 2025 · Paper 1 Foundation · Q7 · [10 marks]

07.1



do not accept more than one line from a box on the left

[2 marks]

07.2

Level 3 (5–6 marks): The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.

Level 2 (3–4 marks): The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.

Level 1 (1–2 marks): The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.

No relevant content (0 marks)

Indicative content

add mixture to water

- in a beaker
- place beaker on a tripod and gauze
- heat
- using a Bunsen burner
- stir
- using a glass rod
- to dissolve the salt

filter using filter paper and funnel

- to remove the sand
- the sand collects in the filter paper
- rinse the sand
- leave to dry

heat the salt solution

- in an evaporating dish
- heat the solution to half volume

or

heat to crystallisation point

- leave the remaining solution to form salt crystals
- heat to dryness to obtain salt

[6 marks]

07.3

(% yield =) (13.6)/(16.0) ×100

= 85 (%)

[2 marks]

Q6 · June 2025 · Paper 1 Foundation · Q8 · Paper 1 Higher · Q1 · [9 marks]

08.1

towards the right **and** the top

allow a description of the position in the periodic table

allow in Groups (3) 4 to 0

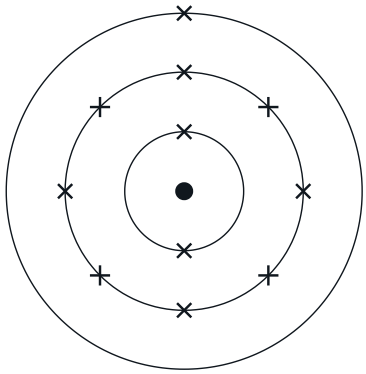
[1 mark]

08.2

a melting point below 100 °C

[1 mark]

08.3



allow any combination of ×, •, o, $e^{(-)}$ for electrons

[1 mark]

08.4

ignore reference to atomic structure

any **one** from:

- so elements / tellurium / iodine were in groups with similar properties
- iodine has similar properties to Group 7 elements
- iodine has different properties to Group 6 elements

allow named elements for Group 6 / 7 elements

allow converse arguments in terms of tellurium

[1 mark]

08.5

allow energy level for shell

argon has a full outer shell (of electrons)

allow argon has eight outer shell electrons

ignore argon has no outer shell electrons

(so argon) has a stable arrangement of electrons

or

(so argon) has a stable electronic structure

allow (so argon) does not gain / lose / share electrons

[2 marks]

08.6

atoms with the same number of protons

allow atoms of the same element

allow atoms with the same atomic number

ignore atoms with the same number of electrons

(but with) different numbers of neutrons

[2 marks]

08.7

~115

[1 mark]

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