AQA GCSE Chemistry

Chemical analysis mark scheme · goes with “Chemical analysis · Foundation tier” · whiteboardchemistry.com/revision/gcse-chemistry/exam-questions

Mark schemes

Chemical analysis · Foundation tier · 6 questions

Q1 · June 2023 · Paper 2 Foundation · Q10 · Paper 2 Higher · Q3 · [8 marks]

10.1

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 plan 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

(potassium ions)

- **place sample on (clean metal) wire**
- **introduce into (blue / non-luminous) flame**
- using (Bunsen) burner
- **observe lilac flame colour**
- which shows presence of potassium (ions)

(bromide ions)

- **dissolve sample**
- in (distilled) water
- in test tube
- add (dilute) nitric acid
- **add silver nitrate (solution)**
- using (dropping) pipette
- **observe cream precipitate (formed after addition of silver nitrate solution)**
- which shows presence of bromide (ions)

[6 marks]

10.2

flame emission spectroscopy

[1 mark]

10.3

any **one** from:

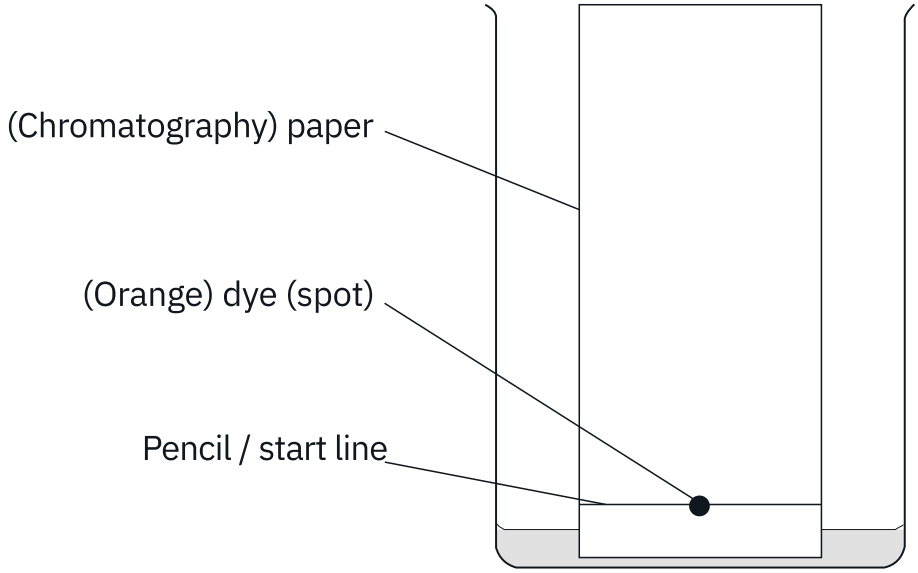
- (more) accurate
- (more) sensitive
- fast(er)
- determine the concentration of ions present

allow requires a small(er) sample

[1 mark]

Q2 · June 2023 · Paper 2 Foundation · Q3 · [10 marks]

03.1



[3 marks]

03.2

left the investigation for too long

[1 mark]

03.3

(there is) more than one spot

or

(there are) three spots

[1 mark]

03.4

(distance moved by red spot) = 1.8 (cm)

allow a value in the range 1.6 to 2.0 (cm)

(distance moved by solvent) = 7.2 (cm)

allow a value in the range 7.1 to 7.3 (cm)

$(R_f =) \frac{1.8}{7.2}$

allow correct use of incorrectly determined distance(s)

= 0.25

[4 marks]

03.5

dark yellow spot

[1 mark]

Q3 · June 2024 · Paper 2 Foundation · Q3 · [9 marks]

03.1

(drew start line in) ink

ink runs / smudges / dissolves

OR

a pencil should be used (to draw the start line) (1)

so that the ink does not run / smudge / dissolve (1)

[2 marks]

03.2

2

[1 mark]

03.3

(dye)

A

(reason)

(dye) A travelled the same distance as a spot from (substance) Y

or

(dye) A has the same R_f value as a spot from (substance) Y

allow (dyes) B, C, and D did not travel the same distance as either spot from (substance) Y

allow (dyes) B, C, and D do not have the same R_f value as either spot from (substance) Y

MP2 is dependent upon the award of MP1

[2 marks]

03.4

(dye) D is insoluble (in water)

allow there is no attraction between (dye) D and water

[1 mark]

03.5

$(R_f =) \frac{2.4}{6.0}$

= 0.4

ignore units

[2 marks]

03.6

solvent

[1 mark]

Q4 · June 2025 · Paper 2 Foundation · Q1 · [10 marks]

01.1

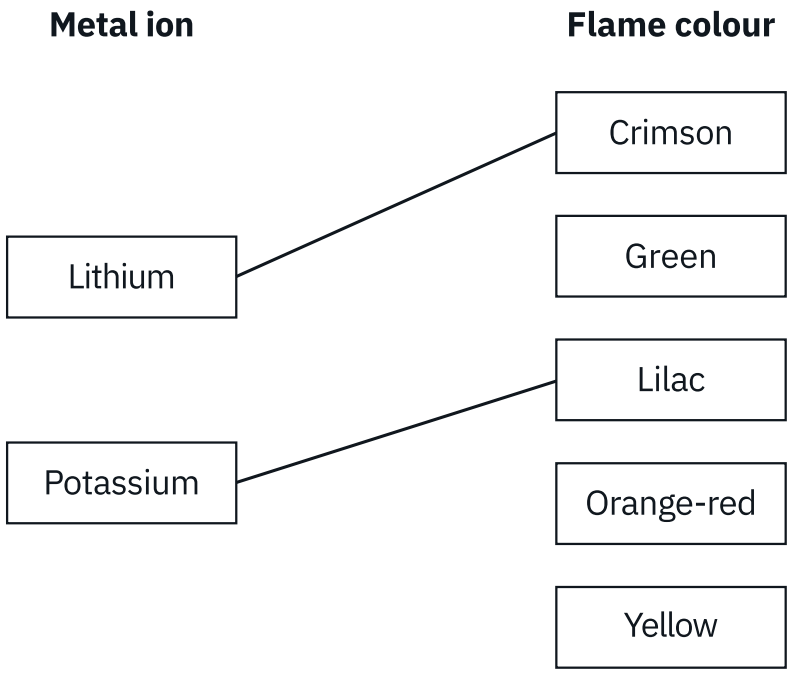
put sample on (metal) wire

ignore references to cleaning

hold wire in (blue / non-luminous) flame

[2 marks]

01.2



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

[2 marks]

01.3

carbon dioxide

[1 mark]

01.4

barium chloride solution

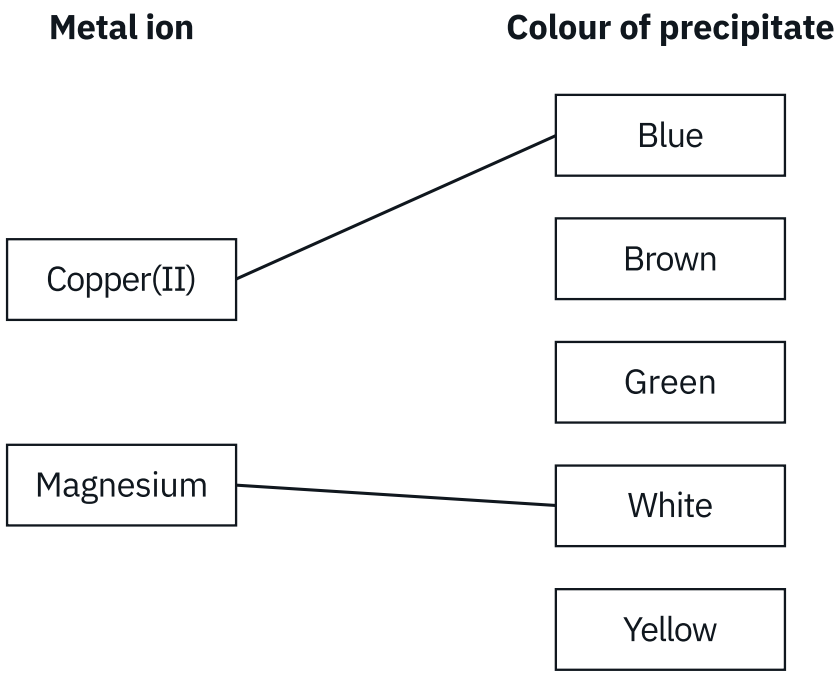
[1 mark]

01.5

solid

[1 mark]

01.6



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

[2 marks]

01.7

yellow

[1 mark]

Q5 · June 2025 · Paper 2 Foundation · Q5 · [12 marks]

05.1

labelled paper in solvent

allow paper touching solvent

labelled start line above solvent level

do not accept start line touching solvent

labelled ink spot on start line

*if no other mark awarded allow **1***

mark for a complete unlabelled diagram

[3 marks]

05.2

(so the start line) does not smudge / run / dissolve

or

pencil is insoluble

allow (because an ink line) would smudge / run / dissolve

[1 mark]

05.3

0.80 = (5.2)/(distance moved by solvent)

distance moved by solvent = (5.2)/(0.80)

= 6.5 (cm)

[3 marks]

05.4

from the start line to the centre of the spot

[1 mark]

05.5

use a different solvent

use a different type of chromatography paper

[2 marks]

05.6

1

[1 mark]

05.7

more accurate

[1 mark]

Q6 · November 2021 · Paper 2 Foundation · Q10 · Paper 2 Higher · Q3 · [8 marks]

10.1

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

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

Level 1 (1–2 marks): The design/plan 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

Method

- draw (pencil) start line on (chromatography) paper
- place spot of food colouring on start line
- use of suitable solvent
- place solvent in beaker / container
- place (chromatography) paper in beaker / container
- so (chromatography) paper is in solvent
- but solvent is below start line
- use a lid
- wait for solvent to travel up the (chromatography) paper (until near top)
- mark solvent front
- dry the (chromatography) paper

Measurements

- measure distance between start line and centre of spot
- measure distance between start line and solvent front
- use of measurements to determine R_f value

[6 marks]

10.2

different solvent used

[1 mark]

10.3

paper

[1 mark]

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