AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.3.4

Halides

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**19**
Available paper years	**2010–2025**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.8.3.4 Halides

Answer 01 · Mark scheme

Question 4

question	answers	extra information	mark
4(a)(i)	yellow		1
4(a)(ii)	lilac		1
4(a)(iii)	melting point		1
4(b)(i)	barium chloride solid		1 1
4(b)(ii)	white dissolved		1 1
Total			**7**

4.8.3.4 Halides

Answer 01 · Mark scheme

January 2010 | CHY3F | Original Q4 | Legacy

CHY3F

4.8.3.4 Halides

Answer 02 · Mark scheme

June 2010 | CHY2F | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)(i)	precipitation		1
5(a)(ii)	filtration		1
5(a)(iii)	lead nitrate sodium iodide		1 1
5(b)	any **four** from: • magnesium (atom) reacts with **two** iodine (atoms) • magnesium (atom) loses • **2** electrons • iodine (atom) gains • **1** electron **or** an electron • iodide ion formed • iodide has negative charge / is a negative ion / particle • magnesium ion formed • magnesium has positive charge • oppositely charged ions attract • a giant structure / lattice is formed	sharing / covalent / metallic = max **3** allow iodine ion allow iodine ignore I^{2-} if reference to ions being formed is made unqualified, allow **1** mark	4
Total			**8**

4.8.3.4 Halides

Answer 02 · Mark scheme

June 2010 | CHY2F | Original Q5 | Legacy

CHY2F

4.8.3.4 Halides

Answer 03 · Mark scheme

Question 4

question	answers	extra information	mark
4(a)(i)	sodium hydroxide green solid		1 1 1
4(a)(ii)	barium chloride white sulfate ions, SO_4^{2-}		1 1 1
4(b)	some indication of contact between (colourless) flame and the chemical	ignore colour of flame	1
4(c)	any **one** from: • accurate • precise • sensitive • reliable • rapid • only small amount needed	ignore reference to cost / safer	1
Total			**8**

4.8.3.4 Halides

Answer 03 · Mark scheme

June 2010 | CHY3F | Original Q4 | Legacy

CHY3F

4.8.3.4 Halides

Answer 04 · Mark scheme

Question 2

question	answers	extra information	mark
2(a)	stop them reacting	owtte	1
2(b)(i)	fizzing / bubbles / effervescence	owtte	1
2(b)(ii)	(g)		1
2(b)(iii)	limewater		1
2(c)	yellow		1
2(d)(i)	barium chloride		1
2(d)(ii)	white		1
2(d)(iii)	eg don't see what is being bought **or** a comment about quality / purity eg may be impure / contaminated	ignore references to cost	1
Total			**8**

4.8.3.4 Halides

Answer 04 · Mark scheme

January 2011 | CHY3F | Original Q2 | Legacy

CHY3F

4.8.3.4 Halides

Answer 05 · Mark scheme

June 2011 | CHY2F | Original Q4 | Legacy

Question 4

question	answers	extra information	mark
4(a)	cannot move		1
4(b)	water		1
4(c)(i)	a positive charge		1
4(c)(ii)	atoms		1
Total			4

4.8.3.4 Halides

Answer 05 · Mark scheme

June 2011 | CHY2F | Original Q4 | Legacy

CHY2F

4.8.3.4 Halides

Answer 06 · Mark scheme

June 2011 | CHY3F | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)(i)	sodium hydroxide solution blue		1 1
3(a)(ii)	barium chloride white		1 1
3(b)	fully ionised in water		1
3(c)(i)	H^+ ions		1
3(c)(ii)	lower than		1
3(d)(i)	(indicator) changed colour / goes colourless	ignore clear / discoloured	1
3(d)(ii)	13.9 **or** (titration) 2		1
3(d)(iii)	13.2	ecf from 3(d)(ii)	1
Total			**10**

4.8.3.4 Halides

Answer 06 · Mark scheme

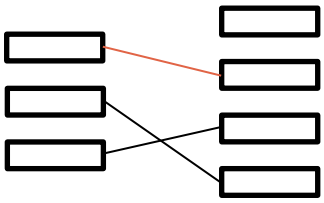
June 2011 | CHY3F | Original Q3 | Legacy

CHY3F

4.8.3.4 Halides

Answer 07 · Mark scheme

June 2014 | CH3FP | Original Q6 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.	ID
6(a)(i)	*method of introducing sample into flame* *clean wire or colourless flame*	*e.g. wire/splint/spray* *allow blue / roaring flame*	1 1	1 / 3.4	E
6(a)(ii)			1 1	2 / 3.4.1a	G
6(a)(iii)	(potassium) chloride	allow KCl **or** Cl^-	1	2 / 3.4.1e	E
6(b)(i)	copper	allow Cu^{2+}	1	2 / 3.4.1c	E
6(b)(ii)	sulfate		1	2 / 3.4.1f	A
Total			**7**		

4.8.3.4 Halides

Answer 07 · Mark scheme

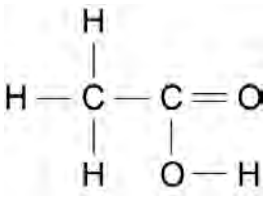
June 2014 | CH3FP | Original Q6 | Legacy



4.8.3.4 Halides

Answer 08 · Mark scheme

June 2016 | CH3FP | Original Q5 | Legacy

Question	Answers	Extra information	Mark	AO / SpecRef
5(a)(i)	fizz / effervescence / bubbles	allow calcium carbonate decreases in size or dissolves	1	AO2/AO3 3.4.1d, 3.6.2b
	because carbon dioxide produced / released	allow because gas produced / released	1	
	limewater turns cloudy / milky / white		1	
	because (a precipitate of or solid) calcium carbonate forms	allow because of carbon dioxide if not already credited	1	
5(a)(ii)		allow –OH do not allow lower case 'h'	1	AO1 3.6.2a
5(a)(iii)	acid	must be in this order ignore any name of an acid	1	AO1 3.6.2b
	ester(s)		1	
5(b)	white (precipitate) no change no change no change	all four correct 2 marks any two correct 1 mark	2	AO2 3.4.1e,f
5(c)(i)	lilac red	must be in this order allow purple	1 1	AO1 3.4.1a
5(c)(ii)	colours are masked / changed by each flame colour		1	AO3 3.4.1a
Total			12	

4.8.3.4 Halides

Answer 08 · Mark scheme

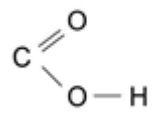
June 2016 | CH3FP | Original Q5 | Legacy

<table>
<tr><th>Question</th><th>Answers</th><th>Extra information</th><th>Mark</th><th>AO / SpecRef</th></tr>
<tr><td>6</td><td></td><td></td><td>6</td><td rowspan="4">2AO1 / 3AO2 / 1AO3 3.4.1g</td></tr>
<tr><td colspan="4">Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a ‘best-fit’ approach to the marking.</td></tr>
<tr><td colspan="4"><table>
<tr><th>0 marks</th><th>Level 1 (1–2 marks)</th><th>Level 2 (3–4 marks)</th><th>Level 3 (5–6 marks)</th></tr>
<tr><td>No relevant content.</td><td>There is a simple description of using some of the apparatus.</td><td>There is a description of an experimental method including addition of acid to alkali which may include an indicator or colour change and may include a measurement of volume.</td><td>There is a description of titrations that would allow a comparison to be made between the two solutions of hydrochloric acid.</td></tr>
</table></td></tr>
<tr><td colspan="4">examples of chemistry points made in the response could include:
acid in burette or flask
alkali/sodium hydroxide or acid in burette or flask
volume of acid or alkali measured using the pipette
indicator in flask
white tile under the flask
slow addition
swirling/mixing
colour change of indicator
burette volume measured</td></tr>
<tr><td>Total</td><td></td><td></td><td>6</td><td></td></tr>
</table>

4.8.3.4 Halides

Answer 09 · Mark scheme

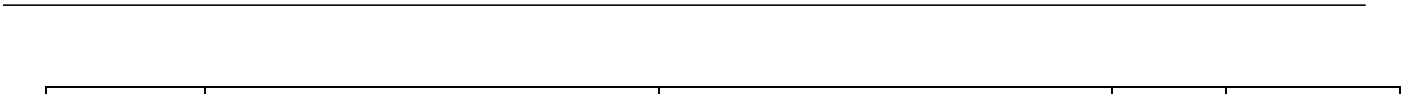
June 2017 | CH3FP | Original Q1 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
1 (a)(i)	numbers	allow number allow numbers circled in the box	1	AO1 3.1.2b
1 (a)(ii)	electrons	allow electron allow electrons circled in the box	1	AO1 3.1.2b
1 (b)(i)	Cl/chlorine	allow CL / cL / cl	1	AO1 3.1.3f
1 (b)(ii)	Cu/copper	allow CU / cU / cu	1	AO2 3.1.3c
1 (b)(iii)	7/seven		1	AO1 3.1.3e
1(c)(i)	tick (✓) by: displacement		1	AO1 3.1.3g
1(c)(ii)	tick (✓) by: Fluorine		1	AO3 3.1.3g
1(d)	tick (✓) by: yellow		1	AO1 3.4.1e
1(e)(i)	circle around: 		1	AO2 3.6.2a
1(e)(ii)	carbon dioxide	allow carbon dioxide circled in the box	1	AO2 3.6.2b
1(e)(iii)	esters	allow esters circled in the box allow ethers	1	AO2 3.6.2b
Total			11	

4.8.3.4 Halides

Answer 09 · Mark scheme

June 2017 | CH3FP | Original Q1 | Legacy



4.8.3.4 Halides

Answer 10 · Mark scheme

June 2019 | 8462/2F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	Filtration → Improve taste Sterilisation → Kill bacteria Desalination Increase pH Remove solids	an extra line from a step to a reason for that step negates that mark	1 1	AO1 4.10.1.2
01.2	chlorine ozone		1 1	AO1 4.10.1.2
01.3	evaporate all water from the sample measure the sample's boiling point		1 1	AO2 4.8.1.1 4.10.1.2
01.4	Aluminium ion → Copper sulfate Sulfate ion → Barium chloride Silver nitrate Sodium hydroxide Sulfuric acid	an extra line from an ion to a compound needed negates that mark	1 1	AO1 4.8.3.2 4.8.3.5
01.5	distillation		1	AO1 4.10.1.2
Total			9	

4.8.3.4 Halides

Answer 11 · Mark scheme

November 2020 | 8462/1F | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	(negative electrode) solid produced	allow the electrode changes colour ignore metal produced	1	AO3 4.4.3.4 RPA 3
	(positive electrode) bubbles / fizzing / effervescence	ignore gas produced	1	
04.2	potassium nitrate		1	AO3 4.4.3.4 RPA 3
	hydrogen is not a metal	allow hydrogen is a gas allow hydrogen is not a solid allow the products at both electrodes are gases allow the product at the negative electrode is not potassium allow potassium is more reactive than hydrogen	1	
04.3	(graphite) conducts (electricity)	allow (graphite) has delocalised / free electrons	1	AO1 4.2.3.2 4.4.3.4 RPA 3
	(graphite) is inert	allow (graphite) is unreactive	1	
04.4	the ions move towards the positive electrode		1	AO3
	the electrode attracts ions of the opposite charge	allow opposite charges attract	1	AO1 4.4.3.1
Total			8	

4.8.3.4 Halides

Answer 12 · Mark scheme

November 2020 | 8462/1F | Original Q9

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	they form ions with different charges		1	AO1 4.1.3.1 4.1.3.2
	they have high melting points		1	
09.2	the (grey) crystals are silver		1	AO3 4.4.1.2
	the copper ions (produced) are blue	allow the copper nitrate / compound (produced) is blue	1	
	(because) copper displaces silver		1	

4.8.3.4 Halides

Answer 12 · Mark scheme

Question 9 continued

Question	Answers	Mark	AO/ Spec. Ref
09.3	**Level 2:** The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.	3–4	AO1 AO3 4.4.1.2 4.5.1.1 RPA 4
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	Indicative content **Key steps** • add the metals to (dilute) hydrochloric acid • measure temperature change **or** compare rate of bubbling **or** compare colour of resulting solution for copper: • no reaction • shown by no temperature change **or** shown by no bubbles for magnesium and iron: • magnesium increases in temperature more than iron **or** magnesium bubbles faster than iron **or** magnesium forms a colourless solution and iron forms a coloured solution **Control variables** • same concentration / volume of hydrochloric acid • same mass / moles of metal • same particle size of metal • same temperature (of acid if comparing rate of bubbling)		

4.8.3.4 Halides

Answer 12 · Mark scheme

Question 9 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.4	$\frac{(203 \times 30) + (205 \times 70)}{100}$ **or** $\frac{6090 + 14\,350}{100}$		1	AO2 4.1.1.6
	= 204.4	ignore units	1	

Total			11

4.8.3.4 Halides

Answer 13 · Mark scheme

November 2020 | 8462/1F | Original Q10

Question 10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	(total) mass before = 156.76 (g) **and** (total) mass after = 156.76 (g) **or** increase in mass of beaker **A** and contents = 29.96 (g) **and** decrease in mass of beaker **B** and contents = 29.96 (g) (so) the mass of products equals the mass of the reactants **or** (so) there is no change in mass during the reaction	allow 78.26 + 78.50 = 156.76 **and** 108.22 + 48.54 = 156.76 allow 108.22 – 78.26 = 29.96 **and** 48.54 – 78.50 = – 29.96 allow (so) no atoms were lost or made during the reaction	1 1	AO2 AO1 4.3.1.1
10.2	filter / filtration	allow a description of filtration	1	AO2 4.1.1.2
10.3	sodium nitrate (solution) **or** silver nitrate (solution) **or** sodium iodide (solution)	allow correct formulae allow sodium / nitrate / silver / iodide ions	1	AO2 4.1.1.2
10.4	to remove / evaporate the water	allow to dry (the solid)	1	AO3 4.1.1.2

Question 10 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.5	(total M_r = 170 + 150) = 320	allow (235 + 85) = 320	1	AO2 4.3.3.2
	(% atom economy =) $\frac{235}{320} \times 100$	allow correct use of incorrectly calculated total M_r	1	
	= 73.4375 (%)		1	
	= 73.4 (%)	allow an answer correctly calculated to 3 significant figures from an incorrect percentage calculation which uses the values in the question	1	
10.6	any **one** from: • for sustainable development • for economic reasons • to produce a high(er) percentage of useful product	allow to reduce waste	1	AO1 4.3.3.2
Total			**10**	

4.8.3.4 Halides

Answer 14 · Mark scheme

November 2020 | 8462/2F | Original Q8

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	green	allow blue-green	1	AO1 4.8.3.1 RPA 7
08.2	did not clean the metal wire (between tests) **or** copper sulfate (solution) is still present (so) colours are mixed / blended / masked		1 1	AO3 4.8.3.1 RPA 7
08.3	(copper sulfate solution) blue precipitate (calcium iodide solution) white precipitate	allow blue solid allow white solid	1 1	AO1 4.8.3.2 RPA 7
08.4	barium chloride (solution)	allow barium nitrate (solution)	1	AO1 4.8.3.5 RPA 7
08.5	silver nitrate (solution) yellow precipitate	 allow yellow solid allow pale yellow precipitate / solid	1 1	AO1 4.8.3.4 RPA 7
Total			**8**	

4.8.3.4 Halides

Answer 15 · Mark scheme

November 2021 | 8462/1F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	by filtration		1	AO3 4.1.1.2

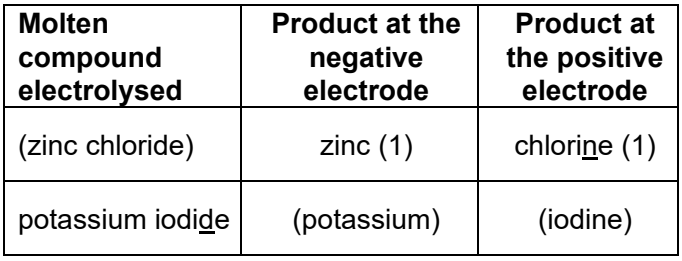
Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	10 minutes per 2 cm on x-axis	allow 5 minutes per 1 cm on x-axis	1	AO2 4.4.3.4
	all points plotted correctly	allow a tolerance of ± ½ a small square allow **1** mark for 3 or 4 points plotted correctly	2	
	line of best fit	allow line of best fit drawn using incorrect plots	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	0.14 (g)	allow ecf from question **07.2** allow a tolerance of ± ½ a small square	1	AO2 4.4.3.4

Question 7 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.4	(copper sulfate solution) pink / orange / red / brown solid (sodium chloride solution) bubbles / effervescence / fizzing	 allow copper plating allow metal for solid if no other mark awarded allow **1** mark for copper **and** hydrogen	 1 1	AO2 4.4.1.2 4.4.3.4 RPA3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.5	toxic / poisonous (fumes)	allow harmful / corrosive (fumes) ignore dangerous / deadly / lethal	1	AO3 4.4.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.6			 2 1	AO2 4.4.3.2

Molten compound electrolysed	Product at the negative electrode	Product at the positive electrode
(zinc chloride)	zinc (1)	chlorine (1)
potassium iodide	(potassium)	(iodine)

allow **1** mark if zinc and chlorine the wrong way round

Total			12

4.8.3.4 Halides

Answer 16 · Mark scheme

November 2021 | 8462/2F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	flame emission spectroscopy flame test		1 1	AO1 4.8.3.1 4.8.3.7 RPA7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	white		1	AO2 4.8.3.2 RPA7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	barium chloride (solution)		1	AO1 4.8.3.5 RPA7

Question 6 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	(conversion) (800 cm^3 = $\frac{800}{1000}$ =) 0.8 (dm^3) (mass =) 0.8 × 258 (g) = 206.4 (g) = 206 (g) **alternative approach:** (conversion) (258 g/dm^3 = $\frac{258}{1000}$ =) 0.258 (g/cm^3) (1) (mass =) 0.258 × 800 (g) (1) = 206.4 (g) (1) = 206 (g) (1)	 allow correct use of incorrect / no volume conversion allow an answer correctly calculated to 3 significant figures from an incorrect calculation which uses the values in the question allow correct use of incorrect / no concentration conversion allow an answer correctly calculated to 3 significant figures from an incorrect calculation which uses the values in the question	 1 1 1 1	AO2 4.3.2.5

Total			8

4.8.3.4 Halides

Answer 17 · Mark scheme

June 2022 | 8462/2F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	100 7	must be in this order	1 1	AO1 4.8.1.1 4.10.1.2 RPA8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	pH probe / meter **or** universal indicator (paper / solution)	allow wide range indicator (paper / solution)	1	AO1 4.10.1.2 RPA8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	balance measuring cylinder		1 1	AO1 4.10.1.2 RPA8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	(mean =) $\frac{1.73 + 1.70 + 1.75 + 1.78}{4}$ = 1.74 (g)		1 1	AO2 4.10.1.2 RPA8

4.8.3.4 Halides

Answer 17 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	(mass =) $\frac{1.5 \times 1000}{50}$ = 30 (g)		1 1	AO2 4.10.1.2 RPA8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	yellow		1	AO1 4.8.3.1 RPA7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	white		1	AO1 4.8.3.4 RPA7

Total Question 1		11

4.8.3.4 Halides

Answer 18 · Mark scheme

June 2023 | 8462/2F | Original Q10

Question 10

Question	Answers	Mark	AO/ Spec. Ref
10.1	**Level 3:** The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.	5–6	AO1 4.8.3.1 4.8.3.4 RPA7
	Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.	3–4	
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	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)		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.2	flame emission spectroscopy		1	AO1 4.8.3.7

4.8.3.4 Halides

Answer 18 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.3	any **one** from: • (more) accurate • (more) sensitive • fast(er) • determine the concentration of ions present	allow requires a small(er) sample	1	AO1 4.8.3.6

Total Question 10	8

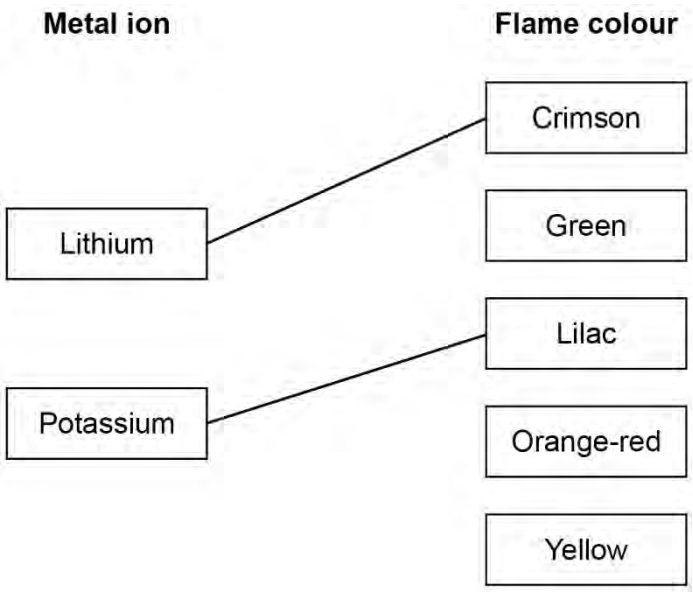
4.8.3.4 Halides

Answer 19 · Mark scheme

June 2025 | 8462/2F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	put sample on (metal) wire hold wire in (blue / non-luminous) flame	ignore references to cleaning	1 1	AO1 4.8.3.1 RPA7

Question	Answers	Mark	AO / Spec. Ref.
01.2	 do **not** accept more than one line from a box on the left	1 1	AO1 4.8.3.1 RPA7

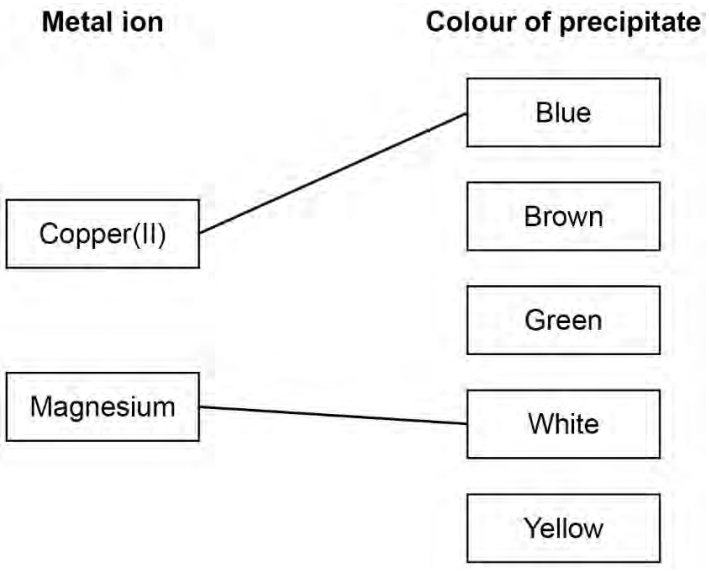
Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	carbon dioxide		1	AO1 4.8.3.3

4.8.3.4 Halides

Answer 19 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	barium chloride solution		1	AO1 4.8.3.5 RPA7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	solid		1	AO1 4.2.2.1 4.8.3.5

Question	Answers	Mark	AO / Spec. Ref.
01.6	 do **not** accept more than one line from a box on the left	1 1	AO1 4.8.3.2 RPA7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	yellow		1	AO1 4.8.3.4

Total Question 1	10

4.8.3.4 Halides

Answer 17 · Examiner comments — June 2022 | 8462/2F | Original Q1

Question 1 (Low demand)

01.1 Around 70% of the students gained 2 marks. The boiling point of pure water was slightly better known than its pH.

01.2 Under half of the students gained this mark, with universal indicator being the most common correct answer and pH scale the most common incorrect response.

01.3 Around 70% of the students gained two marks. Use of a thermometer was the most common incorrect response.

01.4 Very well answered, with nearly 90% of the students gaining both of the marks. the majority both obtaining the correct answer and showing their working.

01.5 This was also very well answered, with more than three-quarters of the students scoring both marks.

01.6 Nearly 50% of the students gained a mark for knowing the flame colour of sodium is yellow.

01.7 Knowing that the halide ion test produces a white precipitate gained a mark for over 50% of the students.

Answer 18 · Examiner comments — June 2023 | 8462/2F | Original Q10

Question 10 (Standard demand)

10.1 This extended response question used the command word ‘plan’.

A simplistic approach to the level descriptors might be:

Level 3 – will produce the expected outcomes.
Level 2 – might produce the expected outcomes with additions or modifications.
Level 1 – will not produce the expected outcomes.

4.8.3.4 Halides

Answer 18 · Examiner comments

However, the marking of extended response questions must always be holistic, so a best-fit approach must always be followed.

Key steps were shown in the indicative content in **bold**.

Most students found this question very difficult with only around 6% of students managing at least a mark in Level 2 and only 25% of students gaining at least 1 mark.

The flame test for the potassium ions was seen more often than the test for the bromide ion, with some students identifying the flame colour but not being able to describe how to carry out the test. Many responses failed to include putting the sample of medicine on the wire or making it clear that the Bunsen was lit. A number of students placed the wire under the Bunsen or did not make it clear that the Bunsen was lit. Some students thought that they needed to sterilise an inoculating loop before using in a flame test.

Many students mixed up the tests by carrying out flame tests on all the reagents.

The test for bromide ions was poorly understood with less than 1% of students recognising that silver nitrate should be added to the medicine and being able to state the correct test result.

Around one-fifth of students scored a Level 1 mark by using the medicine or correct test result in their response and including some relevant points in the correct context from the question.

10.2 The instrumental method was known by very few students with only 1% of students being able to correctly identify flame emission spectroscopy. Most students who attempted the question mentioned laboratory or industrial processes such as fractional distillation or electrolysis. More than a third of the students did not attempt this question.

10.3 Over 30% of students correctly identified an advantage for using an instrumental method over a chemical test. The most popular correct responses were rapidity and accuracy. One quarter of the students did not answer this question.

4.8.3.4 Halides

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

4.8.3.4 Halides

Answer 19 · Examiner comments June 2025 | 8462/2F | Original Q1

Question 1

01.1 Three quarters of students scored at least one mark on this item. The most common mark was for putting the wire into the flame. Students should be encouraged to state that the wire is placed in a blue flame when describing a flame test. Many students described the metal wire as being placed under, over or on a Bunsen with no mention of a flame.

01.2 There were nearly two thirds of students who scored at least one mark for this question. Students knew the flame colour for potassium more frequently than that for lithium.

01.3 Carbon dioxide was identified by two thirds of students.

01.4 Only a quarter of students correctly identified barium chloride solution. Sodium chloride solution was the most common distractor.

01.5 Fewer than 1 in 5 students correctly identified a precipitate as a solid. Most students gave a liquid as the answer.

01.6 Fewer than 20% of students correctly identified both precipitate colours. The most common error was identifying the copper precipitate as green. The magnesium precipitate was given the full range of colours available.

01.7 2 in 5 students correctly identified the iodide precipitate as yellow. The other options were both frequently seen.