

AQA A-Level Chemistry

Group 7

Questions only

The newest questions, about an hour. All 46 are in the exam generator.

Questions

12

Total marks

46

Time allowed

1 h

Name

Class or teacher

Date

Instructions

- Answer all questions in the spaces provided.
- Use black ink. Show your working for every calculation.
- You may use a scientific calculator and the AQA Data Sheet.
- Print the separate mark scheme when you are ready to mark your answers.

For marking

Q	Source	Marks	Score
1	2024 A-level P3 Q20	1	
2	2022 AS P1 Q16	1	
3	2023 A-level P3 Q22	1	
4	2024 A-level P3 Q21	1	
5	2024 AS P1 Q1	7	
6	2024 AS P1 Q13	1	
7	2024 AS P1 Q19	1	
8	2025 AS P1 Q17	1	
9	2025 AS P1 Q2	14	
10	2025 AS P1 Q6	7	
11	2025 A-level P1 Q5	10	
12	2025 A-level P3 Q13	1	

Total _____ / 46 Percentage _____ %

Questions from AQA past papers, 2022–2025, reproduced for revision. Practise these topics online, with instant marking:
whiteboardchemistry.com/revision/aqa-a-level-chemistry/exam-questions?topics=group-7-halogens&len=0

Questions

Group 7 · 12 questions · 46 marks · time allowed 1 h

Q1 · June 2024 · Paper 3 · Q20 · [1 mark]

Which statement correctly describes a trend down Group 7 from Cl to I? X represents Cl, Br or I

Tick (✓) one box.

- ☐ **A** The boiling point of HX increases.
- ☐ **B** The bond dissociation energy of H–X increases.
- ☐ **C** The standard electrode potential value for $X_2(aq) + 2 e^- \rightarrow 2 X^-(aq)$ becomes more positive.
- ☐ **D** The solubility of AgX in ammonia increases.
-

Q2 · June 2022 · AS Paper 1 · Q16 · [1 mark]

Which is a correct trend down Group 7 from fluorine to iodine?

Tick (✓) one box.

- ☐ **A** The boiling point of the element decreases.
- ☐ **B** The oxidising ability of the element decreases.
- ☐ **C** The electronegativity of the atom increases.
- ☐ **D** The first ionisation energy of the atom increases.
-

Q3 · June 2023 · Paper 3 · Q22 · [1 mark]

Which species is the strongest reducing agent?

Tick (✓) one box.

- ☐ **A** F_2
- ☐ **B** I_2
- ☐ **C** F^-
- ☐ **D** I^-

Q4 • June 2024 • Paper 3 • Q21 • [1 mark]

Which statement about chloride ions is correct?

Tick (✓) one box.

- ☐ **A** They are oxidised by concentrated sulfuric acid.
- ☐ **B** They form a cream precipitate with silver nitrate solution.
- ☐ **C** They form a cobalt(II) complex with a tetrahedral shape.
- ☐ **D** They have the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^4$

Q5 • June 2024 • AS Paper 1 • Q1 • [7 marks]

A student does a series of reactions with aqueous solutions of some potassium halides (P, Q and R) of equal concentration. Each solution contains a different halide ion (chloride, bromide or iodide).

The student adds 3 drops of bromine water to 3 drops of each aqueous solution of potassium halide. The student also adds 3 drops of the bromine water to 3 drops of water.

Table 1 shows the student's observations.

Table 1

Observation when 3 drops of bromine water are added	
Solution P	Orange solution
Solution Q	Brown solution
Solution R	Orange solution
Water	Orange solution

(a) Identify the halide ion present in Q.

Give the ionic equation for the reaction that occurs when bromine water is added to Q.

[2 marks]

Halide ion in Q

Ionic equation

(b) Explain, in terms of oxidising ability, why the observations from these reactions do not allow the student to identify the halide ion present in P and the halide ion present in R.

[2 marks]

(c) The student does a second experiment to determine the halide ion in each of P and R.

The student adds a few drops of aqueous silver nitrate solution to 2 cm^3 of each potassium halide solution.

Table 2 shows the student's observations.

Table 2

Student's Observation	
P	Precipitate formed
R	Precipitate formed

Describe a further chemical test that the student can complete on the precipitates formed to identify the halide ion present in P and the halide ion present in R.

Describe how the observations from this test can be used to identify the halide ion present in P and the halide ion present in R.

[3 marks]

Q6 · June 2024 · AS Paper 1 · Q13 · [1 mark]

Which species is never formed during the reactions of chlorine with water?

Tick (✓) one box.

- ☐ **A** Chloride ions
- ☐ **B** Chlorate(I) ions
- ☐ **C** Hydrogen
- ☐ **D** Oxygen

Q7 · June 2024 · AS Paper 1 · Q19 · [1 mark]

Which of these solid sodium halides does not reduce concentrated sulfuric acid?

Tick (✓) one box.

- ☐ **A** NaAt
 - ☐ **B** NaBr
 - ☐ **C** NaCl
 - ☐ **D** NaI
-

Q8 · June 2025 · AS Paper 1 · Q17 · [1 mark]

Which silver halide(s) react(s) with concentrated ammonia solution to form a colourless solution?

Tick (✓) one box.

- ☐ **A** silver chloride only
- ☐ **B** silver chloride and silver bromide
- ☐ **C** silver bromide and silver iodide
- ☐ **D** silver iodide only

Q9 · June 2025 · AS Paper 1 · Q2 · [14 marks]

This question is about the halogens and their compounds.

02.1 Table 1 shows the boiling points of some halogens.

Table 1

Halogen	Boiling point / °C
Fluorine	-188
Chlorine	-35
Bromine	59

Explain the trend in the boiling points of these halogens.

[2 marks]

02.2 Chlorine is toxic but is added to drinking water.

State why chlorine is added to drinking water.

Explain why this is safe to do even though chlorine is toxic.

[2 marks]

Why chlorine is added

Why this is safe

02.3 Give an equation for the reaction of chlorine with water in sunlight.

[1 mark]

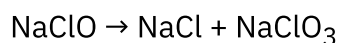
02.4 Give the equation for the reaction between NaOH and Cl₂ to form NaClO

[1 mark]

02.5 When gently warmed in aqueous solution, NaClO reacts to form NaCl and NaClO₃

Complete the equation to ensure that it is correctly balanced.

Deduce the oxidation state of Cl in NaClO₃



Oxidation state of Cl in NaClO₃

[2 marks]

02.6 Deduce the half-equation, in acidic conditions, for the conversion of ClO₃⁻ into Cl⁻

[1 mark]

02.7 A halide ion X^- reduces concentrated sulfuric acid to hydrogen sulfide.

Identify the halide ion.

Give an equation for the reaction.

[2 marks]

Halide ion

Equation

02.8 Some solid sodium halides react with concentrated sulfuric acid without any redox reaction taking place.

Identify a sodium halide that behaves in this way.

Give an equation for the reaction.

State the role of the halide ion in this reaction.

[3 marks]

Sodium halide

Equation

Role of halide ion

Q10 · June 2025 · AS Paper 1 · Q6 · [7 marks]

06.1 A student completes a series of test-tube reactions on two solutions, A and B.

Each solution contains an unknown inorganic compound.

Table 4 shows the observations in these reactions.

Table 4

	Solution A	Solution B
Test 1 Add $\text{H}_2\text{SO}_4(\text{aq})$	White precipitate formed	Effervescence
Test 2 Add $\text{HNO}_3(\text{aq})$ followed by $\text{AgNO}_3(\text{aq})$	White precipitate formed	Effervescence
Test 3 Add $\text{NaOH}(\text{aq})$ and warm gently. Hold a piece of damp red litmus paper over the end of the test tube.	No visible change	Red litmus turns blue

Show how the observations can be used to identify the inorganic compound in

Solution A and the inorganic compound in Solution B.

Give ionic equations for the reactions that occur.

[6 marks]

06.2 Describe a test to confirm that a solution contains hydroxide ions.

[1 mark]

Q11 · June 2025 · Paper 1 · Q5 · [10 marks]

This question also needs Bonding.

This question is about the halogens and some of their compounds.

05.1 Explain why chlorine has a lower boiling point than bromine.

[2 marks]

05.2 Bromine reacts with fluorine to form BrF_3

Determine the oxidation state of bromine and of fluorine in BrF_3

Oxidation state of Br Oxidation state of F

[1 mark]

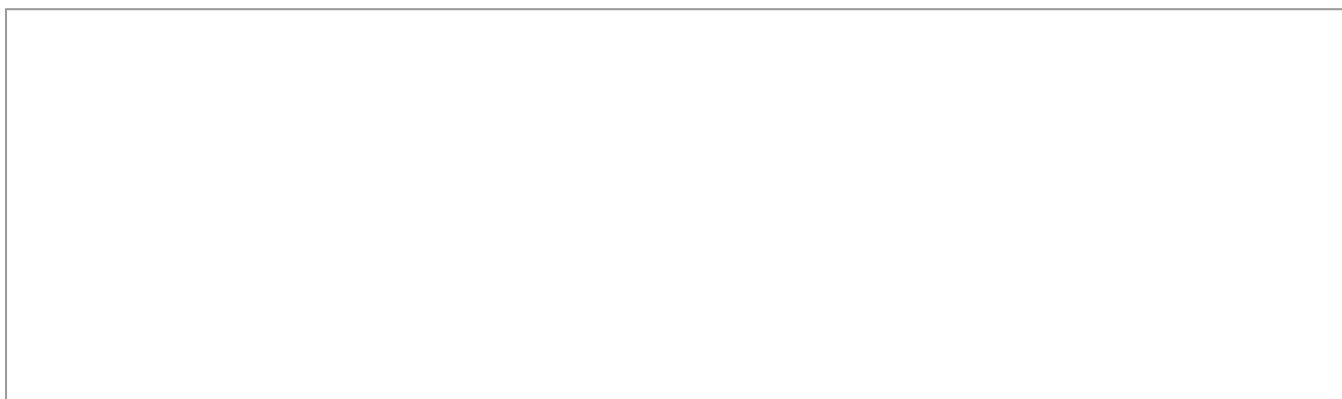
05.3 Draw the shape of a BrF_3 molecule.

Include any lone pairs of electrons that influence the shape.

Explain why the BrF_3 molecule has the shape you have drawn.

[2 marks]

Shape



Explanation of shape

05.4 Solid sodium bromide reacts with concentrated sulfuric acid.

Two reactions occur

- an acid-base reaction
- a redox reaction.

Give an equation and an observation for each reaction.

[4 marks]

Equation for acid-base reaction

Observation for acid-base reaction

Equation for redox reaction

Observation for redox reaction

05.5 Iodide ions reduce copper(II) ions in aqueous solution to form a precipitate of copper(I) iodide.

Give an equation for this redox reaction.

[1 mark]

Q12 · June 2025 · Paper 3 · Q13 · [1 mark]

Compound X reacts with concentrated sulfuric acid to produce compound Y.

Compound Y reacts with an excess of water to produce an alcohol.

Which compound could be X?

Tick (✓) one box.

- ☐ **A** Ethanoyl chloride
- ☐ **B** Methylbenzene
- ☐ **C** Propanone
- ☐ **D** Propene

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Mark scheme:

whiteboardchemistry.com/revision/aqa-a-level-chemistry/exam-questions/pdf/group-7-halogens-mark-scheme.pdf