

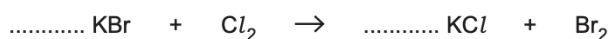
[Identification of ions by chemical and spectroscopic means
(Flame tests (metal ions), Tests for carbonate, sulfate, halides
(Awareness of instrumental methods like flame emission
spectroscopy))]

Q1.a(2019)

A student reacts a solution of KBr with chlorine, Cl_2 .

(i) Balance the equation for this reaction.

[1]



Q1.b(2019)

What is the name of the chemical KBr?

Tick (✓) **one** box.

Bromine

☐

Potassium

☐

Potassium bromide

☐

Potassium bromine

☐

[1]

Q1.c(2019)

What does the reaction tell you about the reactivity of Br_2 and Cl_2 ?

Explain your answer.

.....

.....

..... [2]

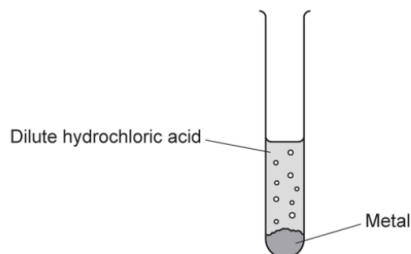
Q2.(2020)

(a) The elements in Group 7 have different physical properties at room temperature.

Group 7 element	Description
Fluorine	Green gas
Chlorine	Grey-black solid
Bromine	Orange-brown liquid
Iodine	Pale-yellow gas

[3]

The diagram shows the reaction of a metal with dilute hydrochloric acid.



Describe a method the student could use to get valid results **and** explain how the student would use the results to place the metals in an order of reactivity.

.....[6]

Q4.a(2021)

In 2010, scientists discovered a new Group 7 element called tennessine. Its symbol is Ts.

The diagram shows where tennessine is placed in Group 7 of the Periodic Table.

F fluorine
Cl chlorine
Br bromine
I iodine
At astatine
Ts tennessine

Use your knowledge of the properties and trends of the Group 7 elements to **predict** the answer to the following questions.

(a) How many outer shell electrons are there in an atom of tennessine?

Put a (ring) around the correct answer.

1 7 17

[1]

Q4.b(2021)

What is the reactivity of tennessine compared to astatine?

Put a (ring) around the correct answer.

less reactive more reactive the same

[1]

Q4.c(2021)

What is the physical state of tennessine at room temperature?

Put a (ring) around the correct answer.

gas liquid solid

[1]

Q4.d(2021)

What is the melting point of tennessine compared to astatine?

Put a (ring) around the correct answer.

higher lower the same

[1]

Q5.a(2022)

This question is about the Group 7 elements.

Table 16.1 shows some information about the Group 7 elements.

Table 16.1

Element	Molecular formula	Appearance at room temperature	Size of molecule (pm)	Boiling point (°C)
Fluorine	F ₂	pale-yellow gas	128	−188
Chlorine	Cl ₂	green gas	204	−34
Bromine	Br ₂	orange-brown liquid	240	
Iodine	I ₂	grey-black solid	278	184
Astatine	At ₂		300	350

(a) Complete the table by predicting the appearance of astatine at room temperature.

Write your answer in the box in Table 16.1.

[1]

Q5.b(2022)

The sizes of the molecules are measured in picometres (pm).

$$1 \text{ picometre} = \frac{1}{1\,000\,000\,000\,000} \text{ metre}$$

What is the size of a fluorine molecule in metres (m)?

Tick (✓) **one** box.

- 1.28 × 10^{−12} m ☐
- 1.28 × 10^{−10} m ☐
- 1.28 × 10¹⁰ m ☐
- 1.28 × 10¹² m ☐

[1]

Q5.c(2022)

Which element has a molecule that is **closest** to twice the size of a molecule of fluorine?

Tick (✓) **one** box.

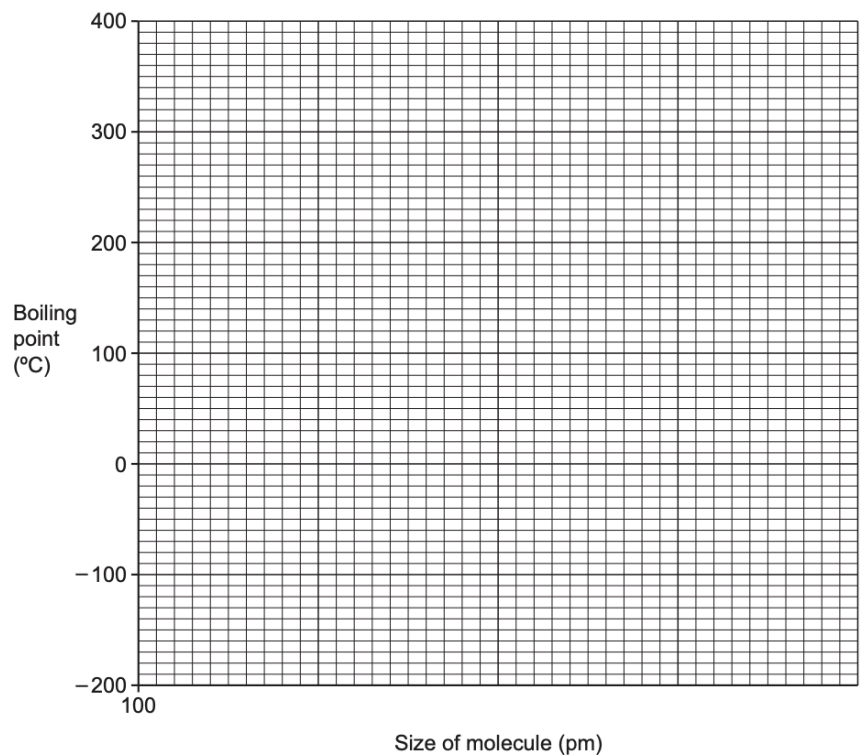
Chlorine ☐ Bromine ☐ Iodine ☐ Astatine ☐

[1]

Q5.d(2022)

Use **Table 16.1** to complete the x axis and plot a **line graph** of the boiling points of fluorine, chlorine, iodine and astatine against the size of their molecules.

Draw a line of best fit.



[4]

Q5.e(2022)

Use your graph to predict the boiling point of bromine.

Boiling point of bromine = °C [1]

Q5.f(2022)

Table 16.1 is repeated below.

Table 16.1

Element	Molecular formula	Appearance at room temperature	Size of molecule (pm)	Boiling point (°C)
Fluorine	F ₂	pale-yellow gas	128	−188
Chlorine	Cl ₂	green gas	204	−34
Bromine	Br ₂	orange-brown liquid	240	
Iodine	I ₂	grey-black solid	278	184
Astatine	At ₂		300	350

(e) A student thinks that fluorine molecules have the **weakest** intermolecular forces.

Give **two** reasons why they are correct.

Use data from Table 16.1.

- 1
- 2
- [2]

Q5.g(2022)

Describe **one** similarity and **one** difference in the arrangement of electrons in **atoms** of fluorine and chlorine.

Similarity

Difference

[2]

Q6.(2023)

Which particles do atoms in Group 7 **gain** when they react?

- A Electrons
- B Ions
- C Neutrons
- D Protons

Your answer ☐

[1]

Q7.a(2024)

This question is about Groups 1, 7 and 0 in the Periodic Table.

What are the properties of the elements in Group 1, Group 7 and Group 0?

Tick (✓) **one, two or three** boxes in each row in **Table 12.1**.

Table 12.1

Properties	Group 1	Group 7	Group 0
They are non-metals.			
They are soft solids.			
They form coloured gases.			

[3]

Q7.b(2024)

A teacher does an experiment to show that the order of reactivity going down Group 1 is:

Lithium
Sodium
Potassium

↓
reactivity increases
↓

- The teacher has pieces of the Group 1 elements of the same size.
- They react these with water.
- They then time how long it takes for the pieces to disappear.

Table 12.2 shows their results.

Complete **Table 12.2** by writing lithium, sodium and potassium in the correct spaces.

Table 12.2

Group 1 element	Time to disappear (s)
.....	4
.....	21
.....	12

[2]

Q7.c(2024)

The teacher also does an experiment to show that the order of reactivity going down Group 7 is:

Chlorine
Bromine
Iodine

↓
reactivity decreases
↓

They react gases of each Group 7 element with small pieces of hot iron and write down their observations.

Table 12.3 shows their results.

Complete **Table 12.3** by writing chlorine, bromine and iodine in the correct spaces.

Table 12.3

Group 7 element	Observation
.....	The iron glows brightly.
.....	The iron glows very brightly.
.....	The iron glows only slightly.

[2]

Q7.d(2024)

Table 12.4 shows the boiling points of some Group 0 elements.

Table 12.4

Element	Boiling point (°C)
Helium	−269
Neon	−246
Argon	
Krypton	−152
Xenon	−108

Describe what happens to the boiling points going from helium to xenon.

..... [1]

Q7.e(2024)

Estimate the boiling point of argon. Use the information in **Table 12.4**.

..... [1]