

(Group 7 – Halogens)

Q1. (2018)

The halogens are elements in Group 7.

Bromine is in Group 7.

Give the number of electrons in the outer shell of a bromine atom.

[1 mark]

Q2.(2018)

What is the formula for fluorine gas?

[1 mark]

Tick **one** box.

F

☐

F₂

☐

F²

☐

2F

☐

Q3.(2018)

A student mixes solutions of halogens with solutions of their salts.

Table 1 shows the student's observations.

Table 1

	Potassium chloride (colourless)	Potassium bromide (colourless)	Potassium iodide (colourless)
Chlorine (colourless)		Solution turns orange	Solution turns brown
Bromine (orange)	No change		Solution turns brown
Iodine (brown)	No change	No change	

Explain how the reactivity of the halogens changes going down Group 7.

Use the results in **Table 1**.

[3 marks]

Q4.(2019)

Chlorine, iodine and astatine are in Group 7 of the modern periodic table.

Astatine (At) is below iodine in Group 7.

Predict:

- the formula of an astatine molecule
- the state of astatine at room temperature.

[2 marks]

Formula of astatine molecule _____

State at room temperature _____

Q5. a) (2020)

This question is about the elements in Group 7 of the periodic table.

Table 1 shows the melting points and boiling points of some of the elements.

Table 1

Element	Melting point in °C	Boiling point in °C
Fluorine	−220	−188
Chlorine	−101	−35
Bromine	−7	59

What is the state of bromine at 100 °C?

Use **Table 1**.

[1 mark]

Tick (✓) **one** box.

Gas

☐

Liquid

☐

Solid

☐

Q5. b) (2020)

What temperature does chlorine gas condense at to form a liquid?

Use **Table 1**.

[1 mark]

Temperature = _____ °C

Q5. c) (2020)

Complete the sentences.

[2 marks]

Going down Group 7 the melting points _____.

This is because the size of the molecules increases so the

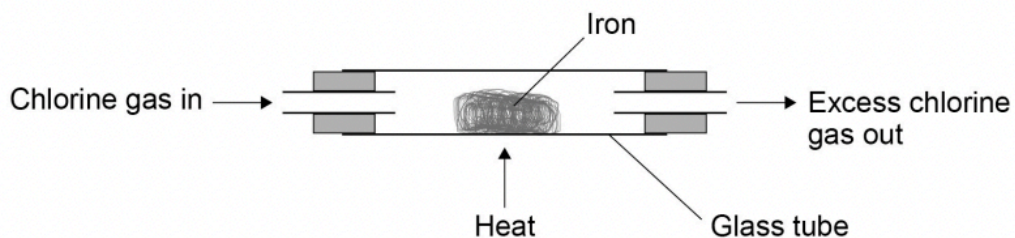
intermolecular forces _____.

Q6.a) (2020)

A teacher investigated the reaction of iron with chlorine.

Figure 1 shows the apparatus used.

Figure 1



Why did the teacher do the investigation in a fume cupboard?

[1 mark]

Tick (✓) **one** box.

Chlorine gas is coloured.

☐

Chlorine gas is flammable.

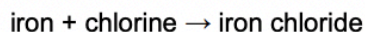
☐

Chlorine gas is toxic.

☐

Q6.b) (2020)

The word equation for the reaction is:



Iron chloride is a solid.

The teacher weighed the glass tube and contents:

- before the reaction
- after the reaction.

What happened to the mass of the glass tube and contents during the reaction?

Give **one** reason for your answer.

[2 marks]

The mass of the glass tube and contents _____.

Reason _____

Q6.c) (2020)

The teacher repeated the investigation with bromine gas and with iodine gas.

Table 2 shows the results.

Table 2

Element	Observation
Chlorine	Iron burns vigorously with an orange glow
Bromine	Iron burns with an orange glow
Iodine	Iron slowly turns darker

Fluorine is above chlorine in Group 7.

Predict what you would observe when fluorine gas reacts with iron.

Use **Table 2**.

[1 mark]

Q6.d) (2020)

Balance the equation for the reaction between iron and bromine.

[1 mark]



Q6.e) (2020)

Calculate the relative formula mass (M_r) of FeBr_3

Relative atomic masses (A_r): Fe = 56 Br = 80

[2 marks]

Relative formula mass (M_r) =

Q7.(2022)

Table 4 shows information about the first five elements going down Group 7.

Table 4

Element	State at 150 °C	Symbol	Formula of the compound with hydrogen
Fluorine	gas	F	HF
Chlorine	<u> </u>	Cl	HCl
Bromine	gas	Br	HBr
Iodine	liquid	I	HI
Astatine	solid	At	<u> </u>

Complete **Table 4**.

[2 marks]

Q8.(2022)

The elements in Group 7 consist of molecules.

What is the formula of a molecule of bromine?

[1 mark]

Tick (✓) **one** box.

Br

☐

Br₂

☐

Br²

☐

2Br

☐

Q9.(2023)

Predict the number of outer shell electrons in an atom of tennessine.

Give **one** reason for your answer.

Use the periodic table.

[2 marks]

Number of outer shell electrons _____

Reason _____

Q10.(2024)

The elements in Group 7 are called the halogens.

A more reactive halogen can displace a less reactive halogen from a solution of its salt.

Which combination of solutions will produce a reaction when mixed?

[1 mark]

Tick (✓) **one** box.

Chlorine and potassium fluoride

☐

Chlorine and potassium bromide

☐

Bromine and potassium fluoride

☐

Bromine and potassium chloride

☐

Q11.(2024)

Which of the following describes the trends going down Group 7?

Tick (✓) **one** box.

[1 mark]

Relative molecular mass decreases and boiling point decreases.

☐

Relative molecular mass decreases and boiling point increases.

☐

Relative molecular mass increases and boiling point decreases.

☐

Relative molecular mass increases and boiling point increases.

☐