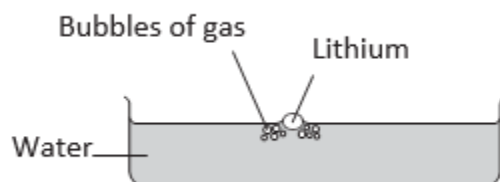


GROUP 1 ELEMENTS

Q1. Lithium is in Group 1 of the periodic table.

(a) Lithium reacts with water to produce a gas and an alkaline solution.



(i) Name the gas produced.

(1 mark)

(ii) Which ion causes the solution to be alkaline?

(1 mark)

(b) Potassium is also in Group 1 of the periodic table.

Potassium reacts with water in a similar way to lithium.

Write down two differences you would see between the reactions of potassium and lithium with water.

(2 marks)

(c) Lithium, sodium and potassium are in Group 1. All these elements react with water.

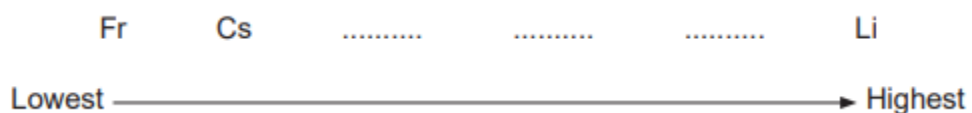
Describe what you see when potassium is added to water.

(2 marks)

Q2. The table shows the melting points of the Group 1 metals arranged in alphabetical order.

Group 1 metal		
Name	Symbol	Melting point in °C
Caesium	Cs	29
Francium	Fr	27
Lithium	Li	180
Potassium	K	64
Rubidium	Rb	39
Sodium	Na	98

(i) Arrange these metals in order of increasing melting point. Three have been done for you.



(1 mark)

(ii) Going down Group 1, the melting points _____.

(1 mark)

Q3. A chemistry teacher demonstrated the reaction between sodium and water to some students. One of the students wrote the following notes.

The reaction between sodium and water

A piece of sodium was cut easily into smaller pieces with a knife.

The sodium was added to water in a trough. The sodium:

- floated
- melted quickly to give a silvery ball
- moved on the surface of the water
- fizzed.

Use the information in the box to help you to answer these questions.

What evidence is there that:

(i) sodium has a low melting point

(1 mark)

(ii) sodium is soft

(1 mark)

(iii) a gas was produced

(1 mark)

Q4. The following article appeared recently in the Manchester Gazette.

Sodium Drum Blaze Scare

A 20 litre drum containing sodium burst into flames when it reacted violently with rainwater at a Manchester factory. It is believed that the sodium, which is normally stored under oil, had been accidentally left outside with the lid off.

A factory worker put out the blaze before the fire services arrived, and a leading fire fighter said, "It was fortunate that potassium wasn't involved as it would have reacted more violently and exploded. These Group 1 *alkali metals* can be very dangerous".

(a) Group 1 metals are stored under oil.

Suggest why.

(1 mark)

(b) Balance the equation which represents the reaction between sodium and water.



(1 mark)

(c) Explain why the Group 1 metals are called the alkali metals.

(1 mark)

(d) Explain, in terms of electrons, why potassium reacts more violently than sodium.

(3 marks)

Q5. Sodium is in Group 1 of the periodic table.

(a) Here are some statements about sodium.

Which **two** of these statements are correct?

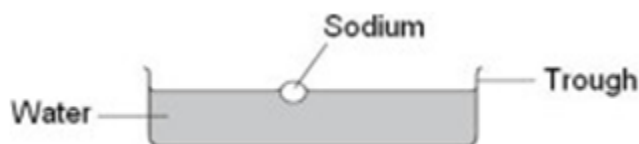
Tick (✓) **two** boxes.

Statement	Tick (✓)
Sodium is a metal.	
Sodium is a halogen.	
Sodium forms an ion with a +1 charge.	
Sodium forms covalent compounds.	

(2 marks)

(b) Sodium reacts with water.

A student drew this diagram and wrote the observations A, B, C and D about the reaction between sodium and water.



A The sodium floated and started giving off a gas.

B The sodium melted.

C The piece of sodium became smaller until all the sodium had gone.

D A colourless solution was left.

Use these observations to answer parts **(i)** and **(ii)**.

(i) Which observation, **A**, **B**, **C** or **D**, shows that sodium has a low density?

