AQA GCSE CHEMISTRY (HIGHER) · 8462

CHEMISTRY



EXAM QUESTION PACK

4.1.2 THE PERIODIC TABLE (PACK 3)

SCORE	PERCENTAGE
/193	%

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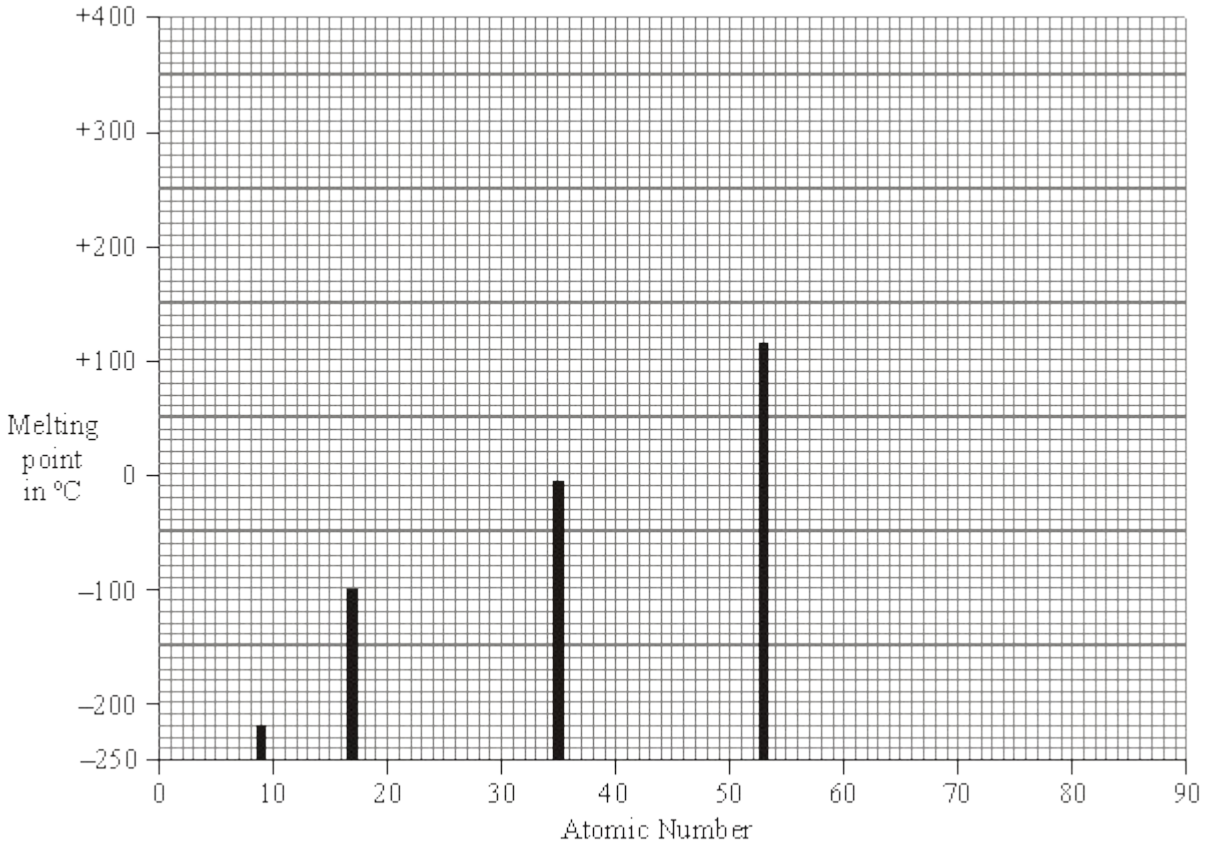
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Q1.

(a) The bar graph shows the melting points of the elements in Group 7 plotted against their atomic numbers.



(i) How do the melting points of the Group 7 elements change as the atomic number increases?

_____

_____

(1)

(ii) The melting point of astatine (atomic number = 85) is not shown on the bar graph. Estimate the melting point of astatine.

_____ °C

(1)

Draw a bar for this value on the bar graph.

(1)

(b) The water from wells in Japan contains bromide ions.

Bromine is extracted from this water. The bromine is displaced by adding another Group 7 element.

(i) Place a tick (✓) next to the name of **one** Group 7 element that could be used to displace bromine from this water.

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Most reactive

Least reactive

Group 7	(✓)
Fluorine	
Chlorine	
Bromine	
Iodine	
Astatine	

(1)

(ii) State why you have chosen this element.

_____

_____

(1)

(iii) One sample of this water contained 2 g of bromine per litre of water.

How many litres of this water would be needed to make 1 kg of bromine?
(1 kg = 1000 g)

_____

_____ litres

(1)

(Total 6 marks)

Q2.

Mendeleev constructed a periodic table in 1869.

In his periodic table:

- most of the elements were put in order of increasing relative atomic mass;
- elements with similar properties were put into groups;
- Mendeleev changed the order of some elements to put them with similar elements;
- spaces were left for elements that Mendeleev thought would be discovered in the future.

One space was in Group 3 between the elements aluminium and indium.

Group 3
Boron

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Aluminium
?
Indium
Thallium

Mendeleev called this undiscovered element 'eka-aluminium'. This element is now known as gallium. In 1871, he also predicted some of the properties of gallium.

The table shows the properties of aluminium and indium, along with some of the predictions made by Mendeleev for gallium.

	Appearance	Metal or non-metal	Boiling point in °C	Density in g per cm3	Relative atomic mass
Aluminium	silvery white	metal	2467	2.7	27
Predicted properties of gallium	silvery white	metal	?	?	68
Indium	silvery white	metal	2080	7.31	115

(i) Suggest **two** reasons why other scientists in 1871 did not accept Mendeleev's periodic table.

Reason 1 _____

_____

Reason 2 _____

_____

(2)

(ii) Suggest why the discovery of gallium in 1875 convinced other scientists that Mendeleev's table was correct.

_____

_____

_____

(1)

(Total 3 marks)

Q3.

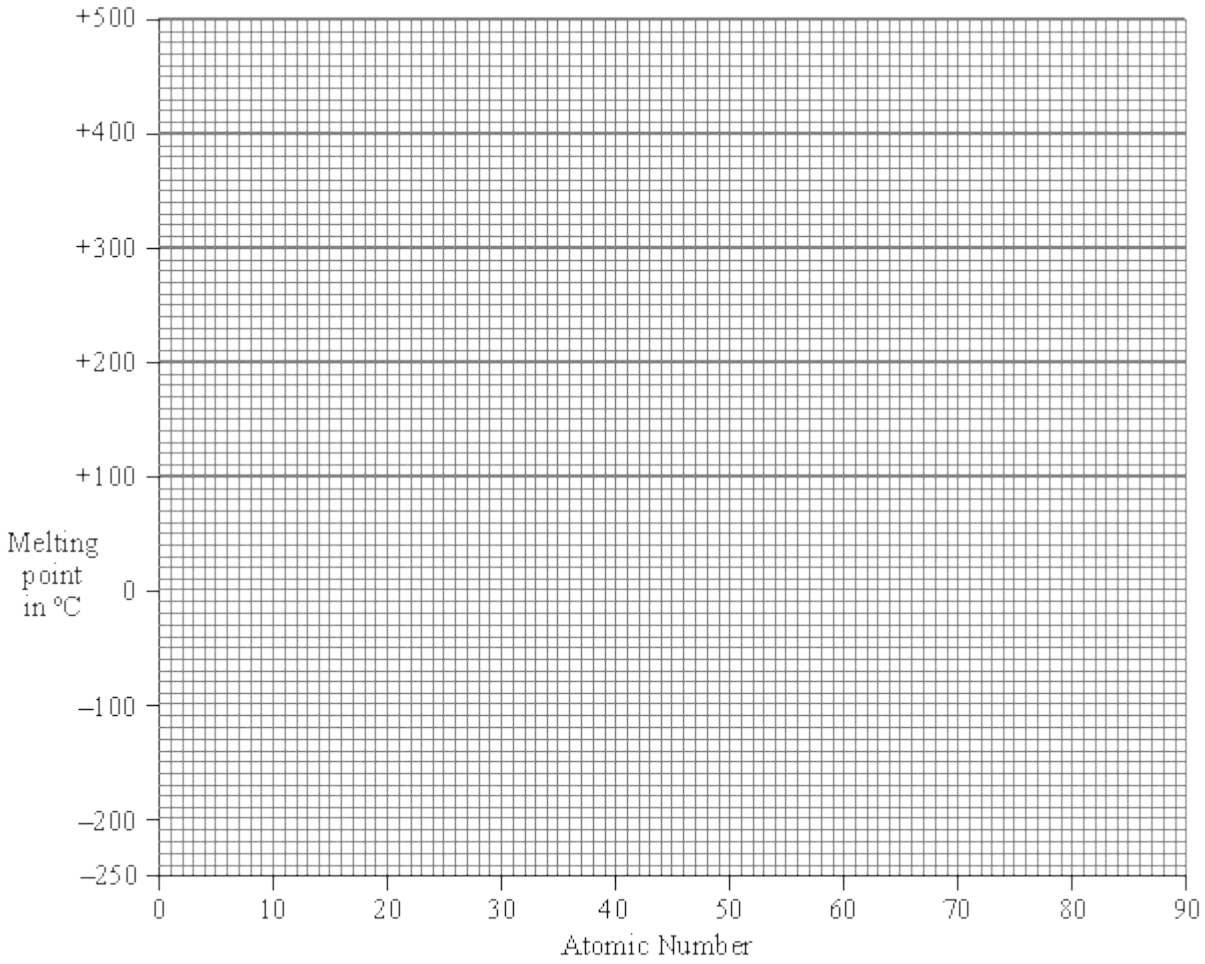
(a) The table gives the melting points of some of the elements of Group 7.

Element	Atomic number	Melting point in ºC

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Fluorine	9	–220
Chlorine	17	–101
Bromine	35	–7
Iodine	53	114
Astatine	85	?

(i) Plot a graph of the melting point against atomic number.



Draw a line of best fit.
Extend your line to estimate a value for the melting point of astatine.

(2)

(ii) Estimate the melting point of astatine. _____ °C

(1)

(iii) Which of the Group 7 elements are solids at 20 °C?

_____

(1)

(b) (i) Draw a diagram to show the arrangement of electrons in an atom of fluorine.

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(1)

(ii) The elements of Group 7 have similar chemical properties.

Explain, in terms of electrons, why they have similar chemical properties.

_____

_____

(1)

(c) Xenon is a very unreactive element.

(i) Explain, in terms of electrons, why xenon is so unreactive.

_____

_____

_____

_____

(2)

(ii) Fluorine reacts with xenon but iodine does not.

Explain, in terms of atomic structure, why fluorine is more reactive than iodine.

_____

_____

_____

_____

_____

_____

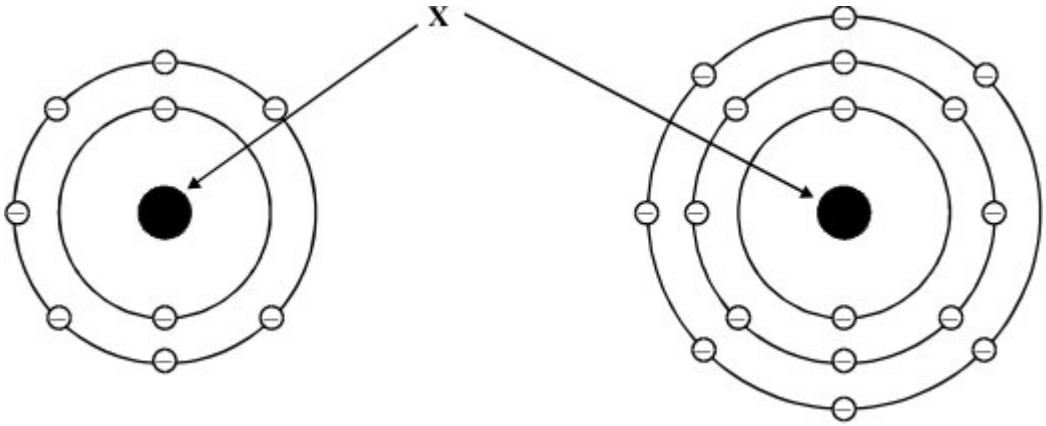
(3)

(Total 11 marks)

Q4.

The diagrams show the electronic arrangement of the atoms of two elements.

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(i) Name the part of the atoms labelled **X**.

_____

(1)

(ii) Why are these two elements in the same group of the Periodic Table?

_____

_____

(1)

(Total 2 marks)

Q5.

Fluorine is more reactive than chlorine. Fluorine reacts with most elements in the Periodic Table. However, fluorine does not react with argon.

Atomic numbers: F 9; Cl 17; Ar 18.

(a) To which group of the Periodic Table do fluorine and chlorine belong?

_____

(1)

(b) (i) Give **one** use for argon.

_____

(1)

(ii) Explain why the noble gas argon is unreactive.

_____

_____

_____

_____

(2)

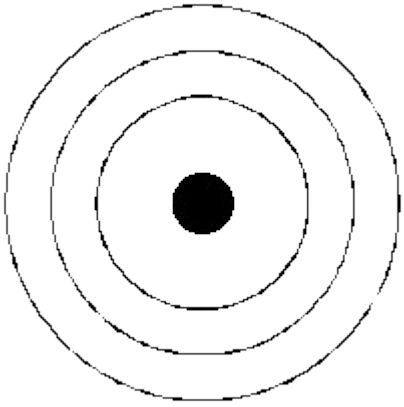
(c) (i) Give **one** use for chlorine.

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_____

(1)

(ii) Draw the electron arrangement of a chlorine atom.



(2)

(iii) Explain why fluorine is more reactive than chlorine.

_____

_____

_____

_____

_____

_____

_____

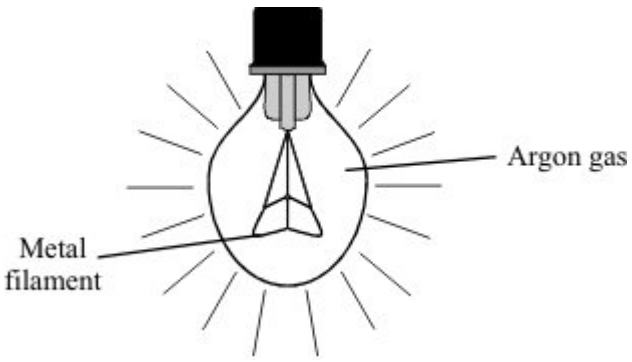
_____

(3)

(Total 10 marks)

Q6.

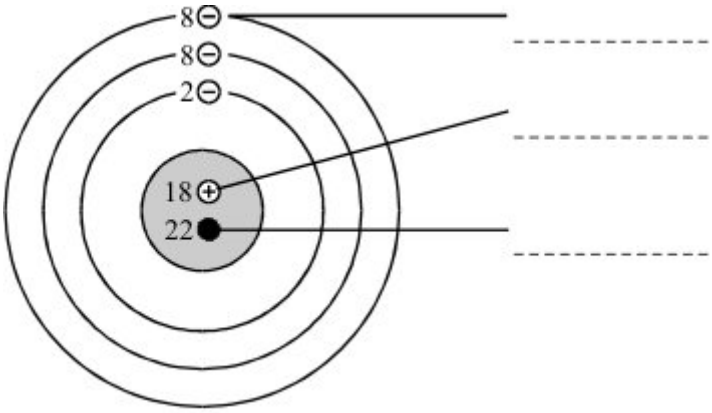
The diagram shows a light bulb.



(a) (i) An argon atom has the structure shown. Use the words in the box to label the particles in the atom. Each word should only be used **once.**

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electron	neutron	proton



(2)

(ii) Argon is unreactive. Why?

_____

_____

(1)

(b) Oxygen would **not** be a suitable gas to use in a light bulb. Explain why.

_____

_____

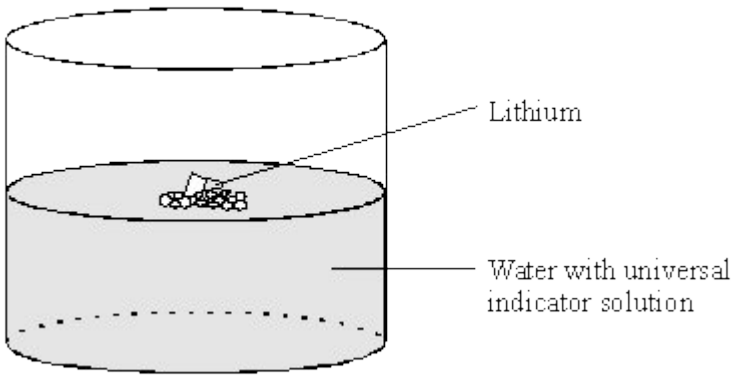
(2)

(Total 5 marks)

Q7.

Lithium is a very reactive metal.

(a) Lithium reacts with cold water.



(i) Which **physical** property of lithium is seen during this reaction?

_____

(1)

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(ii) Which **chemical** property of lithium will be shown by the universal indicator?

_____

(1)

(b) Complete the sentence by writing in the missing numbers.

Lithium has an atomic number of 3 and a mass number of 7.

This means that an atom of lithium has _____ protons _____ electrons

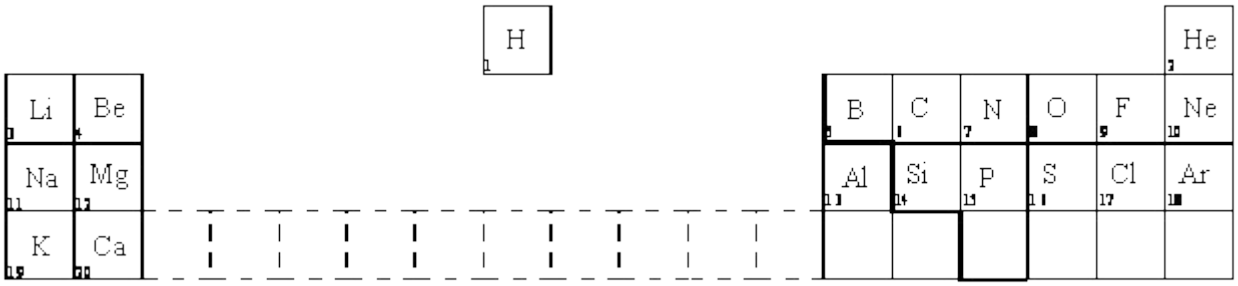
and _____ neutrons.

(3)

(Total 5 marks)

Q8.

The elements in Mendeleev's periodic table were arranged in order of increasing atomic mass. Part of the modem Periodic Table is shown.



(a) Complete the sentence by writing in the missing words.

The modem Periodic Table is arranged in order of increasing

_____ _____ .

(1)

(b) (i) Name a metal in the same group as lithium.

_____

(1)

(ii) Name a non-metal in the same period as magnesium.

_____

(1)

(Total 3 marks)

Q9.

This question is about the Periodic Table.

(a) Dimitri Mendeleev was a Russian scientist who, in 1869, helped to develop the Periodic Table. He made his table with the known elements arranged in order of increasing atomic mass. He started new rows so that elements with similar chemical properties would be in the same column. Mendeleev sometimes had to leave gaps in his table.

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(i) Complete the sentences.

The Periodic Table is now the arrangement of the elements in order

of increasing atomic _____ . The rows are called _____

and the columns are called _____ .

(3)

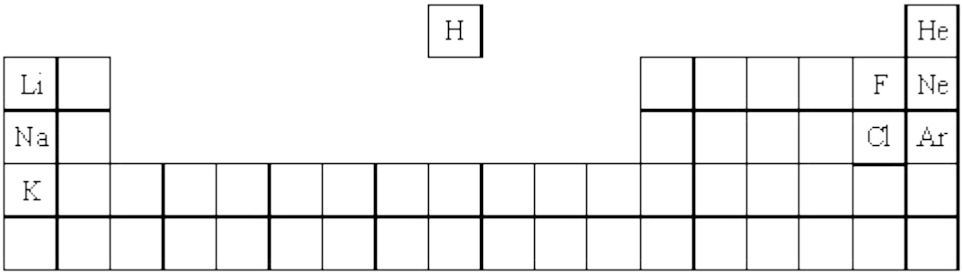
(ii) Suggest why Mendeleev had to leave gaps in his table.

_____

_____

(1)

(b) This section of the Periodic Table shows the positions of some elements.



(i) Give the chemical symbol for **one** of the noble gases.

_____

(1)

(ii) Draw the arrangement of electrons around the nucleus for the noble gas that you chose in (i).



(1)

(iii) Why do the electron arrangements of lithium, sodium and potassium make them react in a similar way?

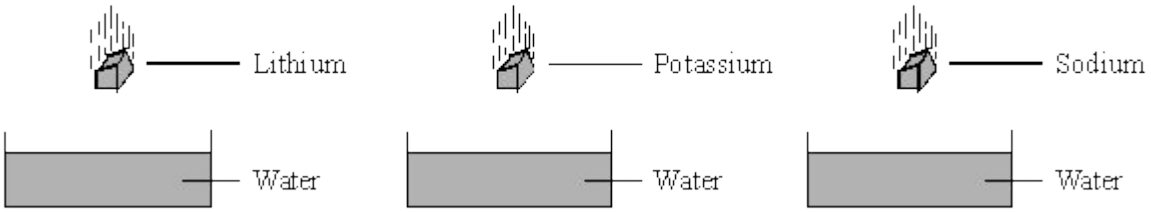
_____

_____

(1)

(iv) Small pieces of lithium, potassium and sodium are added to water.

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What is the order of reactivity for these three metals? Put the most reactive metal first.

_____

_____

(1)

(v) Complete and balance the chemical equation for the reaction of sodium with water.

$2Na(s) + 2H_2O(l) \rightarrow$ _____NaOH(aq) + _____(g)

(2)

(Total 10 marks)

Q10.

The Periodic Table contains groups of elements that have similar chemical properties.

(a) The halogens are in Group 7 of the Periodic Table.

(i) Complete the table. Iodine has been done for you.

Halogen	Colour of vapour
chlorine	
	red-brown
iodine	purple

(2)

(ii) Why do the halogens have similar chemical properties?

_____

_____

(1)

(b) The alkali metals are in Group 1 of the Periodic Table. State what is formed when any alkali metal reacts with water.

_____

_____

_____

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_____

_____

(2)

(Total 5 marks)

Q11.

Fluorine is a very useful element. It is placed in group 7 of the Periodic Table.

Use your knowledge of the elements in group 7 to help you answer these questions. You may find that information in the Data Sheet may help you with this question.

(a) Name another element in group 7 of the Periodic Table.

_____

(1)

(b) Cylinders filled with fluorine molecules are commercially available. What would you expect the formula of a fluorine molecule to be?

_____

(1)

(c) Fluoride ions are added to drinking water to help prevent tooth decay. What is the charge on fluoride ions in the water?

_____

(1)

(d) Fluorine reacts with the non-metal sulphur to make sulphur hexafluoride (SF_6).

(i) What type of bonding would you expect in sulphur hexafluoride?

_____

(1)

(ii) Explain the reason for your answer to part (i).

_____

_____

_____

(1)

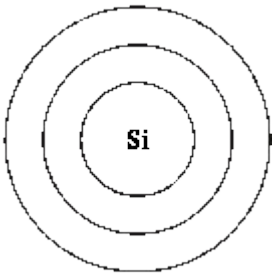
(Total 5 marks)

Q12.

Silicon is an extremely important element. More than a million tonnes of silicon are produced each year. Silicon is made by reducing silicon oxide (sand) with carbon (coke).

(a) (i) Complete the diagram below to show the arrangement of electrons in an atom of silicon. The Data Sheet may help you with this question.

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(2)

(ii) Which electrons in the silicon atom take part in chemical reactions with other atoms?

_____

_____

(1)

(iii) What features of all the atoms of the elements in group 4 of the Periodic Table might give them similar chemical properties?

_____

_____

(1)

(b) Silicon is difficult to classify as a metal or a non-metal because it has properties which resemble both. Some of the properties of silicon are listed below.

- Silicon is a shiny blue/grey solid.
- Silicon is placed in Group 4 of the Periodic Table.
- Silicon has a relative atomic mass of 28.
- Silicon has a very high melting point (1410ºC).
- Silicon has a very high boiling point (2355ºC).
- Silicon conducts electricity.
- Silicon oxide will neutralise alkalis.
- Silicon forms compounds in which the silicon atoms are bonded to other atoms by covalent bonds.

(i) Select **two** properties from the list above in which silicon resembles a metal.

1. _____

2. _____

(2)

(ii) Select **two** properties from the list above in which silicon resembles a non-metal.

1. _____

2. _____

(2)

(Total 8 marks)

Q13.

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Fluorine is the most reactive element in group 7 of the Periodic Table.
Fluorine reacts with all the other elements in the Periodic Table except some of the noble gases. It does not react with helium, neon and argon, but it does react with xenon. Many substances burst into flames when exposed to fluorine.

(a) (i) The electronic structure of chlorine is 2.8.7. What is the electronic structure of fluorine?

_____

(1)

(ii) What is the electronic structure of the chloride ion Cl^-?

_____

(1)

(iii) Explain why fluorine is more reactive than chlorine.

_____

_____

_____

_____

_____

(4)

(b) (i) What does the information at the start of this question suggest about the reactivity of the elements in group 0?

_____

_____

(1)

(ii) A chemist did an experiment to find out if fluorine reacts with xenon. The two gases were mixed in a glass container. The only product detected was silicon fluoride. Explain what happened.

_____

_____

_____

(2)

(iii) The experiment was repeated many years later but the gases were mixed in a different type of container. A white solid was obtained which was xenon fluoride.

Predict whether you think (1) krypton and (2) radon will react with fluorine. Explain the reasons for your predictions.

_____

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_____

_____

_____

_____

_____

(5)

(Total 14 marks)

Q14.

Use the Periodic Table on the Data Sheet to help you to answer this question.

(a) State **one** similarity and **one** difference in the electronic structure of the elements:

(i) across the Period from sodium to argon;

_____

_____

_____

(2)

(ii) down Group 7 from fluorine to astatine.

_____

_____

_____

(2)

(b) (i) State the trend in reactivity of the Group 1 elements.

_____

(1)

(ii) Explain this trend in terms of atomic structure.

_____

_____

_____

_____

_____

(3)

(c) Hydrogen is an element which is difficult to fit into a suitable position in the Periodic Table. Give reasons why hydrogen could be placed in either Group 1 or Group 7.

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_____

_____

_____

_____

_____

_____

(3)

(Total 11 marks)

Q15.

Read the following information about an element X.

The element X melts above 600°C. It conducts electricity at room temperature. It burns in oxygen to form an oxide. When the oxide is mixed with water it turns Universal Indicator blue.

The oxide of X is a white solid at room temperature. It has the formula XO and contains the ion X^{2+}.

The element X reacts with chlorine to form a chloride with a high melting point. The chloride conducts electricity when molten and it is soluble in water.

(a) From the information give **three** pieces of evidence which suggest that X is a metal.

1. _____

_____

2. _____

_____

3. _____

_____

(3)

(b) In which Group of the Periodic Table should X be placed? Give a reason for your answer.

Group _____

Reason _____

_____

(2)

(c) Predict the formula for the chloride of X. _____

(1)

(Total 6 marks)

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Q16.

(a) Why do the elements in Group 1 of the Periodic Table have similar chemical properties?

_____

_____

(1)

(b) Explain why the reactivity of the elements in Group 1 increases down the group.

_____

_____

_____

_____

(2)

(Total 3 marks)

Q17.

Calcium and magnesium are elements. They are found in the Earth's crust as compounds, often carbonates and sulphates. Magnesium is also found as its chloride.

(a) Calcium and magnesium are in the same Group in the Periodic Table.
State which Group this is.

_____

(1)

(b) Use the Data Sheet to help you to answer this question.

(i) Write the chemical formula of magnesium chloride.

_____

(1)

(ii) Name the type of bonding in magnesium chloride.

_____

(1)

(Total 3 marks)

Q18.

X is an element with the following properties:

- melts at –220°C and boils at –188°C;
- does not conduct electricity at room temperature;
- forms molecular compounds with non-metals;
- forms ionic salts with metals in which its ion has a 1–charge.

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(a) Would you expect X to be a solid, a liquid or a gas at 20°C?

_____

(1)

(b) Predict the formula of the product formed when X reacts with aluminium.
(The aluminium ion is Al^{3+} and the X ion is X^{-}.)
Select your answer from the list below.

AlX **AlX_2** **AlX_3** **Al_3X** **Al_2X_3**

Predicted formula _____

(1)

(c) To which Group of the Periodic Table does the element X belong?

_____

(1)

(Total 3 marks)

Q19.

Sodium and potassium are both in Group 1 of the Periodic Table.

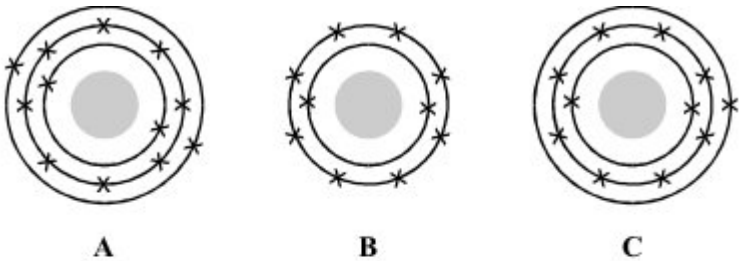
(a) Explain, by reference to their electronic structures, why both elements are placed in Group 1.

_____

_____

(1)

(b) Use the Data Sheet to help you to answer this question.
The diagrams below represent the electronic structures of some atoms and ions.



A **B** **C**



D **E** **F**

Which one of the structures, **A** - **F**

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(i) represents a sodium **atom**, _____

(1)

(ii) represents a potassium **ion**? _____

(1)

(c) Sodium and potassium both react with cold water.

(i) The word equation represents the reaction of sodium with water.

sodium + water → sodium hydroxide + hydrogen

Complete and balance the symbol equation for this reaction.

_____ + _____ → 2NaOH + _____

(2)

(ii) How does the reactivity of potassium with water differ from that of sodium with water?

_____

Explain this difference in reactivity by reference to the electronic structures of the potassium and sodium atoms.

_____

_____

_____

_____

_____

_____

(4)

(Total 9 marks)

Q20.

One definition of an element is:

"A substance that cannot be broken down into simpler substances by chemical methods"

The table below shows some of the 'substances' which Antoine Lavoisier thought were elements. He divided the 'substances' into four groups. He published these groups in 1789.

The modern names of some of the 'substances' are given in brackets.

ACID-MAKING ELEMENTS	GAS-LIKE ELEMENTS	METALLIC ELEMENTS	EARTHY ELEMENTS
sulphur	light	cobalt mercury	lime (calcium oxide)

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phosphorus charcoal (carbon)	caloric (heat) oxygen azote (nitrogen) hydrogen	copper gold iron lead magnese zinc	nickel platina (platinum) silver tin tungsten	magnesia (magnesium oxide) barytes (barium sulphate) argilla (aluminium oxide) silex (silicon dioxide)

Dmitri Mendeleev devised a Periodic Table of the elements in 1869. A modern version of this table is shown on the Data Sheet.

Give **two** ways in which Mendeleev's table is more useful than Lavoisier's.

1. _____

_____

2. _____

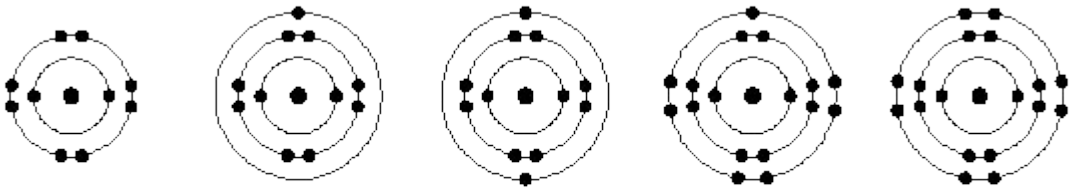
_____

(Total 2 marks)

Q21.

Use the Data Sheet to help you answer this question.

When sodium reacts with water it forms sodium ions.
The diagrams below represent the electron arrangements of some atoms and ions.



2.8
A

2.8.1
B

2.8.2
C

2.8.7
D

2.8.8
E

Which of the diagrams, **A** to **E**, represents the electron arrangement of each of the following?

(i) A sodium atom, Na _____

(ii) A sodium ion, Na^+ _____

(Total 2 marks)

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Q22.

Part of the Periodic Table which Mendeleev published in 1869 is shown below.

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Period 1	H						
Period 2	Li	Be	B	C	N	O	F
Period 3	Na	Mg	Al	Si	P	S	Cl
Period 4	K Cu	Ca Zn	* *	Ti *	V As	Cr Se	Mn Br
Period 5	Rb Ag	Sr Cd	Y In	Zr Sn	Nb Sb	Mo Te	* I

Use the Data Sheet to help you to answer this question.

(a) (i) Give the symbols of **two** elements in Group 1 of Mendeleev's Periodic Table which are **not** found in Group 1 of the modern Periodic Table.

_____ and _____

(1)

(ii) Name these **two** elements.

_____ and _____

(2)

(b) Which group of elements in the modern Periodic Table is missing on Mendeleev's table?

_____

(1)

(c) Mendeleev left several gaps in his Periodic Table. These gaps are shown as asterisks(*) on the table above.
Suggest why Mendeleev left these gaps.

_____

_____

_____

(1)

(d) Complete the following sentence.

In the **modern** Periodic Table the elements are arranged in the order of their

_____ numbers.

(1)

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(e) Mendeleev placed lithium, sodium and potassium in Group 1 of his Periodic Table. This was because they have similar properties.
Some properties of elements are given in the table.
Four of them are properties of lithium, sodium and potassium. One of these properties has been ticked for you. Place a tick next to the other three properties.

PROPERTY	
They react with water to give alkaline solutions.	
They are gases.	
They are non-metals.	
They form an ion with a 1+ charge.	
They react with water and give off hydrogen.	✓
They form an ion with a 1– charge.	
They are metals.	
They react with water to give acidic solutions.	

(3)

(f) What happens when a small piece of sodium reacts with water?
You should describe what you would see and state what substances are formed.

_____

_____

_____

_____

_____

_____

(3)

(Total 12 marks)

Q23.

Part of the Periodic Table which Mendeleev published in 1869 is shown below.

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	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Period 1	H						
Period 2	Li	Be	B	C	N	O	F
Period 3	Na	Mg	Al	Si	P	S	Cl
Period 4	K Cu	Ca Zn	* *	Ti *	V As	Cr Se	Mn Br
Period 5	Rb Ag	Sr Cd	Y In	Zr Sn	Nb Sb	Mo Te	* I

Use the Data Sheet to help you to answer this question.

(a) Name **two** elements in Group 1 of Mendeleev's Periodic Table which are not found in Group 1 of the modern Periodic Table.

_____ and _____

(2)

(b) Which group of elements in the modern Periodic Table is missing on Mendeleev's table?

_____

(1)

(c) Mendeleev left several gaps in his Periodic Table. These gaps are shown as asterisks(*) on the table above.
Suggest why Mendeleev left these gaps.

_____

_____

_____

(1)

(d) Complete the following sentence.

In the **modern** Periodic Table the elements are arranged in the order of their

_____ numbers.

(1)

(Total 5 marks)

Q24.

(a) What is the name given to the block of elements in the middle of the Periodic Table which includes vanadium?

_____

(1)

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(b) Some of the properties of vanadium are shown in this list.

- It has a high melting point.
- It is a solid at room temperature.
- It is a conductor of electricity.
- It is a good conductor of heat.
- It forms coloured compounds.
- If forms crystalline compounds.
- It forms compounds that are catalysts.

Select **two** properties, from the list above, which are **not** typical of a Group 1 metal.

1. _____

2. _____

(2)

(Total 3 marks)

Q25.

In sea water the bromine is present as bromide ions (Br^-). The equation below shows how chlorine can be used to displace bromine from sea water.

$Cl_{2(g)} + 2Br^-(aq) \rightarrow Br_{2(g)} + 2Cl^-(aq)$

Explain, as fully as you can, why chlorine can displace bromine from sea water.
To obtain full marks your answer should refer to electronic structure.

_____

_____

_____

_____

_____

_____

_____

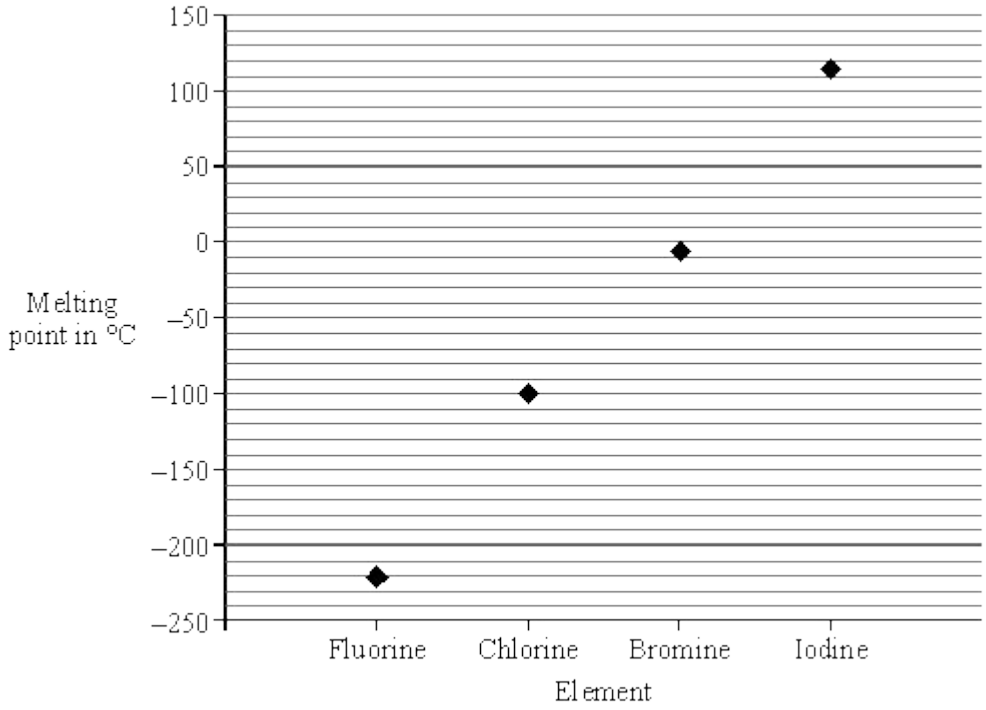
_____

(Total 3 marks)

Q26.

The graph shows the melting point of four elements in Group 7 of the periodic table.

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(a) What is the melting point of fluorine?

_____

(1)

(b) Room temperature is 20°C.

Which element is solid at room temperature?

_____

(1)

(c) Look at the periodic table on the Data Sheet.

Using data from the graph, describe the trend of melting points of the elements in Group 7.

_____

_____

_____

_____

(2)

(d) The elements in Group 7 are non-metals.

Which **two** of the following are properties of non-metals?

Place a tick (✓) in the box against each correct property.

Brittle (if solid) ☐

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Good conductor of heat ☐

High boiling point ☐

Poor conductor of electricity ☐

(2)

(Total 6 marks)

Q27.

The elements in Group 1 are known as the alkali metals.

Which **three** of the following are properties of alkali metals?

Place a tick (✓) in the box against each correct property.

Hard, tough and strong ☐

Low density ☐

Form hydroxides that dissolve in water ☐

React quickly with water ☐

Used as catalysts ☐

Used to make electric cables ☐

(Total 3 marks)

Q28.

Use the periodic table on the Data Sheet to answer these questions.

The table below gives the electronic structures of four elements, **W**, **X**, **Y** and **Z**.

Element	Electronic structure
W	2,5
X	2,7
Y	2,8,8
Z	2,8,8,1

(a) Which element **W**, **X**, **Y** or **Z**:

(i) is a Group 0 gas? _____

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(ii) is nitrogen? _____

(iii) is a Group 7 gas? _____

(iv) reacts violently with water? _____

(3)

(b) Which **two** Groups of the periodic table do **not** contain any non-metals?

_____

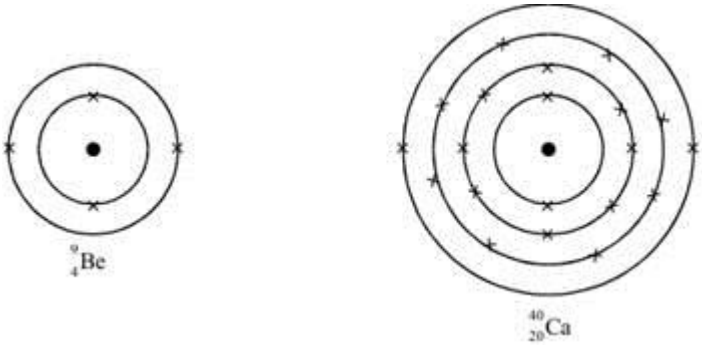
(1)

(Total 4 marks)

Q29.

Beryllium and calcium are metals in Group 2 of the periodic table.

The diagrams show their electronic structures.



(a) Why do beryllium and calcium have similar chemical properties?

_____

_____

_____

_____

(1)

(b) Calcium is more reactive than beryllium.

Suggest an explanation for this in terms of the electronic structure of the two elements.

_____

_____

_____

_____

(2)

(Total 3 marks)

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Q30.

(a) Helium is used to fill party balloons.

Which **two** of the following are properties that make helium suitable for filling party balloons?

Place a tick (✓) in the box against each suitable property.

Coloured	☐
Exists as individual atoms	☐
Less dense than air	☐
Poor conductor of heat	☐
Very unreactive	☐

(2)

(b) The table shows the names of some gases.

Use the correct formulae from the box to complete the table. The first one has been done for you.

CH_4	CO_2	H_2	HCl	NH_3	O_2

Gas	Formula
Oxygen	O_2
Carbon dioxide	
Hydrogen chloride	
Ammonia	

(3)

(Total 5 marks)

Q31.

Use the Periodic Table of Elements on the Data Sheet to help you to answer this question.

Francium (Fr) is a very rare element. It is estimated that there is only 25 g of francium in the Earth's crust. Francium is radioactive and has a half-life of only a few minutes.

Mendeleev predicted the existence of francium in the 1870s but the element was not discovered
until 1939.

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(a) Explain why Mendeleev was able to predict the existence of francium in the 1870s.

_____

_____

_____

_____

(2)

(b) Suggest why there is not much experimental evidence for the properties of francium.

_____

_____

(1)

(c) (i) If you could react francium with water, how would the reaction compare with that of sodium with water?

_____

_____

(1)

(ii) Explain the reason for your answer.

_____

_____

_____

_____

(2)

(Total 6 marks)

Q32.

Use the periodic table on the Data Sheet to help you to answer these questions.

(a) Write the symbol for helium.

_____

(1)

(b) Write the name of an element in Group 4.

_____

(1)

(c) Write the name of the element which has a relative atomic **mass** of 64.

_____

(1)

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(d) Write the name of the element with the next highest atomic number after Te (tellurium) in the periodic table.

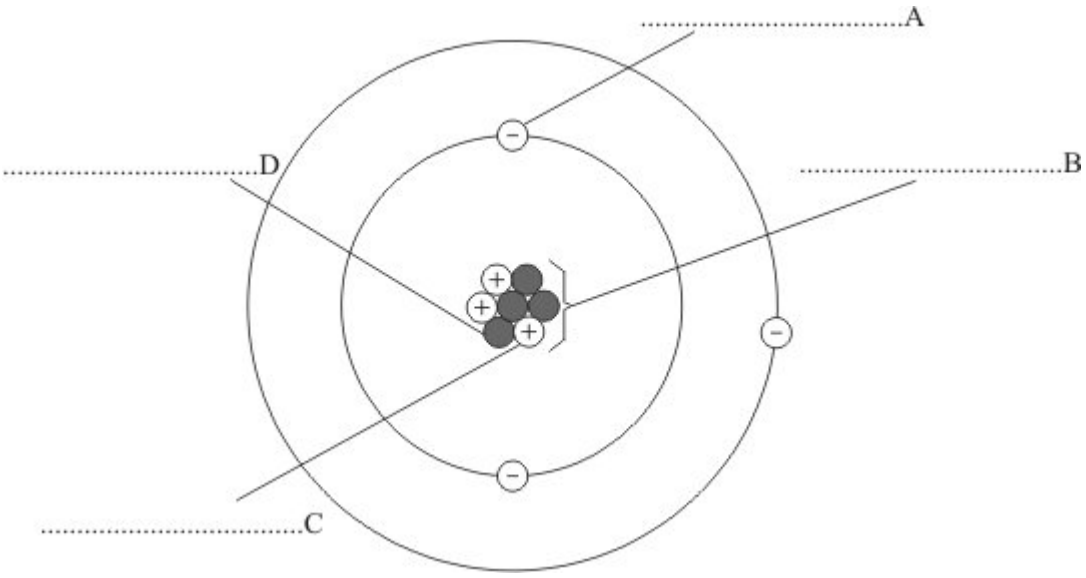
_____

(1)

(Total 4 marks)

Q33.

The diagram shows an atom.



(a) On the diagram, write the names of structures **A**, **B**, **C** and **D**.

(4)

(b) To which Group of the periodic table does this atom belong?

_____

Give **one** reason for your answer.

_____

_____

(2)

(c) Name the element which is made up of this type of atom.

_____

(1)

(Total 7 marks)

Q34.

The table shows some properties of four Group 7 elements.

Element	Boiling point in ºC	Melting point in ºC	State at room	Reaction with hydrogen

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			temperatur e	Description	Product
Fluorine	– 218	– 188	gas	Explosive reaction in dim light	Hydrogen fluoride
Chlorine	– 34	– 101	gas	Explosive reaction in sunlight	Hydrogen chloride
Bromine	+ 59	– 7		Reacts if heated	
Iodine	+ 185	+ 114		Reacts if heated strongly	Hydrogen iodide

(a) What is the state at room temperature of:

(i) bromine; _____

(ii) iodine? _____

(2)

(b) Which **one** of the four elements is most reactive?

_____

(1)

(c) Name the compound formed when hydrogen reacts with bromine.

_____

(1)

(Total 4 marks)

Q35.

The table shows how Group 7 elements react with hydrogen.

Element	Reaction with hydrogen	
	Description	**Product**
Fluorine	Explosive reaction in dim light	Hydrogen fluoride
Chlorine	Explosive reaction in sunlight	Hydrogen chloride
Bromine	Reacts if heated	Hydrogen bromide
Iodine	Reacts if heated strongly	Hydrogen iodine

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Explain the difference in the rates of the reaction of fluorine with hydrogen and of iodine with hydrogen.

_____

_____

_____

_____

(Total 2 marks)

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