United Curriculum
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United Curriculum
End-of-Year Assessment 2023-24

Science - Chemistry

Time: 40 minutes

Year 8

Paper 1

Student surname:

Student first name(s):

Class name / number:

You must have: A ruler, a calculator and the periodic table insert.

Instructions

- Fill in the boxes on the front page.
- Use a black ink pen.
- The marks for each question are shown.
- Answer the questions in the space provided.
- Cross through any work you do not want to be marked.

Advice

- Read each question carefully before you begin.
- Try your best to answer every question. If you have time, go back and review your answers.

For Teacher use only:

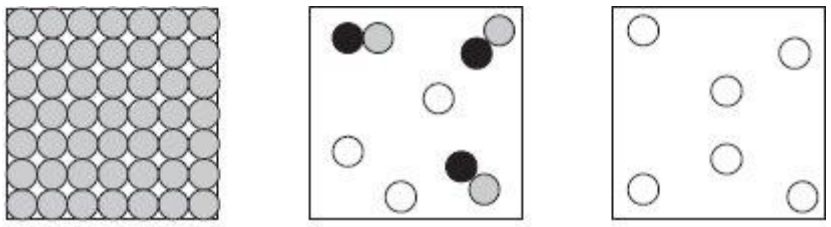
Question 1		7	Question 4		9	TOTAL MARKS	
Question 2		7	Question 5		6		40
Question 3		11					

Question 1 (7 marks)

Particle diagrams and word equations

The diagrams below show the arrangement of atoms or molecules in five different substances **A**, **B**, **C**, **D** and **E**.

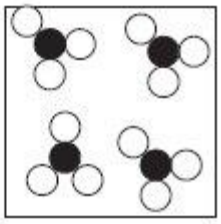
Each of the circles ○, ○ and ● represents an atom of a different element.



A

B

C



D

E

1a. Give the letter of the diagram which represents a solid.

.....

1

1b. Give the letter of the diagram which represents a liquid.

.....

1

1c. Give the letter of the diagram which represents a mixture of gases.

.....

1

1d. **Two** diagrams contain a compound.

Give the letters of **both** diagrams which contain a compound.

.....

1

1e. What is a 'compound'?

.....

.....

1

Below is a word equation for a chemical reaction:

lithium + water → lithium hydroxide + hydrogen

1f. Give the name of one of the **reactants** in this reaction.

.....

1

1g. Give the name of one of the **products** in this reaction.

.....

1

Turn over for the next question

Question 2 (7 marks)

Atmosphere

The data in the table shows the percentages of three gases in the Earth's early atmosphere compared to the atmosphere today.

Name of gas	Percentage (%) of gas in early atmosphere	Percentage (%) of gas in atmosphere today
Nitrogen	0	78
Oxygen	0	21
Ammonia	High	0

2a. Use the data in the table to describe how the atmosphere has changed.

.....

.....

.....

.....

.....

.....

	3

2b. Another gas found in the atmosphere is carbon dioxide.

In the early atmosphere carbon dioxide levels were much higher than they are today.

Give **one** reason why carbon dioxide levels decreased over time.

Tick **one** box.

Process	Tick (✓)
Combustion	
Decomposition	
Photosynthesis	
Respiration	

	1

2c. Carbon dioxide levels are currently increasing.

Scientists think that this is due to human activity.

Name the human activity that is leading to this increase.

Tick **one** box.

Process	Tick (✓)
Combustion	
Decomposition	
Photosynthesis	
Respiration	

1

2d. Which process releases carbon dioxide when an animal or plant dies?

Tick **one** box.

Process	Tick (✓)
Combustion	
Decomposition	
Photosynthesis	
Respiration	

1

2e. During which process do **both** plants and animals release carbon dioxide?

Tick **one** box.

Process	Tick (✓)
Combustion	
Decomposition	
Photosynthesis	
Respiration	

1

Turn over for the next question

Question 3 (11 marks)

Chemical formulae and neutralisation

You will need your **periodic table** for this question.

The chemical formula for nitrous oxide is N_2O.

3a. What elements are contained within nitrous oxide?

Use your periodic table to help you.

.....

.....

1

3b. How many atoms are in one molecule of nitrous oxide?

.....

1

3c. Write the formula of a compound that contains:

- 1 x magnesium
- 2 x chlorine

Use your periodic table to help you.

.....

.....

1

3d. A compound has the formula NaF.

What is the name of this compound?

.....

1

3e. Another compound is potassium oxide.

What is the formula of potassium oxide?

Use your periodic table to help you.

.....

.....

2

3f. Below is a word equation for a reaction between potassium oxide and hydrochloric acid:

hydrochloric acid + potassium oxide → potassium chloride + water

73 g of hydrochloric acid reacted with the potassium oxide.

This produced 149 g of potassium chloride and 18 g of water.

Calculate the mass of potassium oxide which reacted with the acid?

.....

.....

.....

Mass of water = ... g

3

The word equation from question 3f is shown again below to help you answer question 3g:

hydrochloric acid + potassium oxide → potassium chloride + water

This reaction is an example of a **neutralisation** reaction.

All of the hydrochloric acid reacted with **all** of the potassium oxide.

The potassium chloride produced in the reaction dissolved in the water.

3g. What is the pH of the potassium chloride solution?

.....

	1

3h. Suggest the pH of the hydrochloric acid.

.....

	1

Question 4 (9 marks)

Group 1 and 7 elements

The periodic table is divided into groups.

Two of these groups are group 1 and group 7.

4a. Compare the pattern of reactivity in group 1 with group 7.

.....

.....

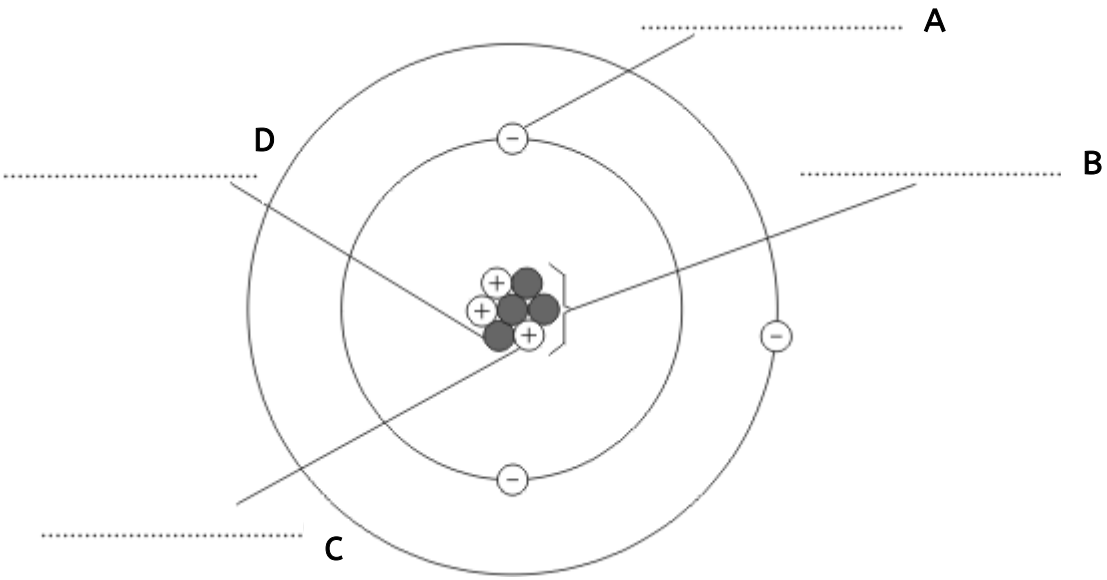
.....

.....

2

4b. The diagram shows an atom of a group 1 element.

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



4

The melting points of the elements in Group 1 show a trend.

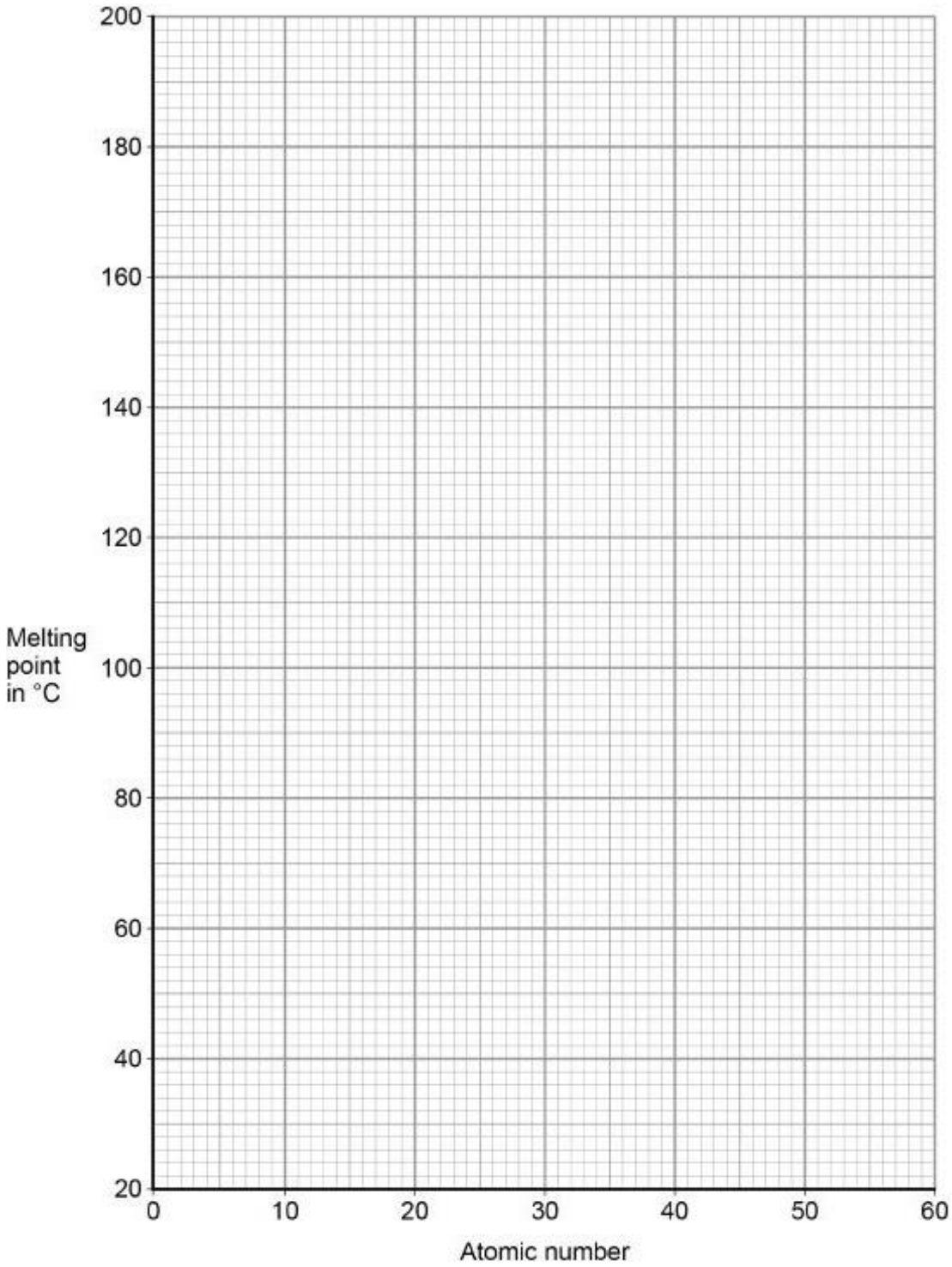
The table below shows the atomic numbers and melting points of the Group 1 elements.

Element	Atomic number	Melting point in °C
Lithium	3	181
Sodium	11	98
Potassium	19	X
Rubidium	37	39
Caesium	55	29

4c. Plot the data from the table on the graph on the opposite page.

You **do not** need to draw a line of best fit.

	2



4d. Predict the melting point, **X**, of potassium, atomic number 19.

Use your graph above.

Melting point = ... °C

	1

Turn over for the next question

Question 5 (6 marks)

Rocks

5a. Draw a line from each type of rock below to the way the rock was formed.

Only draw **one** line from each rock type.

Rock type	Way rock was formed
Sedimentary	The effect of high temperature and pressure on limestone
Igneous	Formed when magma cools
Metamorphic	Particles are deposited in layers

2

5b. Fossilised bones are found in sedimentary rock.

When a boney fish dies it falls to the bottom of the seabed.

Describe how a fossil of the boney fish can be formed in the sedimentary rock after it dies.

	4

END OF ASSESSMENT

This is the end of the assessment.
There are no questions printed on this page.