Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2018–2019

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GDW21] *GDW21*

THURSDAY 28 FEBRUARY 2019, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **5(b)**.
A Data Leaflet, which includes a Periodic Table of the elements is provided.

12274

1 Part of the modern Periodic Table is shown below.

							H										
														N			Ne
	Mg											Al			S		
										Cu						Br	

(a) Use **only the elements shown above** to answer the following questions:

(i) Give the symbols for two elements which are solid at room temperature.

_____ [1]

(ii) How many elements are gases at room temperature?

_____ [1]

(iii) **Name** the element which is a liquid at room temperature.

_____ [1]

(iv) Which element is a yellow non-metal?

_____ [1]

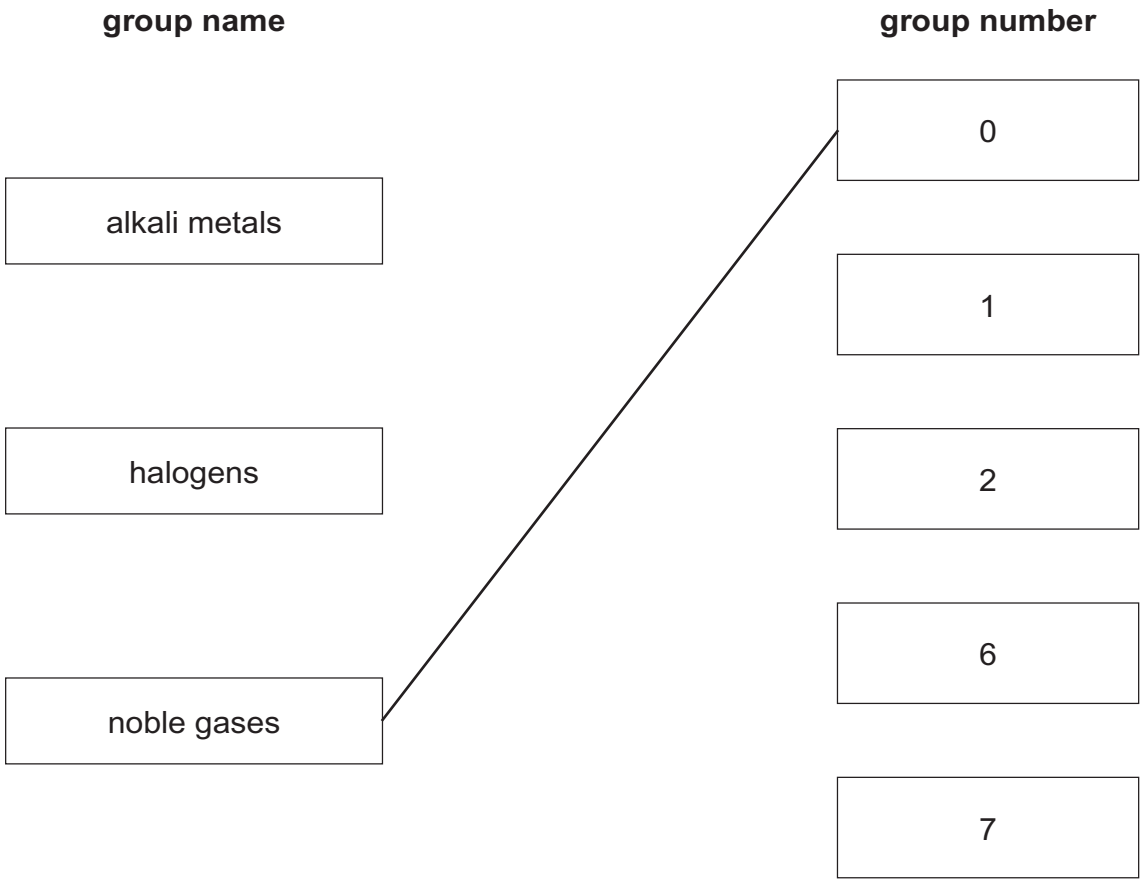
(v) **Name** an element which conducts heat and electricity.

_____ [1]

(vi) Which element has the lowest atomic number?

_____ [1]

(b) Some group names and group numbers are given below. Draw a line from each group name to its correct group number. One has been done for you.

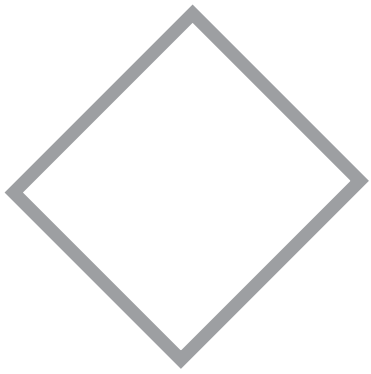


[2]

[Turn over

2 Hazard symbols are used to warn of danger.
They are a diamond shape with a coloured border.

(a) (i) Draw the hazard symbol which means **caution** in the diamond shape below.



[1]

(ii) The shape above has a grey border but what is the actual colour of the border used in these hazard symbols? Circle the correct answer.

yellow **red** **green** **blue** **brown** [1]

(b) The table below gives information about the melting points and boiling points of four substances A, B, C and D.

Substance	Melting point/°C	Boiling point/°C
A	–98	57
B	168–171	208–211
C	44	281
D	15–21	87–92

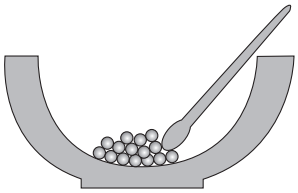
(i) Which substance A, B, C or D is a pure substance and is a liquid at room temperature?

_____ [1]

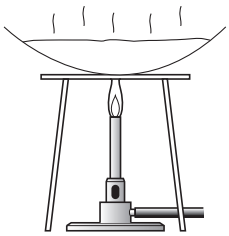
(ii) Which substance A, B, C or D could be a formulation used as a solid fertiliser?

_____ [1]

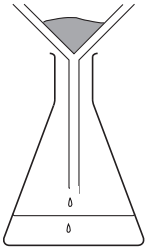
(c) The diagrams below show the different steps in the separation of a sample of pure salt from rock salt.



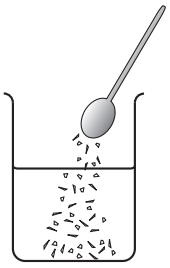
A



B



C



D

(i) Label the residue on one of the diagrams A, B, C or D. [1]

(ii) In which step(s) A, B, C or D will there be a change of state?

_____ [1]

(iii) Name the piece of apparatus which is being heated in step B.

_____ [1]

(d) Choose words from the list below below to complete the sentence.

solute **filtrate** **residue** **solvent** **solubility**

When salt dissolves in water, the water is the _____ and the salt is the _____.

[2]

[Turn over

3 Atoms contain three types of subatomic particles: protons, electrons and neutrons.

(a) Complete the passage below about atomic structure by circling the correct answers.

The | proton / electron / neutron | is **not** found in the nucleus of an atom.

The | atomic mass / atomic number / mass number | is the same as the number of protons in an atom. [2]

(b) The table below gives information about the particles in an atom.
Complete the table by giving the relative mass of the three particles.

Particle	Relative charge	Relative mass
electron	–1	
neutron	0	
proton	+1	

[3]

(c) Four statements are given below.

A Atoms have the same number of protons as electrons

B The neutrons have no electrical charge

C The electrical charges cancel out

D The mass number is the total number of protons and neutrons

Which **two** statements A, B, C or D help to explain why atoms are electrically neutral?

_____ [2]

[Turn over

4 **(a)** Complete the table below.

Formula	Total number of atoms in the formula	Number of oxygen atoms in the formula
H_2O	3	
$Al(OH)_3$		3
$Al_2(SO_4)_3$	17	

[3]

(b) Write the formula for a compound containing 2 potassium atoms, 2 carbon atoms and 4 oxygen atoms.

_____ [1]

(c) The balanced symbol equation for a reaction is given below:

$$2K(s) + 2H_2O(l) \longrightarrow 2KOH(aq) + H_2(g)$$

Write the word equation for this reaction.

_____ [2]

5 Magnesium carbonate reacts with hydrochloric acid. A salt is produced.

(a) What do you understand by the term **salt**?

[3]

(b) Describe the reaction of solid magnesium carbonate with hydrochloric acid. Your answer should include:

- the name of the salt produced and the names of any other products
- the appearance of the reactants
- observations during the reaction

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

The name of the salt produced and the names of any other products:

The appearance of the reactants:

Observations during the reaction:

[6]

[Turn over

6 The elements aluminium and oxygen react to form the ionic compound aluminium oxide.

(a) Draw diagrams to show the arrangement of all the electrons in an aluminium ion and in an oxide ion and give the charge on both ions.

aluminium ion

charge _____

oxide ion

charge _____ [4]

(b) Below are three predictions made by students during a class discussion about aluminium oxide.

Prediction 1: solid aluminium oxide will conduct electricity
Prediction 2: aluminium oxide will have a high melting point
Prediction 3: the formula of aluminium oxide is Al_2O_3

(i) Decide if each prediction is true or false and complete the table below by putting a tick (✓) in the correct boxes. One has been done for you.

Prediction	Prediction is true	Prediction is false
1		✓
2		
3		

[2]

(ii) Explain fully why prediction 1 is false.

_____

_____ [1]

7 The table below shows information about some compounds of lithium.

(a) Complete the table.
(relative atomic masses: Li = 7; C = 12; O = 16; S = 32; Cl = 35.5)

Name	Formula	Relative formula mass (M_r)
lithium chloride		42.5
lithium carbonate	Li_2CO_3	
	Li_2SO_4	110

[3]

(b) Using the information in the table, calculate the number of moles of lithium chloride present in 7.65 g of lithium chloride.

[1]

8 **(a)** Five solutions were tested using a pH meter. The results are shown in the table below.

Solution	pH using a pH meter
A	0.4
B	10.8
C	7.0
D	5.8
E	13.5

Using the letters A, B, C, D and E, answer the questions below.

(i) Which solution would give a green colour with universal indicator?

_____ [1]

(ii) Which solution would give a purple colour with universal indicator?

_____ [1]

(iii) Which solution is a weak alkali?

_____ [1]

(iv) Which solution is a weak acid?

_____ [1]

(v) Which solution could be hydrochloric acid?

_____ [1]

(b) Name and write the formula of the ion present in all acids.

Name: _____

Formula: _____ [2]

(c) C is a solution of sodium chloride.

(i) Name two compounds which could react together to form a solution of sodium chloride.

_____

_____ [2]

(ii) Describe what you would observe when a flame test was carried out on a sample of solid sodium chloride.

_____ [1]

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For Examiner's use only	
Question Number	Marks
1	
2	
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Total Marks	

Examiner Number