

New
Specification



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education
2011–2012

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GSD21]



MONDAY 21 MAY 2012, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

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 **8(c)**.

A Data Leaflet which includes a Periodic Table of the elements is provided.

For Examiner's
use only

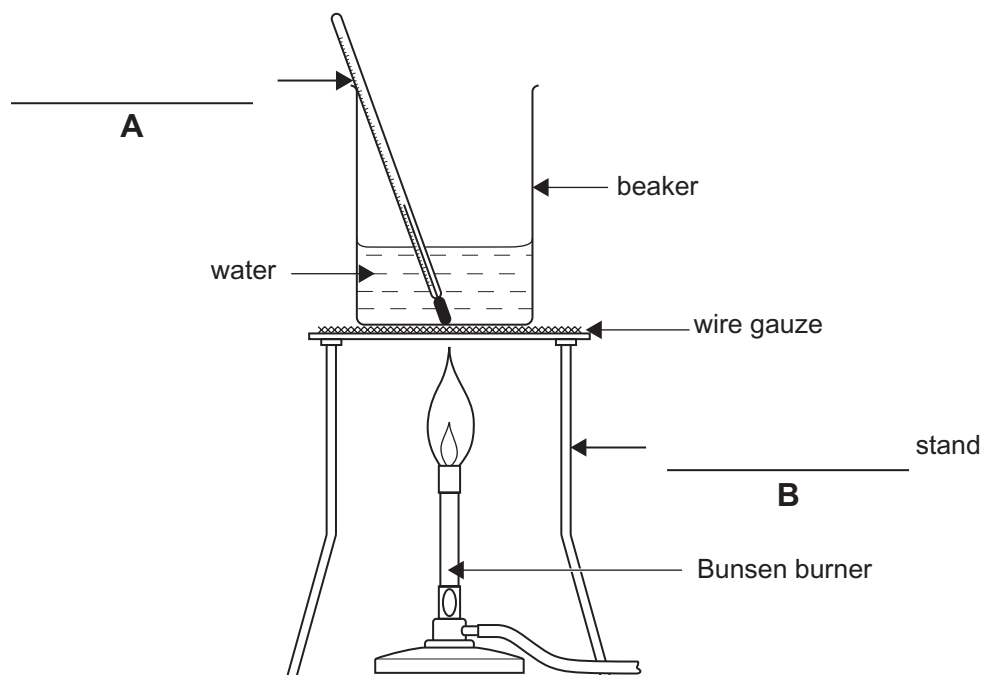
Question Number	Marks
1	
2	
3	
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10	

Total
Marks

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3 The apparatus below can be used to find the boiling point of water.



(a) Complete the labels **A** and **B** in the diagram above. [2]

(b) Give **one** safety precaution, apart from wearing safety glasses, you would take when carrying out this experiment.

_____ [1]

(c) What is the boiling point of water?

_____ °C [1]

(d) Which of the following chemicals can be used to test for water?

Place a tick (✓) in the correct box.

sulfuric acid

anhydrous copper(II) sulfate

universal indicator

hydrated iron(III) oxide

[1]

(e) Potassium chloride is a typical ionic compound. Is potassium chloride soluble or insoluble in water?

_____ [1]

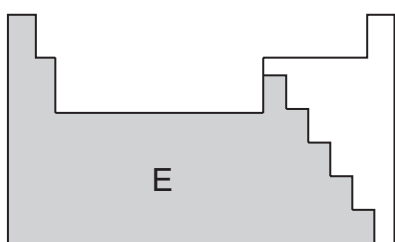
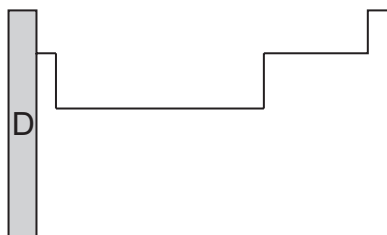
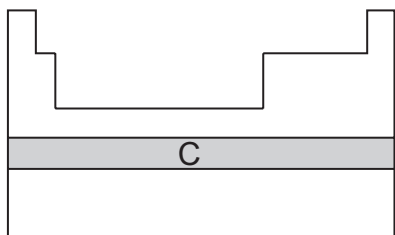
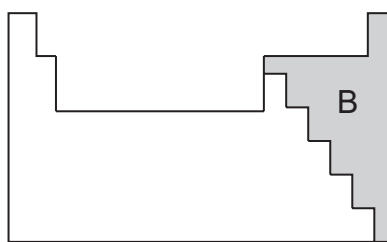
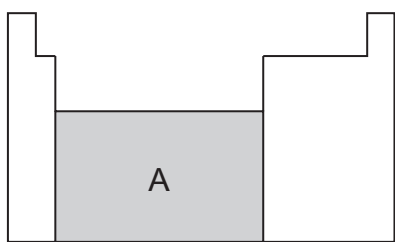
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Marks Remark

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(Questions continue overleaf)

4 The diagrams below show the outline of the modern Periodic Table. A different area A, B, C, D and E, is shaded in each diagram.



(a) Choose the shaded area, A, B, C, D or E which shows

(i) a Group. _____

[1]

(ii) a Period. _____

[1]

(iii) the area where the non-metal elements are.

[1]

Examiner Only	
Marks	Remark

5 (a) Use the information given for the substances X, Y and Z to state whether the substance is a solid, a liquid or a gas at room temperature (20 °C).

(i) X takes the shape of the bottom of its container. It has a definite volume.

Substance X is a _____. [1]

(ii) Y has a definite shape and volume.

Substance Y is a _____. [1]

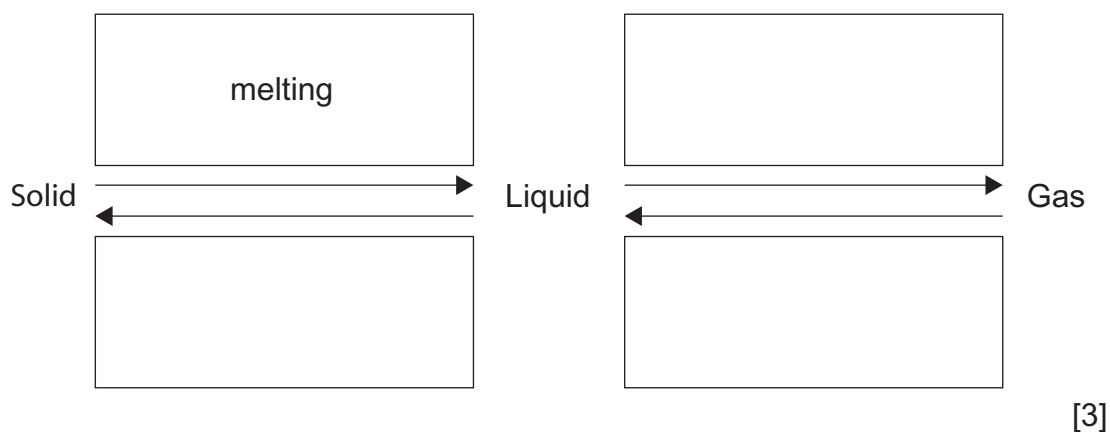
(iii) Z takes the shape and volume of the container.

Substance Z is a _____. [1]

(b) Substance B has a melting point of 16 °C and a boiling point of 118 °C. Is substance B a solid, a liquid or a gas at room temperature (20 °C)?

B is a _____. [1]

(c) Complete the diagram below by labelling the changes of state.



Examiner Only	
Marks	Remark

- 6 Chemists use symbols and formulae in chemical equations to give information about chemical reactions.

You may find your Data Leaflet helpful when answering this question.

- (a) For each of the questions below four answers are given. Only one is correct. Circle the correct answer. The first one has been done for you.

The element with the symbol **P** is:

potassium phosphorus plutonium polonium

- (i) **Sr** is the chemical symbol for:

silver tin strontium sulfur [1]

- (ii) The compound with the formula **Ca(OH)₂** is:

calcium oxide hydride calcium hydroxide calcium oxide calcium water [1]

- (iii) The correct chemical formula for **aluminium nitrate** is:

AlNO₃ Al₃NO Al(NO₃)₃ Al(NO)₃ [1]

- (iv) The formula **NH₃** means:

3 N atoms and 3 H atoms 3 NH atoms 1 N atom and 3 H atoms 1 N atom and 1 H atom [1]

- (b) Balance the chemical equation below which describes the reaction between sulfuric acid and sodium hydroxide.



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Marks Remark

7 (a) Two common isotopes of chlorine are $^{35}_{17}\text{Cl}$ and $^{37}_{17}\text{Cl}$.

(i) Complete the table below to show the numbers of protons, neutrons and electrons in the $^{37}_{17}\text{Cl}$ isotope.

Isotope	Protons	Neutrons	Electrons
$^{37}_{17}\text{Cl}$			

[3]

(ii) What are isotopes?

_____ [2]

(b) (i) Complete the table below which gives information about electronic structures and their relation to the Group number of the Periodic Table.

Element	Atomic number	Electronic configuration	Group of Periodic Table
A	17		7
B	5	2,3	
C		2,8,5	5
D	6		4

[4]

(ii) What is the name of the element in Group 2 Period 3?

_____ [1]

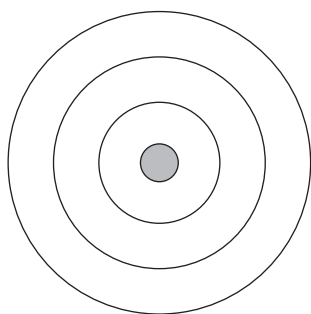
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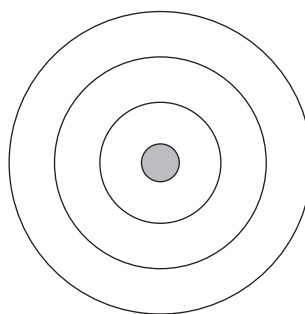
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(Questions continue overleaf)

9 Magnesium reacts with chlorine to form an ionic compound, magnesium chloride.

(a) Complete the diagrams below to show **all** the electrons in a magnesium atom and a chlorine atom.



magnesium atom



chlorine atom

[2]

(b) Explain how the atoms of magnesium and chlorine form **ions**.

[2]

(c) How many chlorine atoms react with one atom of magnesium?

[1]

(d) How are the ions held together in the compound magnesium chloride?

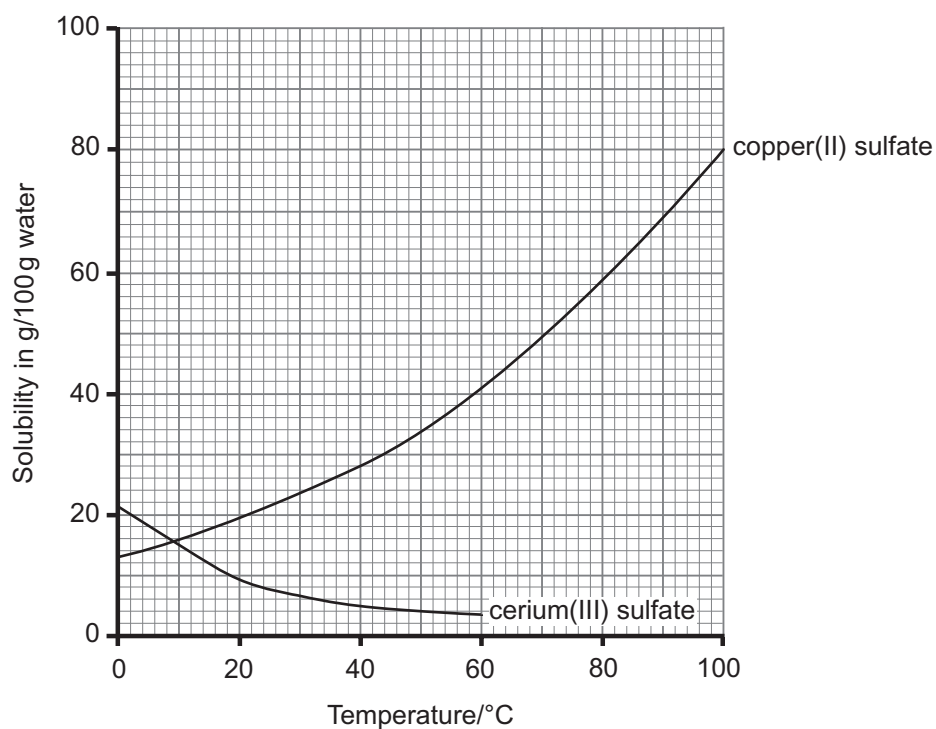
[1]

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Marks

Remark

- 10 The solubility curves for the solids copper(II) sulfate and cerium(III) sulfate are drawn below.



Use the solubility curves to answer the following questions.

- (a) How does the solubility of the cerium(III) sulfate change as the temperature increases?

_____ [1]

- (b) What is the solubility of copper(II) sulfate at 26 °C?

_____ g/100g water [1]

- (c) At what temperature is the solubility of cerium(III) sulfate 8 g/100g water?

_____ °C [1]

- (d) At what temperature is the solubility of the cerium(III) sulfate equal to the solubility of copper(II) sulfate?

_____ °C [1]

- (e) Name the solid which is more soluble at 0 °C.

_____ [1]

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