

Centre Number										
	Can	didat	e Nu	mber	,					

General Certificate of Secondary Education 2014–2015

# Double Award Science: Chemistry

Unit C1 Foundation Tier

Ζ	

[GSD21]

## THURSDAY 14 MAY 2015, MORNING

#### TIME

1 hour, plus your additional time allowance.

### 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 blue or black ink only. 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 7(a).

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

10080.02 **ML** 

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\*20GSD2101\*

Substance	Statement
	Is a white solid
hydrogen	
	Turns limewater milky white
copper oxide	
	Makes a popping sound with a lighted splint
aluminium sulfate	
	Reacts with sulfuric acid to produce a salt and water only
copper carbonate	
	Is a green solid
carbon dioxide	
	Relights a glowing splint
(b) In the box below draw th corrosive substance, su	e hazard symbol that would be found on a bottle on has sulfuric acid.

\*20GSD2102\*

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2 Below is a list of words which are often used in chemistry.

melts		sublimes	condenses	dissolves
e	vaporates	boils	freezes	mixes
Cor	nplete each o	of the sentences bel	ow by choosing a correct	word from the list.
(i)	Sugar		when it is put into hot tea	Э.
(ii)	Water		on the cold surface of w	indows in hot kitchens.
(iii)	Ice cream _		when it is taken out	of the freezer.
(iv)	An iodine cr	ystal	when it chang	es from solid to gas. [4]

10080.02 **ML** 

[Turn over

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\*20GSD2103\*

3	Rea	ad the information below and then answer the questions which follow.						
	Pot Lea	assium iodide crystals dissolve in water to form colourless solution <b>A</b> . d nitrate crystals dissolve in water to form colourless solution <b>B</b> .						
	(a)	(i) Use the information above to name a solute.						
			[1]					
		(ii) Use the information above to name a solvent.						
			[1]					
		If solutions <b>A</b> and <b>B</b> are mixed together, two new substances are formed.						
		One of these substances is a yellow solid, lead iodide, which lies at the b of the beaker. The other substance is potassium nitrate which forms a co solution.	ottom Iourless					
	(b)	From the information above name an insoluble substance.						
			[1]					
	(c)	Draw a <b>labelled</b> diagram of the assembled apparatus you would use to s the yellow solid formed from the colourless solution.	eparate					
			F / 3					
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\*20GSD2104\*

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\*20GSD2105\*

( )	Kea	au the sentences below and then answer the questions which follow.	
	Sol Ele	der is used to help join metals together. ctrum, known as white gold, is an alloy of gold, silver, and copper.	
	(i)	Name four metal elements mentioned in the sentences.	
		1	
		2	
		3	
		4	[2
	(ii)	Why can white gold be described as an alloy?	
	( )		
			[2
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(b)	The	pie chart below shows the composition of stainless steel.	[2
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\*20GSD2106\*



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\*20GSD2107\*

(c)	Give one important use for iron.	
	Give one important use for copper.	
(d)	Give one reason why aluminium alloys are used in aircraft manufacture.	

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\*20GSD2108\*

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5	An outline of part of the Periodic Table is shown below. The numbers 1, 2, 3, 4 and 5
	represent the position of five elements.

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6 (a) Complete the table below which gives information about acids and alkalis.

	solution	pH range	Colour with universal indicator	Strength acid/alkali
Α	sodium hydroxide	12–14		strong alkali
в	hydrochloric acid		red	strong acid
С	ammonia	8–11	blue	
D		3–6	orange	weak acid

- [4]
- (b) Explain why blue litmus paper could not be used to distinguish between solutions **B** and **D**.

[2]

10080.02 **ML** 



\*20GSD2110\*

P2

7 (a) Describe the structure of an atom of carbon with an atomic number of 6 and a mass number of 14.

Your answer should include the number and position of all the different particles in this carbon atom.

You will be assessed on your written communication skills including the use of specialist science terms.

(b) Carbon also has atoms with a mass number of 12. What name is given to atoms with the same atomic number but different mass numbers?

\_\_\_\_\_ [6]

\_\_\_\_ [1] [Turn over

(c) When carbon atoms join together to form molecules they share electrons. What name is given to this type of bonding?

10080.02 **ML** 

30



\*20GSD2111\*

8 A pupil investigated the reaction between calcium carbonate (marble chips) and dilute hydrochloric acid. He used excess calcium carbonate.

The equation for this reaction is:



 $\mathsf{CaCO}_{_3} \ + \ \mathsf{2HCI} \ \rightarrow \ \mathsf{CaCI}_{_2} \ + \ \mathsf{H}_{_2}\mathsf{O} \ + \ \mathsf{CO}_{_2}$ 

The student measured the mass of the flask and its contents every minute for 8 minutes. The results are shown in the table below.

Mass/g	102.8	101.4	100.3	99.5	99.3	99.2	99.1	99.0	99.0
Time/min	0	1	2	3	4	5	6	7	8

(a) What is the name of the salt produced during the reaction?

(b) What caused the mass of the flask and contents to decrease?

\_ [1]

[1]

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\*20GSD2112\*

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(c)	Why did the	student use	excess	calcium	carbonate?
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- (d) Give an accurate way of checking that the resulting solution was neutral.
- (e) Another student in the same class used calcium oxide instead of calcium carbonate. She observed no drop in mass. Explain why.

\_\_\_\_\_ [2]

\_ [1]

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[Turn over

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\*20GSD2113\*

	0	solubility (mg per 100 g water)* at:				
Gas		0°C	20 °C	40 °C	50 °C	
carbon dioxide		348	169	97	76	
nitrogen		2.9	1.9	1.5	1.2	
oxygen		7.0	4.3	3.0	2.7	
(-)	mg/100 g water					
(ii)	Which gas is <b>least</b> soluble at 50 °C?					
(iii)	How does the increases?	e solubility of	the three gase	es change as t	he temperatu	
(iii) (iv)	How does the increases?	e solubility of to help you e warm.	the three gase	es change as t	he temperatu	
(iii) (iv)	How does the increases?	e solubility of to help you e warm.	the three gase	es change as t	he temperatu	

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\*20GSD2114\*

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\*20GSD2115\*

**10** Look at the diagram below. It shows the apparatus used to pass an electric current through molten lead bromide.



- (a) What name is given to the process that happens in the crucible?
- (b) What is the electrolyte in this experiment?
- (c) Give two reasons, other than cost, why graphite is a suitable material for making the electrodes.





\*20GSD2116\*

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\_ [1]

(d) Complete the table below by predicting the **products** and **observations** at the electrodes for the molten salts given.

name of substance	observations at anode	observations at cathode	product at anode	product at cathode
lead bromide		beads of metal	bromine	lead
lithium chloride	bubbles of greenish/ yellow gas	beads of metal		lithium
potassium iodide	bubbles/purple vapour			

[5]

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\*20GSD2117\*

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\*20GSD2118\*

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\*20GSD2119\*

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\*20GSD2120\*

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