

New  
Specification



*Rewarding Learning*

**General Certificate of Secondary Education  
2011–2012**

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**Double Award Science: Chemistry**

Unit C1

Foundation Tier

**[GSD21]**

**MONDAY 21 MAY 2012, MORNING**

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**MARK  
SCHEME**

- 1 (a) (i)  [1]
- (ii) Idea of international recognition/idea of eye-catching/idea of being able to understand it even if you cannot read/idea of warning of danger *any two* [2]
- (b) solvent [1]
- (c) Vinegar is an acid [1]
- (d) Vinegar is a **weak** acid [1]

AVAILABLE  
MARKS

6

- 2 (a)
- | Metal     | Use               |         |                 |
|-----------|-------------------|---------|-----------------|
|           | electrical wiring | coinage | aircraft alloys |
| aluminium | ✓ [1]             |         | ✓ [1]           |
| magnesium |                   |         | ✓ [1]           |
- [3]

- (b) Good conductor **of electricity** [1]  
ductile [1] [2]
- (c) A substance which is made from only **one type** of atom/a substance which cannot be broken down **by chemical means** [1]
- (d) mixture [1]

7

- 3 (a) A = thermometer B = tripod [2]
- (b) Safety precaution related to the danger associated with handling boiling water or working with a Bunsen flame [1]
- (c) 100 (°C) [1]
- (d) Anhydrous copper(II) sulfate [1]
- (e) soluble [1]

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			AVAILABLE MARKS	
4	(a) (i)	D	[1]	8
	(ii)	C	[1]	
	(iii)	B	[1]	
	(b)	Nitrogen and phosphorus have similar chemical properties	[1]	
	(c) (i)	It did not work for all the elements/two elements were placed in the same position (in the list)/he did not use all the elements known at that time/he grouped elements with different reactivity	[1]	
	(ii)	In order of atomic mass (Not mass number)	[1]	
5	(a) (i)	Liquid	[1]	7
	(ii)	Solid	[1]	
	(iii)	Gas	[1]	
	(b)	Liquid	[1]	
	(c)	Evaporating/boiling condensing freezing	[3]	
	(a) (i)	Strontium	[1]	
6	(ii)	Calcium hydroxide	[1]	5
	(iii)	$\text{Al}(\text{NO}_3)_3$	[1]	
	(iv)	1 N atom and 3 H atoms	[1]	
	(b)	$\text{H}_2\text{SO}_4 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$	[1]	

7 (a) (i) 17 20 17

[3]

(ii) Isotopes are atoms of the same element/atoms with the same atomic number/atoms with the same number of protons [1]  
different mass number/number of neutrons [1]

[2]

(b) (i)

Element	Atomic number	Electronic configuration	Group of Periodic Table
A	17	2,8,7	7
B	5	2,3	3
C	15	2,8,5	5
D	6	2,4	4

[4]

(ii) magnesium

[1]

AVAILABLE  
MARKS

10

- 8 (a) Lithium [1]
- (b) Melting point decreases (as the size of the atoms increases) [1]
- (c) Indicative content
- Potassium stored in oil } storage in the laboratory
  - Idea that when freshly cut it is shiny } appearance
  - Idea that as it is left in the air the freshly cut surface becomes dull }
  - Idea that before adding it to water dry the oil from the surface using a paper towel } Preparative steps
  - Idea of using small pieces/cut into small pieces }
  - Handle with tongs } Safety (award a max of 2
  - Wear (safety) glasses/goggles } marks for safety)
  - Use (safety) screen }
- | Response   | Mark    |
|--|---------|
| Candidates must use appropriate specialist terms throughout (at least 5 pts from indicative content) to describe a minimum of 3 of the following; how potassium is stored in the laboratory, appearance, safety precautions and the preparative steps that need to be taken before potassium is added to water. They use good quality spelling, punctuation and grammar and the form and style are of a high standard. | [5]–[6] |
| Candidates must use some appropriate specialist terms throughout (3–4 pts from indicative content) to describe a minimum of 2 of the following; how potassium is stored in the laboratory, appearance, safety precautions and the preparative steps that need to be taken before potassium is added to water. They use satisfactory spelling, punctuation and grammar and the form and style are of a high standard.   | [3]–[4] |
| Candidates make reference to 1–2 of the main points shown above using limited spelling, punctuation and grammar. The form and style is of limited standard and they have made no use of specialist terms.  | [1]–[2] |
| Candidates make no reference to the points above and offer no other suitable response.   | [0]     |
- [6]
- (d) (i) Idea that rubidium is too reactive/too dangerous [1]
- (ii) 1 (electron in the outer shell) [1]

AVAILABLE  
MARKS

10

			AVAILABLE MARKS
<b>9</b>	<b>(a)</b> Draw electronic configurations magnesium 2,8,2 [1] chlorine 2,8,7 [1]	[2]	
	<b>(b)</b> Magnesium loses 2 electrons [1] chlorine gains 1 electron [1]	[2]	
	<b>(c)</b> 2	[1]	
	<b>(d)</b> electrostatic forces/attraction between opposite charges	[1]	6
<b>10</b>	<b>(a)</b> Solubility decreases (as the temperature increases)	[1]	
	<b>(b)</b> 22g/100g water	[1]	
	<b>(c)</b> 22 °C accept 22–24 °C	[1]	
	<b>(d)</b> 9 °C accept 9–9.8 °C	[1]	
	<b>(e)</b> Cerium(III) sulfate	[1]	5
		<b>Total</b>	<b>70</b>