



Rewarding Learning

**General Certificate of Secondary Education
2012**

Science: Chemistry

Paper 2
Foundation Tier

[G1402]

FRIDAY 22 JUNE, AFTERNOON

**MARK
SCHEME**

			AVAILABLE MARKS
1 (a) (i)	iron	[1]	
	(ii) oxygen	[1]	
	(iii) water	[1]	
	(iv) gain of oxygen	[1]	
	(v) red-brown [1] flaky [1] solid [1]	maximum [2]	
(b) (i)	$H_2 + Cl_2 \rightarrow 2HCl$	[3]	
	(ii) chlorine gains hydrogen [1] gain of hydrogen is reduction [1]	[2]	
	(iii) chlorine: yellow-green [1] hydrogen: colourless [1]	[2]	
	(iv) gives out heat	[1]	
(c) (i)	thermal [1] decomposition [1]	[2]	
	(ii) $CuCO_3 \rightarrow CuO + CO_2$	[2]	
	(iii) green [1] to black [1]	[2]	20

2 (a) [1] for each of the following in the order given:

4

12

nucleus

electrons

[4]

(b) (i) four/4

[1]

(ii) 117

[1]

(iii) $\frac{60}{117} \times 100 = 51.28$ (allow 51)

[1]

(c) (i) $12 + 3 \times 16 = 60$

[1]

(ii) $74 - 60 = 14$

[1]

(iii) $\frac{14}{2} = 7$

[1]

(iv) lithium/Li/Li₂CO₃

[1]

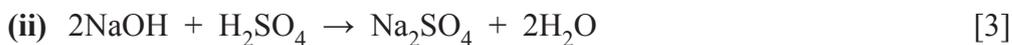
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3 (a) (i)

Substance	acid	base	alkali	salt
magnesium chloride				✓ [1]
magnesium hydroxide		✓ [1]		
sodium hydroxide		✓	✓	
	accept either tick for sodium hydroxide [1]			
zinc sulphate				✓ [1]

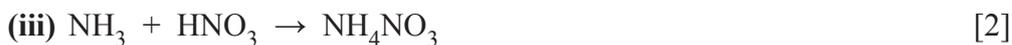
[4]



(iii) magnesium nitrate [1]

(iv) contains water [1]
contains water of crystallisation [2] [2](b) (i) NH_3 [1]

(ii) 9–11 [1]



(iv) hydroxide [1]

(c) (i) pipette [1]

(ii) remove the indicator [1]

(iii) Individual marks are awarded for correctly labelled and recognisable drawings of assembled apparatus.
No labels = no marks.evaporating basin [1]
tripod and gauze [1]
heat/Bunsen burner [1] [3]

(iv) solubility decreases/solution becomes saturated [1]

(v) Any **two** from:
dry between two sheets of filter paper [1]
dry in a low temperature oven [1]
dry in a desiccator [1] [2]AVAILABLE
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- 4 (a) decomposition/breaking down [1]
of a substance using electricity [1] [2]
- (b) bauxite [1]
- (c) (i) A is anode [1]
B is cathode [1]
C is casing [1]
D is (molten) aluminium [1] [4]
- (ii) ions are free to move [1]
idea that ions are the charge carriers [1] [2]
- (iii) 900–1000 °C [1]
- (iv) lower melting point of aluminium oxide/increase conductivity [1]
- (v) Positive electrode: oxide [1]
Negative electrode: aluminium [1] [2]
- (vi) electrode: anode [1]
equation: $C + O_2 \rightarrow CO_2$ [2]
- (vii) aluminium is tapped off [1] at the bottom of the cell [1]

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5 (a)

Gas	Formula	Use	Physical properties	
carbon dioxide	CO ₂ [1]	dry ice/carbonated drinks/fire extinguishers [1]	Any two from: colourless odourless acidic denser than air slightly soluble in water	[4]
hydrogen	H ₂ [1]	weather balloons/rocket fuel [1]	Any two from: colourless odourless neutral less dense than air insoluble in water	[4]

(b)

Gas	Test	Result of positive test	
carbon dioxide	bubble into limewater [1]	milky [1]	[2]
hydrogen	apply a lit splint [1]	pop [1]	[2]
hydrogen chloride	glass rod dipped in concentrated [1] ammonia [1]	white [1] smoke [1]	[4]
water	anhydrous copper sulphate [1] or cobalt chloride paper [1]	white [1] to blue [1] or pale blue [1] to pink [1]	[3]

(c) (i) $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$ [2]

(ii) Any **two** from:
corrodes statues/buildings [1]
kills fish [1]
kills trees/vegetation [1] [2]

(d) (i) brittle [1]
yellow [1]
solid [1] maximum [2]

(ii) $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$ [2]

(iii) melts/forms a liquid [1]
dark red/brown [1]
blue flame [1]
colourless/misty [1]
pungent/bad smell [1] gas [1] maximum [3]

Quality of written communication [2]

(iv) fungicide/bleach/preservative [1]

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6 (a) solid – regular close packed arrangement [1] gas – few particles well spaced out [1]	[2]	AVAILABLE MARKS
(b) (i) oxygen	[1]	
(ii) sulphur	[1]	
(iii) H ₂ O	[1]	
(iv) carbon	[1]	
(v) liquid	[1]	
(vi) 114 (°C)	[1]	
(c) (i) dry ice	[1]	
(ii) from solid to gas [1] on heating [1] or from gas to solid [1] on cooling [1]	[2]	
(iii) iodine	[1]	
(d) (i) 17 (°C) ± 1	[1]	
(ii) A – solid [1] B – liquid [1]	[2]	
(iii) boiling	[1]	16
		120