Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Using Materials and Understanding Reactions
End of Module Test

Higher Tier

[GDB02]

THURSDAY 24 FEBRUARY 2011, MORNING

MARK SCHEME

	AVAILABLE MARKS

1 **(a)** 4 [1]

(b) 8 [1]

(c) 15 [1] — 3

2 **(a)** ^{18}O has 10 neutrons [1] ^{16}O has 8 neutrons [1]
allow [1] for idea of different number of neutrons
[1] for fact that one has 2 extra neutrons unless wrongly qualified [2]

(b) just as reactive as [1] — 3

3 **(a)** **(i)** $CuSO_4$ [1] H_2O [1] [2]

(ii) green [1] ⟶ blue [1] [2]

(b) CO_2/carbon dioxide [1] — 5

4 **(a)**

Water sample	Observation with soap	Observation with detergent
A temporary hard		Lather
B soft	Lather	
C permanent hard	No lather	Lather

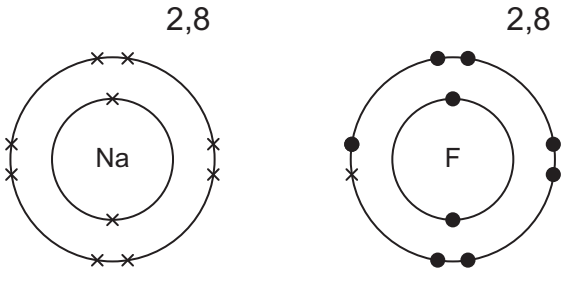
4 correct = [2] 2 or 3 correct = [1] 1 correct = [0] [2]

(b) water which has hardness which can be removed by boiling [1]

(c) good for teeth or bones/reduces risk of heart disease/tanning leather/brewing beer/idea of better taste [1]

scale in pipes or boilers/scum with soap/wastes soap/cost/allow idea of blocked pipes [1] — 5

5 **(a)** correct ion structure [2]

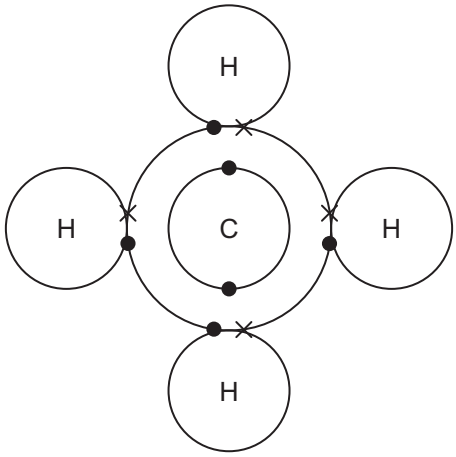


Charge +1 Charge −1 [1]

(b) electrostatic [1] — 4

				AVAILABLE MARKS
6	**(a)**	electrode connected to the negative terminal/negative electrode	[1]	
	(b)	carbon/graphite	[1]	
	(c)	oxygen	[1]	3

7 **(a)**



correct sharing [1]
correct total number of electrons [1] [2]
second mark depends on first

(b) covalent [1]

(c) sulphur dioxide [1] 4

8 $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$ [1]

$\frac{9240 \times 50}{280} = \frac{16000 \times V_2}{320}$

up to [2] method marks
[1] for formula substitution
[1] for computation

$V_2 = \frac{9240 \times 50 \times 320}{280 \times 16000}$ [1]

$= 33\,cm^3$
correct answer [3]
correct units [1] [4] 4

9 **(a)** hydrated [1] iron(III) oxide [1] [2]

(b) **(i)** idea of coated with zinc [1]

(ii) zinc corrodes first [1]
is more reactive than iron [1] [2] 5
not zinc rusting **not** zinc reacts quicker

				AVAILABLE MARKS
10	**(a)**	D	[1]	
	(b)	C	[1]	
	(c)	B	[1]	
	(d)	diamond/quartz [1] high melting point no (electrical) conductivity [1] second mark dependent on first	[2]	5
11	**(a)**	all points correctly plotted [2] 5/6 correct points [1] curve joining points not drawn with ruler [1]	[3]	
	(b)	± 5 202 g/100 g water	[1]	
	(c)	45 ± 3 e.g. $205 - 45 = 160$ g all correct [2], 1 error [1] allow [1] for a correct method mark check graph	[2]	6
12	**(a)**	sulphuric acid	[1]	
	(b)	$2H^+ + 2e^- \longrightarrow H_2$ [1] [1]	[2]	3
			Total	**50**