OCR
RECOGNISING ACHIEVEMENT

GCSE

Chemistry A

General Certificate of Secondary Education **A322/01**

Unit 2: Modules C4, C5, C6

Mark Scheme for June 2010

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Question			Expected Answers	Marks	Additional Guidance
1	a		dark grey to orange ☐ orange to yellow ☐ dark grey to purple ☑ (1) green to brown ☐	[1]	
	b		I_2 (1) (g) (1)	[2]	**not** (gas) or (G)
	c	i*	KF (1)	[1]	**accept** FK
		ii*	melting point rises / becomes less negative (1) boiling point rises (1) reactivity decreases (down the group) (1)	[3]	**ignore** references to atomic number or mass number
	d		non-metal bigger less	[2]	all three correct = 2 marks one or two correct = 1 mark
			Total	[9]	

Question			Expected Answers	Marks	Additional Guidance
2	a		It starts to fizz. ☐ It expands. ☐ It catches fire. ☐ It goes from shiny to dull. ✓ (1)	[1]	
	b		4 (1)	[1]	**accept** four
	c		...more electrons than protons. ☐ ...lower mass than a lithium atom. ☐ ...more protons than neutrons. ☐ ...ion by losing one electron ✓ (1)	[1]	
	d	i	different number of lines / lines in different places / different amount of bars/ different pattern or arrangement idea (1)	[1]	**ignore** 'Different lines' **ignore** just "spectra is different/ different lengths/ different size sections" **accept** "lines do not match up"
		ii	sodium and potassium (1)	[1]	need both for 1 mark **accept** correct symbols i.e. Na and K
			Total	[5]	

Question			Expected Answers	Marks	Additional Guidance
3	a		The ions become free to move. ✓ (1) The ions spread very far apart. ☐ New bonds form between the ions. ☐ The arrangement of ions... ✓ (1) ...a regular arrangement. ☐	[2]	
	b	i	arrow to right (1)	[1]	**accept** arrows that are not horizontal, but are pointing towards the correct electrode any arrow in the **wrong** direction = 0 **accept** arrows above and below the container but **between** the electrodes in the correct direction
		ii	oxygen (1)	[1]	**accept** carbon dioxide/CO_2
	c		...good conductor of heat. ☐ ...less dense than other metals. ✓ (1) ...lower melting point... ☐ ...good electrical conductor. ✓ (1) ...softer... ☐	[2]	
	d		metallic (1)	[1]	
			Total	[7]	

<table>
<tr><th colspan="3">Question</th><th>Expected Answers</th><th>Marks</th><th>Additional Guidance</th></tr>
<tr><td>4*</td><td>a</td><td></td><td>SiO_2 (1)

Al_2O_3 (1)</td><td>[2]</td><td></td></tr>
<tr><td></td><td>b</td><td></td><td>...less chlorine than sodium... ✓ (1)
Chlorine is a gas. ☐
...occurs in other compounds... ✓ (1)
...shows only metals. ☐
...small amount of chlorine... ☐</td><td>[2]</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>[4]</td><td></td></tr>
</table>

<table>
<tr><td>5</td><td>a</td><td></td><td>
<table>
<tr><th></th><th>increases</th><th>same</th><th>decreases</th></tr>
<tr><td>carbon dioxide</td><td>✓</td><td></td><td></td></tr>
<tr><td>oxygen</td><td></td><td></td><td>✓</td></tr>
</table>
</td><td>[1]</td><td></td></tr>
<tr><td></td><td>b</td><td></td><td>carbon dioxide contains two elements / two types of atom / carbon and oxygen (1)

Oxygen contains only one element / only one type of atom / only oxygen <u>atoms</u> (1)</td><td>[2]</td><td>assume “it” refers to carbon dioxide
ignore “it is a mix of carbon and oxygen”
allow “carbon dioxide has more / different elements” or “carbon dioxide has more than one element”
not just “pure element” for oxygen
not “2 oxygen molecules”</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>[3]</td><td></td></tr>
</table>

Question			Expected Answers	Marks	Additional Guidance
6	a*		7 1	[1]	**both** correct for 1 mark must be in correct order
	b*		calcium nitrate (1) carbon dioxide and CO_2 (1) water and H_2O (1)	[3]	 **reject** carbon monoxide **accept** hydrogen oxide numbers in formulae must be smaller than letters. e.g. **accept** CO2 or CO_2 / H2O or H_2O **reject** CO2 or CO^2 / H2O or H^2O **maximum (2) marks** If extra numbers are written in front of formulae e.g. $2CO_2$ etc
	c	i	lower concentration (of acid) (1) lumps of calcium carbonate (1) lower temperature (1)	[3]	**allow "**weaker concentration" **not** just "pieces of calcium carbonate" **allow** "less heat"
		ii	gas/carbon dioxide given off (1)	[1]	**not** "steam" **ignore** "evaporates/ the liquid turns to gas" **not** "$CaCO_3$ turns to a gas" but **accept** "$CaCO_3$ produces a gas
			Total	[8]	

Question			Expected Answers	Marks	Additional Guidance
7	a		bubbles (of gas) given off / fizzing (1) magnesium will dissolve / disappear/ get smaller (1)	[2]	**ignore** just "gas given off" **ignore** "smoke" **ignore** "change of colour"
	b		C D B A (1)	[1]	fully correct order = 1 mark
	c		80% (1)	[1]	
	d		use more acid ✓ (1) heat the reaction... ☐ use smaller pieces... ☐ use a catalyst ☐ use more magnesium ✓ (1) ...for a longer time ☐	[2]	
			Total	[6]	

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