OCR
RECOGNISING ACHIEVEMENT

GCSE

Chemistry A

General Certificate of Secondary Education

Unit **A322/01:** Modules C4, C5, C6 (Foundation Tier)

Mark Scheme for January 2012

Oxford Cambridge and RSA Examinations

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response

	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Subject-specific Marking Instructions

a. If a candidate alters his/her response, examiners should accept the alteration.

b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

Eg

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

c. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, eg one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

d. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.
If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, eg shading or crosses.
Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

Eg If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third <u>should be blank</u> (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

Question			Answer	Marks	Guidance
1	(a)		the flames flash at different rates ☐ different colours in the flame ✓ sodium burns much faster than potassium ☐ the height of the flames is different in each test ☐	1	
	(b)	(i)	**any two from:** lines in different places; different numbers of lines/ more lines in one; different patterns (of lines); different thicknesses of lines; different colours (of lines);	2	do not allow “more lines in sodium” not “dark/light lines” in place of thickness/ colour
		(ii)	lines from sodium are in the spectrum (1) lines from potassium are in the spectrum (1) lines from both are in the spectrum (2) idea that lines from <u>both</u> elements are in the spectrum; lines are in the same <u>places</u>; <u>all</u> the lines from each element are in the spectrum; lines have the same <u>pattern</u>;	2	ignore “spectra are the same”

Question			Answer	Marks	Guidance
1	(c)		lithium / Li 2.8.1 19	2	if the name is missing allow correct symbol for lithium **ie not** Li_2 / li / LI 3 correct = 2 marks 2/1 correct = 1 mark
			Total	**7**	

Question			Answer	Marks	Guidance
2	(a)	(i)	the surface bubbles and fizzes ☐ a flame appears ☐ the surface changes from shiny to dull ✓ the piece of lithium gets smaller ☐	1	
		(ii)	lithium + oxygen → lithium oxide	2	1 mark for LHS and 1 mark RHS (1) all correct (2) if formulae given as well as words, then ignore the formulae if formulae alone used, then must be all correct, but ignore balancing
	(b)	(i)	the lithium moves around ✓ the lithium sinks to the bottom of the water ☐ the level of the water rises ☐ the piece of lithium gets bigger ☐ the lithium fizzes and bubbles form ✓	2	
		(ii)	hydrogen (1)	1	
	(c)	(i)	97 °C (1)	1	
		(ii)	Lithium/ Li (1)	1	if symbol given, then must be correct – but if the name is given with incorrect symbol, then ignore the symbol
			Total	**8**	

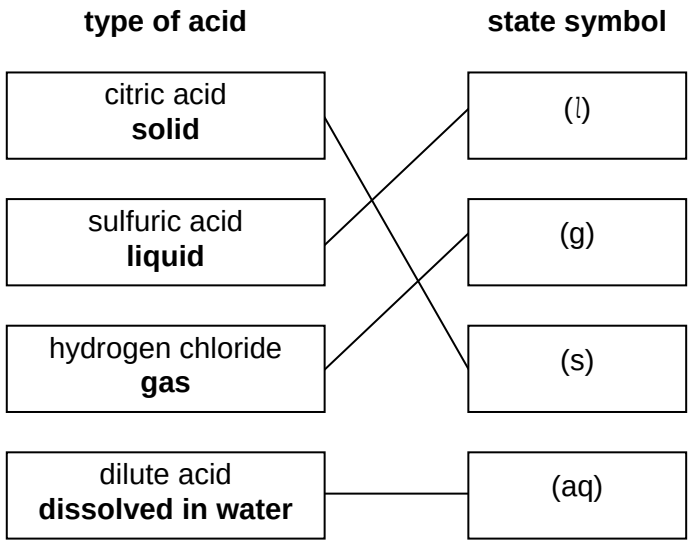
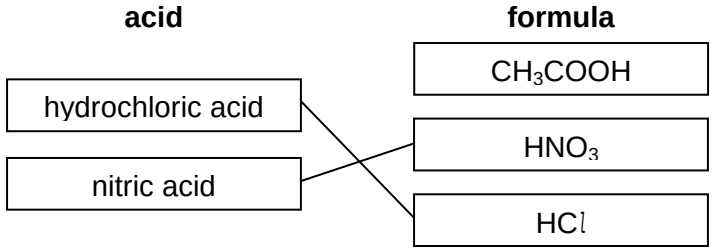
<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>3</td><td>(a)</td><td></td><td>
<table>
<tr><th>what each part contains</th><th>part of the Earth</th><th>scientific name</th></tr>
<tr><td>compounds including ...</td><td>the oceans</td><td>hydrosphere</td></tr>
<tr><td>mainly water with some ...</td><td>outer hard layer of the Earth</td><td>biosphere</td></tr>
<tr><td>a mixture of minerals</td><td>living things</td><td>lithosphere</td></tr>
</table>
</td><td>4</td><td>LHS fully correct = 2 marks
1 or 2 correct = 1 mark

RHS fully correct = 2 marks
1 or 2 correct = 1 mark</td></tr>
<tr><td></td><td>(b)</td><td></td><td>
<table>
<tr><th></th><th>true</th><th>false</th></tr>
<tr><td>There are only very weak attractions between molecules in the air.</td><td>✓</td><td></td></tr>
<tr><td>Oxygen and nitrogen are non-metals.</td><td>✓</td><td></td></tr>
<tr><td>The air is our main source of minerals and metals.</td><td></td><td>✓</td></tr>
<tr><td>Carbon dioxide is an example of a gas in the air that is a compound.</td><td>✓</td><td></td></tr>
</table>
</td><td>2</td><td>all correct = 2 marks
2/3 correct = 1 mark</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>6</td><td></td></tr>
</table>

Question			Answer	Marks	Guidance
4			similarity: both contain carbon, hydrogen <u>and</u> oxygen; all bonds are covalent; **maximum of three from:** difference: contain different numbers of carbon, hydrogen <u>and</u> oxygen; sugar contains more carbon / 6 carbons in sugar and 3 carbons in the amino acid; sugar contains more hydrogen / 12 hydrogens in sugar and 7 hydrogens in the amino acid ; sugar contains more oxygen / 6 oxygen in sugar and 2 in the amino acid; amino acid contains nitrogen and/or sulfur / more (different) elements ora; amino acid is a smaller / lighter molecule / fewer (total) atoms; sugar is a chain (molecule) / amino acid (molecule) is branched;	4	4 marks <u>must include</u> at least one similarity. **ignore** contain C, H and O (not enough) **ignore** 'more Cs' or 'more Hs' or 'more Os' if numbers are given, they must be correct. **ignore** C_6 / C^6 etc. **ignore** 'sugar is straight / amino acid is round' or similar
			Total	**4**	

Question			Answer	Marks	Guidance
5	(a)		lots of common rocks contain silicon dioxide ☐ silicon forms strong bonds with oxygen ☐ silicon and oxygen have the highest percentages in the table ✓ the percentage of silicon is lower than oxygen ☐	1	
	(b)		copper → very large amounts ... ☐ aluminium → The metal can only be ... ☐	2	
			Total	**3**	

Question			Answer	Marks	Guidance
6	(a)	(i)	sulfuric (acid) H_2SO_4	1	both needed **do not accept** H2SO4 / H^2SO^4; numbers should be half way down the letters or lower.
		(ii)	hydrogen H_2	1	both needed **do not accept** H2 / H^2
	(b)	(i)	Rose/ bigger lumps/ smaller surface area slower reaction (1) Luke/ increased concentration faster reaction (1)	2	allow takes more time (Rose) allow takes less time (Luke) if “more acid” stated in response for concentration – do not allow if “more zinc” stated in response for bigger lumps – do not allow
		(ii)	time measurement (1) volume measurement (1)	2	allow for 1 mark how long it takes (for the solid to disappear/ for the gas to be made) allow for 1 mark how much gas/ amount of gas allow for 2 marks how long it takes for all of the gas to be made allow appropriate description of method to collect gas for 1 mark
	(c)		zinc carbonate zinc oxide zinc hydroxide	2	all 3 correct for two marks 2 correct for 1 mark
			Total	**8**	

Question			Answer	Marks	Guidance
7	(a)		corrosive (1)	1	
	(b)			2	all correct = 2 marks 2 / 3 correct = 1 marks 1 correct = 0
	(c)			2	all correct = 2 marks 1 correct = 1 mark
	(d)		neutralisation (1)	1	
			Total	**6**	

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