

**Chemistry A**

General Certificate of Secondary Education **A323/01**

Unit 3: Ideas in Context plus C7

**Mark Scheme for June 2010**

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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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## Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

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

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks  
work done lifting = 1 mark  
change in potential energy = 0 marks  
gravitational potential energy = 1 mark

5. Annotations:  
The following annotations are available on SCORIS.
  - ✓ = correct response
  - ✗ = incorrect response
  - bod = benefit of the doubt
  - nbod = benefit of the doubt **not** given
  - ECF = error carried forward
  - ^ = information omitted
  - I = ignore
  - R = reject
6. If a candidate alters his/her response, examiners should accept the alteration.
7. 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.

E.g.

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

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth one mark.

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth one mark.

8. 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, e.g. 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.

9. 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, e.g. 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.

E.g. If a question requires candidates to identify a city in England, then in the boxes

<b>Edinburgh</b>	
<b>Manchester</b>	
<b>Paris</b>	
<b>Southampton</b>	

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

<b>Edinburgh</b>			✓			✓	✓	✓	✓	
<b>Manchester</b>	✓	x	✓	✓	✓				✓	
<b>Paris</b>				✓	✓		✓	✓	✓	
<b>Southampton</b>	✓	x		✓		✓	✓		✓	
<b>Score:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

Question			Expected Answer	Mark	Additional Guidance
1	a	i	more can be grown (1)	[1]	<b>allow</b> cotton can be planted again
		ii	<b>any two from:</b> reference to using fertilisers; reference to using pesticides; cotton is bleached (using harmful chemicals);	[2]	
		iii	these polymers are made from crude oil (1) (crude) oil/polymers are finite/will one day run out/is not renewable (1)	[2]	
	b		they are easier to use/more convenient / they do not need to be washed / they are kinder to a baby's skin (1)	[1]	<b>allow</b> more comfortable for baby / less likely to leak do <b>not</b> allow economy answers
	c	i	from getting the raw material used to make the product to the disposal of the product (1)	[1]	do <b>not</b> allow answers that start from making product from raw material
		ii	<b>any two from:</b> making materials; making the products from the materials; using the products; disposing of the products;	[2]	
	d	i	raw material production (1) manufacture of components (1)	[2]	
		ii	(generation) of electricity used(1) manufacture of detergent (1)	[2]	
			<b>Total</b>	<b>[13]</b>	

Question			Expected Answer	Mark	Additional Guidance
2	a	i	alcohols (1)	[1]	
		ii	C <sub>2</sub> H <sub>6</sub> O (1)	[1]	accept C <sub>2</sub> H <sub>5</sub> OH
	b		liquid; yes; yes no	[3]	all four correct = 3 marks three correct = 2 marks two correct = 1 mark
	c	i	sugar/glucose (1)	[1]	
		ii	(high concentration of) ethanol kills yeast (1)	[1]	allow the ethanol denatures/destroys the yeast allow ethanol denatures enzymes but do not allow kills enzymes
		iii	distillation (1) <b>plus any two from:</b> mixture is heated/evaporated/boiled; vapour cooled to condense it; ethanol has lower boiling point (so boils off first);	[3]	allow fractional distillation allow explanation marks independent of name but do not give marks for a method that does not separate eg reflux
			<b>Total</b>	[10]	
3	a	i	energy level of reactants is higher than that of products (1) so energy/heat given out during the reaction (1)	[2]	allow energy level at end is lower than at beginning / energy level goes down / energy change is negative
		ii	methane + oxygen → carbon dioxide + water (1)	[1]	Accept symbol equation if correct
	b		taken in/gained/endothemic given out/released/exothermic	[1]	both required for the mark
	c		energy needed to start a reaction (1)	[2]	allow first mark for energy needed for a reaction to take place/begin / energy needed for successful collisions
			energy needed to break bonds (1)		ignore reference to catalysts
			<b>Total</b>	[6]	

Question			Expected Answer	Mark	Additional Guidance
4	a		<p><b>any three from:</b>            put spots of dyes (on origin);            put end of paper in water;            in a beaker;            leave;            until water is nearly at the top of the paper;            observe how far dyes have travelled;</p> <p>QWC mark is for an answer that contains at least ten words with no more than one incorrect spelling in each ten words</p>	[3]	<b>allow</b> other acceptable containers
				[1]	
	b	i	maximum position of solvent travel (1)	[1]	
		ii	pen ink smudges/runs/dissolves in the water (1)	[1]	
		c	i	C (1)	[1]
		ii	one spot from C travelled same distance up paper as the spot from the banned compound (1)	[1]	<b>allow</b> C has a spot at the same level as banned compound
		iii	distance travelled by solvent (1) distance travelled by (banned) dye (1)	[2]	
			<b>Total</b>	[10]	
5	a	i	measure out 25.0 cm <sup>3</sup> of the stock solution (1) make up to 250 cm <sup>3</sup> with (distilled/deionised) water (1)	[2]	<b>allow</b> one mark for adding 1 part stock solution to 9 parts water <b>ignore</b> references to dilution to a tenth of stock concentration
		ii	g/dm <sup>3</sup> (1)	[1]	
	b	i	not accurate (1)	[1]	
		ii	pipette (1)	[1]	<b>allow</b> burette
		iii	to give a colour change (1) when the alkali has been neutralised / when the solution is neutral (1)	[2]	<b>allow</b> to determine the end point = 2 marks <b>allow</b> fully reacted
			<b>Total</b>	[7]	

Question			Expected Answer	Mark	Additional Guidance
6	a	i	a chemical that is made in large quantities (1)	[1]	
		ii	(to show that) the reaction is reversible / goes backwards and forwards (1)	[1]	<b>allow</b> to show that it is a (dynamic) equilibrium
	b		air makes the process (more) sustainable(1) because the supply of air is not limited / air is renewable(1) natural gas makes the process less/not sustainable(1) because it is finite/will one day run out/not renewable(1)	[4]	
	c		speed up the reaction (1)	[1]	<b>accept</b> provides an alternative route / lowers activation energy
	d		<b>any two from:</b> tanker vessel must be strong/pressurised/have thick walls; tanker vessel must be leak proof; tanker must carry a hazard warning sign; speed limits for heavy vehicles;	[2]	<b>allow</b> no naked flames
			<b>Total</b>	<b>[9]</b>	



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