



GCSE

Chemistry B

General Certificate of Secondary Education

Unit **B641/01**: Modules C1, C2, C3 (Foundation Tier)

Mark Scheme for January 2011

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1 Abbreviations, annotations and conventions used in the detailed Mark Scheme.

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

Question		Expected Answers	Marks	Additional Guidance
1	(a)	potato written as the first ingredient on the food label (1)	1	
	(b)	to improve the colour or appearance of food / to stop food reacting with oxygen / to stop oil and water from separating / stabiliser / flavour enhancer / (1)	1	allow to give it colour allow to stop the food going mouldy allow to preserve food ignore to make it last longer to keep food fresh is not sufficient but allow so it does not go off allow to stop ingredients from separating allow to add flavour or taste allow to improve texture more appetising is not sufficient
	(c) (i)	self-cooling drinks can (1)	1	more than one tick scores 0
	(ii)	alkene (1)	1	allow correct answer ticked, circled or underlined in list if answer line is blank
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	oxygen (1)	1	allow air / O ₂
	(b)	any two from: EITHER (propane) is more convenient / portable (as it is stored in small cylinders) (1) (propane) is easy to light (1) (propane) has a high energy value (1) OR (oil) is a liquid (1) (oil) has a high energy value (1) (oil) is easy to light (1) (oil) can be stored easily (1)	2	no mark for propane / oil - marks are for explanation if coal / natural gas scores 0 allow easy to carry
	(c)	(i) (spirit) burner (1)	1	not Bunsen burner
		(ii) poisonous / toxic (1)	1	allow it kills you / reduces ability of blood to carry oxygen / forms carboxyhaemoglobin ignore harmful
	(d)	(i) 19 (1)	1	allow 19 written by question or on side of table but answer in the table takes precedence
		(ii) B (1)	1	allow correct answer indicated in table if answer line is blank
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	coal / (natural) gas (1)	1	ignore petroleum / named fractions of crude oil
	(b)	<p>X = petrol Y = diesel Z = bitumen</p> <p>all three correct (2) but one or two correct (1)</p>	2	
	(c)	<p>any two from: catalyst (1) high temperature (1)</p> <p>converts large (hydrocarbon) molecules into small (hydrocarbon) molecules / makes more useful (hydrocarbon) molecules / makes more petrol / makes alkenes (1)</p>	2	allow correct named catalyst, eg aluminium oxide / porcelain pot allow heat / quoted temperature of 300 to 1000 °C ignore references to pressure
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	<p>solvent - the liquid that dissolves a solid solute - the solid that dissolves in a liquid insoluble - a solid that does not dissolve in a liquid</p> <p>all three correct (2) but one or two correct (1)</p>	2	
	(b)	<p>carbon atoms = 4 hydrogen atoms = 8 oxygen atoms = 2</p> <p>all three correct (2) but one or two correct (1)</p>	2	
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
5	(a)	marble (1)	1	
	(b)	any two from: take up land (1) (increased) noise (1) (increased) traffic (1) dust (1)	2	allow destroys habitats / AW allow lots of lorries on road instead of either noise or traffic ignore more pollution but allow more carbon monoxide in air / more oxides of nitrogen in air allow land has to be reconstructed when quarrying has finished / AW (1)
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	solder (1)	1	
	(b)	lead (1)	1	
	(c)	low melting point / melts easily (1)	1	ignore references to electrical conductivity
	(d)	low density / AW (1)	1	allow lightweight allow because of its density ignore it is light but allow the aeroplane body is light
	(e)	saves (natural) resources / reduces disposal problems / reduces energy consumption (1)	1	allow copper is a finite resource / copper (ore) is scarce allow reduces toxic heavy metal pollution in water ignore environmentally friendly / less pollution
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
7	(a)	thin the mixture / so the paint can be spread easily (1)	1	allow dissolves some ingredients / helps to mix the ingredients ignore helps paints to dry
	(b)	change colour when heated / change colour when cooled (1)	1	
	(c)	particles are mixed and dispersed through a liquid (1) solid particles are suspended in a liquid (1)	2	If more than two ticks, deduct one mark for each additional tick down to zero <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
8	(a)	50 (seconds)	1	
	(b)	more crowded particles / more particles in the same volume / more particles per cm ³ (1) more (frequent) collisions (1)	2	assume answer refers to concentrated acid but allow ora if dilute acid is specified ignore more particles / reaction is faster allow particles are closer together allow more chance of collisions not faster collisions / quicker collisions
	(c)	increases / faster (1)	1	
	(d)	change the temperature / heat it / cool it (1)	1	allow increase temperature / decrease temperature allow use a catalyst allow stir or shake / not stir / not shake
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
9	(a)	acid rain / (photochemical) smog (1)	1	allow effects of acid rain eg erodes buildings / corrodes metals / kills plants / kills animals allow destroys ozone layer allow makes low level ozone
	(b)	any two from: kills aquatic life / kills fish / kills animals (1) damages stonework / AW (1) damages metals / AW (1)	2	not kills plants or pond weed etc given in question
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
10		<p>sodium chloride – as a preservative iron – to make bridges chlorine – to make pesticides copper – to make electrical wiring</p> <p>all four correct (3) but two or three correct (2) but one correct (1)</p>	3	
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	rubidium / caesium / francium (1)	1	allow Rb / Cs / Fr
	(b)	any two from: (very) reactive (1) reacts with air / reacts with oxygen (1) reacts with water (in air) (1)	2	allow reacts with moist air (2)
	(c) (i)	hydrogen (1)	1	allow H / H ₂ not H2 / H ²
	(ii)	sodium hydroxide (1)	1	allow NaOH
	(iii)	most reactive – potassium sodium least reactive – lithium (1)	1	allow correct symbols
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
12	(a)	between 80 and 120 (1)	1	more than one box ticked scores zero
	(b)	29 (1)	1	
	(c)	sodium / magnesium / silicon / phosphorus / sulfur / chlorine / argon (1)	1	allow Na / Mg / Si / P / S / Cl / Ar
	(d)	correct symbol of any transition element	1	ignore names
	(e)	nucleus (1)	1	allow protons and neutrons
	(f)	proton: positive / + / +ve / +1 (1) neutron: 1 / one (1)	2	not -1
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
13	(a)	electrolysis (1)	1	allow correct answer underlined, ticked or circled if answer line is blank
	(b)	bauxite (1)	1	
	(c)	aluminium oxide → aluminium + oxygen (1)	1	allow correct formulae or mix of correct formulae and words allow $\text{Al}_2\text{O}_3 \rightarrow \text{Al} + \text{O}_2$ allow = instead of arrow not and or & for +
	(d)	(graphite) anode / positive (electrode) (1)	1	
		Total	4	

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