

Chemistry B

General Certificate of Secondary Education **B641/01**

Unit 1: Modules C1, C2, C3

Mark Scheme for June 2010

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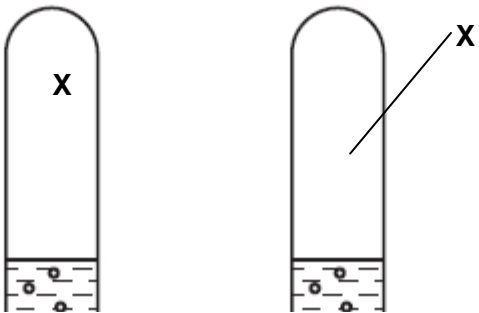
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Question		Expected Answers	Marks	Additional Guidance
1	(a)	emulsifier (1)	1	
	(b)	E415 (1)	1	
	(c)	to make cakes rise (1)	1	allow to produce carbon dioxide allow puts gas in the cake / puts carbon dioxide in the cake / puts CO ₂ in the cake allow puts bubbles in the cake not puts air in the cake ignore 'to make cakes bigger'
	(d)	sodium carbonate / water / carbon dioxide (1)	1	allow more than one correct response allow correct formulae i.e. Na ₂ CO ₃ , CO ₂ , H ₂ O
	(e)	name of chemical used: limewater / calcium hydroxide (solution) (1) result: (limewater) turns milky / turns cloudy / forms white solid / forms white precipitate (1)	2	result mark is dependent on correct reagent but test with limewater (calcium carbonate) can score 2 nd mark allow turns foggy or misty allow bicarbonate indicator (1) changes from red to yellow (1)
		Total	6	

Question		Expected Answers	Marks	Additional Guidance	
2	(a)	nylon is not breathable / Gore-Tex is breathable (1)	1	assume answer refers to nylon if not stated allow nylon does not let water vapour through ignore nylon does not allow sweat or water or air to escape ignore references to hard wearing and waterproof	
	(b)	some polymers release toxic fumes when burned (1) microbes decompose biodegradable polymers (1)	2	each error loses 1 mark down to zero	
	(c)	(i)	(addition) polymerisation (1)	1	
		(ii)	poly(ethene) / polyethene / polythene (1)	1	not polyethane
	(d)	packaging / insulation / protection (1)	1	allow (polystyrene) cups / putting under fish tanks / bean bag filler / cycle helmets / coving / tiles / plant trays / model toys / food containers / floats for swimming (1)	
		Total	6		

Question		Expected Answers	Marks	Additional Guidance
3	(a)	ethene / methane (1)	1	allow correct formula C ₂ H ₄ / CH ₄
	(b)	methane (1)	1	allow correct formula - CH ₄
	(c)	9 / nine (1)	1	
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	petrol (1)	1	more than one response scores zero allow correct answer ticked, circled or underlined if answer line is blank but answer line takes precedence
	(b)	<p>X on diagram in right hand tube above level of water / X at end of label line which points into right hand tube into gas above water (1)</p> <p style="text-align: center;">or</p> 	1	

Question		Expected Answers	Marks	Additional Guidance
4	(c)	<p>any one from: high temperature (1) catalyst / named catalyst e.g. zeolite / aluminium oxide (1) high pressure (1)</p> <p>up to two from: idea of (long chain molecules are) changed into smaller molecules (1) idea of (random) breaking of carbon-carbon or intramolecular bonds (1)</p> <p>saturated / alkane is made (1)</p> <p>unsaturated / alkene is made (1)</p> <p>idea of more useful substances are made (1)</p>	3	<p>USE TICKS IN THIS QUESTION allow any temperature above 200°C allow heat / hot</p> <p>allow any pressure above atmospheric pressure</p> <p>ignore just pressure</p> <p>allow (larger) molecules or hydrocarbons broken down or split up</p> <p>ignore references to intermolecular bonds</p> <p>allow named alkanes</p> <p>allow named alkenes except ethene (given in (b)) allow idea that alkenes can be used to make polymers or plastics / ethene made can be used to make ethanediol or ethanol (1)</p> <p>ignore petrol is made but allow more petrol is made (1)</p> <p>allow higher level answers in terms of the idea that cracking enables (an oil refinery) to match supply with demand (1)</p>
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
5	(a)	10 (1)	1	unit not needed
	(b)	iron (1)	1	allow Fe / FE
	(c)	shorter time / any time less than 55 seconds (1) faster reaction / more crowded particles / more collisions (1)	2	1 st marking point must refer to time and not rate e.g. ignore 'quicker time' ignore 'more particles' allow more particles in the same volume or area allow more frequent collisions or more collisions per second or collide more often or increases collision frequency or more chance of collisions
	(d)	particles are moving faster / particles have more (kinetic) energy (1) more collisions (1)	2	allow more collisions per second or collide more often or increased collision frequency or more chance of collisions (1) allow more successful or energetic collisions (2) ignore references to particles vibrate more ignore references to particles move around more
	(e)	decreases / slower / lower rate of reaction (1) smaller surface area / fewer collisions (per second) (1)	2	ignore references to time e.g. 'takes longer' or 'the time taken will increase' both marks could be scored in the explanation section allow less chance of a collision allow reverse argument for powder
		Total	8	

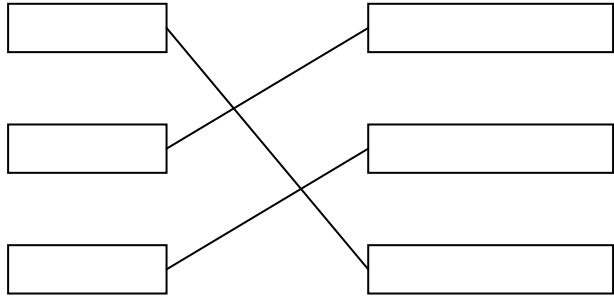
Question		Expected Answers	Marks	Additional Guidance
6	(a)	nitrogen / helium / neon / krypton / argon / xenon (1)	1	allow N ₂ / He / Ne / Kr / Ar / Xe allow methane / CH ₄ allow radon / Rn ignore hydrogen / CFCs
	(b)	(i) combustion / burning (1)	1	
		(ii) photosynthesis (1)	1	
		(iii) respiration (1)	1	ignore breathing not anaerobic respiration
	(c)	(photochemical) smog / acid rain (1)	1	allow triggers asthma attacks allow toxic / helps rusting / erodes buildings or stonework / kills wildlife
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
7	(a)	mantle (1)	1	
	(b)	iron (1)	1	allow circle, underlined or tick by iron but answer line takes precedence
	(c)	earthquakes (1)	1	allow mountains / mountain ranges / effects of earthquakes eg tsunami
	(d)	(i) igneous (1)	1	allow circle, underlined or tick by igneous but answer line takes precedence
		(ii) fast cooling small crystals / slow cooling large crystals (1)	1	
	(e)	(i) sand (1)	1	allow silicon dioxide or sandstone
		(ii) metals / aluminium / iron / copper / lead / tin / zinc / steel / cement / marble / limestone / granite / slate / concrete / breeze blocks / plaster / wood / PVC / plastic (1)	1	allow water / any other building material e.g. grass / mud / straw / stone ignore clay / glass / brick / sand
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
8	(a)	potassium / sodium (1)	1	allow K / Na not lithium / Li
	(b)	iodine (1)	1	allow I / I ₂ ignore chlorine / Cl / Cl ₂ allow sulfur / S
	(c)	sulfur (1)	1	allow S
	(d)	argon (1)	1	allow Ar
	(e)	aluminium / potassium / sodium (1)	1	allow Al / K / Na
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
9	(a)	colour of bromine – red / brown / red-brown (1) state of iodine - solid (1)	2	allow any combination of red, brown and orange e.g. orange-red allow rusty red not combinations where one of the colours is incorrect e.g. black-brown or yellow-brown ignore references to pale or dark
	(b)	fluorine (1)	1	allow F / F ₂
	(c)	preservative / flavouring / to manufacture chlorine (1)	1	allow salt or added to food not just 'food' allow aw for flavouring, e.g. on chips allow melting ice (on roads) / manufacture of bleach / in water softeners
		Total	4	

Question			Expected Answers	Marks	Additional Guidance
10	(a)	(i)	8 / eight (1)	1	
		(ii)	negative (1)	1	allow - / -1 / -ve allow correct answer ticked, circled or underlined in list if answer line is blank
	(b)		positive (1)	1	allow + / +1 / +8 / +ve allow correct answer ticked, circled or underlined in list if answer line is blank
	(c)		(oxygen has electrons in) two (occupied) shells or orbits (1)	1	allow oxygen is in the second row of the periodic table allow has two outer shells or orbits allow has two rings or layers or levels or circles
			Total	4	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	hydrogen + oxygen → water (1)	1	allow hydrogen oxide instead of water allow = instead of → allow $H_2 + O_2 \rightarrow H_2O$ allow mix of formulae and names not and / &
	(b)	(use a) lighted splint (1) burns with a (squeaky) 'pop' (1)	2	ignore use a splint result mark is dependent on correct test but test with a splint or glowing splint that gives a pop scores one mark
	(c)	anode - a positive electrode cathode - a negative electrode electrolyte - a liquid that conducts electricity during electrolysis 	2	all three correct (2) one or two correct (1)
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
12	(a)	breaking down (by heating) (1)	1	allow breaking up (by heating) allow decomposes ignore separate / decay / disintegrate
	(b)	3 / three (1)	1	
		Total	2	

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