UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0620 CHEMISTRY

0620/21

Paper 2 (Core Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

• Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

	Pa	ge 2	Mark Scheme: Teachers' version	Syllabus	Paper
			IGCSE – October/November 2011	0620	21
l	(a)		dicines / food / (drinking) water / air quality ore: kitchens / clothes		[1]
		(ii) 1 st l	pox down ticked (boils slightly above 100°C)		[1]
	(b)	2 or 3 co 0 or 1 co top right bottom	rrect = 2 marks correct = 1 mark correct = 0 marks t → solvent front right → chromatography paperbottom left → solvent → origin line		[2]
	(c)	(i) C			[1]
		(ii) A, (C and D (all three correct for 1 mark)		[1]
		(iii) B			[1]
					[Total: 7]
2	(a)	air / oxy water allow: o	gen damp / humid		[1] [1]
	(b)		reaction of the oxygen (in first two weeks)		[1]
		(oxygen	air reacting reacting) with the iron / rusting / iron reacts		[1]
		(after 2 stopped	reaction with rust / reaction with iron oxide weeks) all the oxygen had reacted / there was no fur / no more oxygen no more air / experiment was finished	ther reaction / reac	ction had [1]
	(c)	•	→) shiny / silvery		[1]
		allow: g (after 2 allow: r ignore:	weeks →) brown / reddish brown / orange ed		[1]
1	(d)	reddish- reject:	ueous) sodium hydroxide / (aqueous) ammonia -brown / brown precipitate (both colour and ppt needo red precipitate nd mark dependent on correct reagent	ed)	[1] [1]
1	(e)	1 mark	hydrochloric acid → iron chloride + hydrogen for iron chloride; 1 mark for hydrogen wrong oxidation numbers / numbers in equation		[2]
					[Total: 11]

Mark Scheme: Teachers' version

Syllabus

Paper

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Page 3			Syllabus	Paper	_	
		IGCSE – October/November 2011	0620	21		
(a)	(i) N	Na / Mg / sodium / magnesium		[[1]	
	(ii) a	any two of Si / P / S / Cl (1 mark each)		[[2]	
(b)	decreases / less metallic / from metals (on left) to non-metals (on right) allow: metals on left and non metals on right ignore: just reference to metals or non-metals alone i.e. metals on left ignore: reactivity decreases					
(c)		ic number / number of protons re: number of electrons		[[1]	
(d)	n n n n e e 3	Any 4 of: nucleus in centre of atom neutrons <u>and</u> protons in nucleus number of protons = 13 number of neutrons = 14 number of electrons = 13 electrons on outside of atom electrons in shells / 3 shells 8 electrons in outer shell electron configuration = 2,8,3 allow: marks from labelled diagram			[4]	
		<u>very</u> good (electrical) conductivity / it is the best conductor / ignore: good conductor	it is a better c	onductor [[1]	
	h	gnore: good conductor nas a low density gnore: other properties		[[1]	
(e)	allow	n right ct balance 2 (KBr) and 2(KCI) v: balance mark if 2Br on right t: if incorrect species			[1] [1]	
(f)	3 rd bo	ox down ticked (argon has a complete outer)		[[1]	
				[Total: 1	4]	

Mark Scheme: Teachers' version

Syllabus

Paper

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	Page 4	Mark Scheme: Teachers' version	Syllabus	Paper			
		IGCSE – October/November 2011	0620	21			
(ethan allow	 ethene decolourises (bromine water) / bromine goes colourless in ethane ethane does not / no change / remains reddish-brown allow: only ethene decolourises bromine = 2 ignore: ethene reacts and ethane does not 					
	i	eat / high temperature gnore: warm llow: quoted values between 300–1000°C		[1			
		atalyst / named catalyst e.g. aluminium oxide / por gnore: high pressure	ous pot	[1			
	` '	lkene collects above the water / alkene not mixed gnore: bubbles / it goes up	with water	[1			
	(iii) 4	2		[1			
	(iv) C	C ₄ H ₈ / 2C ₂ H ₄		[1			
	(c) additi polym	on nerisation		[´ [´			

[Total: 9]

Page 5		wark Scheme: Teachers Version	Syllabus	Paper	
		IGCSE – October/November 2011	0620	21	
(a) (i)		ect points (each <u>within</u> one small square) nark for each incorrect point		[2]	
	smo	smooth curve ignore: continuation of curve at either end			
(ii)		C / the highest w: values above 75°C		[1]	
(iii)	the higher the temperature the faster the reaction / speed greater at higher temperature allow: the higher the temperature the faster the word disappear ignore: gets faster without qualification / faster with temperature / higher temperature reases rate of collisions / it takes less time the higher the temperature				
(b)		eases / gets faster goes fast		[1]	
(c) (i)		um chloride y: listing if extra species		[1]	
(ii)	VI / v	vi / 6 / six		[1]	
(iii)	slow (or n	st death / acidifies lakes or rivers / kills fish / plant in s crop growth / leaches harmful minerals from soil / netals) / kills corals ore: acid rain / kills animals / kills plants or fish in se	erodes (or corroc	des) buildings [1]	
(iv)	2 nd b	oox down ticked (calcium oxide)		[1]	
(v)		nesium gains oxygen / increases its oxidation numb w: loses electrons / Mg gets oxidised	oer / gets oxidised	[1]	
	sulfu allov igno	rr dioxide loses oxygen / decreases its oxidation nulters; gains electrons / SO ₂ gets reduced ore: repeating what is in the equation expected and reduction occurs together = 1	mber;	[1]	
				FT 4 1 401	

Mark Scheme: Teachers' version

Syllabus

Paper

Page 5

(a) O ₂ 2 (O ₂) dependent on O ₂	[1] [1]
(b) car	rbon monoxide / CO	[1]
	ere was no air / the gas was at a low temperature / gas was unburnt nore: there was no gas / there is no combustion	[1]
(d) (i)	water	[1]
(ii)	heat it / warm it / put in dessicator	[1]
(iii)	gets heavier / increases absorbs carbon dioxide / carbon dioxide has mass / carbon dioxide added both points needed for 1	[1]
(e) (i)	cow flatulence / marshes / waste sites / paddy fields allow: bacterial decomposition	[1]
(ii)	global warming / named effect of global warming e.g. rise in air temperature / melting polar ice / desertification / more extreme weather ignore: melting of ice unqualified allow: greenhouse effect	of [1]

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[Total: 9]

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			IGCSE – October/November 2011	0620	21
7	(a) 3 rd h	box d	own ticked (endothermic)		[1]
	(b) (i)	_	around OH ct: round OH and C / around OH of COOH		[1]
	(ii)	C ₆ H ₈	₈ O ₇		[1]
	(c) (i)	prote	lyst / substance which speeds up rate of reaction ein / (substance) found in living things / biological pre: found in washing powder		[1] [1]
	(ii)	filtra allo	tion w: decanting		[1]
	(iii)		water s milky / cloudy / white precipitate		[1] [1]
			ator in flask	(اد: -	[1]
	add	l sodi	ny named indicator (even if can't be used for weak a um hydroxide (from burette) ing / endpoint when indicator changes colour	acia)	[1] [1]
					[Total: 11]

Paper

Mark Scheme: Teachers' version

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(a)	 (i) electrolyte → D allow: (molten) sodium chloride cathode → C 	[1] [1]
	(ii) graphite	[1]
(b)	floats on top of the sodium chloride allow: sodium is on top	[1]
(c)	chlorine / Cl_2 allow: Cl reject: chloride	[1]
(d)	(anode \rightarrow) chlorine / Cl_2 allow: oxygen / O_2 allow: Cl / O	[1]
	reject: chloride / oxide (cathode →) hydrogen / H ₂ allow: H	[1]

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[Total: 7]

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