UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 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.

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Page 2			Syllabus	Paper		
		IGCSE – October/November 2010	0620	21		
1	(a) (pe	(a) (period) 2 / period II				
	(b) (i)	O / O ₂ / oxygen		[1]		
	(ii)	F / F ₂ / fluorine		[1]		
	(iii)	Li / lithium		[1]		
	(iv)	C / carbon		[1]		
	(v)	Be / beryllium		[1]		
	(vi)	N / N ₂ / nitrogen		[1]		
	(c) ato	oms; protons		[2]		
				[Total: 9]		
2	(a) the		[1]			
	(b) (i)	carbon dioxide		[1]		
	(ii)	(colourless) to white / milky IGNORE: goes cloudy		[1]		
	(c) (i)	calcium oxide blown onto surface of iron / mixed with mixed in furnace with iron; forms slag / removes impurities (or named impurities) reacts with phosphorus oxides / reacts with acidic oxide	in iron / reacts with	[1]		
	(ii)	mixture of metal with other metals or mixture of metal	(s) with non-metals	[1]		
	(iii)	neutralising acid soils / neutralising acidic lakes / mak limewash for buildings ALLOW: paint				
	(iv)	·		[2]		
	(v)			[1]		
	(*)		[Total: 10]			
				[10(a), 10]		

3		alloons / diving / cryogenics / coolant / arc welding / protective atmosphere / lasers IOT: hot air balloons	[1]		
	(b) (i	i) nucleus	[1]		
	(ii	i) 3 rd box down ticked (helium has complete outer shell)	[1]		
	(iii	i) 18	[1]		
	(iv	y) 34 Ar	[1]		
	N	toms close together; IOT: atom's diameter from each other toms randomly arranged	[2]		
			[Total: 7]		
4		hloride; IOT: chlorine	[1]		
	S	ulfate	[1]		
		O) 2.32 IGNORE: wrong units			
	(c) (i	warm gently; IGNORE: any results given ALLOW: add iron(II) sulfate			
		then concentrated sulfuric acid	[2]		
	(ii	i) ammonia	[1]		
	(d) (i	i) flask IGNORE incorrect type; condenser ALLOW: condensing tube; pure water / distilled water;	[3]		
	(ii	 any two of: distillation water (in round bottomed flask) boiled NOT: water heated / water evaporates 			
		 water has a lower boiling point (than ions) steam (or water vapour) condenses in condenser / steam or water vapour g liquid in condenser 	oes to		
		ALLOW: gas goes to liquid in condensersolid / ions remain in flask	[2]		
	(iii	i) medicines / drugs / foodstuffs / (drinking) water	[1]		
		Γ	Total: 12]		

Mark Scheme: Teachers' version IGCSE – October/November 2010

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Syllabus 0620 Paper 21

	Page 4			Mark Scheme: Teachers' version	Syllabus	Paper
				IGCSE – October/November 2010	0620	21
5	(a)	(a) pH11				[1]
	(b) 4 th box de			own ticked (slaked lime)		[1]
	(c)	c) (i) plants can't grow well if soil too acidic / crop yields lower if too acidic ALLOW: plants die if soil acidic ALLOW: plants grow best in neutral soil / plants like neutral soil				[1]
	 (ii) any three of: fossil fuels (or correctly named fuel) contain sulfur / sulfur burns / to form sulfur dioxide / sulfur dioxide reacts with oxygen in air / sulfur dioxide (or sulfur trioxide) reacts (or dissolves) with rain 				[3]	
	Sullur dioxide (or sullur trioxide) reacts (or dissolves) with rain				[0]	
	(d) (i) neutralisation ALLOW: neutralising					[1]
		(ii) add indicator to flask ALLOW: any named acid-base indicator;				[1]
		 any two of: add measured amount of calcium hydroxide to flask (or use a volumetric pipette put the calcium hydroxide in the flask) add acid (from burette) into flask 				
				until indicator changes colour record volume of acid added		[2]
						[Total: 10]
6	(a)	(i)	baux	xite / any other ore of aluminium		[1]
				oval of oxygen (from compound or substance) / gair ation number / addition of hydrogen	n of electrons / dec	crease in [1]
			too r	reactive / requires too high a temperature		[1]
				to right: kel, zinc, magnesium		[2]
	(c)	(i)	(volu	ume) decreases		[1]
		(ii)	(volu	ume) increases		[1]
	(d) copper → electrical wiring; aluminium →aircraft bodies ALLOW car bodies or electrical wiring;					
	mild steel → car bodies; stainless steel → chemical plant			[4]		
						[Total: 11]

Page 5		ge 5		Syllabus	Paper			
			IGCSE – October/November 2010	0620	21			
•	(a)	(i)	(group of) molecules with similar boiling points / (group of) molecules with molecular masses / molecules with limited range of boiling points / molecul range of molecular masses / molecules coming off at the same place in th column					
			IGNORE: division of petroleum components		[1]			
		(ii)	$C_{10}H_{22}$ ALLOW reasonable mixtures e.g. $C_7H_{16} + C_3H_6$		[1]			
	(b)		efinery gas: (fuel) for heating / (fuel) for cars / (fuel) for cooking; gasoline: (fuel) for cars / mowers etc					
	(c)	c) contains double bonds / contains C=C bonds;						
	` ,	con	[2]					
	(d)	(i)	1 st box down ticked (catalytic addition of steam)		[1]			
		(ii)	correct structure with all atoms and bonds shown OH instead of O-H = 1 mark only		[2]			
	(e)		monomers;					
		poly	[2]					
					[Total: 11]			
3	(a)	ele	ctrodes		[1]			
	(b)	lead	lead / Pb;					
	. ,		bromine / Br ₂ / Br					
		NO	NOT: lead ions, bromide ions					
	(c)	2 nd and 3 rd boxes down ticked (1 each)		[2]				
	(d)	Pbl	Br ₂		[1]			
	(e)	(i)	solid formed when two solutions mixed NOT: solid formed at bottom of solution		[1]			
		(ii)	3					
		(iii)	6		[2]			
		(iv)	brain damage in children / affects nervous systems or n	erves / poisonous	[1]			
					[Total: 10]			

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