CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0620 CHEMISTRY

0620/23

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



	Page 2	Mark Scheme	Syllabus	Paper
		IGCSE – May/June 2014	0620	23
1		per sulfate / CuSO ₄		[1]
	(ii) calc	ium oxide / CaO		[1]
	(iii) hydi	rogen chloride / HCl		[1]
	(iv) pota	assium bromide / KBr		[1]
	(v) alun	ninium oxide / Al ₂ O ₃		[1]
	(vi) cop	per sulfate / CuSO ₄		[1]
	(b) chemica (1 mark	ılly; different; fixed; each)		[3]
				[Total: 9]
2		loric (acid) / HC <i>l</i> hydroxide / calcium oxide		[1] [1]
	(b) ⇌			[1]
	6H₂O on	right		[1]
	(c) in tube A	A the calcium chloride absorbs the water vapour;		[1]
	In tube E	3 there is both water and air / there is water (vapour	r) in the air;	[1]
	(d) 2 nd box (down ticked (oxidation state of iron)		[1]
	. , . ,	gnesium < zinc < iron < lead ark if one pair reversed / lead > iron > zinc > magne	esium	[2]
		gen removed from the copper oxide / it loses oxy gen;	gen / hydrogen gains	[1]
				[Total: 10]
3	(a) (i) carr	ots; potatoes;		[1]
	(ii) (pH)) 7;		[1]
	(b) (i) Any • •	two from: plants won't grow if (conditions too) acid to raise the pH / to make the soil less acidic / lime high pH; to neutralise (the soil) / neutralisation;	e is alkaline / lime has	[2]

	Page 3			yllabus	Paper
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	(ii)	(ii) lime is alkaline / lime is a base / lime reacts with ammonium salts;			
		ammonia produced;			[1]
		(amr	monia) escapes (into air) / (ammonia) is a gas;		[1]
	(c) (i)	•	two from: increases; up to pH 7.5 / up to quoted values between pH 7 and 8; then levels off / evens out / then stays at the same pH		[2]
	(ii)	pH 9	0.5 / between 9 and 10		[1]
					[Total: 10]
4	(a) (i)	capil	llary tube / very narrow tube;		[1]
	(ii)		would undergo chromatography / ink would run up the paresults / ink would smear / ink mixes with spot ORA for paresults /	•	; [1]
	(iii)	В			[1]
	(iv)	Α			[1]
	(v)	С			[1]
	(b) (i)	4			[1]
	(ii)	H =	1 mark one row correct e.g. 12 × 1 = 12 4 × 14 = 56		[2]
	(c) (i)		of substance formed by (addition of) monomers or simp y monomers or simple units (joined);	le units / idea of	; [1]
	(ii)		(ethene) / polyethene;		
	(11)	poly	(etherie) / polyetherie,		[1] [Total: 10]
5	(a) (i)		eases as number of (carbon) atoms increase / both incre	ase at the same	
		time	/ proportional / more carbon the higher the boiling point;		[1]
	(ii)		ng point allow: between 130 and 150 °C; ual = 141)		[1]
			sity allow: between 0.80 and 1.00; ual = 0.96)		[1]

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(iii)	iquid because me	elting point below room tempera	ature and boiling point above	
	room temperature	e / room temperature is betweer	n melting and boiling point;	[′
(b)				
0				
(C)	-O-H			[′
(c) (i)	burette;			[′
(ii)	sodium hydroxide	;		[′
(iii)	indicator in flask /	reference to indicator;		[1
	run liquid from bu	rette (until indicator changes co	olour);	[′
				[Total: 9
(a) PhF	₂ / Pb ²⁺ 2Br ⁻			[′
(a) 1 D	2/10 201			L
(b) (i)	to melt the lead b	romide / to allow ions to move;		[′
(ii)	graphite;			[′
(iii)	anode: bromine a (both required)	nd cathode: lead;		[1
(c) (i)	Α;			[′
(ii)	(anode): decrease	es in size / becomes eroded;		[′
	cathode: increase	es in size;		[′
(iii)	134;			[2
` ,	,			[Total: 9
(a) (i)	Any four suitable	differences e.g.:		[4
	_	es / only 7 (standard) Groups C	DRA;	
	• •	in same column as Li ORA; ats missing / named element mi	ssing / empty spaces ORA	
	 groups are he being differer 	orizontal rather than vertical / re nt ORA	eference to groups or periods	
	 not ordered a 	according to atomic number / no ne group as Be and Mg ORA	proton numbers	
(ii)	any two from:	bromine. oxvaen . nitrogen . hv		[

fluorine, chlorine, bromine, oxygen , nitrogen , hydrogen

Pa	ge 5	Mark Scheme	Syllabus	Paper
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(b)	denscatastrerhardelect	ing points / boiling points; sity; lytic activity;		[3]
(c)	c) $2 (Cl_2)$; CO_2 (on right);			[1] [1]
(d)	to prevent sodium reacting with air / to stop the Ti reacting with the air / to exclude air / to stop the hydrolysis of the titanium oxide / to exclude wate (vapour);			
	because argon is inert / unreactive / inactive / does not react;			
				[1] [Total: 12]
				[1000.12]
8 (a)	3 rd box d	own ticked (giant ionic);		[1]
(b)	add bariu	um chloride / barium nitrate;		[1]
	white pre	•		[1]
	(both required) note: second mark dependent on correct reagent			
(c)	 conr mixtr idea water on h easil stea water sodii sodii water 	from: denser nected to flask ure in flask of heating the solution / boil the solution er has lower boiling point than sodium sulfate / sodiu er is liquid (at rtp) eating water boils more easily / forms vapour more ly / water boils first / water will evaporate (not sodius m / water vapour goes to top of the flask and into core er vapour gets into condenser um sulfate does not turn to gas um sulfate remains in flask / sodium sulfate is left er vapour / steam goes to liquid in condenser er collected in receiver	m sulfate)	[5] and
(d)	turns pin	k;		[1]

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(e) filtered; [1]

chlorine added / chlorination;

[1]

allow: other stages e.g. sedimentation / flocculation (use of iron chloride / aluminium sulfate etc.) / treatment with sulfur dioxide

[Total: 11]