CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0620 CHEMISTRY

0620/32

Paper 3 (Extended Theory), maximum raw mark 50

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 October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



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	Pa	ge 2	Mark Scheme		Paper
			IGCSE – October/November 2012	0620	32
1		(i) Sb;	_		
		(ii) Xe /	В;		
	((iii) Sr / [*]	Te / A / D;		
	((iv) Sn a	nd I / E and F;		
		(v) Sr / .	А ;		[5]
	(b)		s tronger; higher mp/bp; higher density		[2]
		any two	ere has to be a comparison from:		
		chemica	I s less reactive; forms coloured compounds; forms	a complex ions: its	
		compour	ads have catalytic properties; has more than one c valency electron;		[2]
			e response has to refer to or compare properties of	of both elements	[2]
					[Total: 9]
2	(a)	المستط			
		liquid;			[1]
	(b)	(I) and ([1]
	(b)	(I) and (reversible	e sign;		
	(b)	(I) and (reversibl accept: ignore: a			[1]
		(I) and (reversibl accept: ignore: a must be	e sign; X in equation any compounds just look for state symbols		[1]
		(I) and (reversible accept: ignore: a must be boiling / (e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation		[1] [1]
	(c)	(I) and (reversible accept: ignore: a must be boiling / accept: (in region	e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation condensation; evaporation or vaporisation n BC) solid melts / liquid boils (in region DE);		[1] [1] [1]
	(c)	(I) and (reversible accept: ignore: a must be boiling / accept: (in region	e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation condensation; evaporation or vaporisation		[1] [1]
	(c)	(I) and (reversible accept: ignore: a must be boiling / accept: (in region	e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation condensation; evaporation or vaporisation n BC) solid melts / liquid boils (in region DE);		[1] [1] [1]
3	(c) (d)	(I) and (reversible accept: ignore: a must be boiling / accept: (in region at one / f	e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation condensation; evaporation or vaporisation n BC) solid melts / liquid boils (in region DE);		[1] [1] [1] [1]
3	(c) (d) (a)	(I) and (reversible accept: ignore: a must be boiling / accept: (in region at one / f	e sign; X in equation any compounds just look for state symbols the same compound on both sides of equation condensation; evaporation or vaporisation n BC) solid melts / liquid boils (in region DE); ixed / sharp / single / specific temperature; ect structure of an isomer e.g. 2-chloropropane;		[1] [1] [1] [1] [Total: 6]

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	Page 3		Mark Scheme IGCSE – October/November 2012	Syllabus 0620	Paper 32
	(iii)		d produce 2-chloropropane; d produce HC <i>l</i> ;	0020	[1] [1]
	(b) (i)		d produce dichloropropanes = [2] silver nitrate / lead nitrate;		[1]
		yello note	ow precipitate; e: do not insist on presence of dilute nitric acid panol / propan-1-ol;		[1]
	(ii) (c) (i)	for A			[1]
		parti any	bromobutane present / concentration of bromobuta icles; two ept: reverse arguments for B	ane less / less rea	cting [2]
	(ii)	orga	gens $Cl > Br > I$ reactivity / reactivity decreases do anic halides $I > Br > Cl$ / reactivity increases down osite without explanation = [1]	• • •	[1] [1]
	(iii)	less parti less	three from: energy; icles move slower; collisions / fewer particles have energy to react / fe ver rate;	ewer successful c	ollisions; [3] [Total: 15]
4	(a) C	+ O ₂	$\rightarrow CO_2$		[1]
	(b) (i)	then or	already formed (from C burning or from CaCO ₃); carbon reacts with carbon dioxide; $CO_2 \rightarrow 2CO = [2]$ If equation not balanced = [1]		[1] [1]
	(ii)	not l	$D_3 + 3CO \rightarrow 2Fe + 3CO_2$ balanced = [1] reduction by carbon		[2]
	rea Ca or	icts wi CO₃ + CaO	we / neutralise silica / silicon dioxide / silicon(IV) oxid ith limestone to form slag / calcium silicate; - SiO ₂ → CaSiO ₃ + CO ₂ + SiO ₂ →CaSiO ₃ O_3 → CaO + CO ₂	le / sand;	[1] [1] [1]

Dogo 4		Mark Scheme	ww.dynamicpar		
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(d)	(i) galv	anising / galvanisation / sacrificial protection;		I	
	• •	ificial protection / zinc is sacrificed;			
		corrodes rather than iron;			
		is oxidised in preference to iron; reacts with oxygen and / water in preference to in	ron:		
	zinc	more reactive / electropositive than iron;	- ,		
		loses electrons more readily than iron; trons move on to iron			
		three			
	,				
				[Total: '	
(a)	any two				
		g (wood pulp / silk / straw); turo of sulfuric acid / SQ. / in Contact process:			
		manufacture of sulfuric acid / SO ₃ / in Contact process; fumigating / sterilising; refrigerant; making dyes; making wine; insecticide;			
	fungicide				
(b)	burn / he	eat / react sulfur;			
	in air / o	kygen;			
	or burn / he	eat / roast zinc sulfide or lead sulfide;			
	in air / o				
(c)		ple / pink; not: red			
	to colour	less; not clear			
(d)		of moles of $Na_2SO_3 = 3.15/126 = 0.025$			
		of moles of SO ₂ formed = 0.025 of SO ₂ = 0.025 x 24 = 0.6 dm³/litres or 600 cm	3		
	allow: ec	-			
		of SO ₂ [1] only			
		2.4 max [2] ed correct units for last mark			
	note: ne	ed correct units for last mark			

[Total: 9]

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6	(a) (i)	correct arrow from negative terminal of battery or from anode;	[1]
	(ii)	from battery / power supply / cell; from negative electrode of battery to external circuit;	[1] [1]
		or from anode; from iodide ion losing electron or oxidation of anion;	
	(iii)	ions cannot move in solid / ions can move in liquid;	[1]
	(b) cop	per; anges to) sulfuric acid;	[1]
	(01	anges to summe actu,	[1]
	hy (cł	[1] [1]	
	(c) (i)	$2H^+ + 2e \rightarrow H_2$ not balanced = [1]	[2]
	(ii)	$4OH^- \rightarrow O_2 + 2H_2O + 4e$	[1]
	(iii)	water used up;	[1]
	(d) it is	a cell:	[1]
	hyc this	[1]	
	cha	[1]	
			[Total: 15]
7	(a) (i)	C _n H _{2n+1} OH	[1]
	(ii)	116-17 = 99, 2n+1 = 99, n = 7	
	(,	for any evidence of working out $C_7H_{15}OH$	[1] [1]
	()		
	(iii)	4bps around C; 1 bp on each hydrogen;	[1] [1]
		2bps and 2nbps on oxygen;	[1]
	(b) (i)	increases yield / moves equilibrium to RHS / favours forward reaction high pressure favours side with smaller number of (gas) molecules;	; [1] [1]
	(ii)	any two from: higher temperature / catalyst causes faster reaction;	
		comment about compromise conditions to give best rate and yield; at 250°C (lower temp) higher yield / forward reaction favoured;	
		at 350°C (higher temp) lower yield / back reaction favoured;	[3]

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(c) (i)	(c) (i) methanoic acid; correct SF showing all bonds; accept: -OH				[1] [1]	
(ii)	meth	nyl methanoate;			[1]	
					[Total: 14]	