Location Entry Codes

www.papaCambridge.com As part of CIE's continual commitment to maintaining best practice in assessment, CIE has begun to use different variants of some question papers for our most popular assessments with extremely large and widespread candidature, The question papers are closely related and the relationships between them have been thoroughly established using our assessment expertise. All versions of the paper give assessment of equal standard.

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The content assessed by the examination papers and the type of questions are unchanged.

This change means that for this component there are now two variant Question Papers. Mark Schemes and Principal Examiner's Reports where previously there was only one. For any individual country, it is intended that only one variant is used. This document contains both variants which will give all Centres access to even more past examination material than is usually the case.

The diagram shows the relationship between the Question Papers, Mark Schemes and Principal Examiner's Reports.

Mark Scheme **Question Paper** Principal Examiner's Report Introduction Introduction Introduction **First variant Question Paper** First variant Mark Scheme First variant Principal Examiner's Report Second variant Question Paper Second variant Mark Scheme Second variant Principal Examiner's Report

Who can I contact for further information on these changes?

Please direct any questions about this to CIE's Customer Services team at: international@cie.org.uk

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

WWW. PapaCambridge.com MARK SCHEME for the October/November 2008 question paper

0620 CHEMISTRY

0620/31

Paper 31 (Extended 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.

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_	Page 2	Mark Scheme	Syllabus
		IGCSE – October/November 2008	0620
	red litmus OR white f	paper blue umes/smoke with HC <i>l</i> (g) or (aq)	ambridge
	chlorine		
	"pop" with NOT glowi	a lighted splint or burn with a pop or goes pop and ext ng splint	inguishes flame [1
	oxygen		[1
	carbon dio ACCEPT c	xide correct formulae	[1
			[Total: 5
	(a) 3Na : correc 8e aro	1N_correct ratio t charges und N	[1 [1 [1
	if no sy if cova ignore if the r do not	ymbols then must have correct key lent only mark 1 electrons around sodium esponse includes both a correct and an incorrect answ select correct one, mark = [0]	ver
	(b) (i) <u>po</u>	<u>ositive</u> ions or cations	[1
	la: de	yers or lattice or regular pattern elocalised or free or mobile electrons or sea	[1 [1
	0	R <u>positive i</u> ons or cations	[1
	N at de th de A if	OT atoms or cores or nuclei traction between ions and electrons elocalised or free or mobile electrons or sea e attraction/electrostatic bonding must be between ion elocalised electrons, between cations and anions does CCEPT bond if qualified - electrostatic bond, etc. molecular or molecules then cannot score cation mark	[1 [1 not score
	(ii) de oi	elocalised/free/mobile electrons electrons can move	[1
	la	yers or ions or atoms or particles	[1
			L

Pa	Page 3 (c) (i) tetra 1Si 1O		Mark Scheme	Syllabue	".D. or
ra			IGCSE – October/November 2008	0620	20
(c)			ihedral : 40 bonded/surrounded, etc. : 2 Si	-	Cambrid
		NOT NOT ONL	 molecules of oxygen, etc. intermolecular forces ▲Y tetrahedral can score for either of the above 		
		Des abov	pite what the question states, ACCEPT a clear active three points.	curate diagram wł	nich shows the
	(ii)	hard high colo non/ brittl inso any	mp or bp urless (NOT clear) or shiny or translucent /poor conductor (of electricity) e luble TWO		[2]
		NOT	Γ crystalline or strong		[2]
					[Total: 14]
(a)	(i)	wate air o	er or moisture ACCEPT salty water or oxygen		[1] [1]
	(ii)	galv tin p chro nick coba copp cove anoo cath cove alloy any NOT ACO	anising or coat with zinc late mium plate el plate alt plate per plate er with aluminium dic protection or sacrificial protection odic protection er with plastic /ing (ignore any named metal) TWO [just plate or electroplate need electroplate with s [oil CEPT both galvanising and sacrificial protection	uitable metal	[2]
(b)	(i)	hydr or m	rogen or carbon or carbon monoxide or methane nore reactive metal NOT Group I		[1]
	(ii)	any only	correct equation error not balanced [1]		[2]

Pa	ige 4			Mark Scheme		Syllabus	er er
			IGCSE –	October/Novembe	er 2008	0620	Day
(c)	(i)	196					amb.
	(ii)	112/ = 57 marł ONL othe	196 × 100 (.1)% ACCEPT (e.c.f. to (c)(i) pro (Y ACCEPT 112/a (rwise [0]	57 to nearest who ovided percentage answer (c)(i) × 100	le number not greater thai	n 100%	102
(d)	(i)	form	s carbon dioxide/	carbon monoxide (which escapes))	[1]
	(ii)	form	s silicon(IV) oxide CaO reacts with S	e or silicon oxide o SiO ₂	r silica		[1]
		to fo igno NOT	rm slag or calciur re an incorrect for Si + O_2 + CaO fo	n silicate mula if a correct na orm slag, this gains	ame "slag" giver mark for slag o	n only	[1]
							[Total: 13]
(a)	(i)	C ₆ H _t NOT	5COOH or C ₆ H ₅ C C ₇ H ₆ O ₂ /C ₆ H ₆ CC	O2H)O			[1]
	(ii)	sodi corre ACC	um hydroxide + b ect spelling neede EPT correct sym	enzoic acid = sodiu ed NOT benzenoa bol equation	ım benzoate + v te	water	[1]
	(iii)	sodi any NOT	um carbonate or T WO Na	oxide or hydrogend	carbonate		[2]
(b)	(i)	7.7%					[1]
	(ii)	for a for e	ny number: equa xample 1:1 or 6:6	l number ratio			[2]
	(iii)	emp mole no e	irical formula is C cular formula is (.c.f., award of ma	H C ₆ H ₆ rks not dependent	on (ii)		[1] [1]
(c)	(i)	C ₆ H ₈	3 0 6				[1]
	(ii)	carb alcol NOT hydr	on – carbon doub nol or hydroxyl oı ' hydroxide oxide and alcoho	ole bond or alkene • hydroxy I = 0			[1] [1]
							[Total: 12]

Page 5		Mark Scheme	Syllabus Syllabus
		IGCSE – October/November 2008	0620 73
(a)	(i)	$2H^+ + 2e \rightarrow H_2$	ant
	(ii)	$2Cl^{-} - 2e \rightarrow Cl_2$ or $2Cl^{-} \rightarrow Cl_2 + 2e$	37
	(iii)	Na ⁺ and OH ⁻ are left OR C l^- removed OH ⁻ left NB ions by name or formula essential NOT any reaction of Na or Na ⁺ NOT Na ⁺ and OH ⁻ combine	[1
(b)	(i)	sterilise/disinfect water or kill microbes/germs bacteria, ef NOT just to make it safe to drink or purify it or clean it treat above as neutral they do not negate a correct respon	tc. [1 nse
	(ii)	ammonia or methanol or hydrogen chloride or margarine NOT nylon	. [1
	(iii)	fat or lipid or triester or named fat or glyceryl stearate	[1
		heat	[1
			[Total: 7

6 (a) (i)

(b)

(י)	r					
	aqueous	tin	manganese	silver	zinc	1
	solution	Sn	Mn	Ag	Zn	1
	tin(II) nitrate		R	NR	R	1
	manganese(II) nitrate	NR		NR	NR	1
	silver(I) nitrate	R	R		R	l
	zinc nitrate	NR	R	NR		l
	[1] for each row ignore anything written in	n blank spac	e			[3]
(ii)	Sn + $2Ag^+ \rightarrow Sn^{2+} + 2Ag$ all species correct [1] accept equation with Sn ⁴	+				[2]
(iii)	Mn to Mn ²⁺ need both sp electron loss or oxidation	ecies n number ine	creases			[1] [1]
(iv)	covered with oxide layer makes it unreactive or pr	rotects or al	uminium oxide ι	unreactive		[1] [1]
(i)	potassium has one valer or loses one electron calcium has two valency	icy electron electrons				[1]
	or loses two electrons					[1]
(ii)	potassium hydroxide → r calcium hydroxide → cal ACCEPT metal oxide	no reaction cium oxide a	and water			[1] [1]

Page 6	Mark Scheme	Syllabus Syllabus
	IGCSE – October/November 2008	0620
(iii) 2KNO3 [1] for 2 2Ca(N	$r \rightarrow 2KNO_2 + O_2$ formula of either product $O_3)_2 \rightarrow 2CaO + 4NO_2 + O_2$ formulae of any TWO products	Cambrid
[1] 101		[Total: 17]
(a) (i) 35 cm ³ 40 cm ³		[1] [1]
(ii) forms	carbon monoxide	[1]
poison or effe NOT ju	ous or toxic or lethal or prevents blood carrying ct on haemoglobin ist harmful	g oxygen [1
(b) (i) chlorol numbe	outane or butyl chloride r not required but if given must be 1, it must be	in correct position
(ii) light oi	· UV or 200°C or lead tetraethyl	[1]
(iii) any co or dich	rrect equation for example 2-chlorobutane lorobutane	[1]
(c) (i) correct COND -(CH(C	repeat unit continuation H_3)-CH ₂)-	[1] [1]
(ii) butan- if numl correct	1-ol or butan-2-ol or butanol per given then formula must correspond for seco position	[1] ond mark and number must be in
structu CH₃-C NOT C if first r ACCE	ral formula of above H ₂ -CH ₂ -CH ₂ OH or CH ₃ -CH(OH)-CH ₂ -CH ₃ 4H ₉ OH nark not awarded then either formula will gain n PT either formula for "butanol"	[1] nark [1]
(iii) CH₃-C NOT C respon if equa	H(C <i>l</i>)-CH ₃ or CH ₃ -CH ₂ -CH ₂ -C <i>l</i> ₃ H ₇ C <i>l</i> se must not include HC <i>l</i> tion given look at RHS only	[1]
		[Total: 12]

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

WWW. PapaCambridge.com MARK SCHEME for the October/November 2008 question paper

0620 CHEMISTRY

0620/32

Paper 32 (Extended Theory), maximum raw mark 80

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	Page	2		Mark Schem	ne	Syllabus	· A er
			IGCSE	– October/Nov	ember 2008	0620	No.
a () () () () () () () () () () () () ()	ammo chlorir 'pop" v NOT g relight turns l ACCE	nia with a li glowing s a glov imewat PT corr	ghted splint o r splint wing splint er milky/cloudy rect formulae	r burn with a pop y/chalky/white	or goes pop and ex	xtinguishes flame	Cambrids [1]
							[Total: 5]
2 ((a) 21 cc 86	Na : 1S prrect cl e aroun	correct ratio harges d S				[1] [1] [1]
	if ig if do	covaler nore ele the responder se	nt only mark 1 ectrons around ponse includes elect correct or	d sodium s both a correct a ne, mark = [0]	and an incorrect ans	swer	
	(b) (i)	posit	<u>ive</u> ions or cat atoms or core	tions es or nuclei			[1]
		layer	s or lattice or	regular pattern			[1]
		delo	calised or free	or mobile electro	ons or sea		[1]
		OR p	<u>oositive i</u> ons o	r cations			[1]
		NOT	atoms or core	es or nuclei	20		[1]
		delo	CIION DEIWEEN	ions and electron			
		the a deloc ACC if mo	ction between calised or free attraction/electro calised electro E PT bond if q bles or molecu	ons and electro or mobile electro rostatic bonding i ns, between catio ualified e.g. elect lar cannot score	ons or sea must be between io ons and anions doe trostatic bond, etc. cation mark	ns and s not score	[1]
	(ii	the a deloc ACC if mo	calised or free attraction/electro calised electro EPT bond if q bles or molecu	ons and electro or mobile electro rostatic bonding i ons, between cational ualified e.g. elect lar cannot score obile electrons	ons or sea must be between io ons and anions doe trostatic bond, etc. cation mark	ns and s not score	[1]
	(ii	the a deloc ACC if mo i) deloc or el	ction between calised or free attraction/electro calised electro celes or molecu calised/free/mo ectrons can m	ons and electro or mobile electro rostatic bonding i ons, between cation ualified e.g. elect lar cannot score obile electrons	ons or sea must be between io ons and anions doe trostatic bond, etc. cation mark	ns and s not score	[1]
	(ii	the a deloc ACC if mo i) deloc or el layer	ction between calised or free attraction/electro calised electro celes or molecu calised/free/mo ectrons can m	ons and electro or mobile electro rostatic bonding i ons, between cation ualified e.g. elect lar cannot score obile electrons iove	ons or sea must be between io ons and anions doe trostatic bond, etc. cation mark	ns and s not score	[1] [1] [1]

And Cannor der Second variant Mark Scheme Page 3 Mark Scheme Syllabus IGCSE – October/November 2008 0620 (c) (i) tetrahedral 1Si: 40 bonded/surrounded, etc. 10 : 2 Si **NOT** molecules of oxygen, etc. **NOT** intermolecular forces **ONLY** tetrahedral can score for either of the above Despite what the question states, **ACCEPT** a clear accurate diagram which shows the above three points. (ii) hard high melting point or boiling point colourless (NOT clear) or shiny or translucent non/poor conductor (of electricity) brittle insoluble any TWO [2] NOT crystalline or strong [Total: 14] 3 (a) (i) water or moisture ACCEPT salty water [1] [1] air or oxygen (ii) galvanising or coat with zinc tin plate chromium plate nickel plate cobalt plate copper plate cover with aluminium anodic protection or sacrificial protection cathodic protection cover with plastic alloying (ignore any named metal) any TWO [2] NOT just plate or electroplate need electroplate with suitable metal NOT oil **ACCEPT** both galvanising and sacrificial protection (b) (i) hydrogen or carbon or carbon monoxide or methane or more reactive metal NOT Group I [1] (ii) any correct equation [2] only error not balanced [1]

Pa	ge 4	Mark Scheme	Syllabus Syllabus
		IGCSE – October/November 2008	0620 23
(c)	(i)	196	Phys
	(ii)	36/196 × 100	110
	()	= 18(.4)% ACCEPT 18 to nearest whole number	
		mark e.c.f. to (c)(i) provided percentage not greate ONLY ACCEPT 36/answer (c)(i) × 100 otherwise [0]	er than 100%
(d)	(i)	forms carbon dioxide/carbon monoxide (which esc	apes) [1]
	(ii)	forms silicon(IV) oxide or silicon oxide or silica	[1]
		to form slag or calcium silicate	[1]
		ignore an incorrect formula if a correct name given NOT Si + O_2 + CaO form slag	1
			[Total: 13]
(a)	(i)	C_6H_5COOH or $C_6H_5CO_2H$ NOT $C_7H_6O_2$ / C_6H_6COO	[1]
	(ii)	sodium hydroxide + benzoic acid = sodium benzoa correct spelling needed NOT benzenoate ACCEPT correct symbol equation	ate + water [1]
	(iii)	sodium carbonate or oxide or hydrogencarbonate any TWO NOT Na	[2]
(b)	(i)	7.7%	[1]
	(ii)	for any number: equal number ratio for example 1:1 or 6:6	[2]
	(iii)	empirical formula is CH	[1]
	. ,	molecular formula is C_6H_6	[1]
		no e.c.i., award of marks not dependent on (ii)	
(c)	(i)	C ₆ H ₈ O ₆	[1]
	(ii)	carbon – carbon double bond or alkene	[1]
		alcohol or hydroxyl or hydroxy NOT hydroxide hydroxide and alcohol = 0	[1]
			[Total: 12]

Seco	nd va	arian	t Mark Scheme			WWW	xtrapapers.com
	Page 5			Mark Scheme	Sy	llabus 7	S. er
			IGCSE	– October/November 2008	0	620	No.
5	(a)	(i)	$2H^+ + 2e \rightarrow H_2$				Cambri
		(ii)	$2Cl^ 2e \rightarrow Cl_2$ or	$2Cl^{-} \rightarrow Cl_2 + 2e$			'93e
		(iii)	Na ⁺ and OH ⁻ are lef OR C l^- removed OF	it H⁻ left			[1] COM
			NB ions by name o	r formula essential			
			NOT any reaction of NOT Na ⁺ and OH [−] c	combine			
	(b)	(i)	sterilise/disinfect wa NOT just to make it treat above as neutr	ater or kill microbes/germs bac safe to drink or purify it or cle ral they do not negate a correc	teria, etc. an it t response		[1]
		(ii)	ammonia or methan NOT nylon	nol or hydrogen chloride or ma	Irgarine		[1]
		(iii)	ester or triester or li hydrolysis or saponi	ipid ification			[1] [1]
			,,				L [.] J
							[Total: 7]

6 (a) (i)

(i)							
	aqueous	tin	manganese	silver	zinc	1	
	solution	Sn	Mn	Ag	Zn	1	
	tin(II) nitrate		R	NR	R	1	
	manganese(II) nitrate	NR		NR	NR	l	
	silver(I) nitrate	R	R		R	1	
	zinc nitrate	NR	R	NR		l	
	[1] for each row					[3]	
	ignore anything written in	n blank spac	e				
(ii)	i) $Zn + 2AgNO_3 \rightarrow Zn(NO_3)_2 + 2Ag$ [2] all species correct [1] accept correct ionic equation $Zn + 2Ag^+ \rightarrow Zn^{2+} + 2Ag$ [2]						
(iii)	 ii) Sn²⁺ must be made clear that the oxidant is Sn²⁺ not Sn [1] it gains electrons or oxidation number decreases or it is reduced [1] reason must relate to an oxidant NB not dependent on identifying Sn²⁺ 						
(iv)	 iv) covered with oxide layer makes it unreactive or protects or aluminium oxide unreactive 						

ecor	nd variant Mark Scheme				www.xtrapapers.c			
	Ра	ige 6	6	Mark Scheme IGCSE – October/November 2008	Syllabus er 0620			
	(b)	(i) (ii)	pota or lo calci or lo pota calci	ssium has one valency electron oses one electron oum has two valency electrons oses two electrons ssium hydroxide → no reaction oum hydroxide → calcium oxide and water	Cambridge.com [1]			
		(iii)	2KN [1] fc	$O_3 \rightarrow 2KNO_2 + O_2$ or formula of either product	[2]			
			2Ca([1] fo	$(NO_3)_2 \rightarrow 2CaO + 4NO_2 + O_2$ or formulae of any TWO products	[2]			
					[Total: 17]			
7	(a)	(i)	20 cr 80 cr	m ³ m ³	[1] [1]			
		(ii)	form poise or ef NOT	s carbon monoxide onous or toxic or lethal or prevents blood carrying oxyg ffect on haemoglobin i just harmful, etc.	[1] jen [1]			
	(b)	(i)	chloi num	robutane or butyl chloride ber not required but if given must be 1, it must be in cor	[1] rect position			
		(ii)	light	or UV or 200 °C or lead tetraethyl	[1]			
		(iii)	any or di must	correct equation for example 2-chlorobutane ichlorobutane t include HC <i>1</i>	[1]			
	(c)	(i)	corre CON –(CH	ect repeat unit ID continuation H(CH ₃)–CH ₂)–	[1] [1]			
		(ii)	prop if nu	an-1-ol or propan-2-ol or propanol mber given then formula must correspond for second m	[1]			
			num struc CH ₃ - NOT if firs acce NB (Der must be in correct position ctural formula of above –CH ₂ –CH ₂ –OH or CH ₃ –CH(OH)–CH ₃ ⁻ C ₃ H ₇ OH st mark not awarded then either formula will gain mark [ept either formula for "propanol" in (i) On scoris both marks entered together not as [1] an	[1] 1]. d [1] separately			
		(iii)	CH ₃ - NOT if equ	-CH ₂ -CH ₂ -CH ₂ -C <i>l</i> or CH ₃ -CH ₂ -CH(C <i>l</i>)-CH ₃ C ₄ H ₉ C <i>l</i> uation given look at RHS only onse must not include HC <i>l</i>	[1]			
					[Total: 12]			