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CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

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 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.



	Page 2			Syllabus				
			IGCSE – October/November 201	2 0620	21			
1	(a)	(i)	C / C ₂ H ₄ / ethene;		[1]			
	(iii) (iv) (v)		A / CO ₂ / carbon dioxide; [1					
			E / ethanol / correct formula for ethanol;		[1]			
			D / CH ₄ / methane;					
			A / CO ₂ / carbon dioxide; allow: E		[1]			
			E / ethanol / correct formula for ethanol; allow: A		[1]			
	(b)	C ₂ H	14;		[1]			
	(c) compound: substance containing two or more different atoms joined / bonded together / substance containing 2 or more elements that can only be separate means; allow: different atoms joined / different elements joined / 2 elements react to molecule / molecule with 2 or more elements / substances chemically combining ignore: two or more molecules combined / different elements react / substance molecules reject: if reference to a mixture				rated by chemical [1] t to form a nbined			
		ine	t: unreactive / doesn't react;		[1]			
	catalyst: substance which speeds up a reaction / it speeds up a reaction; allow: changes rate of reaction / changes speed of reaction				[1]			
					[Total: 10]			
2	allo		octure completely correct;; ow: 1 mark for 1 pair of electrons bonded betwe ore: inner shell electrons	en H and C <i>l</i> ;	[2]			
	(b)	(i)	A: burette; B: flask / erlenmeyer;		[1] [1]			
		(ii)	pH starts above 7 / stated value above 7; allow: high pH		[1]			
			decreases (on addition of acid);		[1]			
			(pH) ends at below 7 / stated value below 7; allow: low pH note: pH decreases to pH 7 = 2 marks note: pH goes from alkali to acid = 1 mark		[1]			

Page 3		Mark Scheme	Syllabus	Paper
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` ,		ammonium chloride; reject: ammonia chloride		[1]
		NH ₃ ;		[1]
b p (l) p p (i)	(c) any 4 of: blue solution at start / precipitate formed / (light) blue (precipitate) / precipitate redissolves (in excess ammonia) / solution formed (in excess ammoni precipitate disappears (solution is) deep blue / dark blue allow: goes deep blue / dark blue / goes darker blue			
				[Total: 13]
3 (a) ((i)	magnesium \rightarrow zinc \rightarrow iron \rightarrow lead / Mg > Zn > Fe > if: one pair reversed / complete order reversed = 1 r		[2]
(i	ii)	no / it will not react and zinc is more reactive / iron is ignore : zinc is reactive / iron is unreactive	s less reactive;	[1]
` ,		ox ticked; box ticked;		[1] [1]
(c) ((i)	arrangement: regular / fixed pattern / any indication allow: close together / packed together ignore: stick together / all together	of regularity e.g. in la	yers; [1]
		motion: cannot move / fixed in position/ (only) vibrate ignore: only move a little / move	e;	[1]
(i	ii)	any three of: dissolve sodium chloride / add water / filtration / use a filter paper / sand remains on filter paper / ignore: residue on filter paper salt solution goes through (filter paper) / salt solution the collecting tube allow: decanting for 1 mark (in place of filtration) ignore: water goes through ignore: distillation	ı is the filtrate / salt w	[3] ater goes into
(d) c	disti	llation; lower; volatile; condenser; vapour; (1 mark ea	ach)	[5]
				[Total: 15]

			1000E - October/100veriliber 2012 0020 21				
4	(a)	atoms with same number of protons but different number of neutrons; allow: atomic number for number of protons allow: different mass number / nucleon number for different number of neutrons allow: same (type of) atom with different mass numbers ignore: atoms with different numbers of neutrons ignore: element(s) with different numbers of neutrons ignore: atoms with different relative atomic mass					
	(b)		any 5 of: nucleus (need not be labelled) in middle of atom and electrons round outside (electrons can be shown as dots, crosses or e) / protons in nucleus – labelled or shown by + or p / 3 (protons) / neutrons in nucleus – labelled or shown by n / 4 (neutrons) / 3 electrons – labelled or shown by dots, crosses or e / 2 electrons in first shell and 1 in second				
	(c)	allo	+ $O_2 \rightarrow 2Li_2O$;;; ow: two marks for $2Li + O \rightarrow Li_2O / 4Li + 2O \rightarrow 2Li_2O$ ow: 1 mark for O_2 if no other marks scored	[3]			
	(d)	(i)	electrolyte correctly labelled; anode rod correctly labelled; ignore: label on circuit / label on + sign	[1] [1]			
		(ii)	dissolved in <u>water</u> / solution in <u>water</u> ; allow: answers implying substance is mixed with water ignore: hydrated / hydrous	[1]			
	ı	(iii)	ions can move; allow: ions are free reject: electrons can move	[1]			
			[Tota	l: 13]			
5	(a)	me fue	drogen \rightarrow a fuel with RMM of 2; thane \rightarrow the main constituent of natural gas; I oil \rightarrow fuel for ships; osene \rightarrow fuel for aircraft;	[1] [1] [1] [1]			
	(b)	(i)	amount or mass or volume of water / distance of flame from can / height of flame / s can; ignore: the water (unqualified) / same amount of fuel / time	ame [1]			
		(ii)	to make sure that the water has the same temperature (throughout) / it is at the same temperature / so it is heated evenly / so there are no hot spots / so there are no cold spots; allow: so that all the particles are heated ignore: so that particles mix				

Mark Scheme
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	Page 5		Mark Scheme	Syllabus	Paper	
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	 (iii) petroleum spirit; highest temperature rise / highest increase in temperature; allow: calculation of all the temperature differences form the table ignore: because it releases most heat / because it has the highest temperature if fuel incorrect = 0 for the question 					
	` '		gen / N ₂ / N; en / O ₂ / O;		[1] [1]	
	(d) (i)	allo	os / (to provide an) inert atmosphere / in welding / la w: for lighting ore: for neon lights	sers etc	[1]	
	(ii)	3 / tł	nird / III;		[1]	
	(iii)		/ unreactive; ore: it is stable		[1]	
					[Total: 13]	
6	diff rar mo bot par par Ag (to	rstals of fusion of the cule o	dissolve or go into solution /		[4]	
	` '		$_2 ightarrow 2$ KC l + I_2 ; mark for 2KI + 2C $l ightarrow 2$ KC l + I_2 ;		[2]	
					[Total: 6]	
7	(a) 24	;			[1]	
	(b) 256	6;			[1]	

		- J		
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sulfur rea (sulfur bu ignore: s sulfur did nitrogen to form s sulfur did allow: su allow: su	troleum / crude oil / named fraction from crude oil acts with oxygen / air urns) to form sulfur dioxide sulfur oxide oxide reacts (with gases) in the atmosphere / sulfur	dioxide reacts wit		[4]
(d) nitrogen	/ N ₂ / N; phosphorus / P;			[2]

Syllabus

Mark Scheme

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(e) add (acidified) barium chloride / barium nitrate;white precipitate;note: second mark dependent on correct reagent

[Total: 10]

[1] [1]

Paper