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.



	Pa	ge 2		Syllabus	Paper			
			IGCSE – October/November 2	012 0620	21			
1	(a)	(i)	$C / C_2 H_4 / ethene;$		[1]			
		(ii)	A / CO ₂ / carbon dioxide;		[1]			
		(iii)	E / ethanol / correct formula for ethanol;		[1]			
		(iv)	D / CH ₄ / methane;		[1]			
		(v)	A / CO ₂ / carbon dioxide; allow: E		[1]			
		(vi)	E / ethanol / correct formula for ethanol; allow: A		[1]			
	(b)	C₂⊦	l ₄ ;		[1]			
	 (c) compound: substance containing two or more different atoms joined / bonded together / substance containing 2 or more elements that can only be separated by cher means; allow: different atoms joined / different elements joined / 2 elements react to form a molecule / molecule with 2 or more elements / substances chemically combined ignore: two or more molecules combined / different elements react / substances made molecules reject: if reference to a mixture 							
		-	t: unreactive / doesn't react;		[1]			
			alyst: substance which speeds up a reaction / w: changes rate of reaction / changes speed	• •	[1]			
					[Total: 10]			
2	(a)	allo	icture completely correct;; w: 1 mark for 1 pair of electrons bonded betw ore: inner shell electrons	veen 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						Scheme			Syllabus		Paper
					GCSE –	Octobe	er/Nove	mber 20 ⁻	2	0620		21
		(iii)		nonium c ct: amm		oride						[1]
			NH ₃ ;	;								[1]
	(c)	blue pre (ligi pre pre	cipitat ht) blu cipitat cipitat	ition at s te forme ue (preci te rediss te disapj	d / pitate) / olves (in pears			ia) / solu	tion forme	ed (in excess a	mmonia)	[4]
				is) deep ses deep				darker bl	ue			
			-				-					[Total: 13]
3	(a)	(i)						•	> Fe > Pb d = 1 mar			[2]
		(ii)		it will no ore: zinc					iron is le	ss reactive;		[1]
	(b)		box tio t box t	cked; ticked;								[1] [1]
	(c)	(i)	allov	ngement w: close ore: stick	togethe	r / packe	d togeth	•	ation of r	egularity e.g. ii	n layers;	[1]
				on: canr ore: only			•	on/ (only)	vibrate;			[1]
		(ii)	disso filtra	three of: olve sod tion / use d remain	e a filter	paper /		/				[3]
			salt s the c allow igno	collecting	goes thr g tube nting for er goes t	ough (fil 1 mark (ter pape	r) / salt s of filtratio		the filtrate / sa	lt water g	joes into
	(d)	dist	tillatio	n; lower	volatile	; conden	iser; vap	oour; (1 m	ark each)		[5]

[Total: 15]

	Page 4			Mark Scheme	Syllabus	Paper
4	(a)	allov allov allov igno igno	w: at w: di w: sa ore: a ore: e	IGCSE – October/November 2012 th same number of protons but different number of r omic number for number of protons fferent mass number / nucleon number for different ame (type of) atom with different mass numbers atoms with different numbers of neutrons element(s) with different numbers of neutrons atoms with different relative atomic mass		21 [1] IS
	(b)	be s proto 3 (pr neut 4 (ne 3 ele	eus (howr ons in roton rons eutro ectror	in nucleus – labelled or shown by n /	ns round outside ([5] electrons can
	(c)	allo	w: tw	→ $2Li_2O$;;; ro marks for $2Li + O \rightarrow Li_2O / 4Li + 2O \rightarrow 2Li_2O$ mark for O_2 if no other marks scored		[3]
	(d)	.,	anoc	rolyte correctly labelled; le rod correctly labelled; re: label on circuit / label on + sign		[1] [1]
			allov	blved in <u>water</u> / solution in <u>water;</u> v: answers implying substance is mixed with water re: hydrated / hydrous		[1]
	(allov	can move; v: ions are free c t: electrons can move		[1]
						[Total: 13]
5		meth fuel	nane oil <i>→</i>	n → a fuel with RMM of 2; → the main constituent of natural gas; h fuel for ships; h → fuel for aircraft;		[1] [1] [1] [1]
	(b)		can;	unt or mass or volume of water / distance of flame fr re: the water (unqualified) / same amount of fuel / ti	-	f flame / same [1]
			temp spote allov	ake sure that the water has the same temperature (f perature / so it is heated evenly / so there are no hot s; v: so that all the particles are heated re: so that particles mix		

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	Page	e 5	Mark Scheme	Syllabus	Paper
			IGCSE – October/November 2012	0620	21
	(ii	high allov igno	bleum spirit; est temperature rise / highest increase in temperatu w: calculation of all the temperature differences form ore: because it releases most heat / because it has t el incorrect = 0 for the question	n the table	[1] [1] rature
			gen / N₂/ N; en / O₂ / O;		[1] [1]
	(d) (allo	os / (to provide an) inert atmosphere / in welding / la w: for lighting vre: for neon lights	sers etc	[1]
	(i	i) 3 / tł	nird / III;		[1]
	(ii		/ unreactive; re: it is stable		[1]
					[Total: 13]
6	c d ra b p p (1	liffusion andom i nolecule poth ions particles particles Ag ions a to make	dissolve or go into solution / / movement of ions or named particles (can be atoms ss) / particles move everywhere / particles spread ou and water in constant movement / collide / react / ions react / atoms react and iodide ions (react) /) precipitate of silver iodide / particles move (unqualified)		[4] es or
	• •		$I_2 \rightarrow 2\text{KC}l + I_2;$ mark for 2KI + 2C $l \rightarrow 2\text{KC}l + I_2;$		[2]
					[Total: 6]
7	(a) 2	24;			[1]
	(b) 2	256;			[1]

Page 6		Mark Scheme	Syllabus	Paper
		IGCSE – October/November 2012	0620	21
(c)	sulfur rea (sulfur bu ignore: sulfur did nitrogen to form s sulfur did allow: su allow: su	troleum / crude oil / named fraction from crude acts with oxygen / air urns) to form sulfur dioxide sulfur oxide oxide reacts (with gases) in the atmosphere / s		h oxygen /
(d)	nitrogen	/ N ₂ / N; phosphorus / P;		
(e)	white pre	lified) barium chloride / barium nitrate; ecipitate; cond mark dependent on correct reagent		
				[Total: 1