UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2007 question paper

0620 CHEMISTRY

0620/02

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

• CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2007 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2007	0620	2

1 (a) ALLOW: correct names / correct formulae

	(i)	В	[1]
	(ii)	E	[1]
	(iii)	D	[1]
	(iv)	E	[1]
	(v)	С	[1]
	(vi)	B + C	[1]
	(vii)	A + F	[1]
(b)	(i)	car exhausts / from vehicles ALLOW: from metal smelting NOT: from factories / from natural causes e.g. volcanoes NOT: from fuels if unqualified	[1]
	(ii)	damage to brain / nervous system (in children) ALLOW: mental damage / poisonous / toxic / lung irritant NOT: harmful / lung cancers / poisonous to lungs / makes you ill / respiratory diseases / lung problems etc.	[1]
(c)	ALL RE	ns sulphur dioxide / acid rain OW: sulphur burns to form acid rain IECT: carbon monoxide / dioxide causes acid rain = 0 IECT: sulphur causes acid rain = 0	[1]
	e.g. dan dan NO	ct of acid rain chemical erosion / chemical weathering / corrodes metals / nages trees [or plants] / kills trees [or plants] / damages limestone buildings / nages or kills plants [or animals] in lakes T: harmful / makes soils acidic / corrodes limestone [or buildings] / pollutant IECT: global warming / affects ozone layer	[1]
			FT 4 1 441

[Total: 11]

		IGCSE – May/June 2007	0620	2
(a)	nitroger oxygen			[2]
(b)	(i) car	bon dioxide / CO ₂		[1]
	(ii) wa	ter / H ₂ O		[1]
	(iii) O ₂ cor	on left; rect balance		[2]
(c)	(i) (Pe	eriod) 3		[1]
		ole gases / inert gases LOW: group 0 / 8		[1]
	(iii) cor	rect electronic structure of argon 2.8.8		[1]
	ALI NO	rt / doesn't react / prevents (tungsten) filament from b LOW: implication that argon produces light after exci current (discharge tubes) PT: argon produces light when it reacts PT: argon lights up		[1]
	(v) 22			[1]
(d)	169 IGNOR	E: units		[1]
(e)	(i) Xel	F ₄ O (atoms in any order)		[1]
	(ii) cov			[1]
	NO	T: double and single bonding		[Total: 14]

Mark Scheme

Page 3

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Paper

Syllabus

	r ugo +			IGCSE – May/June	2007	0620	2
						0020	
3	(a)	(i) 2 on both sides (NOTE: only one mark)					
		(ii)	TON TON	es from water / water won't run of: arguments about pollution easily made / renewed ECT: found in air and water	out / water renewat	ole resource	[1]
		(iii)	exot	hermic			[1]
	(b)		bon d ter / H	lioxide / CO_2 ; I_2O			[2]
	(c)	cor (if f	rect u	or each correct fraction; use <u>linked</u> to each specific fraction in incorrect mark cannot be giver us:			[2] [2]
		Fra	ction	1	Use		
			finery T: me	gas ethane / natural gas	fuel (alone or qu ALLOW: for hea	•	
		Na	phtha		feedstock for ch making specific	emicals / chemicals e.g. etha	ne
		Par	raffin ,	/ kerosene	oil stoves / heat feedstock for ch ALLOW: for coo NOT: fuel alone	king	
		Die	sel		fuel in cars / fue central heating NOT: fuel alone		,
		Fue	el oil		fuel for ships an NOT: fuel alone	d power stations	
		Luk	oricati	ng fraction	lubricants / wax	es / polishes	
		Bitu	umen	/ residue	roads / sealing ı	roofs	
	(d)	(i)	mak (idea ALL	iking down of (larger) hydrocarbo ing alkenes from larger alkanes a of large hydrocarbons to smalle OW: breaking down petroleum fr c: decomposing unless qualified	er ones)		[1]

Mark Scheme

Page 4

Syllabus

Paper

Pa	Page 5		Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2007	0620	2
	(ii)	ALL(temperature OW: heat ECT: heat and burn		[1]
		ALLO IGNO NOT	lyst OR high pressure OW: aluminium oxide / silicates; ORE: incorrect name of catalyst 「: high pressure alyst + high pressure = 1 mark maximum)		[1]
	(iii)		ect structure of ethene toms and bonds must be shown		[1] [Total: 13]
4 (a)	(i)		stance which speeds up (rate of) reaction F: slows rate of reaction		[1]
	(ii)		sition elements / transition metals : specific metals / named metals		[1]
(b)	(i)	ALL(s correctly labelled with time on horizontal axis and OW: V for volume and t for time ect plotting of points (-1 per error / omission) alise 110 cm ³ points only once	use of full grid	[1] [2]
			oth line going through all points		[1]
	(ii)	endii NOT	steeper at start; ng up at same level Γ: ending up after 50 mins Γ: joining previous line before 50 minutes		[1] [1]
	(iii)	ALL	inc used up / hydrochloric acid is in excess OW: zinc and hydrochloric acid have completely re r: reaction finished / completed / HC <i>l</i> completely re		[1]
(c)	(i)	(com	eed would be) fast <u>er</u> / rate increases		[1]
	(ii)	(spe	T: takes less time / reacts more red would be) slower / rate decreases reparative needed) T: takes more time / reacts less		[1]
(d)	(i)	zinc	chloride		[1]
	(ii)	_	ed splint / light the gas; s / explodes etc.		[1] [1]
					[Total: 14]

Page 6		Mark Scheme	Syllabus	Paper
		IGCSE – May/June 2007	0620	2
(a)	electron			[1]
(b)	NOT: hig	of: selectricity / conducts heat / shiny / malleable / duct th density / high melting point / high boiling point / h solid if qualified by mercury as exception		[2]
(c)	4 th box d	own ticked		[1]
(d)	(light) blu	sodium hydroxide; ue ppt; in excess		[1] [1] [1]
	(light) blu	ammonia; ue ppt; n excess / forming (dark) blue solution		
(e)		wiring / water pipes / cooking utensils / coinage / a wires / for pipes	ny other sensible <u>s</u> i	pecific use [1]
				[Total: 8]

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Page 7		,	Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2007	0620	2
(a)		assiuı m <u>ine</u>	m chlor <u>ide;</u>		[1] [1]
(b)			wer in group / less reactive than chlorine / iodine les bond between potassium and chlorine is <u>too</u> strong		
(c)	(i)	ÄLL	/ black; OW: purple black : brown / brown-black / purple		[1] [1]
	(ii)		OW range of -200 to -90 (actual = -188); OW range of 1.6 to 4.0 (actual = 3.12)		[1] [1]
(d)	(i)	9			[1]
	(ii)	7			[1]
(e)	kills de- ALL	bact tinnin OW:	able use e.g. in swimming pools/ water purification / eria / bleaching agent (for paper) / extraction of titar g scrap tinplate etc. making named chemicals e.g. making hydrochloric making halogenoalkanes / making CFCs / making wage treatment / cleaning	nium / acid /	[1]

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[Total: 10]

Pa	ge 8		Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2007	0620	2
(a)	it is	below	v the electrolyte		[1]
(b)	grap	hite			[1]
(c)	Α				[1]
(d)		: bed	m is too reactive / a very reactive metal / above cause carbon won't remove the oxygen from the n't reduce the oxide / won't react		y series [1]
(e)	(i)	the a	aluminium oxide / the electrolyte		[1]
	(ii)	CO ₂			[1]
			on is released as carbon dioxide / carbon dioxide: it's getting oxidised / reaction between carbon	_	[1]
(f)	530	(kg)			[1]
(g)	molt ions				[2]

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[Total: 10]