## UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

## MARK SCHEME for the May/June 2006 question paper

## **0620 CHEMISTRY**

0620/02

Paper 2, maximum raw mark 80

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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

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Page 1	Mark Scheme	Syllabus	Paper
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1	(a)		estance containing only 1 type of atom/substance which cannot be broken down to any er substance by <u>chemical</u> means	/ [1]
	(b)	В		[1]
	(c)	A +	D (both needed)	[1]
	(d)	(i)	C	[1]
		(ii)	carbon	[1]
		(iii)	drill bits/ for cutting OWTTE	[1]
	(e)	con	ducts heat/conducts electricity/malleable/ductile/sonorous/shiny T: silvery/high melting OR boiling points	[3]
	(f)	(i)	alloy(s)	[1]
		(ii)	mild steel → car bodies; stainless steel → chemical plant; aluminium → aircraft ALLOW car bodies; copper → electrical wiring	[4]
			[Total:	14]
2	(a)	res	piration	[1]
2			oiration $CH_4; O_2 (1 mark each)$	[1] [2]
2		(i)		
2		(i) (ii)	$CH_4; O_2$ (1 mark each) fuel OWTTE arrangement: random/not regularly arranged/not ordered/widely spaced OWTTE;	[2] [1]
2		(i) (ii) (iii)	CH <sub>4</sub> ; O <sub>2</sub> (1 mark each) fuel OWTTE arrangement: random/not regularly arranged/not ordered/widely spaced	[2]
2		(i) (ii) (iii)	CH <sub>4</sub> ; O <sub>2</sub> (1 mark each) fuel OWTTE arrangement: random/not regularly arranged/not ordered/widely spaced OWTTE; motion: moving/random;	[2] [1]
2		(i) (ii) (iii) (iv) (v)	CH <sub>4</sub> ; O <sub>2</sub> (1 mark each)  fuel OWTTE  arrangement: random/not regularly arranged/not ordered/widely spaced OWTTE; motion: moving/random;  alkane(s)	[2] [1] [2] [1]
2	(b)	(i) (ii) (iii) (iv) (v) C	CH <sub>4</sub> ; O <sub>2</sub> (1 mark each)  fuel OWTTE  arrangement: random/not regularly arranged/not ordered/widely spaced OWTTE; motion: moving/random;  alkane(s)	[2] [1] [2] [1]
2	(b)	(i) (ii) (iv) (v) C (i)	$CH_4;\ O_2\ (1\ mark\ each)$ fuel OWTTE $ arrangement:\ random/not\ regularly\ arranged/not\ ordered/widely\ spaced \\ OWTTE; \\ motion:\ moving/random; \\ alkane(s) \\ C_2H_6\ box-2^{nd}\ from\ left\ ticked $	[2] [1] [2] [1] [1]
2	(b) (c) (d)	(i) (ii) (iv) (v) C (i) (ii)	$CH_4; O_2 \ (1 \ mark \ each)$ fuel OWTTE $arrangement: \ random/not \ regularly \ arranged/not \ ordered/widely \ spaced \ OWTTE; \\ motion: \ moving/random; \\ alkane(s) \\ C_2H_6 \ box - 2^{nd} \ from \ left \ ticked$ the bacteria NOT: living things/plants/animals	[2] [1] [2] [1] [1] [1]
2	(b) (c) (d)	(i) (ii) (iv) (v) C (i) (ii)	$CH_4; O_2 \ (1 \ mark \ each)$ fuel OWTTE $arrangement: \ random/not \ regularly \ arranged/not \ ordered/widely \ spaced \ OWTTE; motion: moving/random; \\ alkane(s) \\ C_2H_6 \ box - 2^{nd} \ from \ left \ ticked$ the bacteria NOT: living things/plants/animals speeding up of a chemical reaction by a specific substance	[2] [1] [2] [1] [1] [1] [1] [1] [2]

		icoc may/cano zoco		<u> </u>
3 (a)	(i)	D		[1]
	(ii)	A + C (both needed)		[1]
	(iii	В		[1]
	(iv	) E		[1]
	(v)	С		[1]
(b)	sha	aring; chlorine; low; diamond; strong		[5]
(c)	(i)	2 electrons paired and two atoms shown		[1]
	(ii)	lighted splint; pops/explodes OWTTE		[2]
				[Total 13]
<b>4</b> (a)	(i)	hydrogen;		[1]
	(ii)	ethene		[1]
	(iii	carbon dioxide		[1]
(b)	wit	ld) bromine water/aqueous bromine ALLOW: bromine: h ethene – decolourises OWTTE;		
	wit	h methane – no reaction/remains orange/brown OWTTE		[3]
(c)	(i)	(addition) polymerisation		[1]
	(ii)	4 <sup>th</sup> box from left (last one) ticked		[1]
(d)	cra	cking ALLOW thermal decomposition		[1]
(e)	(i)	test: add (red) litmus paper; goes blue		[2]
	(ii)	17		[1]
(f)	ha kill AL	phur dioxide formed; mful effect of sulphur dioxide e.g. acid rain/breathing difficulties s fish/leaf drop on trees etc LOW: carbon dioxide; global warming LOW: carbon monoxide; poisonous	;/	[2]
				[Total: 14]

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Syllabus 0620 Paper 02

Page 3		e 3	Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2006	0620	02
(a)	(i)	filtration	on/description of filtration		
	(ii)	weakly	acidic/2 <sup>nd</sup> box down ticked		
(b)	(i)	from t	the limestone/ from the underlying rocks		
	(ii)	carbo	n dioxide; water (1 each)		
(c)	(i)	carbo	nate/CO <sub>3</sub> <sup>2-</sup>		
	(ii)	20 mg	g (unit must be present)		
	(iii)	nitrate	e/NO <sub>3</sub> <sup>-</sup>		
	(iv)		ous) sodium hydroxide/other suitable hydroxide/ammon rown/ brown;	iia;	
		precip	oitate oluble in excess' minus 1 mark		
(d)			oxide higher (in soil air);		
			igher (in soil air); wer (in soil air);		
(e)	cor	rect for	mula with all atoms and bonds		
					[Tota
(a)	hae	ematite	; ALLOW other correct named ores		
(b)	(i)	2:2			
	(ii)	poison of blo	nous ALLOW: answers related to reducing oxygen carry od/effect on haem etc	ving capaci	ty
(c)	(i)		xide + carbon monoxide $\rightarrow$ iron + carbon dioxide g oxidation number(s) = 0)		
	(ii)	reduc	tion		
(d)	(i)	(thern	nal) decomposition		
	(ii)	any s	uitable e.g. making cement		
	(iii)	slag			
(e)	(i)	mang	anese		
	(ii)	acidic			

[1]

[Total: 11]

(iii) 6%