## 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.

CIE is publishing the mark schemes for the May/June 2006 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Page 1	Mark Scheme	Syllabus	Paper	
	IGCSE – May/June 2006	0620	02	

1	(a)	Substance containing only 1 type of atom/substance which cannot be broken down to any other 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	<sup>,</sup> 3 of: 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 <sub>4</sub> ; O <sub>2</sub> (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 OWTTE; motion: moving/random;	[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 OWTTE; motion: moving/random; alkane(s)	[2] [1] [2] [1]						
2	(b)	(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;	[2] [1] [2] [1]						
2	(b)	(i) (iii) (iii) (iv) (v) C	$CH_4;\ O_2\ (1\ mark\ each)$ 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)	(i) (iii) (iv) (v) C (i)	$CH_4;\ O_2\ (1\ mark\ each)$ fuel OWTTE $arrangement:\ random/not\ regularly\ arranged/not\ ordered/widely\ spaced\ OWTTE;\\ motion:\ moving/random;\\ alkane(s)$ $C_2H_6\ box\ -\ 2^{nd}\ from\ left\ ticked$ 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]						
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] [1] [2]						

(i) 2 electrons paired and two atoms shown  (ii) lighted splint; pops/explodes OWTTE  [T  (i) hydrogen;  (ii) ethene  (iii) carbon dioxide  (add) bromine water/aqueous bromine ALLOW: bromine: with ethene – decolourises OWTTE; with methane – no reaction/remains orange/brown OWTTE		Pag	e 2				Mark Sch		)G		Syllabu	S	Paper
(iii) A + C (both needed)  (iii) B  (iv) E  (v) C  sharing; chlorine; low; diamond; strong  (i) 2 electrons paired and two atoms shown  (ii) lighted splint; pops/explodes OWTTE  (i) hydrogen;  (ii) ethene  (iii) carbon dioxide  (add) bromine water/aqueous bromine ALLOW: bromine: with ethene – decolourises OWTTE; with methane – no reaction/remains orange/brown OWTTE  (i) (addition) polymerisation  (ii) 4 <sup>th</sup> box from left (last one) ticked cracking ALLOW thermal decomposition  (i) test: add (red) litmus paper; goes blue  (ii) 17  sulphur dioxide formed; harmful effect of sulphur dioxide e.g. acid rain/breathing difficulties/ kills fish/leaf drop on trees etc ALLOW: carbon dioxide; global warming ALLOW: carbon monoxide; poisonous						IGCSE	<u> – iviay/</u>	June 200	16		0620		02
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[To	(f)	har kills ALL	mful ef s fish/le _OW: c	ffect of eaf dro carbo	of sulphu op on tre n dioxide	r dioxide es etc e; global v	warming		reathing	difficultie	es/		
													[7

Pag	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)	red-br	eous) sodium hydroxide/other suitable hydroxide/ammor rown/ brown; bitate bluble in excess' minus 1 mark	nia;	
nitr	ogen h	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	/ing 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

(iii) 6%

[1]

[1]

[Total: 11]