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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Chemistry (Modular) 3423/F
Specification A

Mark Scheme

2006 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

GCSE CHEMISTRY (MODULAR) 3423/F
MARK SCHEME – FOUNDATION TIER (TERMINAL PAPER)
SUMMER 2006

3423/F Q1

	answers	extra information	mark
(a)	nitrogen	accept correct formula N_2	1
(b)	limewater		1
(c)	fermentation		1
(d)	ammonia	accept NH_3	1
total			4

3423/F Q2

	answers	extra information	mark
(a)	12		1
(b)	bacteria		1
(c)	enzymes are damaged/destroyed/ denatured (above 43°C)	do **not** accept reference to dying/being killed	1
total			3

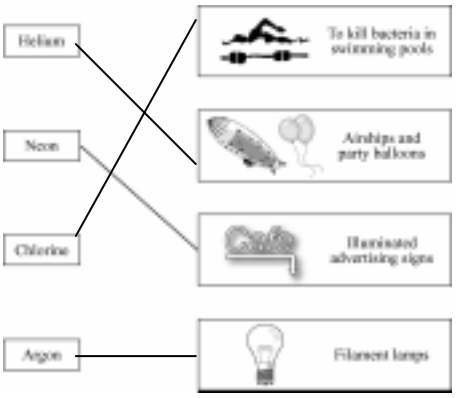
3423/F Q3

	answers	extra information	mark
(a)			1
			1
(b) (i)	30		1
(ii)	hydrogen peroxide is being used up/concentration of hydrogen peroxide is decreasing	accept it is being used up	1
(iii)	the hydrogen peroxide is all used up	accept it has been used up	1
(iv)	curve above and to the left of existing curve		1
	reaches same horizontal level	± 1 tiny square	1
total			7

3423/F Q4

	answers	extra information	mark
(a)	reading down the page: proton electron neutron	all three correct (2 marks) one correct (1 mark)	2
(b)	electron		1
(c) (i)	6		1
(ii)	12		1
(d)	it has 2 more/a different number of neutrons	accept has a larger/different atomic mass	1
total			6

3423/F Q5

	answers	extra information	mark
(a)		three correct (2 marks) one **or** two correct (1 mark)	2
(b)	apply a flame burns with 'pop'		1 1
total			4

3423/F Q6

	answers	extra information	mark
(a)	**G**	accept Ga/gallium	1
(b)	**A**	accept Li/lithium	1
(c)	**J**	accept F/fluorine	1
(d)	**E**	accept Ar/argon	1
(e)	**D**	accept H/hydrogen	1
total			5

3423/F Q7

	answers	extra information	mark
(a)	sodium	accept Na^+ /named sodium salts	1
(b)	iron (III)	accept Fe^{3+}	1
(c)	carbonate/hydrogencarbonate	accept CO_3^{2-}/HCO_3^- accept sulphite/SO_3^{2-}	1
(d)	copper carbonate	mark independently accept $CuCO_3$ for both marks	1 1
total			5

3423/F Q8

	answers	extra information	mark
(a) (i)	water (of crystallisation) is removed/ it is dehydrated/ the $5H_2O$ are removed		1
(ii)	dehydrating/ability to remove water		1
(b)	blue colour would return/turns blue		1
(c)	it has a protective/surface coating of (aluminium) oxide/Al_2O_3		1 1
total			5

3423/F Q9

	answers	extra information	mark
(a) (i)	water	accept H_2O accept UI (solution)	1
(ii)	$H^+(aq)$	accept H^+	1
(b) (i)	only partially ionised in water	accept only produces a few H^+ ions in solution do **not** accept a pH range	1
(ii)	tartaric acid		1
(iii)	ammonia (solution)		1
(c)	red/pink		1
total			6

3423/F Q10

	answers	extra information	mark
(a)	carbon	accept C	1
(b) (i)	carbon monoxide	accept CO	1
(ii)	reduces ability of blood to carry oxygen		1
(c)	natural gas	do **not** give mark for wood, coal **or** oil	1
(ii)	easy to light/(fairly) cheap/clean flame/ no solid residue	if wood, coal **or** oil given in (c) (i) award mark if a correct reason has been given	1
total			5

3423/F Q11

	answers	extra information	mark
(a)	platinum	accept Pt	1
(b)	nitrogen dioxide + water + oxygen	any order accept correct formulae	1
(c) (i)	14 + 4 +14 + 48 = 80	correct answer with no working 2 marks ignore units	1 1
(ii)	(28 ÷ 80) x 100 = 35(%)	correct answer with no working 2 marks	1 1
total			6

3423/F Q12

	answers	extra information	mark
	• decomposes into/forms simpler substances/ammonia and hydrogen chloride • products re-combine on cooling • reaction can go in either direction (depending on conditions) **Quality of written communication** 1 mark for correct linking of ideas	Q (✓ or x) **links** to look for: decomposition linked to heating recombining linked to cooling appearance at top of tube linked to reversible reaction **sequence** to look for: heat → decomposition → cool → recombining	1 1 1 1
total			4

3423/F Q13

	answers	extra information	mark
(a)	1 electron **transfers**	accept correct arrow on diagram for 2 marks	1
	from sodium to chlorine		1
(b)	1 electron from each atom	accept a correct diagram for 2 marks	1
	forms a shared pair/is shared		1
(c)	ionic		1
	covalent		1
total			6

3423/F Q14

	answers	extra information	mark
(a) (i)	2 → 2		1
(ii)	248.9	accept the same **or** no change	1
(iii)	no new atoms have been created or destroyed (owtte)	needs to be reference to no gain/loss	1
(b) (i)	less than (342.5g)		1
(ii)	gas has escaped		1
total			5

3423/F Q15

	answers	extra information	mark
(a)	• Oxygen oxidises / reacts with non-metal / impurities		1
	• $CaCO_3$ reacts with / neutralises / forms slag with / acidic impurities / substances formed		1
	• carbon changes the properties / makes iron harder / stronger		1
	Quality of written communication 1 mark for correct use of a scientific term oxidises, non-metal, neutralises, slag, acidic		1
(b)	silver		1
(ii)	Ag^+		1
total			6

3423/F Q16

	answers	extra information	mark
(a)	sulphur air/oxygen water	three correct (2 marks) one **or** two correct (1 mark) do **not** accept vanadium oxide	2
(b)	as a catalyst/speeds up the reaction rate (owtte)		1
(c)	(acid) mist (which is difficult to contain) is formed	accept reference to very exothermic **or** violent reaction	1
total			4

3423/F Q17

	answers	extra information	mark
(a) (i)	**A**	accept magnesium/Mg	1
	B	accept zinc/Zn	1
(ii)	metal added is more reactive than iron/metal added displaces metal in solution	accept reference to positions in reactivity series	1
(b)	the middle/central part	accept between Groups 2 and 3	1
(c)	silver/gold/platinum	accept copper	1
total			5

3423/F Q18

	answers	extra information	mark
(a)	(fractional) distillation		1
(b)	4	accept 171-220 ^{o}C	1
(c)	heat/thermal decomposition		1
	with a catalyst/in absence of air/ under pressure	accept broken **or** porous pot or aluminium oxide	1
total			4