

IGCSE Chemistry 4437 / 2F

Mark Scheme (Final)

November 2007

IGCSE

IGCSE Chemistry (4437/2F)

Question Number	Question		
1	(a)		
	Acceptable Answers	Reject	Mark
	8		
	Notes		(1)

Question Number	Question		
1	(b)		
	Acceptable Answers	Reject	Mark
	6		
	Notes		(1)

Question Number	Question		
1	(c)		
	Acceptable Answers	Reject	Mark
	Si		
	Notes		(1)

Question Number	Question		
1	(d)		
	Acceptable Answers	Reject	Mark
	N		
	Notes		(1)

Question Number	Question		
1	(e)		
	Acceptable Answers	Reject	Mark
	6		
	Notes		(1)

Total 5 marks

Question Number	Question		
2	(a)		
	Acceptable Answers	Reject	Mark
	Protons / electrons		
	Notes		(1)

Question Number	Question		
2	(b)		
	Acceptable Answers	Reject	Mark
	Neutrons		
	Notes		(1)

Question Number	Question		
2	(c)		
	Acceptable Answers	Reject	Mark
	Elements		
	Notes		(1)

Question Number	Question		
2	(d)		
	Acceptable Answers	Reject	Mark
	Compounds		
	Notes		(1)

Question Number	Question		
2	(e)		
	Acceptable Answers	Reject	Mark
	Electrons		
	Notes		(1)

Question Number	Question		
2	(f)		
	Acceptable Answers	Reject	Mark
	Carbon		
	Notes		(1)

Total 6 marks

Question Number	Question		
3	(a)		
	Acceptable Answers	Reject	Mark
	s l aq g		
	Notes 4 correct = 2 , 3/2 correct = 1 and 1/0 correct = 0 .		(2)

Question Number	Question		
3	(b)		
	Acceptable Answers	Reject	Mark
	- Fizzing/effervescence/bubbles - Moves/darts about - Gets smaller /Disappears - Floats Notes Max 2.	Reference to flames. Reject 'dissolves'	(2)

Question Number	Question		
3	(c)		
	Acceptable Answers	Reject	Mark
	(add) red litmus/universal indicator turns blue. Allow 'purple' for UI		
	Notes		(2)

Total 6 marks

Question Number	Question		
4	(a)		
	Acceptable Answers	Reject	Mark
	brown / red-brown/ orange-brown/ foxy brown Notes	Rusty Orange Red	(1)

Question Number	Question		
4	(b)		
	Acceptable Answers	Reject	Mark
	air / oxygen water/ moisture/ dampness Notes		(2)

Question Number	Question		
4	©		
	Acceptable Answers	Reject	Mark
	iron (III) oxide accept iron oxide Notes Ignore reference to hydrated	ignore oxidation state	(1)

Question Number	Question		
4	(d)		
	Acceptable Answers	Reject	Mark
	oxidation (3 rd box) Notes		(1)

Question Number	Question		
4	(e)		
	Acceptable Answers	Reject	Mark
	Galvanising Notes		(1)

Question Number	Question		
4	(f)		
	Acceptable Answers	Reject	Mark
	(cover with) oil / grease / paint / plastic Notes		(1)

Total 7 marks

Question Number	Question		
5	(a)		
	Acceptable Answers	Reject	Mark
	hydrochloric acid Notes	(not hydrogen chloride)	(1)

Question Number	Question		
5	(b)		
	Acceptable Answers	Reject	Mark
	effervescence / fizzing / bubbles / solid disappears or dissolves Notes		(1)

Question Number	Question		
5	(c)		
	Acceptable Answers	Reject	Mark
	limewater cloudy / milky / white precipitate Notes		(2)

Question Number	Question	
5	(d)	
	Acceptable Answers	Reject
	fish harmed/killed stonework eaten away/ OWTTE iron rusts (more quickly) plants killed Notes Max 2	
		(2)

Total 6 marks

Question Number	Question	
6	(a)	
	Acceptable Answers	Reject
	$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array} $ Notes Ignore bond angles	
		(1)

Question Number	Question	
6	(b)	
	Acceptable Answers	Reject
	C_3H_8 Notes	
		(1)

Question Number	Question	
6	(c)	
	Acceptable Answers	Reject
	$\text{C}_n\text{H}_{2n+2}$ (2 nd option) Notes	
		(1)

Question Number	Question	
6	(d)	
	Acceptable Answers	Reject
	butane + oxygen → carbon dioxide + water	
	Notes (reactants = 1, products = 1)	
		(2)

Total 5 marks

Question Number	Question	
7	(a)	
	Acceptable Answers	Reject
	(i) iron oxide (III) accept iron oxide/ haematite / Fe_2O_3	NOT iron ore
	(ii) coke / carbon / C (not coal)	
	(iii) limestone / calcium carbonate / CaCO_3	NOT lime
	Notes marks (i) - (iii) can be awarded in any order	
	(iv) slag / calcium silicate / CaSiO_3	
	(v) iron / Fe	
	Notes award 1 if (iv) and (v) are correct but in wrong order	Iron (II) or iron (III)
		(1)
		(1)
		(1)
		(1)
		(1)

Question Number	Question	
7	(b)	
	Acceptable Answers	Reject
	(i) 1	
	(ii) carbon dioxide loses oxygen/ oxidation number of carbon decreases	
	Notes	
		(1)
		(1)
		(1)

Question Number	Question		
7	(c)		
	Acceptable Answers	Reject	Mark
	toxic / poisonous/ correct effect on blood		
	Notes		(1)

Question Number	Question		
7	(d)		
	Acceptable Answers	Reject	Mark
	too reactive / higher than carbon in reactivity series/ very reactive		
	Notes		(1)

Total 10 marks

Question Number	Question		
8	(a)		
	Acceptable Answers	Reject	Mark
	(i) C / F		(1)
	(ii) A and B		(1)
	(iii) E		(1)
	Notes		

Question Number	Question		
8	(b)		
	Acceptable Answers	Reject	Mark
	Poly((ethene)). Accept polythene/Polyethylene correct repeat unit $\begin{array}{c} \text{H} \\ \\ -\text{C}- \\ \\ \text{H} \end{array}$ Or any multiple length (2 + carbons) continuation bonds ____ or (only if first mark awarded) Notes Ignore 'brackets' and 'n' or other subscripts		(1) (1) (1)

Total 6 marks

Question Number	Question															
9	(a)															
	Acceptable Answers		Reject	Mark												
	<table border="1"><thead><tr><th>Particle</th><th>Relative mass</th><th>Relative charge</th></tr></thead><tbody><tr><td>Electron</td><td>$\frac{1}{1840}$ $\frac{1}{2000}$ $\frac{1}{1850}$ $\frac{1}{1836}$</td><td>-1</td></tr><tr><td>Neutron</td><td></td><td>0 / nil</td></tr><tr><td>Proton</td><td>1</td><td></td></tr></tbody></table> Notes Ignore negligible		Particle	Relative mass	Relative charge	Electron	$\frac{1}{1840}$ $\frac{1}{2000}$ $\frac{1}{1850}$ $\frac{1}{1836}$	-1	Neutron		0 / nil	Proton	1		0 for mass	(4)
Particle	Relative mass	Relative charge														
Electron	$\frac{1}{1840}$ $\frac{1}{2000}$ $\frac{1}{1850}$ $\frac{1}{1836}$	-1														
Neutron		0 / nil														
Proton	1															

Question Number	Question		
9	(b)		
	Acceptable Answers	Reject	Mark
	(i) helium / carbon / nitrogen / oxygen / neon / magnesium / silicon / sulphur / calcium		(1)
	(ii) silicon		(1)
	(iii) hydrogen		(1)
	Notes Max penalty 1 if give symbols for all 3 rather than names		

Question Number	Question		
9	(c)		
	Acceptable Answers	Reject	Mark
	7		
	Notes		(1)

Question Number	Question		
9	(d)		
	Acceptable Answers	Reject	Mark
	(i) full / complete ignore saturated		(1)
	(ii) unreactive/inert/do not undergo reactions		(1)
	Notes		

Total 10 marks

Question Number	Question		
10	(a)		
	Acceptable Answers	Reject	Mark
	zinc is less reactive than magnesium Magnesium is more reactive than Zinc Notes Or correct reference to positions in reactivity series	<u>I</u> t is more reactive	(1)

Question Number	Question		
10	(b)		
	Acceptable Answers	Reject	Mark
	(i) $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$ reagents products Notes incorrect balancing = -1 be generous with cases (ii) (dark) grey (1) to pink-brown (1) blue (1) to green (1) Notes Ignore additional information		(1) (1) (2) (2)

Question Number	Question		
10	(c)		
	Acceptable Answers	Reject	Mark
	hydrogen more reactive than copper hydrogen less reactive than iron Notes Hydrogen between Fe + Cu for both marks	Iron(II) or Copper (II)	(1) (1)

Total 9 marks

Question Number	Question		
11	(a)		
	Acceptable Answers	Reject	Mark
	(i) shared electron pair all other electrons correct (ignore inner shells even if wrong) (ii) bottom box crossed Notes		(1) (1) (1)

Question Number	Question		
11	(b)		
	Acceptable Answers	Reject	Mark
	same number of electrons / same electronic configurations 'Same protons' negates Notes		(1)

Question Number	Question		
11	(c)		
	Acceptable Answers	Reject	Mark
	add sodium hydroxide (solution)/ammonia solution/ ammonium hydroxide green ppt/solid/suspension Orange/brown/orange-brown/foxy brown/rusty brown/red-brown ppt/ solid/suspension Notes If miss out ppt then give 1 mark for 2 correct colours result marks only given if test correct	Powder/crystals/bits Orange/rusty/red	(1) (1) (1)

Total 7 marks

Paper total 75 marks