SCOTTISH QUALIFICATIONS AUTHORITY

2006 Chemistry

Standard Grade − General

Finalised Marking Instructions

Standard Grade Chemistry

General information for markers

The general comments given below should be considered during all marking.

1. Marks should **not** be deducted for incorrect spelling or loose language as long as the meaning of the word(s) is conveyed.

   Example: Answers like 'distiling' (for 'distillation') and 'it gets hotter' (for 'the temperature rises') should be accepted.

2. A right answer followed by a wrong answer should be treated as a cancelling error and no marks should be given.

   Example: What is the colour of universal indicator in acid solution?

   The answer 'red, blue' gains no marks.

3. If a right answer is followed by additional information which does not conflict, the additional information should be ignored, whether correct or not.

   Example: Why can the tube not be made of copper?

   If the correct answer is 'It has a low melting point', and the candidate's answer is 'It has a low melting point and is coloured grey' this would **not** be treated as a cancelling error.

4. Full marks should be awarded for the correct answer to a calculation on its own; the part marks shown in the Marking Instructions are for use when working is given.

5. A half mark should be deducted in a calculation for each arithmetic slip.

6. A half mark should be deducted for incorrect or missing units **only when stated in the Marking Instructions.**

7. Where a wrong numerical answer (already penalised) is carried forward to another step, no further penalty is incurred provided the end result is used correctly.

8. Ignore the omission of one H atom from a full structural formula provided the bond is shown.

9. A symbol or correct formula should be accepted in place of a name.

10. If an answer comes directly from the text of the question, no marks should be given.

    Example: A student found that 0.05 mol of propane, C_3H_8 burned to give 82.4 kJ of energy.

    $C_3H_8(g) + 5O_2(g) \longrightarrow 3CO_2(g) + 4H_2O(l)$

    Name the kind of enthalpy change which the student measured.

    No marks should be given for 'burning' since the word 'burned' appears in the text.

11. A guiding principle in marking is to give credit for (partially) correct chemistry rather than to look for reasons not to give marks.

Example: A student measured the pH of four carboxylic acids to find out how the strength is related to the number of chlorine atoms in the molecule. The results are shown.

Structural Formula	pH
CH_3COOH	1.65
$CH_2ClCOOH$	1.27
$CHCl_2COOH$	0.90
CCl_3COOH	0.51

How is the strength of the acids related to the number of chlorine atoms in the molecule?

Although not completely correct, an answer such as 'the more Cl_2, the stronger the acid' should gain the full mark.

12. Unless the question is clearly about a non-chemistry issue, eg costs in industrial chemistry, a non-chemical answer gains no marks.

Example: Why does the (catalytic) converter have a honeycomb structure?

A response such as 'to make it work' may be correct but it is not a chemical answer and the mark should not be given.

13. When it is very difficult to make a decision about a partially correct answer, a half mark can be awarded.

14. When marks have been totalled, a half mark should be rounded up.

2006 Standard Grade Chemistry
General Level

Marking Instructions

Part 1 – 20 marks

1	(a)	A	1 or 0
	(b)	C	1 or 0
	(c)	E	1 or 0
	(d)	F	1 or 0
2		B and E	1 or 0
3	(a)	B and D	1 or 0
	(b)	B	1 or 0
	(c)	C	1 or 0
4		C	1 or 0
5	(a)	B	1 or 0
	(b)	D	1 or 0
6	(a)	A	1 or 0
	(b)	E	1 or 0
	(c)	A and B	1 or 0
7	(a)	E	1 or 0
	(b)	D	1 or 0
	(c)	A and B	2, 1 or 0
8		A and D	2, 1 or 0

Please note that **NO HALF MARKS** are awarded in Part 1

Part 2

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
9 (a)	Lime water (½) turns milky/cloudy/chalky/white (½)	**1**	Wrong chemical	
(b)	Less time/shorter/quicker/faster Decrease/speeds Any indication of less time	**1**	Ignore reference to surface area Increase	Larger particles
(c)	$C_6H_8O_6$	**1**	Superscript Numbers in front of symbols	Empirical formula cancels

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a)	Nucleus (nuclei)	**1**		
(b) (i)	2 electrons in first shell 8 electrons in second shell Accept dots/crosses/e/e^-	**1**	Not on ring 1^{st} 2 e^- in nucleus	
(ii)	Noble gases	**1**	Inert gases (does not cancel) Gases	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	Will run out/will not last forever Limited amount Non-renewable Can't be replaced	**1**	Short supply Depleted Not a lot/much Can be used up Used up faster than it can be replaced	
(b) (i)	• Millions of years ago ½ • Animals/sea creatures/organisms ½ Any 2 from • Buried • Rot/turned into/decay • Pressure/crushed/temperature **1 mark**	**2**	Not plants by its self A long time ago/prehistoric Thousands of years B.C. Land, swamps Bitumen on its own	Not plants by its self A long time ago/prehistoric Thousands of years B.C. Land, swamps Bitumen on its own
(ii)	Residue/Over 350ºC	**1**		
(c)	Reduce pollution/prevent acid rain/prevent SO_2 forming Combustion products has to be clear – produces toxic/ harmful/dangerous/poisonous. (ignore global warming/greenhouse effect)	**1**	Bad for environment It is "poisonous/toxic" They are "poisonous/toxic" Remove to make H_2SQ_4	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	Vertical scale ½ Bars labelled ½ Bar height correct 1 Deduct ½ each missing bar/error up to max of 1 Allow half box tolerance Deduct max ½ mark if less than half graph paper used in either direction. Spike graph	**2**	Line graph max 1	
(b) (i)	Potassium/K or phosphorus/P	**1**	Phosphate	Any other element
(ii)	Soluble/dissolve	**1**	Easily absorbed into soil	
(c)	Roots/root/nodules	**1**	Stem, leaves Chlorophyll	Stem, leaves Chlorophyll

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	Lead, nitrogen and oxygen or correct symbols	**1**		
(b) (i)	Lead iodide	**1**	Lead, lead iodine/lead iodide solution	
(ii)	Filtering	**1**	Filtering Pour off the water Decant	Evaporation

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a)	Slow or some indication of slower than reaction with bromine Fairly fast Quite fast Moderately fast Reasonably fast Not very fast	**1**	Normal Average Quick Medium Steady	
(b) (i)	C_4H_8	**1**	Superscripts Structural formula	
(ii)	Bromine (½) will decolourise (½) (Iodine)	**1**	Clear/see through Changes colour/transparent	Alkenes saturated Alkanes unsaturated

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
15 (a)	Table drawn (½) Suitable headings (½) Correct entries (1) Deduct ½ mark for each incorrect pair of entries up to a maximum of 1 mark.	**2**		
(b)	Increases	**1**		
(c)	Burn/flammable/explosive/ignite/ignite easily too reactive/very reactive/very reactive with oxygen Inflammable	**1**	Cheaper Reacts with oxygen Not safe It's dangerous/harmful Quite reactive	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a)	Ammonia (½) Nitrogen monoxide (½) Oxygen (½) Sulphuric (acid) (½)	**2**		
(b)	NO_2	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
17 (a)	Will not rust/will not corrode/lighter Iron would rust/corrode Last longer	**1**	Cheaper on its own Malleable Less maintenance Decompose Iron will react with water Rot	
(b)	Man-made/not natural/unnatural Made in lab/chemical industry Factory Human made	**1**	Made from chemicals Made from oil Artificial	
(c)	Toxic/poisonous CO/carbon monoxide HCI/HCN – cyanide Harmful Lethal/fatal Kills people Damages health	**1**	Carbon dioxide Bad chemicals Sooty, smoke Damages the atmosphere/ environment Irritant Pollution Pollutants	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	A	**1**		
(b)	Less than 20 (not zero)	**1**	Negative number Less than 20	
(c)	Volume of acid/temperature of acid/voltage/ type of electrode/same electrode Depth of solution Distance between electrodes Same power supply/battery Size of electrodes Same size beaker	**1**	Heat/same apparatus Same mA – same current Amount of acid Type of solution Concentration of solution Size of wire pH/mass of solution	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a)	Complete the circuit/finish/ions to flow/move	**1**	e^- – to flow/complete cell Conduct electricity Carry current/salt bridge Create electrical pathway Allow electricity through/ produce electricity Conductor	
(b)	**Silver** ring to the **gold** ring	**1**		
(c) (i)	Alloy	**1**	Compound	
(ii)	Silver 5% (½) Gold 75% (½) Copper (½) 20% (½)	**2**	18-carat gold	

[END OF MARKING INSTRUCTIONS]