SCOTTISH QUALIFICATIONS AUTHORITY

2005 Chemistry

Standard Grade – General

Finalised Marking Instructions

These Marking Instructions have been prepared by Examination Teams for use by SQA Appointed Markers when marking External Course Assessments.

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 scheme 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 scheme.**

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.

2005 Standard Grade Chemistry
General Level

Marking Instructions

Part 1 – 20 marks

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

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

Part 2

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
9 (a)	Two atoms joined Atoms go around in pairs Made up of two atoms	**1**	Two atoms in the element Two molecules joined Double atoms They go around in pairs	
(b)	Exothermic	**1**	Combustion	
(c)	A substance which speeds up a reaction	**1**	A substance which: Slows down a reaction Alters the rate	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a) (i)	Halogens	**1**	Group 7	
(ii)	Similar chemical properties/the same number of outer electrons/both have 7 outer electrons	**1**	Similar electron arrangement	
(b)	Vertical scale ½ mark Correct labelling of bars ½ mark Bars drawn correctly (½ box tolerance) 1 mark Deduct ½ mark for each incorrect bar up to a max of 1 If line graph drawn – max 1 mark Deduct ½ mark if less than half graph area is used	**2**		
(c)	Calcium, iodine and oxygen or correct symbols	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	A compound made up of carbon (C) and hydrogen (H) It contains hydrogen (H) and carbon (C) only	**1**	An atom/element made up of hydrogen and carbon	
(b)	Petrol	**1**		
(c)	$C_{10}H_{20}$ / $H_{20}C_{10}$	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a) (i)	Electrons	**1**	Negatively charged particles	
(ii)	Less than 0.92 Any answer below 0.92 – higher than 0.00	**1**		
(b)	Portable or safer Lower voltage Small and lightweight	**1**	Cheaper Rechargeable	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	Table drawn ½ mark Suitable headings ½ mark Correct entries 1 mark Deduct ½ mark (up to a max of 1) for each incorrect/missing pair of entries	**2**		
(b) (i)	Tin – 65 Lead – 35	**1**		
(ii)	Conducts electricity	**1**	Conductor Malleable Light Strong Ductile	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a) (i)	Addition	**1**	Reduction Addition polymerisation	
(ii)	C_4H_{10} or $H_{10}C_4$	**1**		
(b) (i)	Polybutene	**1**	Polybutane	
(ii)	Does not rot away, longer lasting Does not decay, decompose	**1**	Does not corrode, erode, wear away, degrade, disintegrate Can be recycled	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
15 (a)	The breaking up of a compound using electricity	**1**	Mention of splitting or breaking up elements, atoms, molecules	
(b)	Ions are free to move	**1**	Particles/electrons/charged particles able to move	
(c)	Chlorine/Cl_2	**1**	Cl Chloride	
(d)	Any answer that indicates that cost of heating has been reduced/less energy required/overall cost of production is less More economical More cost effective	**1**	Produced quicker Easier to melt Safer More efficient	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a) (i)	Insoluble/does not dissolve	**1**		
(ii)	It would/neutralise/react with stomach acid/carbon dioxide would be produced	**1**	It is not digested It is insoluble It is an alkali	
(b)	$BaCO_3$ (ignore charges)	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
17 (a)	Carbon dioxide/CO_2 (½ mark) and water/H_2O (½ mark)	**1**	Carbon oxide	
(b)	Softens/melts when heated Can be reshaped/soften on heating/melting Can be melted Loses its shape when heated/melted	**1**	Can be burned and reshaped	
(c)	The radiator would rust/salt would increase the rate of rusting Corrode/oxidation accepted in place of rust	**1**	Radiator steel would erode/be damaged Salt and water react	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	Chlorophyll	**1**	Chloroplasts	
(b) (i)	The further away the less bubbles/the nearer the greater the bubbles	**1**	Distance and rate relationship	
(ii)	The size/type of the plant/same bulb/wattage/temperature/ light intensity/brightness of bulb/number of plants	**1**	Volume of water Time	
(c)	Fermentation Anaerobic respiration Incomplete respiration	**1**	Brewing Respiration	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a)	An inverted test tube correctly positioned/syringe or suitable apparatus eg beaker	**1**	Sealed inverted test tube Any contact with water	
(b)	pH paper turns blue universal indicator/litmus turns dark green - blue - purple	**1**	Correct colour with wrong indicator pH value above 7	
(c) (i)	Nitrogen/N_2	**1**	Nitrate	
(ii)	Population growth/demand for more food	**1**	Bigger/more plants Less land	

[END OF MARKING INSTRUCTIONS]