2011 Chemistry

Standard Grade General

Finalised Marking Instructions

Standard Grade Chemistry General

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 “distilling” (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, C3H8 burned to give 82.4 kJ of energy.

    $C_3H_8(g) + 5O_2(g)\ 3CO_2\ (g) + 4H_2O(1)$

    Name the kind of enthalpy change which the student measured.
    No mark 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 nonchemical 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.

2011 Standard Grade Chemistry
General Level

Marking Instructions

Part 1 – 20 marks

1	(a)	C	1 or 0
	(b)	D	1 or 0
2	(a)	A	1 or 0
	(b)	B and D	1 or 0
3	(a)	D	1 or 0
	(b)	F	1 or 0
	(c)	E	1 or 0
	(d)	F	1 or 0
4	(a)	F	1 or 0
	(b)	A	1 or 0
	(c)	B	1 or 0
5	(a)	D	1 or 0
	(b)	C and E	1 or 0
	(c)	B	1 or 0
	(d)	E	1 or 0
6	(a)	C	1 or 0
	(b)	A	1 or 0
7		B	1 or 0
8		B and C	2 or 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)	Same or equal number of protons and electrons or Same or equal number of positive and negative charges Number of positive charges/protons cancels out/ balances out number of electrons/negative.	**1**		
(b)	Alkali Metals (reactive) Halogens (non-metal) Noble Gases (non-metal) (unreactive) 4 × ½ marks	**2**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a)	N_2H_4 or H_4N_2	**1**	NH_2 or H_2N	
(b)	Bond/covalent bond Ignore any mention of network/molecular/lattice Shared pair of electrons Attraction between shared electrons and (positive) nuclei	**1**	Ionic bond Intermolecular bond Atomic bond	
(c)	Hydrazine ⟶ ammonia + nitrogen + hydrogen Accept correct formulae equation – all formulae must be correct If formulae equation allow follow through from 10(a)	**1**	Any equation with = sign	

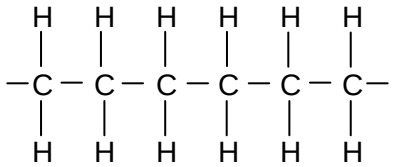
Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	Vertical scale + label including unit (½) Correct bar labelling (½) Bars drawn correctly (1) Deduct ½ mark for each incorrect bar up to a maximum 1 If line graph drawn – maximum 1 mark Deduct max ½ mark if less than half of graph paper has been used on either axis Allow ½ box tolerance when drawing bars.	**2**		

(b)	Kills/destroys/harms any named living thing or erodes/destroys or wears away stone/rocks/buildings or speeds up rusting of iron or causes corrosion of metals/metal structures or causes rusting of iron/car bodies/iron structures or reacts with limestone/marble or affects plant growth	**1**	Pollution Dissolves stone Erosion Corrosion Rusting } on its own Corrodes stone/rock Erodes metals	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	C	**1**		
(b)	Glucose/fructose/maltose or any other named reducing sugar	**1**	Sucrose Reducing sugar	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	(aerobic) respiration	**1**	Combustion Burning Oxidation Anaerobic Respiration	
(b)	Water/H_2O/hydrogen oxide	**1**		
(c)	383 - 394 inclusive	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a)	low density conducts electricity conducts heat	**1 or 0**		
(b)	(metal) ore	**1**	Combined metal oxides	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
15 (a) (i)	Will not rot/decompose/decay/cannot be broken down by bacteria	**1**	Can't be recycled/erode/corrode Does not dissolve/wear away/ degrade/compost/perish	
(ii)	 Ignore one missing end bond Deduct ½ if both end bonds missing	**1**	Hydrogen at one/both ends	
(b)	Increase/goes up/upward trend	**1**		Increases, decreases then increases

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a)	no air/oxygen	**1**		
(b) (i)	Fe^{2+}/Fe^{+2}	**1**	Iron (II) Fe (II)	
(ii)	magnesium higher in electrochemical series or magnesium more reactive or magnesium provides sacrificial protection or magnesium provides electrons or magnesium corrodes rather than/instead of iron	**1**	Magnesium provides ions Magnesium doesn't corrode/rust Mention of magnesium providing a coating	Magnesium doesn't corrode/rust

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
17 (a)	water carbon dioxide ethanol bacteria 4 × ½ marks	**2**		
(b) (i)	Put pH paper or universal indicator into substance Match to pH/colour chart/pH scale	**1**	To see if it turns red/acid etc	
(ii)	Any number below 7	**1**		
(c)	increases	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	Gas or Coal or Peat or Natural Gas	**1**	Methane	
(b) (i)	Gases or below 20°C	**1**	Gas	
(ii)	Brown	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a) (i)	5	**1**		
(ii)	Slower or not as fast	**1**	Takes more time/takes longer	
(b)	Burns with a pop Burning/lit splint pops	**1**	Squeaky pop test Burning pop test	Glowing splint

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
20 (a) (i)	C_4H_6 H_6C_4	**1**	Structural formula	
(ii)	aromatic	**1**	Ring compound	
(b)	Any correct full or shortened structural formula with 5 carbons and 12 hydrogens	**1**		
(c)	Bromine (½) decolourises (½) Second ½ mark can only be awarded if first part (Bromine) is correct.	**1**	Clear rather than decolourises Bromide rather than Bromine	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
21 (a) (i)	Electrolyte	**1**		
(ii)	zinc copper wires	**1**		
(b)	Chemical reaction stops Runs out of chemicals Reactants used up	**1**	Runs out of energy/charge/ fuel/ power Electrolyte used up Paste dries up Electrons/ions used up Goes flat. Cells run out Electrons do not flow Charge used up	

[END OF MARKING INSTRUCTIONS]