



2008 Chemistry

Standard Grade – Credit

Finalised Marking Instructions

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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 “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.

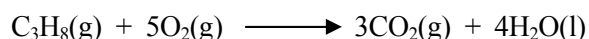
8. Ignore the omission of one H atom from a full structural formula provided the bond is shown.

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

10. When formulae of compounds are given as answers, if any charge is given which is correct, the charge can be ignored. However, if the charge is incorrect, no mark should be awarded.

11. 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.



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.

12. 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 ₃ COOH	1.65
CH ₂ ClCOOH	1.27
CHCl ₂ COOH	0.90
CCl ₃ COOH	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 Cl₂, the stronger the acid” should gain the full mark.

13. 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.

14. When it is very difficult to make a decision about a partially correct answer, a half mark can be awarded.
15. When marks have been totalled, a half mark should be rounded up.

**2008 Standard Grade Chemistry
Credit Level**

Marking Instructions

Part 1 – 20 marks

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

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

Marking Instructions


Chemistry Standard Grade – Credit

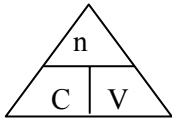
Part 2

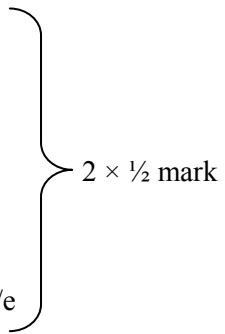
Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a)	Halogen	1	Non-metals, group 7, diatomic	
(b)	Positive electrons both required	1		
(c)	As the size increases the amount of energy decreases/ as the size decreases the energy increases The energy required decreases as the size increases/the energy required increases as the size decreases	1	As the energy decreases the size increases.	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	Hydroxide/OH ⁻	1	OH/hydroxyl	
(b)	Increase/speed it up	1		
(c)	Sacrificial	1	Electrochemical/chemical	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
<p>12 (a) (i)</p>	<p>Both scales correct ½ mark Both labels correct including units ½ mark Plots correct ½ mark Joining plots ½ mark</p> <p style="margin-left: 150px;">[allow ½ box tolerance allow one plotting error]</p> <p>[Deduct a maximum of ½ mark if <u>less</u> than half the graph paper is used in either direction bar graph – maximum of 1 mark volume of gas scale is the exact values from the table giving a straight line – maximum of 1]</p> <p>(ii) Answer should be checked against candidate's graph +/- 1 If no graph accept 13 +/- 1</p>	<p>2</p> <p>1</p>		
<p>(b)</p>	<p>$\text{NaN}_3 \longrightarrow 1\frac{1}{2} \text{N}_2 + \text{Na}$</p> <p>$2\text{NaN}_3 \longrightarrow 3\text{N}_2 + 2 \text{Na}$ or correct multiples</p>	<p>1</p>		
<p>(c)</p>	<p>Unreactive/will not react with sodium/does not burn/not flammable</p>	<p>1</p>	<p>Not very reactive/inflammable/readily available/not poisonous</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	Conducts electricity/conductor	1	Cheap	Metal and conductor
(b)	$2\text{Cl}^- \longrightarrow \text{Cl}_2 + 2\text{e}^-$ $2\text{Cl}^- - 2\text{e}^- \longrightarrow \text{Cl}_2$ State symbols not required	1		
(c)	Ions free to move	1	electrons/particles/molecules/charged particles can move 	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a)	Carbon, hydrogen, oxygen -all 3 required C, H/H ₂ , O/O ₂	1		
(b)	Sucrose	1	C ₁₂ H ₂₂ O ₁₁ /sugar	
(c)	<p>0.0033 (0.003) on its own 1 mark</p> <p>$0.01 \times \frac{330}{1000}$ ½ mark</p> <p>= 0.0033 (0.003) ½ mark</p> <p>0.01 × 330 = 3.30 ½ mark</p>	1	 <p>n = c × v on its own</p> <p>3.30 without working</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
15 (a) (i)	1  (ii) Electron/e	1	+1/-1	
(b) (i)	proton 90 neutron 144 2 × ½ mark	1		
(ii)	84	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a)	FM = 303 1 mark % lead = $207/303 \times 100$ $\frac{1}{2}$ mark = $68.3/68$ $\frac{1}{2}$ mark 68.3/68 on its own 2 marks maximum 1 mark if atomic numbers used (63/63.1) Deduct $\frac{1}{2}$ mark for each arithmetical error Deduct 1 mark for chemical error Maximum 1 mark for % of sulphur/oxygen	2		
(b)	aluminium lead both required for 1 mark	1		
(c)	Less reactive/lower in reactivity series	1		
(d)	Reduction	1	Redox/oxidation	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
17 (a) (i)	No reaction/no × (ii) Reaction occurred/yes ✓ both required for 1 mark – no ½ marks	1		
(b) (i)	2NO_3 only required to be circled once.	1		Any other ion circled
(b) (ii)	Filtration/filtering or correct description	1		Evaporation/ distillation with filtration

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	Lightning	1	Thunder/electricity	
(b)	Bacteria/nitrogen – fixing/nitrifying bacteria	1	Denitrifying bacteria	
(c)	Ammonia/NH ₃	1	Ammonium	
(d)	<p>As the temperature <i>increases</i> solubility <i>decreases</i></p> <p>As the temperature <i>decreases</i> solubility <i>increases</i></p> <p>The solubility decreases as the temperature increases</p>	1	<p>As the solubility decreases, temperature increases</p> <p>The temperature increases as the solubility decreases</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a)	Any correct full structural formula for 2-methylhexane (C ₇ H ₁₆) Allow branch to be shortened to CH ₃ allow either one hydrogen or one carbon to hydrogen bond to be missing	1	More than one hydrogen/bond missing. Both hydrogen and a bond missing	
(b)	Isomers	1		
(c)	20 – 27	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
20 (a)	28 on its own 2 marks 1 moles 2 moles ½ mark 160 112 ½ mark 40 28 1 mark Alternative 40/160 = 0.25 moles ½ mark 0.25 mol \longrightarrow 0.5 mol ½ mark 0.5 \times 56 = 28 1 mark (0.25 \times 112 = 28) No units required Maximum 1 mark if atomic numbers used (27/27.3g) Deduct ½ mark for each arithmetical error Deduct 1 mark for a chemical error	2		
(b)	3+/three positive/Fe ³⁺	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
20 (c) (i)	To provide/supply oxygen To produce carbon dioxide/monoxide To provide oxygen to react with carbon For combustion to take place	1	To provide carbon dioxide To react with carbon	
(ii)	Iron would be solid/harden/solidify Iron would not be able to flow/molten/liquid	1	Iron melts at 1535 °C It is the melting point of iron	

[END OF MARKING INSTRUCTIONS]