



2011 Chemistry

Standard Grade Credit

Finalised Marking Instructions

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Standard Grade Chemistry Credit

General information for markers

The general comments given below should be considered during all marking. It should be noted that these are general marking principles and may be superseded by decisions made at the Markers' Meeting.

1. Markers are reminded to read candidate responses **in their entirety**. If the candidate shows a clear understanding of the chemistry but does not use the exact words of the Marking Instructions they should still be given credit.
2. Markers are reminded that **no** comments are to be written on scripts. Comments such as 'ARITH', 'ERROR' and 'BOD' (Benefit of doubt) are **not** acceptable.
3. 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.

4. 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 "hydrolic acid" (for "hydrochloric acid") and "it gets hotter" (for "the temperature rises") should be accepted.

However the example below would not be acceptable, as an incorrect chemical term, which the candidate should know, has been given.

Example: If the correct answer is "ethene", and the candidate's answer is "ethane", this should not be accepted.

5. 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.

6. 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.

7. 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.
8. A half mark should be deducted in a calculation for each arithmetic slip.
9. A half mark should be deducted for incorrect or missing units **only when stated in the Marking Instructions**.
10. A half mark should be deducted for a transcription error.
11. 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.
12. Ignore the omission of one H atom from a full structural formula provided the bond is shown.
13. A symbol or correct formula should be accepted in place of a name.
14. If an answer comes directly from the text of the question, no marks should be given.

Example: Why do ionic compounds, like copper chloride, conduct electricity when in solution?

No marks for "because they are ionic" since the word "ionic" appears in the text.

15. 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.

16. When formulae of ionic compounds are given as answers it will only be necessary to show ion charges if these have been specifically asked for. However, if ion charges are shown, they must be correct. If incorrect charges are shown, no marks should be awarded.
17. When it is very difficult to make a decision about a partially correct answer, a half mark can be awarded.
18. When marks have been totalled, a half mark should be rounded up.

**2011 Standard Grade Chemistry
Credit Level**

Marking Instructions

Part 1 ~ 20 marks

1		B	1 or 0
2	(a)	E	1 or 0
	(b)	A	1 or 0
3	(a)	A	1 or 0
	(b)	B and C	1 or 0
	(c)	C and D	1 or 0
4	(a)	F	1 or 0
	(b)	A and F	1 or 0
5	(a)	B and F	1 or 0
	(b)	C	1 or 0
	(c)	E	1 or 0
6	(a)	D	1 or 0
	(b)	B	1 or 0
7		C and E	1 or 0
8		D and E	2 or 1 or 0
9		A and D	2 or 1 or 0
10		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

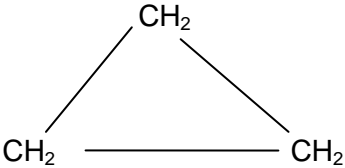
Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	Distillation/fractional distillation Evaporation then condensation Must have both and in this order.	1	fractionating evaporation or condensation on its own	
(b) (i)	Isotopes	1		
(ii)	8 10 8 8	1 or 0		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	Fermentation Anaerobic respiration	1	Aerobic respiration	
(b) (i)	As the percentage increases...the density decreases As the percentage decreases...the density increases Density increases as percentage decreases Density decreases as percentage increases etc	1	As the density increases percentage decreases eg wrong cause and effect	
(ii)	20	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	<pre> H Cl C = C H Cl Cl H C = C Cl H </pre>	1	<pre> Cl H C = C H Cl </pre>	
(b)	<p>Hydrogen chloride, HCl</p> <p>Carbon monoxide</p>	1	<p>Chlorine</p> <p>Carbon dioxide CO₂</p> <p>Hydrochloric acid</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a)	a higher	1		
(b)	<p>Both labels with units ½ mark</p> <p>Both scales ½ mark</p> <p>Plots correct (allow one error and ½ box tolerance) ½ mark</p> <p>Plots joined ½ mark</p> <p>Max 1 mark if bar graph/spike graph drawn</p> <p>Deduct max ½ mark if less than half of graph paper is used in either direction</p>	2		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
15 (a)	$C_{12}H_{22}O_{11}$	1		
(b)	Maltose Lactose	1		
(c) (i)	Biological catalyst	1	Natural catalyst Catalyst on its own	
(ii)	pH Acidity or Alkalinity Concentration of acid Concentration of alkali	1	Acid Alkali	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a)	Full or shortened structural formula of cyclopropane eg 	1		
(b) (i)	Lower temperature Less heat/energy	1	Less cost/money Can be reused Not used up Chemically unchanged Cheaper Produce more product } On their own	
(ii)	Al_2O_3 If ion charges are shown all must be correct $(\text{Al}^{3+})_2 (\text{O}^{2-})_3 / \text{Al}_2^{3+} \text{O}_3^{2-}$	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	d.c. or direct current	1	Battery, lab pack	
(b)	Chlorine gas Bubbles of gas Gas given off Fizzing/effervescence Green/yellow gas Cl ₂ (g)	1	Green/yellow colour Chlorine on its own	Bubbles of any other gas eg Hydrogen gas
(c)	Two positive, 2+, Co ²⁺	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a)	Arrows drawn from unreacted gases to hydrogen and nitrogen box or catalyst box or between these two	1 or 0		
(b) (i)	Platinum, Pt	1		
(ii)	It is an exothermic reaction The reaction produces heat	1		
(c)	Convert pollutant gases to harmless gases Convert harmful gases to harmless gases (accept toxic to non toxic poisonous to non poisonous) $\begin{array}{l} \text{CO} \longrightarrow \text{CO}_2 \\ \text{NO}_x \longrightarrow \text{N}_2 \end{array} \quad \text{OR}$	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
20 (a) (i)	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{NaI}(\text{aq}) \longrightarrow \text{PbI}_2(\text{s}) + 2\text{NaNO}_3(\text{aq})$ Or correct multiples	1 or 0		
(ii)	filtration	1		
(b)	Copper carbonate CuCO_3	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
(c) (i)	Indicator/named acid/base indicator pH/universal indicator	1	Ferroxyl indicator Bicarbonate indicator	
(ii)	Moles $n = c \times v$ (½ mark) = 0.1×0.02 moles (if 20 used max ½ mark) = 0.002 moles (½ mark) 0.002 on its own 1 mark	1		
(d)	Apply mole ratio (½ mark) $0.002 \longrightarrow 0.004$ (½ mark) 0.004 on its own 1 mark Follow through applies from answer (c) (ii)	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
21 (a)	<p>A ← B</p> <p>On or close to the wires</p>	1	<p>Arrow in solution or arrow continues into solution or ion bridge →</p>	<p>Also negates if arrow also drawn on wire correctly</p>
(b)	<p>$\text{Au}^+(\text{aq}) + \text{e}^- \longrightarrow \text{Au}(\text{s})$</p> <p>State symbols not needed Negative sign on electron not needed</p>	1		
(c)	<p>Ion bridge/salt bridge</p> <p>Filter paper soaked in salt solution/electrolyte</p>	1	<p>Ion-electron bridge Electrolyte or bridge on its own</p>	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
22 (a)	Same general formula and same/similar properties OR same/similar chemical properties Both required	1		
(b)	$ \begin{array}{cccc} & \text{H} & & \text{H} & \text{H} & \text{H} \\ & & & & & \\ \text{H} & - \text{C} & - \text{S} & - \text{C} & - \text{C} & - \text{C} & - \text{H} \\ & & & & & \\ & \text{H} & & \text{H} & \text{H} & \text{H} \end{array} $ Allow one missing H or bond to a H but not a missing C or S or bonds between	1		
(c)	addition	1	Addition polymerisation	

[END OF MARKING INSTRUCTIONS]