



2013 Chemistry

Standard Grade General

Finalised Marking Instructions

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General Marking Principles for Chemistry Standard Grade General

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.
- (b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Chemistry Standard Grade General

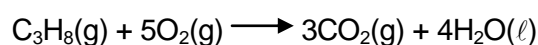
The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

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.



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 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.

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.

**2013 Standard Grade Chemistry
General Level**

Marking Instructions for each Question

Part 1 – 20 marks

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

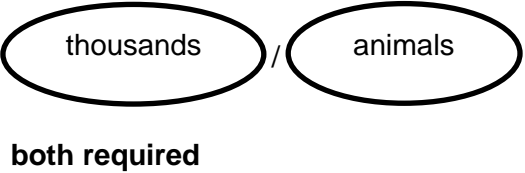
For Qs 7-9 additional answers affect the marks awarded
2 correct and 1 incorrect answers would be worth 1 mark
e.g. Q7 A and C and D is worth **1**
A, B, C and D is worth **0**

Marking Instructions

Chemistry Standard Grade – General

Part 2

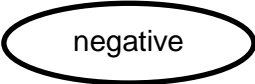
Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
10 a	<p>Table drawn (½)</p> <p>Suitable headings, e.g. plastic, polymer (½) Property / characteristic must be present as a heading Poly(ethane) accepted as a slip Correct entries (1)</p> <p>Pairs must be correct</p> <p>Deduct (½) mark for each missing/incorrect pair of entries up to a maximum of 1 mark (Ignore minor spelling mistakes)</p>	2	<p>Use / What they do...instead of Property as a heading.</p> <p>Name in place of Plastic is incorrect.</p>	
10 b	<p>Can be broken down (by bacteria/naturally/living things)</p> <p>Rot/rot away/decompose/decay/disintegrate/deteriorate</p> <p>Ignore any mention of time or rate</p>	1	<p>On their own:</p> <p>Erode/wear away/degrade/corrode/dissolves/composts/perishes/waste away Disappears/ destroyed Can be recycled/reused/disposed of These answers do not negate</p>	Polymerisation
10 c i	<p>solute</p>	1		
10 c ii	<p>Decreases/not as soluble/less soluble Reversed trend must be accurate and fully described</p>	1	Insoluble/not soluble	

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
11 a	Vertical scale + label (½) either percentage or % Correct bar labelling (½) – can use a key/code Bars drawn correctly (½ box tolerance) Deduct (½) mark for each incorrect bar up to max 1 Spike graph acceptable If line graph drawn – max 1 mark Horizontal graph ok Deduct a maximum of (½) mark if less than half of graph paper has been used on either axis	2		
11 b	 <p>thousands / animals</p> <p>both required</p>	1		A separate third word circled or identified

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
11 c	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 Can only be used once Used up faster than it can be replaced A certain amount	
11 d	carbon dioxide or CO ₂ (½) water or H ₂ O (½)	1	carbon monoxide Incorrect formula e.g. Co ₂	Incorrect formula with a correct name e.g. CO or CO ²

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
12 a	B A C	1	C A B	
12 b	Hydrogen or H ₂	1	H	H
12 c i	Copper/Silver/Mercury/Gold/Platinum Accept correct formula	1		
12 c ii	Size/mass (of metal / substance) Surface area Particle size Temperature Concentration (of acid) /moles per litre or correct units pH (of acid) Number of moles / amount/quantity <u>of metal</u> (metal must be mentioned)	1	<u>Type</u> /volume/amount/number of moles of acid amount/quantity <u>of substance</u> Volume of metal Time Size of test-tube	

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
13 a	Chlorophyll	1	Chloroplast Chloro	
13 b	Carbon dioxide/CO ₂	1		
13 c	9 - 15 inclusive	1		

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
14 a	Electrolysis	1		
14 b		1		
14 c	Bubbles (of gas) Gas given off Fizzing/effervescence (Green/yellow) gas (Chlorine) gas $\text{Cl}_2(\text{g})$ Ignore any mention of colour of gas	1	Green/yellow colour Chlorine on its own Cl_2 Chloride	Bubbles of any other gas eg hydrogen Chloride
14 d	Carbon/ C Graphite	1	Hydrogen (electrode)	

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
15 a	Butane C_4H_{10} Accept (correct) full or shortened structural formula Ignore state symbols	1		Incorrect name of substance with correct formula or vice versa.
15 b	Bromine/solution/it decolourises It goes colourless Colour change from yellow/orange/red/brown to colourless Ignore starting colour Ignore any mention of speed	1	It/Bromine goes clear It changes colour Addition takes place Discolour	
15 c	0.7 The same	1		

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
16 a	<p>increases/goes up</p> <p>moves towards 7</p> <p>moves/increases to any pH value above 2</p> <p>moves to 7</p>	1	<p>Becomes less acidic</p> <p>Mention of acidity/alkalinity or neutral</p>	Becomes more acidic, after correct answer
16 b i	<p>calcium + hydrochloric → calcium + carbon + water carbonate acid chloride dioxide</p> <p>All reactants must be to the left end of the arrow and all products to the right</p> <p style="text-align: center;"> calcium + hydrochloric carbonate acid ↓ calcium + carbon + water chloride dioxide </p> <p>All reactants must be above the arrow and all products below</p> <p>Accept correct formula equation – all formulae must be correct. Ignore charges. Mix of words and formulae accepted</p>	1	<p>Any equation with = sign</p> <p>Use of 'and' in place of +</p> <p>hydrogen chloride in place of hydrochloric acid</p> <p>Stomach acid</p> <p>Equilibrium arrow</p>	Incorrect formulae

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
16 b ii	Limewater goes cloudy/milky/chalky/white	1		
16 c	$C_5H_{12}O_5$	1		

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
17 a	Blue/purple Blue or purple Violet Blue/green Green to Blue etc.	1	Green Blue/Black	
17 b	Ostwald (process)	1		
17 c	(Reaction which) releases/produces/gives out/creates heat and/or energy Loses energy/heat	1	Heats up/ itself Temperature increase	
17 d	Lightning Thunder and lightning Electrical storm	1	Thunder/storm on its own Electricity	Nitrifying bacteria

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
18 a i	Arrow from left to right (on or near to wire)	1		Arrow going into or through the potato
18 a ii	Increase/goes up/gets bigger	1		
18 b	Portable Lower voltage/current/power Safer Can be used in a power cut	1	Cheaper Rechargeable DC not AC	Cheaper
18 c i	Lead/Pb	1		
18 c ii	2	1		

Question	Acceptable Answers	Mark	Unacceptable Answers	Negates
19 a	Al_3 AlI_3 If ionic formula used – ignore charges/brackets	1	I_3Al	
19 b i	Aluminium nitrate $Al(NO_3)_3$ If ionic formula used – ignore charges	1		Insoluble salt aluminium nitrate
19 b ii	Filtration/correct description of filtration/filter(paper)	1	Sieve Check description – if evaporation of solution to give solid, then incorrect Decant Use a filter funnel on its own	Evaporation

[END OF MARKING INSTRUCTIONS]