



2009 Chemistry

Intermediate 1

Finalised Marking Instructions

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Intermediate 1 Chemistry

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 It should be noted that these are general marking principles and may be superseded by decisions made at the Markers Meeting.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 "polyethene", and the candidate's answer is "polyethane", 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. However, if selecting information from the Data Booklet is required, the information selected must be relevant and correct, as this would negate.
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 transcription errors.
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. A symbol or correct formula should be accepted in place of a name **unless stated otherwise in the Marking Instructions.**
13. If an answer comes directly from the text of the question, no marks should be given.

Example: Propane burns to give out energy.

Name the type of chemical reaction taking place.

No marks should be given for “burning” since the word “burns” appears in the text.

14. 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.

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

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Marking scheme

Section A

1	D	11	A
2	A	12	D
3	C	13	B
4	B	14	D
5	A	15	A
6	C	16	C
7	A	17	B
8	C	18	C
9	B	19	A
10	D	20	D

Marking Instructions

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Section B

Question	Acceptable Answer	Mark	Worth $\frac{1}{2}$	Worth 0
1 (a)	O ₃	1	O3, O ³ , o3	Wrong formula eg OO ₂
(b)	Toxic/Poisonous Harmful/irritant	$\frac{1}{2}$ $\frac{1}{2}$		Dangerous, death
(c)	(Sunscreen) 3	1 or 0		

Question	Acceptable Answer	Mark	Worth ½	Worth 0
2 (a)	Mass/weight of salt in grams Mass/weight of salt (grams) Mass/weight of salt (g)	1	Mass of salt Salt in grams/g Mass in grams/g grams of salt added weight of salt Amount in grams/g	Amount on its own
(b)	$(101 - 100) = 1^{\circ}\text{C}$ 1°C	1	101-100 101-100 = wrong answer	
(c)	Saturated saturate	1 or 0		
3 (a)	Wine and lemonade	1	Wine or lemonade on its own	Wine plus incorrect Lemonade plus incorrect
(b)	(Black) coffee	1 or 0		
(c) (i)	A solid/powder (at the bottom of the test-tube)/ Saw a precipitate/crystals	1 or 0	It didn't dissolve/ Wouldn't dissolve	Incorrectly named substance Any mention of insoluble
(ii)	Nitric (acid)	1 or 0		

Question	Acceptable Answer	Mark	Worth ½	Worth 0
4 (a)	Sodium carbonate Hydrochloric acid Carbon dioxide Ignore additional non-conflicting information (eg lumps, dilute) All three for 1 mark	1 or 0		
(b) (i)	Oxygen O ₂ O o	1 or 0		Air
(ii)	Combustion	1 or 0		Burning/ Flaming/ on fire/ Firing/ incineration
5 (a)	(Fractional) distillation distilling	1 or 0		Fractionating/fractioning
(b)	carbon and hydrogen C H ₂ H c h	1 or 0		additional wrong element carbon on its own hydrogen on its own
(c)	lower smaller	½ ½		higher with larger – no follow through
(d)	(100-65) = 35%	1 or 0	100 – 65 on its own 100 – 65 = wrong answer	65

Question	Acceptable Answer	Mark	Worth ½	Worth 0
6 (a)	alloys	1 or 0		
6 (b) (i)	It decreases Decreases Gets smaller Makes melting point lower Makes it drop (Increasing the % of tin) decreases the melting point of solder (or reverse)	1 or 0		Wrong cause and effect eg decreasing melting point will decrease percentage of tin It will melt quicker
(ii)	191-226 inclusive	1 or 0		
(c)	Lead is toxic/poisonous/harmful (Example of harmful effect) allow additional non-conflicting eg lead is toxic and is soft	1 or 0		Dangerous, Soft, Finite, any mention of reactivity, heavy } won't negate Additional incorrect chemistry with correct answer eg lead is toxic and explodes in water
7 (a)	(Oxygen) will relight a glowing splint relights a glowing splint with a pop	1 or 0		relights a burning splint glowing splint test relights with a pop
(b) (i)	Very bright glow Bright white glow Brighter Bright orange glow	1 or 0		
(ii)	Any one of: Mercury/gold/silver/platinum symbol for those elements correct or incorrect	1 or 0		

Question	Acceptable Answer	Mark	Worth ½	Worth 0
8 (a)	By changing the number of drops of detergent added	1 or 0	to make sure it is right/ incase you have made a mistake/ double check (results)/ to check results	Different volumes/amounts of detergent to make it a fair test
(b)	To obtain accurate/reliable results To get an average (results)	1 or 0		
(c)	Scum	1 or 0		limescale
9 (a)	Calcium Ca CA Calcium + mineral/vitamin	1 or 0		
(b) (i)	(Vitamin) C (Vitamin) A (Vitamin) B2/ (Vitamin) B	½ each		
(ii)	(Vitamin) D (Vitamin) A	½ each		

Question	Acceptable Answer	Mark	Worth ½	Worth 0
10 (a)	(The effect of) temperature/heat suitable description eg what temperature it works best at	1 or 0		temperature and volume
	Enzyme/yeast does not work (at 60°C)/ Enzyme (activity) was destroyed/ Enzyme/yeast will not work at high temperature/ Enzyme/yeast is denatured/changes shape Yeast killed	1 or 0		Enzyme killed/ Bacteria killed/ Too hot/ There are enzymes in yeast
11 (a)	Thermometer Temperature gauge/probe	1 or 0		
	(b) The test-tubes/spoons (or burning carbohydrates) are at different heights Flame is not held at the same height/place Burning spoon not being held at same height/place Different distances between test-tube and spoon Different distances between burning sugar/carbohydrate and test-tube	1 or 0		Not the same amount/ One is a powder one is a lump

Question	Acceptable Answer	Mark	Worth ½	Worth 0
12 (a) (i)	Phosphorous or P p Label on y-axis percentage or % Bars correctly identified with symbols or abbreviations Scale on y-axis Any scaling error do not award ½ mark Bars to correct height ½ box tolerance on height of bars allow symbols or abbreviations Allow one plotting error Ignore different widths and spacing Deduct ½ mark if less than half the graph paper is used Line graph maximum 1 mark (labels and scale must be correct)	1 or 0 ½ ½ ½ ½		Phosphorous plus any other element
(b)	Blue Purple Any alkaline colour	1 or 0		Any alkaline number/pH number Blue-black Blue with any wrong colour Test without result
(c)	Rub onto (filter) paper – leaves a greasy/transparent/translucent mark Test and result	1 or 0		

[END OF MARKING INSTRUCTIONS]