



2010 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 It should be noted that these are general marking principles and may be superseded by decisions made at the Markers Meeting.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.

2010 Chemistry Intermediate 1

Marking scheme

Section A

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

Section B

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|---|--------|----------|--|
| 1 (a) | Hg | 1 or 0 | HG/hg/hG | |
| (b) | Metal | 1 or 0 | | |
| (c) | (clinical) thermometer/dental amalgam/barometer/polish top hats | 1 or 0 | | |
| 2 (a) | Circle corrosive symbol (2 nd) | 1 or 0 | | Circle corrosive and 1 other |
| (b) (i) | 5 (accept if not in table) | 1 or 0 | | Correct names but incorrect percentages (cancelling) |
| (ii) | LHS = paints or 20% Top RHS = fertilisers or 35% Bottom RHS = fibres or 10% Names and percentages Correct percentages entered rather than names (accept abbreviations if recognisable) All three for 1 mark | 1 or 0 | | |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|---|--------|---------|--|
| 3 (a) | Bubbles of gas/ Fizzing/ Effervescence/ Colour change/ Change in appearance/ Energy change/gets hot/flame produced Gas given off Gas produced is flammable New substance/ product/ chemical made Reactants used up/lumps disappear/lumps dissolve/ lumps get smaller Calcium (carbide) used up Light energy produced Smell of gas produced | 1 or 0 | | Smell produced Fire burns Burns with a squeaky pop Lamp would light up/light would turn on Carbon used up Smoke is produced Condensation |
| (b) | Calcium carbide + water → acetylene Correct formulae Ignore states Any order for reactants <p style="text-align: right;">All 3 for 1 mark</p> | 1 or 0 | | Calcium alone |
| (c) | Quicker/faster/speeds up/increases (any indication of faster rate) Less time | 1 or 0 | | |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|---|--------|-----------------------------|--|
| 4 (a) | (body) growth and repair (body) growth (body) repair Repair/building muscle (and tissues) Build up muscles (and bones/ heart/cells) Build up hair/nails/skin/tissues | 1 or 0 | | Keeps body healthy Strength and fitness Growth and energy Healthy teeth Healthy bones Good balanced diet Healthy heart Builds blood Builds body organs Builds cells Brain development The above are additional info and do not cancel Energy reference Any reference to energy cancels correct answer |
| (b) (i) | C ₃ H ₂ N ₁ 1 not needed | 1 or 0 | Obvious superscript numbers | |
| (ii) | Molecule Compound | 1 or 0 | | Substances Chains |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|---|---------------|---|--|
| 5 (a) | Lead and bromine/ Pb and Br/ Pb and Br ₂ Accept incorrect formulae/symbol Both for 1 mark | 1 or 0 | | Lead and bromine and any other element Bromide Lead and bromide |
| (b) | High and strong Both for 1 mark | 1 or 0 | Low and weak | High and weak Low and strong |
| (c) | A | 1 or 0 | | A and B/ A and C |
| 6 (a) | (Zinc) <u>chloride</u> | 1 or 0 | | Hydroxide Hydrochloride Chlorine Cl |
| (b) | Burns with a (squeaky)pop/ Lighted splint pops Test and result needed | 1 or 0 | | glowing splint relights Any mention of glowing splint will cancel Pop test |
| (c) | Less (air) bubbles/ Less gas Less hydrogen made | 1 or 0 | Reaction is slower Rate is lower X takes longer to dissolve | heat produced |

| Question | Acceptable Answer | Mark | Worth $\frac{1}{2}$ | Worth 0 |
|----------|--|--------|--|---------|
| 7 (a) | Alloy Variation of spelling acceptable | 1 or 0 | | |
| (b) | Bars to correct height $\frac{1}{2}$ mark Labels on/directly below bars $\frac{1}{2}$ mark Accept abbreviations Accept bars of different widths Must take up at least half of graph paper, if not – $\frac{1}{2}$ mark Half box tolerance allowed | 1 or 0 | Spike graph if all correct Missing bar - $\frac{1}{2}$ mark | |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|--|--------|---------|--|
| 8 (a) | Oxygen/O/O ₂ /air | 1 or 0 | | salt |
| (b) (i) | Blue Blue-green/bluey green Ignore initial colour of indicator | 1 or 0 | | Green Any other colour Blue and any other colour |
| | (ii) C Any indication of choosing C e.g. on diagram | 1 or 0 | | |
| 9 (a) | Oil/ Gas/ Peat | 1 or 0 | | |
| (b) | Plant remains Trees Named plant (remains) | 1 or 0 | | Plants and animals Swamps Fossils Dead things Animals cancel |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|--|--------|--|--|
| (c) | Turns milky/ Turns chalky/ Turns cloudy/ Turns white/ Turns foggy/ Turns creamy/ Turns cloudy then clear/ White precipitate formed Water turns cloudy etc. | 1 or 0 | | Solution not clear Colour change |
| 10 (a) | Cracking | 1 or 0 | | Splicing |
| (b) | Polyethene/ Polythene/ Poly(ethene) Spelling does not need to be correct | 1 or 0 | | |
| (c) | Can be reshaped on heating/shaped on heating Flexible/bends when heated Melted and reshaped (must have idea of both heat and shape) | 1 or 0 | Melts/softens on heating Melts Melted down and reused/recycled | Can be reshaped (no mention of heat) Flexible Recycled/reused Any mention of burning |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|---------------|--|---------------|--|---|
| 11 (a) | Phosphorus/P Phosphorus and potassium/nitrogen | 1 or 0 | | Phosphorus and any other element Phosphate |
| (b) | (Very) soluble Potassium is soluble Any mention of solubility Ignore additional information | 1 or 0 | | |
| (c) | Beans/clover/any mention of types of beans | 1 or 0 | | Beans/clover/peas + a wrong answer eg peas and potatoes |
| 12 (a) | B → D → E → A → C | 1 or 0 | | |
| (b) | Mass of carbohydrate/ flour/ icing sugar Distance burning spoon from test-tube/ Same amount of mass of carbohydrate/ Same (size of) test tube Same (size of) burning spoon Weight of carbohydrate/icing sugar/flour | 1 or 0 | Amount of carbohydrate/flour/icing sugar | Volume of carbohydrate Same temperature of water Same time Position of thermometer |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|----------|---|--------|---------|--|
| 13 (a) | 26 | 1 or 0 | | |
| (b) | Sucrose/glucose/fructose/maltose Any correctly named sugar or formula | 1 or 0 | | Carbohydrate Starch |
| (c) | Heart disease Heart attacks Heart problems Angina Get fat/obese Strokes Clogs/blocks arteries High blood pressure Cardiovascular problems Overweight | 1 or 0 | | Diabetes Weight gain Organ failure Blood clot These do not cancel a correct answer (content out-with Int 1 course) |

| Question | Acceptable Answer | Mark | Worth ½ | Worth 0 |
|--------------------------|--|----------------------|--|---|
| <p>14 (a) (i)</p> | <p>Alter the flavour/ Tastes better/worse Improve the keeping qualities/ Lasts longer/ Supply nutrition/ Enhance nutrition/ Change colour/appearance Better flavour etc and make it work Make it easier to take/swallow Make it look more attractive</p> <p>Any answer which implies change in appearance/taste/nutrition/preservative</p> | <p>1 or 0</p> | | <p>Help make it work</p> |
| | <p>(ii)</p> <p>$1/10 \times 100$ ½ mark = 10% ½ mark</p> <p>10% on its own 1 mark</p> | <p>1 or 0</p> | <p>Arithmetic mistake – ½ mark</p> | |
| <p>(b)</p> | <p>Antibiotic</p> | <p>1 or 0</p> | <p>Any named antibiotic e.g. penicillin, erythromycin, amoxicillin</p> | <p>Paracetamol/ nurofen/aspirin</p> |

[END OF MARKING INSTRUCTIONS]