



2007 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.

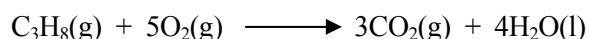
8. Ignore the omission of one H atom from a full structural formula provided the bond is shown.

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.

**2007 Standard Grade Chemistry
Credit Level**

Marking Instructions

Part 1 – 20 marks

- | | | | |
|----|---------|---------|-------------|
| 1 | (a) | A | 1 or 0 |
| | (b) | D | 1 or 0 |
| 2 | (a) | A | 1 or 0 |
| | (b) | B and C | 1 or 0 |
| 3 | (a) | E | 1 or 0 |
| | (b) | A | 1 or 0 |
| 4. | (a) | F | 1 or 0 |
| | (b) | B and D | 1 or 0 |
| 5. | (a) | C | 1 or 0 |
| | (b) | F | 1 or 0 |
| 6. | (a) | E | 1 or 0 |
| | (b) | C | 1 or 0 |
| | (c) | A and D | 2 or 1 or 0 |
| 7. | D and E | | 2 or 1 or 0 |
| 8. | C and E | | 2 or 1 or 0 |
| 9. | B and D | | 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) | Equal amount/same amount/50:50 Even/one for one Even number/half and half | 1 | Almost/nearly/roughly About/similar Equal mass/volume One of each Same size | |
| (b) | p = 47 ½ n = 60 ½ e = 46 1 | 2 | | |
| (c) (i) | 2AgNO ₃ + Cu → 2Ag + Cu(NO ₃) ₂ or correct multiples | 1 | | |
| (ii) | Mercury or gold or platinum Or correct symbols | 1 | | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|--|------|--|---------|
| 11 (a) | Acceptable structure for butanoic acid Allow one C – H bond or one H to be missing but not <u>OH</u> – hydrogen Accept OH instead of O – H | 1 | | |
| (b) (i) | Boiling point increases as the number of (carbon) atoms increases As the (carbon) atom number increases the boiling point increases | 1 | Reference to just Size of molecule Add 23 each time... | |
| (ii) | 175-193 | 1 | Greater than > | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|--|------|---------------------|---------|
| 12 (a) | Both scales correct (½ mark) Both labels correct (½ mark) including units (%) Plots correct (½ mark) Joining points (½ mark) Allow ½ box tolerance Allow 1 plotting error Deduct max ½ mark if less than half paper used in either direction Bar graph max 1 mark Straight line graph max 1 mark Axes can be reversed | 2 | | |
| (b) | 60 ± 1– if no graph drawn If graph drawn answer should be checked against candidate's graph (allow ½ box tolerance) | 1 | | |
| (c) | Alkali/a hydroxide/base Group 1/2 hydroxide ½ mark | 1 | | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|---|------|---|-----------------------|
| 13 (a) | Glucose and fructose | 1 | Monosaccharides | |
| (b) | Biological catalyst } Enzyme/acid } 1 mark Sucrase/Invertase ½ mark Hydrochloric acid ½ mark HCl/stomach acid | 1 | Saliva Natural Amylase Biological on its own | Saliva Amylase |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|---|------|---|------------|
| 14 (a) | negative | 1 | | |
| (b) (i) | Galvanising | 1 | Dip coating | |
| (b) (ii) | Zinc is more reactive Zinc is higher up in the electrochemical series/reactivity series Zinc provides sacrificial protection E ⁻ flow to iron Zinc gives e ⁻ to iron/Zinc provides electrons Zinc sacrifices itself Zinc sacrificially oxidises (iron is less reactive than steel) | 1 | Ions flow between Zinc → Iron Zinc protects iron Zinc rusts Zinc provides physical barrier to O ₂ /H ₂ O | Zinc rusts |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|--|------|---|---------|
| 15 (a) | Correct diagram showing all outer electrons with a pair of electrons being shared accept – petals/circles/cross and dot diagrams – symbols needed | 1 | | |
| (b) | To form full/complete/stable electron shell/circle/level To become stable Reference to same electron arrangement as noble gas To have a stable octet To get 8 outer e ⁻ in outer level To be like a noble gas To become more stable | 1 | To bring them closer to full energy level | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|------------|---|------|--|----------------|
| 16 (a) (i) | Fermentation/Anaerobic Respiration | 1 | Incomplete combustion Brewing Incomplete respiration Oxidation, Redox | |
| | (ii) Slows down/decreases/stop/will not work/goes to zero | 1 | Might not work | Enzyme killed |
| (b) (i) | Addition or hydration | 1 | Additional Saturation Hydrolysis Polymerisation | Polymerisation |
| | (ii) Isomers | 1 | Alkanols Homologous series | |
| | (iii) Distillation Evaporation and condensation | 1 | Evaporation or condensation on their own Chromatography | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|---|------|---------------------|---------|
| 17 (a) | Zinc sulphide | 1 | | |
| (b) | Aluminium chloride or AlCl_3 or $\text{Al}^{3+}(\text{Cl}^-)_3$ If ion charges shown both must be given and be correct including bracket | 1 | | |
| (c) | GFM = 78 1 mark % Ca = $40/78 \times 100 = 51.3/51/51.2$ 1 mark 51.3/51 on its own 2 marks Deduct $\frac{1}{2}$ mark for each arithmetic error eg incorrect rounding -52 if working shown Deduct 1 mark for chemical error eg maximum 1 mark if atomic numbers used (52.6) If % F calculated max of 1 mark (48.7) | 2 | | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|------------|--|----------|--|---------|
| (d) | $\text{Fe}_2\text{O}_3 + \text{CO} \longrightarrow \text{Fe} + \text{CO}_2$ <p>If ionic formula used – it must be correct Ignore any balancing Ignore heat above arrow</p> | 1 | Heat before arrow = sign instead of arrow | |
| (e) | Gold or mercury or silver or platinum Or correct symbols | 1 | | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|---------------|--|----------|---|---------|
| 18 (a) | Reshaped/moulded/softens on heating/on melting Flexes when heated | 1 | Reshaped (on its own) Melts on its own | |
| (b) | Condensation | 1 | | |

| Question | Acceptable Answer | Mark | Unacceptable Answer | Negates |
|----------|---|------|---|---|
| 19 (a) | Colourless | 1 | Clear | |
| (b) | $\text{Ni}^{2+}(\text{NO}_3^-)_2$ | 1 | $\text{Ni}^{2+} + 2\text{NO}_3^-$ | |
| (c) (i) | Yellow | 1 | | |
| (ii) | Allow ions to move/flow Completes the circuit/finish circuit | 1 | As answers on their own <ul style="list-style-type: none"> allow electrons to flow through wire/metal complete cell/carry current/create electrical pathway/produce electricity/conduct electricity | Must be specific through wire/metal or otherwise it negates |
| (iii) | Insoluble | 1 | Do not negate <ul style="list-style-type: none"> carry voltage acts as a salt bridge conducting solution allow electricity to flow | |

