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# Mark Scheme (Final)
# Summer 2007

GCSE

## GCSE Science B (1C/5637, 1C/5657, 4C/5638, 4C/5658)

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# USING THE MARK SCHEME

1. This mark scheme gives you;
   * an idea of the type of response expected
   * how individual marks are to be awarded
   * the total mark for each question
   * examples of responses that should not receive credit.

2. ; separates points for the award of each mark.

3. / means that the responses are **alternatives** and either answer should receive full credit.

4. ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.

5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.

6. **OWTTE** (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.

7. '**Ignore**' means that this answer is not worth a mark but does not negate an additional correct response.

8. '**Reject**' means that the answer is wrong and negates any additional correct response for that specific mark.

9. **ORA** (or reverse argument) indicates that the complete reverse is also valid for the award of marks.

10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

**MARKING**

1. You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The total mark awarded for a question should be written in the box at the end of the question.

2. The total marks for a question should then transferred to the front of the script.

3. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.

4. **Do not** award marks for repetition of the stem of the question.

5. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

**AMPLIFICATION**

1. In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.

2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.

3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.

4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

**QUALITY OF WRITTEN COMMUNICATION**

Students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use of a suitable structure and style of writing.
- use ✓c or Xc to show if the communication mark is given or not.

**Mark Scheme**

**If there are two question numbers, the first refers to the Foundation tier paper and the second to the Higher tier paper.**

**1** a)

| | | |
|---|---|---|
| firework… | | alkalis neutralise… |
| powdered coal… | | enzymes are… |
| when using enzymes… | | the action of enzymes… |
| microorganisms… | | increasing the surface…. |
| calcium hydroxide… | | different chemical… |

**4**

**Total 4 marks**

**2** a) halogens; **1**
b) chlorine; **1**
c) metal; **1**
d) calcium carbonate; **1**

**Total 4 marks**

**3** a) any noble gas; correct symbol; **2**
b) any alkali metal; correct symbol; **2**

**Total 4 marks**

**4/1** a) correct plotting;;(tolerance ± ½ square) ignore no point at 0,0 **2**
(allow if line in correct place)
(minus 1 for each incorrect plot)
Allow 'sticks' if correct length for plotting (not bars)
suitable curved line through origin; (allow if plotting incorrect) **1**

b) no effect; acid already in excess/does not increase rate of collisions **2**
allow one mark for increases with an explanation in terms of increased collisions
communication mark: ensure that spelling, punctuation and grammar are correct so that the meaning is clear; **1**

**Total 6 marks**

**5** a) from **marine** deposits/plankton/**sea/water** creatures; **1**
ignore plants/fossils reject fish (reference to water could come later)
Plus any one from: **1**
buried (under layers of silt);
lack of oxygen/air;
effects of temperature or heat **and** pressure;
over long time (period)/millions of years/many years;
(mark correct answers unless they contradict)

b) (i) (fuel for) cars/petrol powered machines/chainsaws etc. **1**
ignore bikes

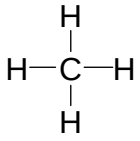
(ii) (fuel for) aircraft/planes/jets/heaters/stoves/BBQs/blowlamps etc; **1**

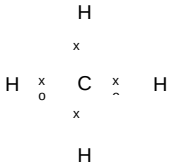
**Total 4 marks**

**6/3** a) i) (strange) blue flame; **1**

ii) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ reactants; products; balanced and fully correct; (ignore state symbols) **3**

b) correct methane structure; **1**




accept with circles etc round letters
3d acceptable if correct

c) methane could be used as a fuel; **1**
(methane and/or carbon dioxide) greenhouse gases;
(methane and/or carbon dioxide could contribute to) global warming /greenhouse effect;
(danger of) explosion;
(causes damage to) ozone layer;
methane wasted;

d) i) lack of oxygen/faulty appliances; reject no oxygen **1**

ii) toxic (gas); **1**
poisonous (gas);
kills/death; ignore suffocation
prevents blood from carrying oxygen;
forms carboxyhaemoglobin;
combines with haemoglobin (in place of oxygen)

**Total 8 marks**

**2** a)

| element | atomic number | electron arrangement | melting point |
|---|---|---|---|
| lithium | | **2.1** | |
| sodium | | | |
| potassium | | **2.8.8.1** | |
| rubidium | **37** | | **28 to 50** |

**4**

electron arrangement allow comma/colon as separation
melting point any value in range 28 to 50 inclusive but must be a single value

b) rubidium/Rb; **1**

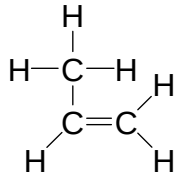
c) same number of outer electrons; =1; **2**
allow 2 marks for reference to (all) lose the outer/one electron

d) has 2 outer electrons/forms 2+ ions/forms $Ca^{2+}$/electron arrangement is 2.8.8.2; **1**

**Total 8 marks**

**4** a) unsaturated/ contains a double bond/alkene; **1**

b) i) correct structure; **1**



ii) $C_3H_6 + Br_2 \rightarrow C_3H_6Br_2$ reactants; product; any incorrect attempt to balance max 1 (allow reversal of elements in product ignore state symbols) **2**

c) i) fractional distillation/fractionation;(catalytic) cracking; must be in this order **2**

ii) any two from strong heat/high temperature/stated temperature above 400°C; catalyst/aluminium oxide; no air; ignore pressure and references to incorrect catalysts **2**

**Total 8 marks**

**TOTAL FOR PAPER: 30 MARKS**