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Mark Scheme (Results)
Summer 2007

GCSE

GCSE Science B (3C/5637, 6C/5638)

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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

oxygen		turns acidified potassium dichromate from orange to green
carbon dioxide		relights a glowing splint
hydrogen		turns limewater milky
sulphur dioxide		when lit burns with a squeaky pop

4

Total 4 marks

2 a) i) zinc sulphate; sodium carbonate; either order **2**

ii) filter/decant; **1**
accept filter paper/filtration (any recognisable spelling)

b) **3**

burette		used to measure exactly 25 cm^3 of sodium hydroxide solution
indicator solution		used to measure the volume of hydrochloric acid required
pipette		used to show the end point when the required volume…

Total 6 marks

3 a) i) iron; steel; oxygen; aluminium; **4**

b) i) a mixture of metals; **1**

ii) strength increased/stronger/becomes strong; **1**
ignore more shiny and colour/density change references

c) i) oxide coating thickened; **1**

ii) increases protection/decreases reactivity/less corrosion/more durable/lasts longer/lasts better/improve appearance; **1**
reject less likely to rust/stronger

Total 8 marks

4/1 a) concentration of alcohol/ethanol in red wine greater/wine contains **1**

a higher percentage of alcohol;
allow red wine stronger ORA ignore references to longer fermentation (assume it means wine)

b) (scientific/medical)journals/magazines/internet/websites/ radio /TV/(news)papers/lecture/hospitals/universities/surgeries/schools **1**

c) carbon dioxide; water(accept hydrogen oxide); either order ignore formulae **2**

d) ethanol; oxidised/reacts with oxygen; (ignore air) **2**
accept correct equation;; $C_2H_5OH + O_2 \rightarrow CH_3COOH + H_2O$
allow 1 mark for any equation showing ethanol and oxygen as reactants e.g. ethanol + oxygen →

Total 6 marks

5/4 a) little/no lather/foam/bubbles; scum/white solid or precipitate; **2**
ignore cloudy/milky/limescale
communication mark: presents relevant information in a form that suits its purpose; **1**
1 science mark scored or a reference to hard water/calcium ions/Ca^{2+}

b) add silver nitrate solution;
(and dilute nitric acid)/forms a white precipitate; **2**

c) several/more than one (ion that would) colour flame/ **1**
can't see a single colour/will not see specific colours/other substances distort the test/mixture of substances/ions/
allow only works for pure metal ions;

Total 6 marks

2 a) causes the temperature to rise/provides the heat/energy (for the furnace)/makes the furnace hot; **1**

b) $CaCO_3 \rightarrow CaO + CO_2$ reactants; products; **2**
max 1 if incorrect attempts to balance
ignore state symbols only penalise C_A once

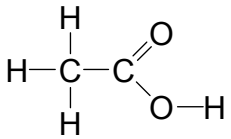
c) i) any two from **2**
carbon content reduced/(some)carbon removed;
oxygen blown onto surface/oxygen lance;
carbon oxidised/oxygen reacts with carbon/ forms carbon monoxide/dioxide;

ii) iron (too) brittle/ (steel) more flexible/stronger; **1**
reject does not rust, ignore harder/tougher

d) 1500 (dm^3) = 2 $\frac{3000}{2}$ or correct ratio = 1 i.e 2vol of CO needs 1 vol O_2 **2**
1500 with wrong unit = 1

Total 8 marks

3 a) correct structure; **1**



b) methyl ethanoate; **1**

c) $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$ **2**
reactant; products; any incorrect attempt to balance max 1
allow other versions of formulae if correct

Total 4 marks

5 a) i) poor agreement between first two/first two not close (enough) / second different to first/to get a result closer to one of them/to identify anomalies/first was rough; **1**
ignore references to average/reliable etc

ii) 25.1(0) ;cm^3; **2**

b) **either** **3**

$\frac{20 \times 0.250}{1000}$ / 0.005 (mol) / 5×10^{-3} (mol)

0.005×2 / 0.010 (mol) / 1×10^{-2} (mol) allow ecf

$0.01 \times \frac{1000}{25}$ / 0. 4(0) (mol dm^{-3}) allow ecf

or

$\frac{20 \times 0.250}{1000}$ / 0.005 (mol) / 5×10^{-3} (mol)

$\frac{25\ x}{1000}$ / 0.025x (mol)

$\frac{2}{1} = \frac{25x/1000}{20 \times 0.250/1000}$ / $\frac{2}{1} = \frac{25x}{20 \times 0.250}$ / 0.40 (mol dm^{-3}) allow ecf

(final answer 0.4 (mol dm^{-3}) worth 3 marks)

(final answer 0.2 (mol dm^{-3}) worth 2 marks)

wrong unit max 2

Total 6 marks

TOTAL FOR PAPER: 30 MARKS