GCSE

edexcel

Science: Double Award B (1536)

Separate Sciences: Biology B (1529),
Chemistry B (1539), Physics B (1549)

Summer 2005

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Mark Scheme (Results)

2C/5667
2C/5637
5C/5668
5C/5638

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 <u>meaning</u> 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 <u>bald</u>, 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.
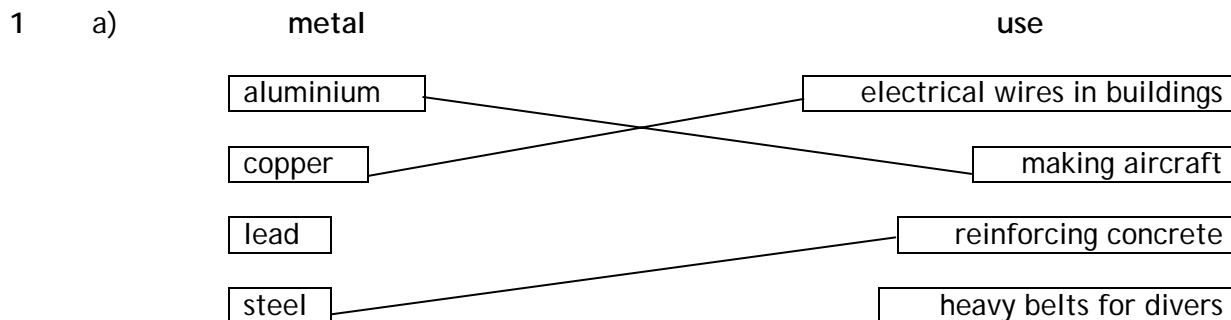
QUALITY OF WRITTEN COMMUNICATION

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)   **metal**   **use**

aluminium → making aircraft
copper → electrical wires in buildings
lead
steel → reinforcing concrete
heavy belts for divers

one mark for each correct line
'lead' is joined to 'heavy belts for divers' in the question as an example.
lines that disappear into a common line and then re-emerge = 0.   3

     b)   ores; iron; aluminium; electrolysis;   4
                 1 mark for each answer underlined / circled / ticked etc
                 accept any method of indication (ie underlining, circling, ticking etc) as
                 long as the correct answers are clearly indicated.
                 If more than 1 answer underlined, circled, ticked etc in a box then 0
                 marks to be awarded for that sentence.

                                                                    Total 7 marks

2   a)   i)   heat / energy given out/given off; (ignore heats up)   1
          ii) temperature change/feel the warmth/heat (warming them);(allow ecf   1
               from (i))
     b)   18 ; (allow 16+2 seen but addition wrong) (allow 1 mark for 17 or 33)   2
     c)   i)   He; This is the only acceptable answer. no mark for he or HE   1
          ii) light(er than air)/low density;   1
          iii) unreactive/does not burn/does not explode/more stable;   2
               ORA if clearly for hydrogen
               plus communication mark for presenting relevant information in a form
               that suits its purpose; (must score a science mark to be relevant with not
               too much incorrect/irrelevant)
     d)   1; -1; (accept in words i.e. one and minus one)   2

                                                                    Total 10 marks

3/1 a)   less soluble/less dissolves (at higher temperatures)/increased   1
               respiration(by marine organisms);
     b)   one from:
               only small rise in CO_2;
               limited evidence; (accept cannot be proved ignore no evidence)
               other possible causes;
               stated other causes; (e.g. deforestation/pollution or emissions from cars
               or factories) (reject references to ozone layer)   1
     c) $C + O_2 \rightarrow CO_2$; (ignore state symbols) (not CO^2)
               reactants; products;   2
               Max 1 if incorrect attempt to balance
               Must be upper case but if in doubt allow
                                                                    Total 4 marks

| 4/2 | a) | Cl; 11; 18 | 3 |

One mark for each answer in the correct box
accept eleven eighteen in words, accepting phonetic spelling
do not accept clear upper case L or lower case c

b) any three from:
ionic/ions/made of Na^+ **and** Cl^-;
lattice/regular arrangement; (ignore giant structure)
strong forces/attraction; (accept strong bonds) (ignore strong structure)
crystalline/crystals; (ignore cubic)   3
(a labelled diagram would probably score max 2)

c) any three from: [must be at least one in i) and one in ii)]
i) sodium floats **and** copper sinks/does not (float);
sodium disappears (accept dissolves) **and** copper does not/sinks;
sodium reacts (or correct description of reaction) **and** copper does not
react; (reject sodium would react more than copper)
sodium makes the solution alkaline **and** copper does not (change the pH)
/copper sinks;
sodium melts **and** copper does not;

ii) sodium low density / copper high density;
sodium alkali metal/in group 1/has one electron in outer shell;
(ignore references to reactivity series)
copper transition metal;   3
reaction with sodium exothermic;
(allow answers in either part but must be at least one from i) and one
from ii))

Total 9 marks

3	a)	slow cooling; (accept cooling over many years/long time. Ignore where)	
		of magma (accept molten rock) (ignore lava);	2
	b)	heat (accept temperature) and pressure;	
		changed A into B/formed from (rock) A;	
		communication mark: relevant information in a form that suits its	3
		purpose; (must score a science mark to be relevant with not	
		too much incorrect/irrelevant)	

Total 5 marks

4	a)	$2C + O_2 \rightarrow 2CO$ **or** $CO_2 + C \rightarrow 2CO$; (ignore state symbols)	
		in either case reactants; product; balanced and fully correct;	3
	b)	any three from:	

carbon monoxide (the bonding is between) non-metals;
CO simple molecules/small molecules; (ignore covalent)
weak forces between particles/molecules;(reject weak bonds for this)
iron oxide metal + non metal;
ionic/lattice (structure);
strong forces between particles/ions; (reject atoms or molecules)   3
(accept strong bonds)

c)
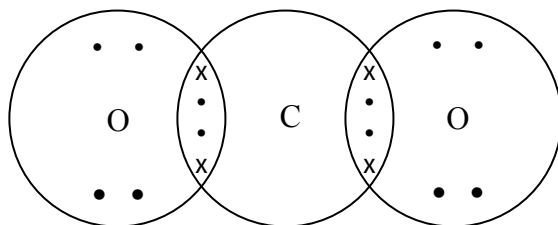
fully correct (does not need circles, oxygen atoms do not have to be lone pairs);   2
(allow one mark if only dots or crosses **OR** if C and O not labelled **OR** only correct bonding shown)
(accept if not straight)

d)   0.64(g)of oxygen; (allow if 0.64 seen)

| $\dfrac{1.68}{56}$ | : | $\dfrac{0.64}{16}$; | i.e. evidence of $\dfrac{mass}{RAM}$ only need 1 of these for mark |
| 0.03 | : | 0.04 ; | |

Fe_3O_4 ;   4

must have some correct working for full marks i.e. evidence of $\dfrac{mass}{RAM}$

Fe_3O_4 alone = 2

If 2.32 used as mass of oxygen allow 3 marks if some working shown

$\dfrac{1.68}{56}$	:	$\dfrac{2.32}{16}$	;
0.03	:	0.145	;
6		29	

Fe_6O_{29} ;
or FeO_5
If 32 used as RAM of oxygen then answer is Fe_3O_2 – allow 3 marks
If 32 used with 2.32   then answer is Fe_2O_5– allow 2 marks

Total 12 marks
TOTAL FOR PAPER: 30 MARKS