

Mark Scheme (Results)

Summer 2007

GCSE

GCSE Science B (2C/5637, 2C/5667, 5C/5638,
5C/5668)

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 bold, 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)	ores;	1
	b)	reduction;	1
	c)	alkali;	1
	d)	catalysts;	1

Total 4 marks

2	a)	i) One/1;	1
		ii) covalent; bond(s); OR electrons; shared pair;	2
	b)	12/twelve; 6/six; 6/six; (reject a number with p or n)	3
	c)	16; allow 12+4 if addition incorrect (ignore C or H)	1
	d)	heat/energy; given out/released/produced/lost;	2
		First mark dependent on 2 nd mark.	
		Allow one mark for "gets hot"/"temperature rises"	
		Could get marks in terms of energy transfer to the surroundings.	

Total 9 marks

3	a)	nitrogen; carbon dioxide;	2
	b)	no records/no one lived then; accept no/limited/evidence/proof	1
	c)	burning-decreases; photosynthesis-increases;	2

Total 5 marks

4/1	a)	any two from black (solid); turns to pink/brown/red (solid); (colourless) liquid/droplets/condensation (on cool parts of tube); (allow water/steams up) Smaller/green/green-blue flame; Solid/copper oxide glows Allow one mark for (copper oxide/solid) changes colour if no/incorrect/insufficient references to full colour change.	2
	b)	communication mark: uses a suitable structure and style of writing; $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ reactants; products; any incorrect attempt to balance max 1. (ignore state symbols)	1
	c)	reduced;	2

Total 6 marks

5/2 a)	element		3
	magnesium	chlorine	
	symbol of atom		
	number of electrons in atom		17
	symbol of ion		
	number of electrons in ion	10	18

- b) Some indication of correct charge, however expressed
e.g. 2+ on magnesium (ion) and 1- on chloride/chlorine (ion);
charges need to be equal/balanced/neutral/the same;
OR magnesium loses 2 electrons; each chlorine gains 1;
Magnesium gives 2 electrons to 2 chlorines = 2 marks. 2
- c) an explanation to include any one of 1
ionic (bonds/compound)
strong attraction between ions or particles/lots of energy needed to
separate ions or particles. Reject atoms and molecules.
strong (ionic) bonds (reject intermolecular bonds)
lots of energy needed to break bonds

Total 6 marks

- 3 a) igneous; (accept any recognisable spelling and ignore "intrusive"
and "extrusive". 1
- b) rapid cooling; of lava/magma/molten rock; 2

Total 3 marks

- 4 a) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ reactants; product; balanced and fully correct;
(ignore state symbols) 3
- b) Diagram fully correct showing 2 shared pairs and 4 non bonding
electrons on O (however arranged) and no extra electrons on H;; 2
Allow one mark if only correct shared pairs.
allow 1 mark if correct but all dots/crosses **OR** atoms not labelled
(ignore inner electrons)

c) 1.6(g) of oxygen; (allow 1.6 seen) 4

$$\frac{12.8}{64} : \frac{1.6}{16} ; \quad (\text{allow RAM Cu}=63.5)$$

$$0.2 \quad 0.1 ;$$



must have some correct working for full marks e.g.. evidence of mass

RAM

Cu_2O with no working = 2

If 14.4 g used as mass of oxygen up to 3 marks can be allowed:

$$\frac{12.8}{64} : \frac{14.4}{16} ; \quad (\text{allow RAM Cu}=63.5)$$

$$0.2 \quad 0.9 ;$$



Total 9 marks

- 5 a) i) Low(er) density (than air) or lighter than air/nitrogen/oxygen; 1
ii) full (outer) shell/orbit(al) (of electrons) / much energy needed to add or remove electrons/noble gas or stable electronic configuration pattern/structure; 1
- b) i) (Yield) increases; (accept more ammonia) 3
and an explanation to include any two from more (moles of gas) molecules on left of equation than on right; forward reaction gives decrease in volume/smaller volume on right etc.; forward reaction favoured (by increase in pressure)/ equilibrium moves to right;
- ii) improve rates/process more efficient/ reduce (activation) energy needed (accept speeds up reaction/makes reaction quicker); 1
reject greater yield unless related to time.

Total 6 marks

TOTAL FOR PAPER: 30 MARKS