SCOTTISH QUALIFICATIONS AUTHORITY

2004 Chemistry SG Credit
Finalised Marking Instructions

Strictly Confidential

These instructions are **strictly confidential** and, in common with the scripts entrusted to you for marking, they must never form the subject of remark of any kind, except to Scottish Qualifications Authority staff. Similarly, the contents of these instructions must not be copied, lent or divulged in any way now, or at any future time, to any other persons or body.

Markers' Meeting

You should use the time before the meeting to make yourself familiar with the question paper, instructions and any scripts which you have received. Do **not** undertake any final approach to marking until **after** the meeting. Please note any points of difficulty for discussion at the meeting.

Note: These instructions can be considered as final only after the markers' meeting when the full marking team has had an opportunity to discuss and finalise the document in the light of a wider range of candidates' responses.

Marking

The utmost care must be taken when entering and totalling marks. Where appropriate, all summations for totals must be carefully checked and confirmed.

Where a candidate has scored zero marks for any question attempted, "0" should be entered against the answer.

Recording of Marks

The mark for each **question**, where appropriate, should be entered **either** on the grid provided on the back page of the answer book, **or** in the case of question/answer books, on the grid (if provided) on the last page of the book. Where papers assess more than one element, care must be taken to ensure that marks are entered in the correct column.

The **Total** mark for each paper or element should be entered (in red ink) in the box provided in the top-right corner of the front cover of the answer book (or question/answer book).

Always enter the **Total** mark as a **whole number**, where necessary by the process of rounding up.

The transcription of marks, within booklets and to the Mark Sheet, should always be checked.

Markers are reminded that they must not write comments on scripts.

10 May 2004
© SQA

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 'distiling' (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 scheme 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 scheme.**

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, C_3H_8 burned to give 82.4 kJ of energy.

    $$C_3H_8(g) + 5O_2(g) \longrightarrow 3CO_2(g) + 4H_2O(l)$$

    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_3COOH	1.65
$CH_2ClCOOH$	1.27
$CHCl_2COOH$	0.90
CCl_3COOH	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 Cl_2, 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.

2004 Standard Grade Chemistry
Credit Level

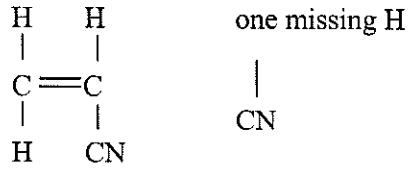
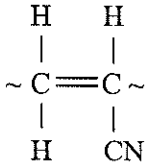
Marking Instructions

Part 1 – 20 marks

1	(a)	B	1 or 0
	(b)	A and E	1 or 0
2	(a)	B	1 or 0
	(b)	A and F	1 or 0
	(c)	F	1 or 0
3	(a)	C	1 or 0
	(b)	A and C	1 or 0
	(c)	A	1 or 0
4	(a)	C and D	1 or 0
	(b)	F	1 or 0
5	(a)	A and E	1 or 0
	(b)	D	1 or 0
6	(a)	C and D	1 or 0
	(b)	A and F	1 or 0
7		B and C	2 or 1 or 0
8		A and F	2 or 1 or 0
9		B and D	2 or 1 or 0

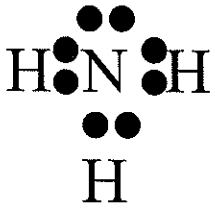
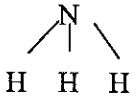
Please note that there are **NO HALF MARKS** in Part 1.

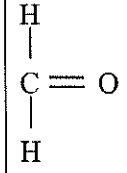
Section B

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
10 (a)	 one missing H	1		
(b)	Carbon Monoxide or cyanide ½ Hydrogen Cyanide CO, HCN	1	CN CN^-	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
11 (a)	A mixture of metals (or metals and non-metals)	1	any implication that a compound has formed	
(b) (i)	0·287g 0·29g 0·3g if working shown	1	answers based on wrong metal	
(ii)	0·01 moles=$\frac{\text{mass}}{\text{RAM or RFM}}$ ½	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
12 (a)	Gas escapes, any reference to gas or CO_2 forming	1	answer involving wrong gas	CO_2/H_2
(b)	Both scales correct (½) Both labels correct (½) Plots correct (½) ½ box tolerance, allow 1 error plot must use ≥ 50% of each axis Joining points (½) including origin	2	irregular scales max 1 bar graph max 1	
(c)	0·8g	1		
(d)	Calcium chloride $CaCl_2$ $Ca^{2+}(Cl^-)_2$	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
13 (a)	Attraction between nuclei (or protons)(or + charges) it must be clear that <u>both</u> nuclei are attracted to the electrons And shared electrons (or - charges)	1	reference to <u>one</u> nucleus	
(b) (i)	 symbols required. allow circle diagrams, cloud diagrams. Electrons must be <u>paired</u>.	1	missing line pair no symbols	
(ii)	 all 3 H's must lie to one side of the N. Symbols not required.	1	trigonal planar 4 bonds	use of word "tetrahedral" in answer

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
14 (a) (i)		1	missing H; dot/cross diagram	
(ii)	Removing hydrogen (atoms, molecules)	1	reference to hydrogen ions remove all hydrogen remove a hydrogen	
(b)	Carbon monoxide CO	1	carbon oxide, carbon dioxide	

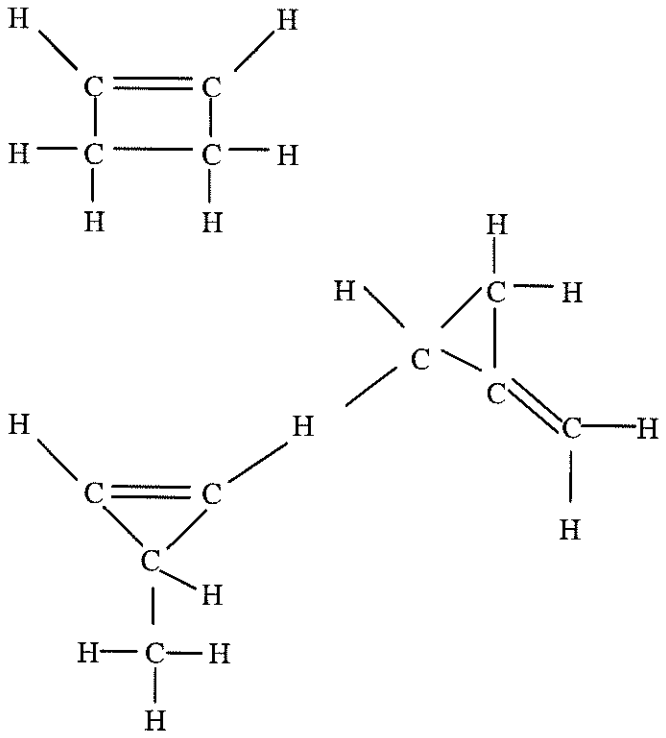
Question	Acceptable Answer		Mark	Unacceptable Answer	Negates
15 (a)	Left to right on the wires		1	arrows passing through U tube or solution	
(b)	pH paper or Universal indicator turns blue	ferroxyl → pink indicator → pink measure pH: pH>7	1 **no ½ mark**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
16 (a)	Splitting up a compound using electricity ½ ½	1	"separating" "causes reactions at electrodes"	
(b)	Aluminium forms strong bonds with oxygen Al_2O_3 very/too stable Al more reaction than C: Al too/very reactive	1	Al reactive Al_2O_3 stable	
(c)	$2Cl^- \rightarrow Cl_2 + 2e^-$ – signs on e not required $2Cl^- - 2e^- \rightarrow Cl_2$ ignore state symbols	1		
(d)	Iron is more reactive than tin Iron above tin in ECS 1 mark Electrons flow from iron to tin Iron sacrificially protects tin 1 mark	1 1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
17 (a)	$Na^+HCO_3^-$ both charges required. ignore brackets.	1	no charges $Na^+H^+CO_3^{2-}$	
(b) (i)	$3Ag_2S + 2Al \rightarrow 6Ag + Al_2S_3$ or multiple	1		
(ii)	displacement or redox	1	oxidation, reduction oxidation and reduction	
(c)	FM = 150 1 mark %Al = $\frac{54 \times 100}{150}$ = 36% ½ mark	1 1	-½ for arithmetic error wrong units -½	

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
18 (a)	Ammonia dissolved/absorbed/reacted/went into water/ soluble/mixed/diffused into water	1	reference to vacuum	
(b)	Any value above 7	1	alkaline	acidic

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
19 (a)	Gas	1		
(b)	-5°C ±1°C	1		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
20 (a)	Same general formula **And** similar (chemical) properties	**1 / 0**		
(b)	$C_n H_{2n-2}$ or equivalent. Allow "floating" 2. must resemble a general formula	**1**	H = 2C-2	
(c)	$C_5H_8Br_4$	**1**	$C_5H_8B_4$ $C_5H_8BR_4$	
(d)	Correct structural formula for a cyclobutene 	**1**		

Question	Acceptable Answer	Mark	Unacceptable Answer	Negates
21 (a)	Indicator would change colour any reference to colour change	1	turns clear	
(b) (i)	$20{\cdot}6cm^3$	1	20·8	
(ii)	$\frac{20{\cdot}6 \times 0{\cdot}2}{1000} = 0{\cdot}00412$ mol mole = conc x vol 0·004 4·12 ½ ½	1	4	
(iii)	0·00824 mol / double answer of (b)(ii) recognise mole ratio ½ allow follow through from (b)(ii)	1		

[END OF MARKING INSTRUCTIONS]