



**2002 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.

**Standard Grade Chemistry
Credit**

Part 1 – 20 marks

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

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

Part 2 – 40 marks

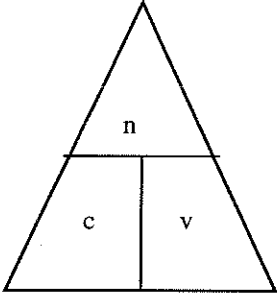
Accepted		Not Accepted
10	<p>(a) cracking (thermal, catalytic ok)</p> <p>(b) (i)</p> <pre> H H ——— C ——— C ——— H Cl </pre> <p>Cl in any position</p> <p>allow 1 missing C-H bond 1 missing H if bond is in</p> <p>allow 1 missing end bond both missing (-½) allow dots allow CL ignore brackets x n x 3</p> <p>highlighted on original structure</p> <p>(ii) carbon monoxide/CO hydrogen chloride/HCL hydrochloric acid</p>	<p>distillation then cracking distillation (cracking)</p> <p>missing Cl</p> <p>carbon dioxide chlorine hydrogen cyanide chlorine oxide hydrochloride hydrochlorine gas</p>
11	<p>(a) (i) hydrolysis hydrolyse hydrolysatation</p> <p>(ii) fructose maltose lactose galactose</p> <p>(iii) temperature too high amylase denatured/destroyed not optimum temperature amylase needs a certain temperature</p>	<p>digestion addition (hydrolysis)</p> <p>sucrose</p> <p>amylase killed/dies/poisoned starch is burned into sucrose no reducing sugar formed not broken down into glucose no reaction wrong temperature</p>

	Accepted	Not Accepted
	(b) $C_6H_{12}O_6$ (any order) $C_6(H_2O)_6$	$(CH_2O)_6$
12	(a) (i) scheme accept multiples $\times \frac{1}{2}$ s	
	(ii) covalent (ignore double) polar covalent weak covalent covalent molecular	covalent network molecular van der Waal's
	(b) 60% no working 2 marks otherwise use scheme with follow through 1 max if use atomic numbers don't need % sign ignore other units -½ for arithmetic slip	60% wrong working
13	(a) scheme $Cu + 2Ag^+ \rightarrow Cu^{2+} + 2Ag$ no state symbols required (1,0)	
	(b) $Cu \rightarrow Cu^{2+} + 2e$ $Cu \rightarrow Cu^{2+} + 2e$ ($Cu \rightarrow Cu^{2+} + 2e$ (oxidation)) ($Ag^+ + e \rightarrow Ag$) ($2Ag^+ + 2e \rightarrow Ag$) $Cu - 2e \rightarrow CO^{2+}$ ignore state symbols	($Cu \rightarrow Cu^{2+} + 2e$) ($2Ag^+ + 2e \rightarrow Ag$)
	(c) (i) copper - left silver - right silver nitrate/silver (I) or (II) nitrate copper anode silver cathode correct symbol/formulae	silver solution silver ions Ag^+ - label

	Accepted	Not Accepted
	(ii) copper or silver carbonate is insoluble/precipitate solid silver/copper carbonate forms on ion bridge sodium carbonate reacts with 1 or both solutions	sodium carbonate reacts
14	(a) can you collect gas (syringe or over water) – 1 mark ½ mark - if it can be measured (volume) by scale/ruler/markings ½ mark - labelling any 1 relevant part (syringe/gas/CO ₂ /waterM.Cylinder) no line in M/Cylinder to show water or cylinder full of gas (ok)	if it does not work – 0 marks words only description – 0 marks delivery tube through side of beaker – 0 marks label not relevant beaker/tubing delivery tube -½ if lime water used
	(b) both labels + units → ½ mark appropriate scales → ½ mark correct plotting ± ½ box → ½ mark join points ± ½ box → ½ mark using a ruler ok as long as it is within limits graph must be at ½ of graph paper on both axis graph drawn opposite way (ok)	bar graph + spike graph (max 1 mark if all other info correct) ignore graph on p17 if directed to graph on p24 -½ if not
	(c) read pupil graph ± ½ box toward mark read off a reasonable estimate if no graph 21 ± 1 ignore the word "about"	can't estimate from the table
	(d) (Na ⁺) ₂ CO ₃ ²⁻ ← (must look like oxygen) or 2Na ⁺ (aq) + CO ₃ ²⁻ (aq) ignore additional brackets	

Accepted		Not Accepted
15	<p>(a) scheme words or correct symbols mercury Hg lead Pb magnesium Mg (1,0)</p> <p>(b) (i) blast furnace/blasting furnace</p> <p>(ii) apply scheme if candidate mentions 160, or 112g in working then award 160 (½) 112 (½) 1600 1120 (2 marks) units not required atomic numbers used (max 1 mark)</p>	
16	<p>(a) carbon dioxide/CO₂</p> <p>(b) alcohol poisons yeast yeast dies/gets killed yeast stops reacting/working alcohol too concentrated for yeast starts to destroy yeast</p> <p>(c) (i) addition/hydration</p> <p>(ii)</p> <pre> H OH H H H - C - C - C - C - H H CH₃ H N OH H H H H - C - C - C - C - H H CH₃ H N </pre> <p>missing bond ok missing H but not on OH</p> <p>bond to - OH need not go to O bond to - CH₃ need not go to CH₃</p>	<p>furnace/smelter</p> <p>enzymes kill poison enzymes denatured yeast alcohol too concentrated mentioned bacteria</p> <p>additional additional polymerisation</p>

		Accepted	Not Accepted
17	(a) (i)	$C_nH_{2n}O$ $C_nH_{2n}+O$ ignore other plus signs ignore order can use x_s	
	(ii)	-OH at end aldehyde -OH at bottom ketone middle hydroxide ok ignore ions/molecules/atoms O rather than -OH ok	link to name 1-ol, 2-ol wrong same molecular, different structure
	(b)	hard to remove oxygen from aluminium/ Al_2O_3 aluminium holds onto oxygen too hard aluminium more reactive than Cu Al higher in e.c.s. or activity series Al hard to remove from Al_2O_3 Al_2O_3 too stable/very unreactive	aluminium too reactive Al_2O_3 won't decompose on heating electrolysis aluminium oxide can't be reduced (by alcohols)
18	(a)	cheap/readily available/free/plentiful	will not run out renewable/easy to replace natural resources conservation of other resources
	(b)	hydrogen/ H_2 (1,0)	H
	(c)	ammonium phosphate $(NH_4)_3 PO_4$ (must be correct) charges must be correct in ionic formula	ammonia phosphate ammonium salt
	(d) (i)	as the temperature increases the yield decreases (or the opposite) as the temperature decreases the yield increases a high temp gives a low yield a low temp gives a high yield	yield decreases the temp increases

Accepted		Not Accepted
	<p>(ii) reversible/breaks back down/ reaction can go both ways ammonia breaks down to its elements equilibrium statement</p>	<p>$N_2 + H_2$ have to be re-cycled it's not 100% efficient it's not 100% yield they don't react well</p>
19	<p>(a) (i) 20.1 (1,0)</p> <p>(ii) follow through from (a) (i) scheme $n = C \times v$ (½ mark) $n = 0.1 \times 20.1$ (½ mark) accept: 0.002 CO_1 atom not necessary</p>	 <p>does not imply they can use</p>
	<p>(b) scheme</p> <p>only $C = \frac{n}{v}$ (not in part (a) (ii))</p> <p>rounding up ok follow through ok</p> <p>formula to get answer from start ok</p> <p>no double penalty for not dividing by 1000</p>	<p>$C = \frac{n}{v}$</p> <p>formula</p>

[END OF MARKING INSTRUCTIONS]