2003 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.

23 May 2003
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2003 Standard Grade Chemistry
Credit Level

Marking Instructions

Part 1 – 20 marks

1  (a)  A and C  1 or 0  CLOSED
    (b)  E  1 or 0

2  (a)  A and E  1 or 0  CLOSED
    (b)  B and E  1 or 0  CLOSED

3  (a)  F  1 or 0
    (b)  C and D  1 or 0  CLOSED
    (c)  A and C  2 or 1 or 0  OPEN

4  A and C  2 or 1 or 0  OPEN

5  C and E  2 or 1 or 0  OPEN

6  C and D  2 or 1 or 0  OPEN

7  B and C  2 or 1 or 0  OPEN

8  (a)  C  1 or 0
    (b)  A  1 or 0

9  (a)  A and D  1 or 0  CLOSED
    (b)  C  1 or 0

Please note that there are NO HALF MARKS in Part 1.
Part 2 – 40 marks

10  (a)  is a chemical which burns giving out energy
burns/reacts with oxygen $\frac{1}{2}$
(not exothermic/reacts) 1 mark

(b)  (i)  $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
(accept multiples/fractions) 1 mark

(ii)  carbon (soot)
(not carbon oxide/charcoal/sulphur dioxide/smoke) 1 mark

(c)  

must be an attempt to show a tetrahedral shape (symbols not needed but
if shown must be correct)(arrows etc could be used for bonds) 1 mark

11  (a)  (i)  isotopes 1 mark

(ii)  35 or Ci (not lighter ones)(deduct ½ for any units shown) 1 mark

(b)  the positive nuclei are attracted to the negative electrons
(answer must clearly indicate that both atoms are involved)
(reference to attraction between protons and electrons ½ if
unclear that two atoms involved) 1 mark

(c)  

<table>
<thead>
<tr>
<th>Particle</th>
<th>Number</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>proton</td>
<td>17</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>neutron</td>
<td>18</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>electron</td>
<td>18</td>
<td>1</td>
</tr>
</tbody>
</table>
12  (a) both labels correct (½)
both scales correct (½) (must used ½ height/width)
plots correct (½) (allow ½ box tolerance)
joining points (½)
(bar chart/spike graph – maximum 1)
(accept axes either way round) 2 marks
(b) read from graph +/-2 seconds (units not required)
(deduct ½ if wrong units given) 1 mark
(c)  
\[ \text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \]
1 mole 1 mole ½
65.5g 2g ½
32.75g (32.8) (33 if working shown) 1g ½ 1 mark

13  (a) silver nitrate (solution)(not silver) 1 mark
(b) covalent (network)(molecule)(double)(polar) 1 mark
(c) hydrogen 1 mark
(c) (fractional) distillation/distilling  1 mark
(not evaporation + condensation)

14  (a) (i) addition(al)/adding
(not addition polymerisation) 1 mark
(ii)
\[
\begin{array}{cccc}
\text{H} & \text{H} & \text{Br} & \text{H} \\
\text{Br} & \text{C} & \text{C} & \text{C} & \text{H} \\
\end{array}
\]
(must be 1, 2 – dibromoethane) 1 mark
(b) 
\[
\begin{array}{cccccc}
\text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 \\
\text{~C} & \text{C} & \text{C} & \text{C} & \text{C} & \text{~C} \\
\text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\
\end{array}
\]
(allow two neighbouring methyl groups) 1 mark
(not H atoms at ends)
15  (a) \[6\text{Na}^+(aq)\text{ and }6\text{Cl}^-(aq)\text{(treat separately - }\frac{1}{2}\text{ mark each)}\]
(any wrong ion - 0) 1 mark
(b) filtration/filtering 1 mark
(c) \[
\text{Ca}_3(\text{PO}_4)_2\quad \text{FM} = (3 \times 40) + (2 \times 31) + (8 \times 16) = 310\text{g (1 mark)}
\]
\[
\%\text{ calcium ions} = \frac{120 \times 100}{310} \quad (\frac{1}{2}\text{ mark})
\]
\[
= 38.7\% \quad (\frac{1}{2}\text{ mark})(\text{accept 39}(\text{not 38}) \quad 2\text{ marks}
\]

16  (a) (i) arrows must be on/close to wire (not in solutions) 1 mark
(ii) reduction 1 mark
(b) (i) blue/black colour would appear (allow blue/black/purple) (not black solid or any other colour) (not iodine forming) 1 mark
(ii) \[2\text{I}^- (aq) \quad \text{I}_2(s) + 2e^- \text{ (or correct variant)(not } \Gamma \rightarrow \Gamma + e^-\text{)(ignore state symbols)(deduct } \frac{1}{2}\text{ for }"==")\] 1 mark
17  (a) enzyme/acid/catalyst/biological catalyst
    (amylase/hydrochloric acid, HCl – ½)  1 mark

    (b) hydrolysis/hydrolysation  1 mark

    (c) respiration (aerobic)
        (not anaerobic/combustion/oxidation/breathing)  1 mark

    (d) fructose/galactose  1 mark

18  (a)  2, 8, 1  1 mark

    (b)  (i) as you go from lithium to neon the ionisation energy increases
         rises (from 500 kJ to 2000 kJ)/increase
         (not any reference to up/down/up down)  1 mark

         (ii) as you go down a group the ionisation energy decreases
              decreases/goes down  1 mark
(a) (i) 

other positions allowed if current would be detected 1 mark

(ii) the glass beaker does not allow the ions to flow
(general idea of cardboard container allowing ions to flow or acting as ion bridge or allowing solutions to mix or come into contact)
(not any reference to electrons or glass non-conductor or incomplete circuit) 1 mark

(iii) lowers/drops/voltage drops 1 mark

(b) \[ FM = 63.5 + 71 = 134.5g \]
\[ n = \text{conc} \times \text{vol} \]
\[ = 0.05 \text{ moles} \]
\[ \text{mass} = 0.05 \times 134.5 = 6.7g \] 2 marks