



Mark Scheme (Results)

January 2013

International GCSE  
Chemistry (4CH0) Paper 2C

Edexcel Level 1/Level 2 Certificate  
Chemistry (KCH0) Paper 2C

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| Question number | Expected Answer   | Accept   | Reject                  | Marks    |
|-----------------|---|--|-------------------------|----------|
| 1 (a)           | bar drawn at height of 32<br>bar drawn at height of 8<br>bar drawn at height of 62-64 | 2 marks for all 3<br>1 mark for any 2<br><br>horizontal lines at correct heights<br>vertical lines ending at correct heights |                         | 2        |
| (b)             | <b>M1</b> - capric <u>AND</u> palmitic solid  | S  | any other state symbols | 1        |
|                 | <b>M2</b> - formic liquid   | l  |                         | 1        |
|                 |   |  | <b>Total</b>            | <b>4</b> |

| Question number | Answer   | Accept  | Reject                 | Marks             |
|-----------------|--|---|------------------------|-------------------|
| 2 (a) (i)       | D  | d   |                        | 1                 |
| (ii)            | A  | a   |                        | 1                 |
| (b)             | <p><b>M1</b> - B</p> <p><b>M2</b> - the spots do not line up (with any of the blue, red or yellow spots)</p> <p><b>M2</b> dependant on <b>M1</b></p> | <p>b</p> <p>the colours do not match (with any one of blue, red or yellow)</p> <p>the spots are not the same (as those for blue, red or yellow)</p> | contains other colours | <p>1</p> <p>1</p> |
|                 |  |   | <b>Total</b>           | <b>4</b>          |

| Question number | Answer  | Accept  | Reject                             | Marks    |
|-----------------|---|---|------------------------------------|----------|
| 3 (a) (i)       | <b>M1</b> - at least two layers of circles drawn with the majority touching one another   |   |                                    | 1        |
|                 | <b>M2</b> - no regular pattern <b>overall</b>   |   |                                    | 1        |
| (ii)            | (particles/they are) <u>more</u> closely packed<br>or<br>(particles they are) <u>closer</u> together<br>or<br><u>more</u> (particles of them) in a given volume/in the tank | <u>less</u> space between particles, etc<br><br>molecules or atoms for particles<br><br>reverse arguments | oxygen in place of particles       | 1        |
| (b) (i)         | <b>M1</b> - bright/brilliant/blinding/white flame   | light for flame   | any other colour<br>glow for flame | 1        |
|                 | <b>M2</b> - <u>white</u> powder / solid / smoke / ash   |   |                                    | 1        |
| (ii)            | MgO   | correct formula as part of an equation  |                                    | 1        |
| (c) (i)         | base/alkali   | basic/alkaline<br>(it) forms hydroxide ions (in water)  | contains hydroxide ions            | 1        |
| (ii)            | $\text{OH}^-$ / hydroxide   |   |                                    | 1        |
|                 |   |   | <b>Total</b>                       | <b>8</b> |

| Question number | Answer  | Accept  | Reject                                   | Marks |
|-----------------|---|---|--|-------|
| 4 (a)           | <b>M1</b> - bubbles (of gas) / fizzing / effervescence  | gas/carbon dioxide given off  |  | 1     |
|                 | <b>M2</b> - <u>lump/calcium carbonate/solid</u> disappears/gets smaller   | dissolves<br>forms a colourless solution  |  | 1     |
| (b)             | <b>M1</b> - (bubble through) limewater/calcium hydroxide <b>solution</b>  | <b>white</b> precipitate/<br>suspension/solid (formed)  |  | 1     |
|                 | <b>M2</b> - (goes) milky/cloudy/chalky<br><br>M2 dependent on M1 or near miss, e.g. $\text{Ca}(\text{OH})_2(\text{s})$<br>IGNORE references to lighted spill goes out |   |  | 1     |
| (c)             | time <b>increases</b> , mass <b>decreases</b><br><br>IGNORE references to mass eventually stops decreasing  | reverse statement<br>mass decreases with time<br>(they have a) negative correlation<br>3 min 18s to 3 min 30s | mass goes down with no reference to time | 1     |
| (d)             | (i) 3.3 to 3.5  |   |  | 1     |
|                 | (ii) lump/calcium carbonate/solid <u>completely</u> reacted   | used up/has gone  | has dissolved (both) reactants used up   | 1     |

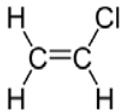
| Question Number | Answer  | Accept  | Reject   | Marks     |
|-----------------|---|---|--|-----------|
| 4 (e) (i)       | calcium chloride <b>AND</b> hydrochloric acid   | hydrogen chloride for hydrochloric acid<br>correct formulae |  | 1         |
| (ii)            | IGNORE carbon dioxide / carbonic acid / calcium carbonate<br>calcium chloride <b>AND</b> hydrochloric acid<br>IGNORE carbon dioxide / carbonic acid | hydrogen chloride for hydrochloric acid<br>correct formula  | calcium carbonate  | 1         |
| (f)             | <b>M1</b> - steeper curve to left of original starting at, or close to (100,0)<br><b>M2</b> - levels at 98.4 g                                      |   | curves that 'dip' below 98.4 by more than ½ small square | 1<br>1    |
|                 |   |   | <b>Total</b>   | <b>11</b> |





| Question Number   | Answer  | Accept                | Reject       | Marks     |
|---|---|-----------------------|--------------|-----------|
| 5 (c)   | <b>M1</b> - dissolve both (lead(II) nitrate and sodium chloride) in water                   | dissolve one in water |              | 1         |
|   | penalise <b>M1</b> is any other reagents added  |                       |              |           |
|   | <b>M2</b> - mix/add (the two solutions)   | react                 |              | 1         |
|   | <b>M3</b> – filter  | decant                |              | 1         |
|   | <b>M4</b> - wash <u>residue/solid/lead ((II)) chloride</u> (with deionised/distilled water) |                       |              | 1         |
| <b>M5</b> - dry on filter paper/in a (warm) oven/leave to dry /heat | other sensible methods of drying  | strong heating        | 1            |           |
|   |   |                       | <b>Total</b> | <b>12</b> |

| Question number | Answer  | Accept   | Reject   | Marks |
|-----------------|---|--|--|-------|
| 6 (a)           | $C_{12}H_{22}O_{11} + H_2O \rightarrow 2C_6H_{12}O_6$<br>Ignore yeast   |  | lower case symbols and numbers not given as subscripts | 1     |
| (b) (i)         | no more bubbles/fizzing/effervescence<br>IGNORE when no more ethanol is formed/all the glucose has reacted/all the yeast has reacted/references to mass/references to temperature | no more gas/carbon dioxide given off   |  | 1     |
| (ii)            | filtration/filtering<br>IGNORE sieving  | decant   | evaporation/distillation                               | 1     |
| (c) (i)         | (the elements of) water removed   | H <sub>2</sub> O removed<br>2 hydrogen (atoms) and 1 oxygen (atom) are removed   |  | 1     |
| (ii)            | aluminium oxide/Al <sub>2</sub> O <sub>3</sub>  | (concentrated) sulfuric acid<br>(concentrated) phosphoric acid   | dilute acid<br>phosphorus/phosphorous                  | 1     |
| (iii)           | chlorine (gas) / Cl <sub>2</sub><br>If both name and formula given, both must be correct  | correct name or formula as part of an equation   | chloride / Cl <sup>-</sup>                             | 1     |
| (iv)            | CH <sub>2</sub> ClCH <sub>2</sub> Cl → CH <sub>2</sub> (=)CHCl + HCl  | C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> for CH <sub>2</sub> ClCH <sub>2</sub> Cl and<br>C <sub>2</sub> H <sub>3</sub> Cl for CH <sub>2</sub> =CHCl |  | 1     |

| Question Number | Answer   | Accept | Reject       | Marks     |
|-----------------|--|--------|--------------|-----------|
| (d) (i)         |  <p>IGNORE bond angles and positions of H and Cl relative to each other</p>   |        |              | 1         |
| (ii)            | <p><b>Any three from:</b></p> <p><b>M1</b> - (one bond in the) double bond breaks</p> <p><b>M2</b> - small molecules/monomers/chloroethene molecules join together</p> <p><b>M3</b> - to form a (long) chain/macromolecule</p> <p><b>M4</b> - product/polymer contains only single bonds</p> |        |              | 3         |
|                 |  |        | <b>Total</b> | <b>11</b> |

| Question number | Answer   | Accept  | Reject | Marks       |
|-----------------|--|---|--------|-------------|
| 7 (a) (i)       | <b>M1</b> - $\frac{144}{24\,000}$<br><b>M2</b> - 0.006   | One mark for $(144 \div 24) = 6$  |        | 1<br>1      |
| (ii)            | 0.006  |   |        | 1           |
| (iii)           | <b>M1</b> - $\frac{0.888}{0.006}$<br><b>M2</b> - 148 ( <u>MUST</u> be a whole number)                                |   |        | 1           |
| (iv)            | <b>M1</b> - $(\text{CO}_3) = 60$<br><b>M2</b> - 88<br><b>M3</b> - Sr / strontium<br><br>Mark csq throughout part (a) | answer csq on correctly calculated value of <b>M2</b> (i.e. metal closest to calculated $A_r$ ), but <u>must</u> be a Group 2 metal |        | 1<br>1<br>1 |

| Question Number | Answer   | Accept | Reject       | Marks     |
|-----------------|--|--------|--------------|-----------|
| 7 (b)           | Any <b>two</b> from:<br><br><b>M1</b> - gas was lost between adding acid and replacing bung<br><b>M2</b> - bung does not fit/there are leaks in the apparatus<br><b>M3</b> - some gas dissolved/reacted in the water<br><b>M4</b> - the carbonate was impure<br><b>M5</b> - the temperature (of the gas) was <u>lower</u> than room temperature/25°C |        |              | 2         |
|                 |  |        | <b>Total</b> | <b>10</b> |

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