



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**CHEMISTRY**

**0620/63**

Paper 6 Alternative to Practical

**October/November 2017**

MARK SCHEME

Maximum Mark: 40

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**Published**

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This document consists of **5** printed pages.



| Question | Answer  | Marks |
|----------|---|-------|
| 1(a)     | pestle  | 1     |
|          | (teat) pipette  | 1     |
| 1(b)     | to increase surface area / make it dissolve faster          | 1     |
| 1(c)     | nitric (acid)   | 1     |
| 1(d)     | residue   | 1     |
| 1(e)     | <b>M1</b> add a more reactive metal (e.g. zinc / magnesium) | 1     |
|          | <b>M2</b> displaces lead / filter out lead                  | 1     |

| Question | Answer   | Marks |
|----------|--|-------|
| 2(a)     | temperature boxes completed: 23, 16, 14, 13, 12, 11, 11, 11, 11, 11<br>all readings correct = [2]<br>8 or 9 readings correct = [1]           | 2     |
| 2(b)     | temperature boxes completed correctly: 22, 26, 29, 31, 32, 33, 34, 35, 35, 35<br>all readings correct = [2]<br>8 or 9 readings correct = [1] | 2     |
| 2(c)     | all points plotted   | 1     |
|          | two smooth line graphs<br>(one line graph correct = [1])   | 2     |
|          | both graphs appropriately labelled   | 1     |
| 2(d)(i)  | value from graph   | 1     |
|          | shown clearly  | 1     |

| Question  | Answer  | Marks           |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
|---|---|-----------------|-------------|-------------|-------------------------------|-----------------------------|-----------------------|----------------------------------|---|--------------------------------------|---|----------------|---------------------------|---|---|---|
| 2(d)(ii)  | value from graph  | 1               |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
|   | shown clearly   | 1               |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| 2(e)  | exothermic  | 1               |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| 2(f)  | room temperature / 22 °C<br><b>AND</b><br>reaction has finished / all the solid has dissolved   | 1               |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| 2(g)  | <table border="1"> <thead> <tr> <th>source of error</th> <th>improvement</th> </tr> </thead> <tbody> <tr> <td>heat losses</td> <td>use a lid / lag the apparatus</td> </tr> <tr> <td>use of a measuring cylinder</td> <td>use a pipette/burette</td> </tr> <tr> <td>wet cup in the second experiment</td> <td>use new/another cup <b>OR</b> dry the cup</td> </tr> <tr> <td>the solid absorbs water from the air</td> <td>store in a sealed container / airtight container / desiccator</td> </tr> <tr> <td>only done once</td> <td>repeat <b>and</b> average</td> </tr> <tr> <td>different masses of solids used / masses of solids not measured</td> <td>use same mass of solid / weigh the solids</td> </tr> </tbody> </table> | source of error | improvement | heat losses | use a lid / lag the apparatus | use of a measuring cylinder | use a pipette/burette | wet cup in the second experiment | use new/another cup <b>OR</b> dry the cup | the solid absorbs water from the air | store in a sealed container / airtight container / desiccator | only done once | repeat <b>and</b> average | different masses of solids used / masses of solids not measured | use same mass of solid / weigh the solids | 4 |
| source of error   | improvement   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| heat losses   | use a lid / lag the apparatus   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| use of a measuring cylinder                                     | use a pipette/burette   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| wet cup in the second experiment                                | use new/another cup <b>OR</b> dry the cup   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| the solid absorbs water from the air                            | store in a sealed container / airtight container / desiccator   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| only done once  | repeat <b>and</b> average   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| different masses of solids used / masses of solids not measured | use same mass of solid / weigh the solids   |                 |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |
| 2(h)  | fewer data / less detail / fewer readings / graph not as good / not enough readings whilst the solid is reacting  | 1               |             |             |                               |                             |                       |                                  |   |                                      |   |                |                           |   |   |   |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 3(a)(i)         | green  | 1            |
|                 | precipitate  | 1            |
| 3(a)(ii)        | green solution / precipitate dissolves                                   | 1            |
| 3(a)(iii)       | bubbles / fizzing / effervescence  | 1            |
|                 | (red) litmus paper / Universal Indicator paper                           | 1            |
|                 | (red litmus paper) turns blue / (Universal Indicator paper) turns purple | 1            |
| 3(b)            | ammonia / NH <sub>3</sub>  | 1            |
| 3(c)            | (aqueous) ammonia / NH <sub>3</sub>                                      | 1            |

| Question | Answer  | Marks |
|----------|---|-------|
| 4        | <p><i>heating to dryness method</i></p> <p>max [6]:<br/> <b>M1</b> weigh (any) sample of washing soda<br/> <b>M2</b> heat (to remove water of crystallisation)<br/> <b>M3</b> in named container<br/> <b>M4</b> cool<br/> <b>M5</b> reweigh<br/> <b>M6</b> repeat heating<br/> <b>M7</b> to constant mass<br/> <b>M8</b> appropriate calculation suggested for the percentage of water</p> <p><i>mass of water method</i></p> <p>max [6]:<br/> <b>M1</b> weigh (any) sample of washing soda<br/> <b>M2</b> heat to remove water of crystallisation<br/> <b>M3</b> in named container<br/> <b>M4</b> using apparatus capable of collecting water (vapour)<br/> <b>M5</b> cool / condense (water vapour)<br/> <b>M6</b> continue until no more collects<br/> <b>M7</b> weigh water<br/> <b>M8</b> appropriate calculation suggested for the percentage of water</p> | 6     |