Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CHEMISTRY **5070/41**

Paper 1 Alternative to Practical **May/June 2017**

MARK SCHEME

Maximum Mark: 60

Published

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Abbreviations used in the mark scheme
• / separates alternatives within a marking point.
• **OR** gives the alternative marking point.
• **Allow** indicates an answer that is less than ideal but which should be marked correct.
• **Ignore** means mark as if the response was not there.
• **Reject** means the response is not given credit
• M1, M2 etc. distinguish each marking point within an answer
• Ecf means credit a correct statement / working that follows from a previous wrong response.
• Use of brackets in the Answer column indicates that the word(s) is / are ideal but not required to obtain the mark.

Question	Answer	Marks
1(a)	**A** – crucible (1) **B** – tripod (1)	**2**
1(b)	Escape of MgO / (white) powder / smoke out of top of crucible (1) Place a lid on crucible / cover crucible (1) **OR** The magnesium has not been heated long enough / not enough air gets in / magnesium has not been completely burned (1) Heat contents for a longer time / to constant mass (1)	**2**
1(c)	Atomic mass of zinc is greater (or reverse argument) (1) Fewer moles of zinc heated in 0.36 g / requires fewer moles of oxygen / less oxygen (1)	**2**
1(d)	Safety goggles / safety glasses	**1**

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Question	Answer	Marks
2	**Method 1** M1 Add water to beaker containing mixture and stir / heat / mix / dissolve sodium chloride (1) M2 Filter (1) M3 Dry the sand (1) M4 Weigh (dry) sand (1) M5 Percentage of sand = mass of sand / 10.0 × 100 and percentage of sodium chloride = 100 – percentage of sand (1) **OR** **Method 2** M1 Add water to beaker containing mixture **and** stir / heat / mix / dissolve sodium chloride (1) M2 Filter (1) M3 Evaporate filtrate to dryness / remove all water (1) M4 Weigh (dry) sodium chloride (1) M5 Percentage of sodium chloride = mass of sodium chloride × 100 / 10.0 (1)	**5**

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Question	Answer	Marks
3(a)(i)	**C** – condenser	**1**
3(a)(ii)	To return unreacted alcohol to reaction flask	**1**
3(b)	M1 Condenser attached (to the top of flask), sloping (1) M2 Water in / water out correct (1) M3 Thermometer in correct position (1) M4 Receiver flask under end of condenser, open (1)	**4**
3(c)	Water/H_2O (1) 100 (°C) (1)	**2**
3(d)	Effervescence / fizzing / bubbling	**1**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(a)</td><td>1.44 (g)</td><td>1</td></tr>
<tr><td>4(b)</td><td>Increase rate of reaction</td><td>1</td></tr>
<tr><td>4(c)(i)</td><td>Hydrogen</td><td>1</td></tr>
<tr><td>4(c)(ii)</td><td>Pops in a flame / lighted splint pops / burning splint pops</td><td>1</td></tr>
<tr><td>4(d)(i)</td><td>Volumetric flask / graduated flask / standard flask</td><td>1</td></tr>
<tr><td>4(d)(ii)</td><td>Pipette</td><td>1</td></tr>
<tr><td>4(e)</td><td>M1 Purple / pink (1)

M2 KMnO4 will be in excess / present (1)</td><td>2</td></tr>
<tr><td>4(f)</td><td><table><tr><td>25.1</td><td>28.6</td><td>37.1</td></tr><tr><td>0.0</td><td>4.2</td><td>12.5</td></tr><tr><td>25.1</td><td>24.4</td><td>24.6</td></tr></table>3 marks: award 1 mark for each correct row or column to the benefit of the candidate (3)
Mean titre = 24.5 cm^3 (1)</td><td>4</td></tr>
<tr><td>4(g)</td><td>0.00049 moles OR ecf on candidate’s mean titre</td><td>1</td></tr>
<tr><td>4(h)</td><td>0.00245 moles OR ecf (g) × 5</td><td>1</td></tr>
<tr><td>4(i)</td><td>0.0245 moles OR ecf (h) × 10</td><td>1</td></tr>
<tr><td>4(j)</td><td>1.372 g OR ecf (i) × 56</td><td>1</td></tr>
<tr><td>4(k)</td><td>95.2 to 95.3% OR ecf (j)/(a) × 100</td><td>1</td></tr>
</table>

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Question	Answer	Marks
5(a)	Transition metal / element **ion** or transition metal / element **compound** not present	**1**
5(b)	Zn^{2+} (1) Al^{3+} (1)	**2**
5(c)	M1 Add aqueous ammonia (1) M2 Zn^{2+} ions give a white ppt., soluble in excess, Al^{3+} ions give a white ppt., insoluble in excess / Zn^{2+} gives colourless solution with excess, Al^{3+} gives (white) ppt with excess (1)	**2**
5(d)	Aqueous silver nitrate / $AgNO_3$ (1) Chloride: white ppt. (1) Iodide: yellow ppt. (1)	**3**

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Question	Answer	Marks
6(a)	All correct for two marks, three correct for one mark: 32, 55, 69, 80 (2)	**2**
6(b)	All points plotted correctly (1) Straight line (1) Smooth curve (1) All extrapolations correct (1)	**4**
6(c)(i)	Potassium chlorate(V): 0.4 g	**1**
6(c)(ii)	Sodium chloride: 2.60 g	**1**
6(d)(i)	76 °C	**1**
6(d)(ii)	35 (g / 100 g of water)	**1**
6(e)	Potassium chlorate(V) – solid and liquid present / some solid dissolved / not all solid dissolved (1) Sodium chloride – colourless solution / no solid present (1)	**2**
6(f)	Increase in temperature gives increase in solubility of both salts (1) Increase in temperature increases solubility of potassium chlorate(V) more than the solubility of sodium chloride (1)	**2**

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