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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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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**

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**

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**

Question	Answer	Marks
4(a)	1.44 (g)	**1**
4(b)	Increase rate of reaction	**1**
4(c)(i)	Hydrogen	**1**
4(c)(ii)	Pops in a flame / lighted splint pops / burning splint pops	**1**
4(d)(i)	Volumetric flask / graduated flask / standard flask	**1**
4(d)(ii)	Pipette	**1**
4(e)	M1 Purple / pink (1) M2 $KMnO_4$ will be in excess / present (1)	**2**
4(f)	<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)	**4**
4(g)	0.00049 moles **OR** ecf on candidate's mean titre	**1**
4(h)	0.00245 moles **OR** ecf (g) × 5	**1**
4(i)	0.0245 moles **OR** ecf (h) × 10	**1**
4(j)	1.372 g **OR** ecf (i) × 56	**1**
4(k)	95.2 to 95.3% **OR** ecf (j)/(a) × 100	**1**

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**

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**