Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CHEMISTRY **5070/41**

Paper 4 Alternative to Practical **October/November 2016**

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.

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Question	Answer	Mark
1(a)(i)	Fractionating column	1
1(a)(ii)	Separate pentane and hexane / separate vapours / separate mixture / separate components / stop hexane reaching the condenser	1
1(a)(iii)	Condenser	1
1(b)	1 There should be no bung or cork on the conical flask / conical flask should be open (1) 2 Water in and out are the wrong way round / reversed (1)	2
1(c)	Fractional distillation	1
1(d)(i)	Flammable / inflammable (liquids or alcohols or mixture)	1
1(d)(ii)	Water bath / hot plate / electrical heater	1
1(e)	Different boiling points (1) Pentane has a lower boiling point / hexane has a higher boiling point (1)	2

Question	Answer	Mark
2(a)	Carbon / graphite / platinum	1
2(b)	Brown / orange / pink	1
2(c)	Oxygen (1) Relights a glowing splint (1)	2

Question	Answer	Mark
3	**A**	**1**

Question	Answer	Mark
4	**D**	**1**

Question	Answer	Mark
5	**B**	**1**

Question	Answer	Mark
6	One mark each for any **five** of: M1 Add (dilute) sulfuric acid to the mixture. M2 Excess sulfuric acid / heat / stir / shake / mix M3 Filter / centrifuge / decant M4 Black solid on filter paper or at the bottom or remains undissolved / blue solution M5 Carbon on filter paper or at the bottom or remains undissolved / copper sulfate solution formed M6 Wash or dry carbon	**5**

Question	Answer	Mark
7(a)	4.5(0)	**1**
7(b)	Volumetric flask	**1**
7(c)	Red / pink to yellow / orange	**1**
7(d)	29.6 46.2 33.8 0.0 17.1 4.4 29.6 29.1 29.4 (3) Mean titre = 29.5 cm^3 (1)	**4**
7(e)	0.00295	**1**
7(f)	0.00295	**1**
7(g)	0.0295	**1**
7(h)	0.1	**1**
7(i)	0.0705	**1**
7(j)	0.03525 / 0.0352 / 0.0353	**1**
7(k)	100	**1**
7(l)	3.525 / 3.52 / 3.53	**1**
7(m)	78.3 / 78.2 / 78.4	**1**

Question	Answer	Mark
8(a)	(**L**) contains ions of a transition metal or transition element / (**L**) contains a compound of a transition metal or transition element	**1**
8(b)(i)	Green precipitate (1)	**4**
8(b)(ii)	Insoluble / does not dissolve (1)	
8(b)(iii)	Gas or ammonia turns red litmus blue (1) Ammonia (1)	
8(c)(i)(ii)	Fe^{2+}	**1**
8(d)	Barium chloride / barium nitrate (1) (Dilute) hydrochloric / nitric acid (1) White precipitate (1)	**3**
8(e)	Oxidation / reaction with oxygen (1) Fe^{3+} formed (1)	**2**

Question	Answer	Mark
9(a)(i)	Exothermic	**1**
9(a)(ii)	Solid or magnesium dissolves / colourless solution formed (1) Effervescence / bubbles / fizzing (1)	**2**
9(a)(iii)	$Mg + 2HCl \rightarrow MgCl_2 + H_2$	**1**
9(b)	All points plotted correctly (to within half a small square) (1) Ruled straight line (1) Line extended to intersect the y-axis (1)	**3**
9(c)(i)	39.5 (^oC) (answer must be based on candidate's graph)	**1**
9(c)(ii)	19.5 (^oC)	**1**
9(d)(i)	210 (J)	**1**
9(d)(ii)	4095 (J)	**1**