Cambridge
O Level

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Cambridge Ordinary Level

CHEMISTRY **5070/41**

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

MARK SCHEME

Maximum Mark: 60

Published

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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

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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**

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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**

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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**

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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**

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