



**Cambridge International Examinations**  
Cambridge Ordinary Level

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**CHEMISTRY**

**5070/41**

Paper 4 Alternative to Practical

**October/November 2016**

MARK SCHEME

Maximum Mark: 60

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**Published**

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
1(a)(i)	Fractionating column	<b>1</b>
1(a)(ii)	Separate pentane and hexane / separate vapours / separate mixture / separate components / stop hexane reaching the condenser	<b>1</b>
1(a)(iii)	Condenser	<b>1</b>
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)	<b>2</b>
1(c)	Fractional distillation	<b>1</b>
1(d)(i)	Flammable / inflammable (liquids or alcohols or mixture)	<b>1</b>
1(d)(ii)	Water bath / hot plate / electrical heater	<b>1</b>
1(e)	Different boiling points (1) Pentane has a lower boiling point / hexane has a higher boiling point (1)	<b>2</b>

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

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
3	A	1

<b>Question</b>	<b>Answer</b>	<b>Mark</b>
4	D	1

<b>Question</b>	<b>Answer</b>	<b>Mark</b>
5	B	1

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

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
7(a)	4.5(0)	<b>1</b>
7(b)	Volumetric flask	<b>1</b>
7(c)	Red / pink to yellow / orange	<b>1</b>
7(d)	$\begin{array}{r} 29.6 \quad 46.2 \quad 33.8 \\ \underline{0.0} \quad \underline{17.1} \quad \underline{4.4} \\ \underline{29.6} \quad \underline{29.1} \quad \underline{29.4} \end{array} (3)$ <p>Mean titre = 29.5 cm<sup>3</sup> (1)</p>	<b>4</b>
7(e)	0.00295	<b>1</b>
7(f)	0.00295	<b>1</b>
7(g)	0.0295	<b>1</b>
7(h)	0.1	<b>1</b>
7(i)	0.0705	<b>1</b>
7(j)	0.03525 / 0.0352 / 0.0353	<b>1</b>
7(k)	100	<b>1</b>
7(l)	3.525 / 3.52 / 3.53	<b>1</b>
7(m)	78.3 / 78.2 / 78.4	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
8(a)	(L) contains ions of a transition metal or transition element / (L) contains a compound of a transition metal or transition element	<b>1</b>
8(b)(i)	Green precipitate (1)	<b>4</b>
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 <sup>2+</sup>	<b>1</b>
8(d)	Barium chloride / barium nitrate (1) (Dilute) hydrochloric / nitric acid (1) White precipitate (1)	<b>3</b>
8(e)	Oxidation / reaction with oxygen (1) Fe <sup>3+</sup> formed (1)	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
9(a)(i)	Exothermic	<b>1</b>
9(a)(ii)	Solid or magnesium dissolves / colourless solution formed (1) Effervescence / bubbles / fizzing (1)	<b>2</b>
9(a)(iii)	$\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$	<b>1</b>
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)	<b>3</b>
9(c)(i)	39.5 (°C) (answer must be based on candidate's graph)	<b>1</b>
9(c)(ii)	19.5 (°C)	<b>1</b>
9(d)(i)	210 (J)	<b>1</b>
9(d)(ii)	4095 (J)	<b>1</b>