Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

CHEMISTRY **5070/42**

Paper 4 Alternative to Practical **May/June 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.

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 / accept** 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
- 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)	M1:**Thermometer / bulb** Thermometer / bulb is too low / should be higher / should not touch the beads / should be at entrance to condenser (1) M2: **Receiver / conical flask / C** There should be no bung or cork on **C** / **C** should be open (1)	2
1(b)(i)	Fractionating column	1
1(b)(ii)	Separate components / separate mixture / separate heptane and hexane / separate liquids / stop heptane reaching condenser	1
1(b)(iii)	Condenser	1
1(b)(iv)	(To convert) vapour / gas to liquid **or** liquefy vapour / gas **or** condense vapour / gas	1
1(c)(i)	69 °C	1
1(c)(ii)	Hexane	1
1(d)	M1 Electric (heater) / water bath / hot plate / (1) M2 (components of mixture are) flammable / inflammable(1)	2

Question	Answer	Marks
2(a)	M1 (aqueous) NaOH / sodium hydroxide (solution) (1) M2 A*l* / aluminium(foil) / Devardas alloy (1) M3 Heat / warm (1) M4 Ammonia **or** **gas** turns litmus blue (1)	4
2(b)	M1 Heat (1) M2 To crystallisation point / saturation (point) (1) M3 Wash **and** dry (crystals) (1)	3
2(c)(i)	21 24 (1) (–)3 (1)	2
2(c)(ii)	Endothermic	1

Question	Answer	Marks
3(a)(i)	1.3(0) g	1
3(a)(ii)	1.62 g	1
3(a)(iii)	0.32 g	1
3(a)(iv)	M1 1.30 / 65 and 0.32 / 16 **or** 0.02 and 0.02 **or** both 1 / 50 (1) M2 ZnO (1)	2
3(b)	Hydrogen (1) Pops in a flame / lighted splint pops / burning splint pops (1)	2

Question	Answer	Marks
4	**B**	1

Question	Answer	Marks
5	**A**	1

Question	Answer	Marks
6	**C**	1

Question	Answer	Marks
7(a)	Blue to colourless	1
7(b)	28.1 30.9 47.1 0.0 3.5 19.5 28.1 27.4 27.6 (3) Mean titre 27.5 cm^3 (1)	4
7(c)	$0.0025 / 2.5 \times 10^{-3}$	1
7(d)	$0.0025 / 2.5 \times 10^{-3}$	1
7(e)	$0.0909 / 9.09 \times 10^{-2}$	1
7(f)	88	1
7(g)	M1 (M_r of COOH) = 45 **or** 12 + 16 + 16 + 1 **or** 12 + 32 + 1 (1) M2 **n** = 3 (1) M3 $C_4H_8O_2$ (1) M4 butanoic acid / methyl propanoic acid (1)	4

Question	Answer	Marks
8(a)	Colourless (solution)	1
8(b)	**(Both)** Al^{3+} or Zn^{2+} (ions present)	1
8(c)	Al^{3+} (ions confirmed)	1
8(d)	M1 (dilute) HNO_3 / nitric acid ignore acidify(1) M2 (aq) aqueous solution of $AgNO_3$ / silver nitrate (1) M3 white precipitate(1)	3
8(e)	$AlCl_3$	1

Question	Answer	Marks
9(a)	White	1
9(b)	1.3(0), 1.95, 2.6(0), 2.8(0), 2.8(0)	1
9(c)(i)	All points correct (1) (Only) two intersecting straight lines, one mark for each line (2)	3
9(d)(i)	Value as read from graph (correct to within 0.1) e.g. 3.7	1
9(d)(ii)	Value as read from graph (correct to within 0.025) e.g. 2.8	1
9(d)(iii)	Value as read from graph (correct to within 0.1) e.g. 8.6	1
9(e)	M1 $\frac{10 \times 1.2}{8.6}$ (1) **OR** (moles $BaCl_2$) = $\frac{10 \times 1.2}{1000}$ or = 0.012 (1) M2 1.395 / 1.4 (1) (mol/dm^3)	2