CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2013 series

5070 CHEMISTRY

5070/42 Paper 4 (Alternative to Practical), maximum raw mark 60

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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CAMBRIDGE
International Examinations

1 **(a)** green (1)

(b) 3.04 (g) (1)

(c) **(i)** 1.69 (g) (1)

(ii) 1.35 (g) (1)

(iii) 0.011 (moles) (1)

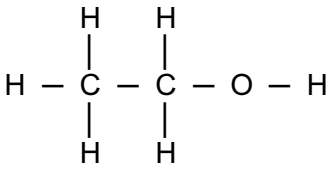
(iv) 0.075 (moles) (1)

(d) **(i)** 6.82 (g) (1)

(ii) ***x*** = 7 (1)

[Total: 8]

2 **(a)** **(i)**



(1)

(ii) ethanoic acid, and CH_3CO_2H /CH_3COOH (1)

(iii) H_2SO_4 *or* acidified *or* H^+ (1)

$K_2Cr_2O_7$ / $Cr_2O_7^{2-}$ or $KMnO_4$ / MnO_4^- (1)

orange to green or purple or pink to colourless (1)

(b) **(i)** cork added at correct position at top of fractioning column (1)

(ii) fractionating column (1)

(iii) separating liquids (1)

(iv) water in and out of condenser at correct places (1)

(c) **(i)** 141 (^oC) (1)

(ii) propanoic acid (1)

(iii) temperature rises (1)

[Total: 12]

3 a **[Total: 1]**

4 d **[Total: 1]**

5 d **[Total: 1]**

6 b **[Total: 1]**

7 c **[Total: 1]**

8 **(a)** 1.04 g (1)

(b) pink or red, to yellow (1)

(c)

25.9	48.4	32.2
0.0	23.3	6.9
25.9	25.1	25.3

1 mark for each correct line or column (3)

average volume = 25.2 (cm^3) (1)

(d) 0.00252 (moles) (1)

(e) 0.00252 (moles) (1)

(f) 0.0252 (moles) (1)

(g) 0.05 (moles) (1)

(h) 0.0248 (moles) (1)

(i) 0.0124 (moles) (1)

(j) **(i)** relative formula mass of **R** = 84 (1)

(ii) relative atomic mass of **R** = 24 (1)

(k) magnesium (1)

[Total: 15]

9 **(a)** colourless solution (1)

(b) Zn^{2+} (1) or Al^{3+} (1) ions present (2)

(c) Zn^{2+} ions present (1)

(d) aq. $AgNO_3$ (1) / HNO_3 (1) **or** $Pb(NO_3)$ (1) / HNO_3 (1) (2)

yellow ppt (1)

conclusion:
ZnI_2 (1)

[Total: 8]

10 **(a)** highest temperature / °C: 27.8, 30.6, 33.3, 34.0 (1)

rise in temperature / °C: 2.8, 5.6, 8.3, 9.0, 9.0 (1)

(b) all points plotted correctly (1)

two intersecting straight lines (1)
line passes through (0, 0) (1)

(c) **(i)** 29.2 (°C) (1)

(ii) 0.65 (g) (1)

parts **(c)(i)** and **(ii)** read from candidate's graph
± half a small square for all plotting and answers

(iii) $Zn + CuSO_4 \rightarrow Cu + ZnSO_4$ (1)

(iv) 0.65/65 = 0.01

50 x M / 1000 = 0.01 (1)

M = 0.01 x 1000/50

M = 0.2 (mol / dm^3) (1)

(d) Any two from:

Zinc/grey solid dissolves/disappears (1)

Copper/red brown/pink/orange/brown solid/deposit/precipitate (1)

Bubbles/fizzing/effervescence (1)

Solution goes from blue to colourless/goes colourless/blue colour fades/discolours (1) (2)

[Total: 12]