CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5070 CHEMISTRY

5070/41 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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1 **(a)** **C** (1)

(b) **E** (1)

(c) **B** (1)

(d) **D** (1) **[Total: 4]**

2 **(a)** **(i)** silvery/grey metal or solid (1)

(ii) white powder/solid (1)

(b) **(i)** hydrogen (1)

(ii) pops in a flame (1)

(iii) $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (1)

(c) **(i)** burn or heat magnesium in oxygen, air or steam (1)

(ii) $2Mg + O_2 \rightarrow 2MgO$

or $Mg + H_2O \rightarrow MgO + H_2$ (1) **[Total: 7]**

3 **(a)** add anhydrous copper(II) sulfate (1)

colour changes from white (1) to blue (1)

or

add anhydrous cobalt(II) chloride or cobalt chloride paper (1)

colour changes from blue (1) to pink (1)

(b) measure the boiling point (1)

boils at 100 °C (1) **[Total: 5]**

4 **(a)** pass gas through lime water; turns milky/white (1)

(b) **(i)** effervescence or fizzing ceases (1)

(ii) solid remains (1)

(c) filtration/centrifuge/decantation (1)

(d) 0.05 (1)

(e) **(i)** molar mass = 161 (1); mass = 161 × 0.05 = 8.05 g (1)

(ii) volume of CO_2 = 0.05 x 24000 = 1200 cm^3 (1) **[Total: 8]**

5 **(d)** (1) **[Total: 1]**

6 **(b)** (1) **[Total: 1]**

7 **(a)** (1) **[Total: 1]**

8 **(d)** (1) **[Total: 1]**

9 **(a)** pink to colourless (1)

(b) 27.1 48.8 34.1 1 mark for each correct row or column (3)

0.0 22.3 7.8

27.1 26.5 26.3

mean titre: 26.4 (1) cm^3

(c) 0.0025 (1)

(d) 0.0025 (1)

(e) 0.0947 (1)

(f) 74 (1)

(g) 74 – 45 = 29 : C_nH_{2n+1} = 29 (1)

n = 2 (1)

$C_2H_5CO_2H$ (1)

(h) **(i)** C_3H_7OH/propanol (1)

(ii) potassium dichromate(VI) or potassium manganate(VII) or formulae (1) **[Total**

10 **(a)** transition metal ions absent (1)

(b) **(i)** white ppt.

and

(ii) soluble in excess (1)

(c) **(i)** white ppt

and

(ii) soluble in excess (1)

(d) HNO_3 (1)/$AgNO_3$ or $Pb(NO_3)_2$ (1)/yellow ppt (1)

ZnI_2 (1)

[Total: 7]

11 **(a)** 18, 29, 38, 40 (1) all correct

(b) all points plotted correctly (1)

passing through zero (1)

two smooth curves through the points (1)

(c) **(i)** 35 (1)

(ii) 50 (1)/3 = 16.67 (1)

(iii) 0.15 mol/dm^3 (1) as 50% more hydrogen produced in 2 (1)

(d) greater slope (1) same finishing line as 1(1)

[Total: 11]