UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

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 must be read in conjunction with the question papers and the report on the examination.

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1 **(a)** pipette (1)

(b) **(i)** safety bulb or pipette filler (1)

(ii) to prevent liquid entering mouth. (1) [3]

2 **(a)** condenser (1) to return reactants to flask, etc. (1)

(b) **(i)** ethanol, C_2H_5OH (1)

(ii) potassium dichromate(VI), $K_2Cr_2O_7$ (1)
orange to green (1)
OR potassium manganate(VII), $KMnO_4$ (1)
purple to colourless (1)

(iii) electric heater, not Bunsen (1) e.g. flammable alcohol etc. (1)

(c) **(i)** ethanoic acid – orange/yellow (1)
sulfuric acid – red (1)

(ii) a gas / hydrogen is evolved (1)
speed is faster with sulfuric acid as it is a strong acid (1)
OR it is a stronger acid than ethanoic acid (1)

(d) ethyl ethanoate (1) $CH_3CO_2C_2H_5$ (1) ester (1) [14]

3 **(a)** **(i)** white ppt./solid (1)

(ii) filter precipitate (1), wash with water (1) dry the solid (1)

(b) **(i)** 0.075 (1)

(ii) 0.1 (1)

(iii) 0.075 (1)

(iv) 233 (1) × 0.075 = 17.48 g (1) [9]

4 **(b)** [1]

5 **(c)** [1]

6 **(b)** [1]

7 **(b)**

8 **(d)** [1]

9 **(a)** 2.69 (1) g

(b) yellow to orange, red, pink. (1)

(c)

25.9	48.6	32.4
0.0	23.3	7.3
25.9	25.3	25.1

1 mark for each correct row **or** column. (3)
Mean value = 25.2 (1) cm^3

(d) 0.0024 (1)

(e) 0.0048 (1)

(f) 0.048 (1)

(g) 56 (1)

(h) 56 – 17 = 39 (1) [11]

10 **(a)** colourless solution (1)

(b) white ppt (1) insoluble in excess (1)

(c) no ppt (1) **or** slight white ppt (1)

(d) aq. silver nitrate (1) / nitric acid (1) white ppt. (1) [7]

11 **(a)** Temperatures: 56, 35, 24, 15. (1) all correct
Solubilities: 50, 25 (1) both correct.

(b) all points plotted correctly (1)
Smooth curve through the points (1)
Passing through *y*-axis (1)

(c) **(i)** 18 (1) g / 100 cm^3

(ii) 62 (1) g / 100 cm^3

(d) 70 (1) g / 100 cm^3 $\rightarrow$ 44° (1)

(e) 50°C $\rightarrow$ 86 (1) g / 100 cm^3 $\rightarrow$ 150 – 86 = 64 (1) g

In all appropriate cases read the candidate's graph to the nearest half small square. [11]