UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2010 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.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 **(a)** **(i)** measuring cylinder (1)

(ii) 44 (1) cm^3

(iii) 0.0044 (1) moles

(b) **(i)** 0.005 (1) moles

(ii) $Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$ (1)
magnesium + explanation (1)

(c) **(i)** pops in a flame (1)

(ii) 0.106 dm^3 (1) [8]

2 **(a)** **(i)** final temperatures: 44, 32, 38 (2)
rise in temp: 24, 12, 18 (1)

(ii) rise in temperature or increased thermometer reading or wtte (1)

(b) **X** – butanol, **Y** – ethanol, **Z** – propanol (2)

(c) **(i)** propanol or **Z** (1)

(ii) potassium manganate / permanganate or $KMnO_4$ (1)
purple to colourless (1)
OR
sodium dichromate or $Na_2Cr_2O_7$ (1)
orange to green (1)

(d) **(i)** butanol or **X** (1)

(ii) ester (1) [11]

3 **(b)** [1]

4 **(b)** [1]

5 **(a)** [1]

6 **(b)** [1]

7 **(a)** [1]

8 **(a)** 3.12 g (1)

(b) **(i)** pink to

(ii) colourless (1)

(c)

25.2	31.1	48.3
0.0	6.8	23.8
25.2	24.3	24.5

[Mark rows or columns to the benefit of the candidate. One mark for each correct row or column.] (3)
Mean value 24.4 (1) cm^3

(d) 0.00244 (1) moles

(e) 0.00244 (1) moles

(f) 0.0244 (1) moles

(g) 0.05 (1) moles

(h) 0.0256 (1) moles

(i) 0.0256 (1) moles

(j) 122 (1)

(k) $H_5COOH = 50$: $C_n = 122 – 50 = 72$: $72/12 = 6$
correct answer together with evidence of working (2)
some correct working but incorrect answer (1)
Calculation must be based on answer **(j)** to score any marks. [15]

9 **(a)** coloured solution or compound (1) (No solids or precipitates)

(b) **(i)** blue ppt (1)

(ii) insoluble in excess (1)

(c) **(i)** blue ppt (1)

(ii) soluble in excess giving a **dark** blue solution (1)

(d) aq. NaOH (1) / A*l* foil (1) / heat (1); (No A*l* or NaOH – 0 marks for reactants but observation can score)
ammonia (1) or gas turns litmus blue (1)
(Use of nitric acid or any nitrate in test loses all 4 marks)
$Cu(NO_3)_2$ (1) [10]

10 **(a)** 0.90, 1.20, 1.50
0.80, 1.20, 1.60, 1.60 all correct (1)

(b) all points plotted correctly (1)
one straight line for experiment 1 (1)
two intersecting straight lines for experiment 2 (2)
including zero in both cases
if one or both lines do not include zero, 1 mark is lost.

(c) 1 – 34 (1) minutes
2 – 25 (1) minutes

(d) 1.40 – 1.04 (1) = 0.36 (1)

(e) 54 (1) minutes (must show evidence of extending lines and lines crossing)

(f) increase concentration, volume or
amount of aqueous silver nitrate (1) or use of a silver anode (1)

In parts **(c)**, **(d)** and **(e)** please read candidate's graph in awarding marks.
Read graphs to +/– half small square. [11]