**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

General Certificate of Education O Level

# MARK SCHEME for the November 2004 question paper

## 5070 CHEMISTRY

**5070/04** **Paper 4 (Alternative to Practical), maximum mark 60**

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UNIVERSITY of CAMBRIDGE
International Examinations

**NOVEMBER 2004**

GCE O Level

# MARK SCHEME

## MAXIMUM MARK: 60

**SYLLABUS/COMPONENT: 5070/04**

**CHEMISTRY**
**Paper 4 (Alternative to Practical)**

UNIVERSITY of CAMBRIDGE
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**1** 24(1) $cm^3$ **[1]**

**2** **(a)** **(i)** ethanol (1), $C_2H_5OH$ (1) (e.c.f. allowed or mark separately for ethanol or correct formula)

**(b)** yeast (1)

**(c)** when the thermometer showed an increase, or temperature rises above the boiling point of ethanol (1)

not no more distillate produced.

**(d)** **(i)** orange (1) to green (1) (mark separately within reason)

**(ii)** ethanoic acid (1)

**(e)** **(i)** ethyl ethanoate (1), $CH_3COOC_2H_5$ (1) no e.c.f except for an ester. Not $C_4H_8O_2$

**(ii)** esters (1) e.c.f allowed here from **(e) (i)**

(carboxylic acids not organic acids if appropriate e.c.f.) **[10]**

**3** **(a)** chromatography (1)

**(b)** line drawn below base line (1) (must be straight, using a ruler, and parallel with the base line)

**(c)** ink consists of different colours, dyes, components (1) which would be separated (1)

**(d)** X contains S and U. (1)

Y contains R, S, and T. (1) (all in each case for 1 mark)

**(e)** distance travelled by t = 4 cm

distance travelled by solvent front = 5.5 cm (both 1)

(No other values are acceptable as they are drawn exactly at 4.0 and 5.5 cm.)

$R_f$ = 4/5.5 = 0.72 or 0.73 (1) (to two d.p.) (not 0.7)

Accept any e.c.f. for $R_f$ even if >1 **[8]**

**Question 4 to 7 (a), (b), (c). 1 mark each** **[4]**

**8** **(a)** 1.55 g (1)

**(b)** to allow gas to escape (1) or to prevent pressure build up.

**(c)** red or pink or orange to yellow (1)

**(d)** 24.1 41.1 28.5 1 mark for
0.0 17.6 4.8 correct row or
24.1 23.5 23.7 column (3)

mean value = 23.6 (1) $cm^3$

**(e)** 0.00236 (1)

**(f)** 0.00236 (1)

**(g)** 0.0236 (1)

**(h)** 0.05 (1)

**(i)** 0.0264 (1)

**(j)** 0.0132 (1)

**(k)** **(i)** 100 g (1)

**(ii)** 1.32 g (1)

**(iii)** 85.2% (1) **[16]**

**9** **1** colourless solution (1) (no substances or solids.)

**2** **(a)** white ppt. (1)

**(b)** soluble in excess (1)

**3** **(a)** white ppt. (1)

**(b)** insoluble in excess (1)

**4** A*l* foil (1), aq NaOH and heat (1), $NH_3$ or

gas evolved (1), test for $NH_3$ (1).

A*l* foil (1) followed by incorrect chemistry loses the second mark and the ammonia or gas evolved mark. The test for ammonia may be scored if correct.

**or** 'Brown Ring' test:

aq. $FeSO_4$ (1), conc. $H_2SO_4$ (1), aq. and conc. (1)

brown ring (1)

Formula $Al(NO_3)_3$ (1) **[10]**

**10** **(a)** hydrogen (1)

**(b)** 18, 40, 54, 60 (2) all correct (one error 1 mark)

**(c)** all points, recorded in the table, plotted correctly (1) two smooth curves (1), any attempt to draw reasonable curves (no straight lines between points) both passing through zero (1)

**(d) (i)** 48 (1) $cm^3$

**(ii)** 2.6 (1) minutes (in both cases read candidates graph and insist **to** half a small square)

**(e) (i)** powdered (1)

25 $cm^3$ of 0.200 $mol/dm^3$ or equivalent (2 or 0)

or double the concentration and halve the volume (2)

or increase the concentration and reduce the volume to give the same number of moles (2)

(increase concentration and reduce volume worth 1) **[11]**