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

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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NOVEMBER 2004

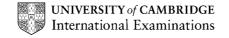
GCE O Level

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 5070/04

CHEMISTRY
Paper 4 (Alternative to Practical)



	Page 1	Mark Scheme	Syllabus	Paper			
		O LEVEL – NOVEMBER 2004	5070	4			
1	24(1) cm	3		[1]			
2		(a) (i) ethanol (1), C ₂ H ₅ OH (1) (e.c.f. allowed or mark separately for ethanol or correct formula)					
	(b) yeast	b) yeast (1)					
	` '	when the thermometer showed an increase, or temperature rises above the boiling point of ethanol (1)					
	<u>not</u> n	not no more distillate produced.					
	(d) (i) o	(d) (i) orange (1) to green (1) (mark separately within reason)					
	(ii) e	(ii) ethanoic acid (1)					
	. , . ,	thyl ethanoate (1), $CH_3COOC_2H_5$ (1) no e.c.f exeq H_8O_2	cept for an	ester. Not			
	(ii) e	sters (1) e.c.f allowed here from (e) (i)					
	(0	carboxylic acids not organic acids if appropriate e.c	c.f.)	[10]			
3	(a) chron	(a) chromatography (1)					
	(b) line drawn below base line (1) (must be straight, using a ruler, and paral with the base line)						
		(c) ink consists of different colours, dyes, components (1) which would be separated (1)					
	(d) X cor	ntains S and U. (1)					
	Y cor	ntains R, S, and T. (1) (all in each case for 1 mark)					
	(e) distar	nce travelled by t = 4 cm					
	dista	nce travelled by solvent front = 5.5 cm (both 1)					
	(No c 5.5 c	ther values are acceptable as they are drawn exac m.)	ctly at 4.0 ar	nd			
	$R_f = 4$	4/5.5 = 0.72 or 0.73 (1) (to two d.p.) (not 0.7)					
	Acce	pt any e.c.f. for R _f even if >1		[8]			
Qı	Question 4 to 7 (a), (b), (c). 1 mark each [4]						

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)

Page 2	Mark Scheme	Syllabus	Paper
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(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) cm³

- **(e)** 0.00236 (1)
- (i) 0.0264 (1)
- **(f)** 0.00236 (1)
- **(j)** 0.0132 (1)
- **(g)** 0.0236 (1)
- **(k) (i)** 100 g (1)
- (h) 0.05 (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 Al foil (1), aq NaOH and heat (1), NH₃ or

gas evolved (1), test for NH₃ (1).

Al foil (1) followed by incorrect chemistry loses the second mark <u>and</u> 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)

Page 3	Mark Scheme	Syllabus	Paper
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- (d) (i) 48 (1) cm³
 - (ii) 2.6 (1) minutes (in both cases read candidates graph and insist **to** half a small square)
- **(e) (i)** powdered (1)

25 cm³ of 0.200 mol/dm³ 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]