

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

5070 CHEMISTRY

5070/31

Paper 3 (Practical Test), maximum raw mark 40

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.

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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5070	31

1 (a) Titration [12]

Accuracy 8 marks

For the two best titres give:

4 marks for a value within 0.2 cm³ of supervisor

2 marks for a value within 0.3 cm³ of supervisor

1 mark for a value within 0.4 cm³ of supervisor

Concordance 3 marks

Give:

3 marks if all the ticked values are within 0.2 cm³

2 marks if all the ticked values are within 0.3 cm³

1 mark if all the ticked values are within 0.4 cm³

Average 1 mark

Give 1 mark if the candidate calculates a correct average (error not greater than 0.05) of all his ticked values.

Assuming a 25 cm³ pipette and a titre of 24.8 cm³.

(b) concentration of hydrogen ions in P [2]

$$= \frac{25 \times 0.1}{24.8} \text{ (1)}$$

$$= 0.101 \text{ (1)}$$

Answers should be correct to + or – 1 in the third significant figure.

(c) moles of hydrogen ions in 10000 dm³ of contaminated water [1]

$$= 0.101 \times 10000 \text{ (1)}$$

$$= 1010$$

(d) mass of calcium carbonate needed to neutralise the acid [2]

$$= 1010/2 \text{ (1)}$$

$$= 1010 \times 100 \text{ (1)}$$

$$= 50500 \text{ g}$$

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5070	31

2 R is aluminium S is potassium nitrate

Test	Notes
<p>General points For ppt allow solid, suspension, powder</p> <p>For gases Name of gas requires test to be at least partially correct. Effervesces = bubbles = gas vigorously evolved (but not just gas evolved)</p> <p>Solutions Colourless not equivalent to clear, clear not equivalent to colourless</p>	
Solution R	
Test 1 effervescence (1) pops with a lighted splint (1) hydrogen (1)	
Test 2 white ppt (1) soluble in excess (1) colourless solution (1)	
Test 3 white ppt (1) insoluble in excess (1)	
Test 4 (a) effervescence (1) pops with a lighted splint (1) hydrogen (1) (b) white ppt (1) soluble in excess (1) colourless solution (1)	
Test 5 (a) no reaction (1) (b) red/brown solid formed (1) blue colour fades (1) effervescence (1)	

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	5070	31

Test 6		
(a) liquid turns green	(1)	accept green-yellow or colourless
(b) green ppt	(1)	black/dirty green ppt
insoluble in excess	(1)	
Test 7		
turns litmus blue	(1)	
ammonia	(1)	

[20]

R is aluminium/Al (ppt must dissolve in test 2 and ppt must not dissolve in test 3) (1)

R is acting as a reducing agent (any green in test **6(a)** or green/black in test **6(b)**) (1)

S contains nitrate or NO_3^- (test 7 correct – allow alkaline gas, smell of ammonia) (1)

[3]

Note: 26 marking points, maximum 23.