UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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

5070 CHEMISTRY

5070/31 Paper 3 (Practical Test), maximum raw mark 40

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International Examinations

1 (a) Titration [12]

Accuracy 8 marks
For the two best titres give:
4 marks for a value within 0.2 cm^3 of supervisor
2 marks for a value within 0.3 cm^3 of supervisor
1 mark for a value within 0.4 cm^3 of supervisor

Concordance 3 marks
Give:
3 marks if all the ticked values are within 0.2 cm^3
2 marks if all the ticked values are within 0.3 cm^3
1 mark if all the ticked values are within 0.4 cm^3

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 cm^3 pipette and a titre of 24.8 cm^3.

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

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

= 0.101 (1)

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

(c) moles of hydrogen ions in 10000 dm^3 of contaminated water [1]

= 0.101 × 10000 (1)
= 1010

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

= 1010/2 (1)

= 1010 × 100 (1)

= 50500 g

2 **R** is aluminium **S** is potassium nitrate

Test	Notes
General points For ppt allow solid, suspension, powder For gases Name of gas requires test to be at least partially correct. Effervesces = bubbles = gas vigorously evolved (but not just gas evolved) Solutions Colourless not equivalent to clear, clear not equivalent to colourless	
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)	

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

[20]

R is aluminium/A*l* (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.