UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

5070 CHEMISTRY

5070/32 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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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1 (a) Titration

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 20.2 cm^3.

(b) concentration of hydrochloric acid in **P** [2]

$= \frac{25 \times 0.05 \times 2}{20.2}$ (1)

= 0.124 (1)

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

(c) concentration of hydrochloric acid in scale remover [1]

= 0.124 × 10 (1)

= 1.24

Answer from **(b)** × 10

(d) mass of calcium carbonate removed [1]

$= \frac{1.24 \times 100 \times 2}{2}$ (1)

= 124

Answer from **(c)** must be processed properly i.e. there must be working evident not just × 100.

2 **R** is manganese (IV) oxide, **S** is manganese(II) chloride, **T** is potassium manganate(VI)

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 gas evolved Solutions Colourless not equivalent to clear, clear not equivalent to colourless		
Solution **R**		
Test 1 effervescence relights a glowing splint oxygen	 (1) (1) (1)	
Test 2 yellow or brown liquid	 (1)	
Test 3 **(a)** filtrate is yellow **(b)** red-brown or brown precipitate insoluble in excess	 (1) (1) (1) (1)	
Test 4 **(a)** no reaction **(b)** white ppt	 (1) (1)	
Test 5 **(a)** white, yellow or brown precipitate insoluble in excess colour darkens **(b)** dark (or black) brown solid effervescence relights a glowing splint oxygen	 (1) (1) (1) (1) (1) (1) (1) (1)	this mark is awarded for noting the darkening of the colour in either **(a)** or **(b)**

Test 6 turns colourless or decolourised (1) effervescence (1)	
Test 7 **(a)** filtrate is green (1) **(b)** filtrate turns pink, red or purple (1)	

Conclusions
The anion in **S** is chloride or Cl^- (white ppt in **test 4(b)**) (1)
R is acting as an oxidising agent (**test 2** correct or **test 3(a)** yellow or **3(b)** brown) (1)
T is acting as an oxidising agent (decolourised or effervescence in **test 6**) (1)

Note: 25 marking points, maximum 24.