CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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/her ticked values. [12]

Assuming a 25.0 cm^3 pipette and a titre of 24.6 cm^3.

(b) concentration of sulfuric acid in **P**

$$= \frac{25.0 \times 0.08}{24.6 \times 2} \text{ (1)}$$

= 0.0407 (1) [2]

(c) moles of sulfuric acid that reacted with carbonate

= 0.1 – 0.0407 (1)

= 0.0593 [1]

(d) moles of carbonate that reacted with sulfuric acid

= 0.0593 (1) [1]

(e) relative atomic mass of M

$$= \frac{5.04 - 60}{0.0593} \text{ (1)}$$

= 24.9 [1]

[Total: 17]

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2 **R** is ammonium aluminium sulfate

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 **(a)** white ppt (1) **(b)** soluble in excess (1) colourless solution (1)	
Test 2 white ppt (1) soluble in excess (1) colourless solution (1)	
Test 3 gas turns litmus blue (1) ammonia (1)	to score ammonia mark there must be an indication of the gas e.g. 'smell of ammonia', 'pungent gas', 'alkaline gas', 'tested with litmus'
Test 4 white ppt (1) insoluble in excess (1)	
Test 5 turns red (1)	accept pink
Test 6 effervescence (1) turns limewater milky (1) carbon dioxide (1)	to score carbon dioxide mark there must be some indication of the limewater test e.g. 'tested with limewater',

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Test 7 effervescence (1) 'pops' with a lighted splint (1) hydrogen (1)	to score hydrogen mark there must be some indication of a test e.g. 'popped with a splint', 'tested with a burning splint'
Test 8 **(a)** white ppt (1) **(b)** remains in acid (1)	

[19]

Al^{3+} (there must be a white ppt which is soluble in Test 1 **and** insoluble in Test 4) (1)
NH_4^+ (at least 1 mark must be scored in Test 3) (1)
H^+ (Test 4 correct or effervescence in Test 6 or 7) (1)

SO_4^{2-} (Test 8 correct in both **(a)** & **(b)**) (1) [4]

[Total: 23]

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