CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

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.

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 20.2 cm^3.

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

$= \frac{25.0 \times 0.0640}{20.2}$ (1)

$= 0.0792$ (1) [2]

(c) moles of hydrochloric acid that reacted with oxide

$= 0.2 - 0.0792$ (1)

$= 0.121$ [1]

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(d) moles of oxide that reacted with hydrochloric acid

= 0.121/2 (1)

= 0.0605 [1]

(e) relative atomic mass of M

= $\frac{3.36}{0.0605}$ - 16 (1)

= 39.5 [1]

[Total: 17]

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2 **R** is ammonium chloride **S** is iron(II) 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 For solutions Colourless not equivalent to clear, clear not equivalent to colourless		
Test 1 solid sublimes or process described	(1)	
Test 2 gas turns litmus blue ammonia	(1) (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 3 white ppt	(1)	
Test 4 ppt remains	(1)	
Test 5 ppt dissolves colourless solution	(1) (1)	

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Test 6 green ppt (1) insoluble in excess (1) ppt (at the surface) goes brown (1)	
Test 7 **(a)** yellow solution formed (1) **(b)** bubbles relights a glowing splint (1) oxygen (1) red-brown ppt (1) insoluble in excess (1)	to score oxygen mark there must be some indication of the correct test e.g. 'tested with a glowing splint' accept brown
Test 8 **(a)** white ppt (1) **(b)** ppt remains (1)	
Test 9 decolourised or turns colourless (1)	accept yellow or green

[19]

The formulae of two ions in **R** are Cl^- (Tests 3 and 4 must be correct) [1]

NH_4^+ (at least 1 mark must be scored in Test 2) [1]

The formulae of two ions in **S** are SO_4^{2-} (Test 8 correct in both **(a)** and **(b)**) [1]

Fe^{2+} (green ppt in Test 6) [1]

[Total: 23]

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