CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 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]

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Assuming a 25.0 cm^3 pipette and a titre of 25.2 cm^3,

(b) moles of sulfuric acid present in average volume of **Q**

$$= \frac{25.2 \times 0.1}{1000}$$

= 0.00252 [1]

(c) moles of sodium carbonate in **P**

$$= \frac{25.0 \times 0.02}{1000}$$

= 0.0005 [1]

(d) moles of sulfuric acid reacting with sodium carbonate

= 0.0005 [1]

(e) moles of sulfuric acid reacting with sodium hydroxide

= 0.00252 – 0.0005

= 0.00202 [1]

(f) concentration of sodium hydroxide in **P**

$$= \frac{0.00202 \times 2 \times 1000}{25.0}$$

= 0.162 mol/dm^3 [1]

[Total: 17]

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2 **R** is hydrochloric acid; **S** is sodium sulfite.

Observations		Notes
General points For ppt/precipitate 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		
white ppt	(1)	
Test 2		
insoluble in acid	(1)	
Test 3		
ppt disappears	(1)	
colourless solution	(1)	
Test 4		
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'
solid disappears	(1)	
Test 5		
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'
solid disappears	(1)	

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Test 6 turns colourless/decolourised (1)	
Test 8 **(a)** white ppt (1) **(b)** ppt disappears (1) colourless solution (1)	
Test 9 **(a)** white ppt (1) **(b)** ppt disappears (1) **(c)** coloured solid (1)	if ppt remains in **(b)** allow mark in **(c)** providing the solid is not white
Test 10 **(a)** red solution (1)	allow brown or orange or any mixture of these three colours
(b) turns yellow (1)	allow green or green–yellow or yellow–green
(c) green or black ppt (1)	do not allow any reference to brown e.g. black–brown
insoluble in excess (1)	

A cation present in **R** is hydrogen/H^+ (bubbles or gas tested in test 4 or 5). [1]

An anion present in **R** is chloride/Cl^- (tests 1 and 2 white ppt remains in acid). [1]

If cation and anion identifications are both correct but inverted allow 1 mark.

S is acting as a reducing agent/reductant.
(in test 6 decolourised or green/black ppt in test 10) [1]

Any 23 out of the 26 scoring points

[Total: 23]

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