CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 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.

Cambridge will not enter into discussions about these mark schemes.

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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) moles of sodium hydroxide in 25 cm^3 of **Q**

$$= \frac{25 \times 0.527}{1000}$$

$$= 0.0132$$ [1]

(c) moles of hydrochloric acid reacting with 25 cm^3 of **Q**

$$= 0.0132$$ [1]

(d) moles of hydrochloric acid in 110 cm^3 of **P**

$$= \frac{0.0132 \times 110}{20.2}$$

$$= 0.0719$$ [1]

(e) moles of hydrochloric acid in 100 cm^3 1 mol / dm^3 acid

$$= \frac{100 \times 1}{1000}$$

$$= 0.1$$ [1]

(f) moles of hydrochloric acid that reacted with magnesium hydroxide

= 0.1 – 0.0719

= 0.0281 [1]

(g) concentration in g / dm^3 of magnesium hydroxide = $\frac{0.0281}{2} \times 58 \times \frac{1000}{10}$ g

= 78.7 g

If the answer from **(f)** undergoes **any one** of the following processes, score 1 mark
If answer from **(f)** undergoes **all** of the following processes, score 2 marks

(f) / 2 mole of magnesium hydroxide reacting

(f) × 58 mass of magnesium hydroxide

(f) × 1000 / 10 mole in 1 dm^3

[2]

[Total: 19]

2 **R** is dilute sulfuric acid; **S** is copper(II) oxide

Test		Notes
General points For precipitate/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) ppt remains	(1)	
Test **2**		
(a) bubbles	(1)	
'pops' with a lighted splint	(1)	
hydrogen	(1)	to score hydrogen mark there must be some indication of a test e.g. 'gas pops' (with a splint), 'test with lighted splint'
solid disappears	(1)	
(b) white ppt	(1)	
insoluble in excess	(1)	
Test **3**		
blue solution	(1)	
Test **4**		
blue ppt	(1)	
soluble in excess	(1)	
dark / deep blue solution	(1)	

Test **5** **(a)** (solution / liquid) turns yellow / brown (1) ppt (1) **(b)** decolourised (1) solid (remains) (1)	
Test **6** **(a)** no reaction / few bubbles / solid insoluble (1) **(b)** bubbles (1) relights a glowing splint (1) oxygen (1)	to score oxygen mark there must be some indication of a test e.g. 'tested with a glowing splint', 'relights a (burning) splint'

Any 19 out of 20 points to score. [19]

R contains sulfuric acid / hydrogen sulfate / H_2SO_4 (dependent on white ppt insoluble in acid in test **1 and** bubbling in test 2) (1)

Cation in **S** is copper(II) / Cu^{2+} (dependent on blue in test 3 **or** blue ppt / deep blue solution in test **4**) (1)

[2]

[Total: 21]