

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

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1 (a) Titration

Accuracy 8 marks

For the two best titres give:

4 marks for a value within 0.2 cm³ of supervisor

2 marks for a value within 0.3 cm³ of supervisor

1 mark for a value within 0.4 cm³ of supervisor

Concordance 3 marks

Give:

3 marks if all the ticked values are within 0.2 cm³

2 marks if all the ticked values are within 0.3 cm³

1 mark if all the ticked values are within 0.4 cm³

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 cm³ pipette and a titre of 20.2 cm³.

(b) moles of sodium hydroxide in 25 cm³ of **Q**

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

$$= 0.0132$$

[1]

(c) moles of hydrochloric acid reacting with 25 cm³ of **Q**

$$= 0.0132$$

[1]

(d) moles of hydrochloric acid in 110 cm³ of **P**

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

$$= 0.0719$$

[1]

(e) moles of hydrochloric acid in 100 cm³ 1 mol/dm³ acid

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

$$= 0.1$$

[1]

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

$$= 0.1 - 0.0719$$

$$= 0.0281$$

[1]

(g) concentration in g/dm³ of magnesium hydroxide = $\frac{0.0281}{2} \times 58 \times \frac{1000}{10}$ g

$$= 78.7 \text{ g}$$

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 dm³

[2]

[Total: 19]

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

Test	Notes
<p>General points For precipitate/ppt allow solid, suspension, powder</p> <p>For gases Name of gas requires test to be at least partially correct Effervesces = bubbles = gas vigorously evolved but not gas evolved</p> <p>Solutions Colourless not equivalent to clear, clear not equivalent to colourless</p>	
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)	

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

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]