

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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MARK SCHEME for the October/November 2012 series

5070 CHEMISTRY

5070/31

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) concentration of hydrochloric acid in P

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

$$= 0.0792 \quad (1) \quad [2]$$

(c) moles of hydrochloric acid that reacted with oxide

$$= 0.2 - 0.0792 \quad (1)$$

$$= 0.121 \quad [1]$$

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(d) moles of oxide that reacted with hydrochloric acid

$$= 0.121/2 \quad (1)$$

$$= 0.0605 \quad [1]$$

(e) relative atomic mass of M

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

$$= 39.5 \quad [1]$$

[Total: 17]

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2 R is ammonium chloride S is iron(II) sulfate

Test	Notes
<p>General points For 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>For solutions Colourless not equivalent to clear, clear not equivalent to colourless</p>	
<p>Test 1</p> <p>solid sublimes or process described (1)</p>	
<p>Test 2</p> <p>gas turns litmus blue (1)</p> <p>ammonia (1)</p>	<p>to score ammonia mark there must be an indication of the gas e.g. 'smell of ammonia', 'pungent gas', 'alkaline gas', 'tested with litmus'</p>
<p>Test 3</p> <p>white ppt (1)</p>	
<p>Test 4</p> <p>ppt remains (1)</p>	
<p>Test 5</p> <p>ppt dissolves (1)</p> <p>colourless solution (1)</p>	

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

[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]