

**MARK SCHEME for the May/June 2011 question paper  
for the guidance of teachers**

**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.

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**1 (a) Titration** [12]

Accuracy            8 marks

For the two best titres give:

4 marks for a value within 0.2 cm<sup>3</sup> of Supervisor

2 marks for a value within 0.3 cm<sup>3</sup> of Supervisor

1 mark for a value within 0.4 cm<sup>3</sup> of Supervisor

Concordance      3 marks

Give:

3 marks if all the ticked values are within 0.2 cm<sup>3</sup>

2 marks if all the ticked values are within 0.3 cm<sup>3</sup>

1 mark if all the ticked values are within 0.4 cm<sup>3</sup>

Average            1 mark

Give 1 mark if the candidate calculates a correct average (error not greater than 0.05) of all the ticked values.

Assuming a 25 cm<sup>3</sup> pipette and a titre of 24.8 cm<sup>3</sup>:

**(b) concentration of iodine in P** [2]

$$= \frac{24.8 \times 0.1}{2 \times 25} \quad (1)$$

$$= 0.0496 \text{ mol/dm}^3 \quad (1)$$

Answers should be correct to + or – 1 in the third significant figure.

**(c) mass of iodine in 1 dm<sup>3</sup> of P** [1]

$$= 0.0496 \times 254$$

$$= 12.6 \text{ g}$$

**(d) amount of iodine present in seaweed** [1]

$$= 12.6 \times 1000000 / 15000$$

$$= 840 \text{ ppm}$$

**[Total: 16]**

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2 R is hydrochloric acid S is sodium hydroxide

<b>Test</b>	<b>Notes</b>
<p><b>General points</b>            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>Solutions            Colourless not equivalent to clear, clear not equivalent to colourless</p>	
<b>Solution R</b>	
<p><b>Test 1</b></p> <p>effervescence (1)            gas turns limewater milky (1)            carbon dioxide (1)            solid disappears (1)</p>	
<p><b>Test 2</b></p> <p>(a) white ppt (1)</p> <p>(b) soluble in excess (1)            colourless solution (1)</p>	
<p><b>Test 3</b></p> <p>(a) effervescence (1)            gas pops with a lighted splint (1)            hydrogen (1)            liquid gets hot (1)            solid disappears (1)</p> <p>(b) white ppt (1)            insoluble in excess (1)</p>	
<p><b>Test 4</b></p> <p>white ppt (1)            soluble in excess (1)            colourless solution (1)</p>	
<p><b>Test 5</b></p> <p>(a) green ppt (1)            soluble in excess (1)            green solution (1)</p> <p>(b) green ppt (1)            soluble in excess (1)            green solution (1)</p>	

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<b>Test 6</b>	
gas turns damp litmus blue	(1)
ammonia	(1)

### Conclusions

Cation in **R** is hydrogen (indication of gas in test **1** or **3(a)**) (1)

Anion in **R** is chloride (white ppt in test **2(a)**) (1)

Anion in **S** is hydroxide (ammonia in test **6** or ppt in test **3(b), 4** or **5**) (1) [3]

**Note:** 28 marking points, maximum 24.

**[Total: 24]**