

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**MARK SCHEME for the May/June 2012 question paper
for the guidance of teachers**

5070 CHEMISTRY

5070/31

Paper 3 (Practical Test), maximum raw mark 40

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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 cm³ of Supervisor2 marks for a value within 0.3 cm³ of Supervisor1 mark for a value within 0.4 cm³ of SupervisorConcordance 3 marks

Give:

3 marks if all the ticked values are within 0.2 cm³2 marks if all the ticked values are within 0.3 cm³1 mark if all the ticked values are within 0.4 cm³Average 1 mark

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

Assuming a 25 cm³ pipette and a titre of 24.8 cm³.

(b) concentration of ethanedioic acid in **P**

[2]

$$= \frac{25.0 \times 0.15}{24.8 \times 2} (1)$$

$$= 0.0756 (1)$$

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

(c) concentration of ethanedioic acid in **P** in g/dm³

[1]

$$= 0.0756 \times 90 (1)$$

$$= 6.80$$

(d) mass of water in g

[1]

$$= 9.45 - 6.80 (1)$$

$$= 2.65$$

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(e) the value of **x** [2]

$$\text{mole H}_2\text{O} = \frac{2.65}{18}$$

$$= 0.147$$

$$\mathbf{x} = \frac{0.147}{0.0756}$$

$$= 1.94 \text{ or } 2$$

Shows the working to obtain value of **x** (1)

The value of **x**

i.e. the correct arithmetical answer or the nearest whole number (1)

[Total: 18]

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2 **R** is potassium iodide **S** is hydrogen peroxide

Test	Notes
General points For 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) yellow ppt (1) (b) insoluble in acid (1)	accept pale yellow
Test 2 red/brown solution (1)	
Test 3 (a) turns brown (1) solid formed (1) (b) turns green (1) solid disappears (1)	accept black

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Test 4		
(a) yellow/red/brown solution	(1)	
(b) black solid	(1)	allow dark brown solid
Test 5		
(a) yellow solution	(1)	allow brown
(b) red-brown ppt	(1)	
insoluble in excess	(1)	
bubbles	(1)	
gas relights a glowing splint	(1)	
oxygen	(1)	
Test 6		
purple colour lost	(1)	turns colourless/decolourised
bubbles	(1)	
oxygen	(1)	
Test 7		
(a) no reaction	(1)	
(b) bubbles	(1)	
oxygen	(1)	
liquid turns blue	(1)	

Conclusions

The anion in **R** is iodide or I^- (in Test 1 yellow ppt remains in acid) (1)

S is acting as an oxidising agent (in Test 5 yellow solution or red-brown ppt) (1)

S is acting as a reducing agent (in Test 6 indication purple colour lost) (1)

Note: 25 marking points, maximum 22.

[Total: 22]