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

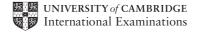
Paper 3 (Practical Test), maximum raw mark 40

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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 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 ticked values.

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

(b) concentration of ethanedioic acid in P

[2]

$$=\frac{25.0\times0.15}{24.8\times2}$$
 (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]

mole
$$H_2O = \frac{2.65}{18}$$

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

Shows the working to obtain value of \mathbf{x} (1)

= 1.94 or 2

The value of ${\bf x}$

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	
For ppt	General points For ppt Allow solid, suspension, powder		
Name o	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)	accept pale yellow	
(b)	insoluble in acid (1)		
Test 2			
red/brov	vn solution (1)		
Test 3	Test 3		
(a)	turns brown (1)	accept black	
	solid formed (1)		
(b)	turns green (1)		
	solid disappears (1)		

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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 c	olour 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 \mathbf{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]