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 cm^3 of Supervisor
2 marks for a value within 0.3 cm^3 of Supervisor
1 mark for a value within 0.4 cm^3 of Supervisor

Concordance 3 marks

Give:
3 marks if all the ticked values are within 0.2 cm^3
2 marks if all the ticked values are within 0.3 cm^3
1 mark if all the ticked values are within 0.4 cm^3

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 cm^3 pipette and a titre of 24.8 cm^3.

(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/dm^3 [1]

= 0.0756 × 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 $H_2O = \frac{2.65}{18}$

$= 0.147$

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

$= 1.94$ 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)	accept pale yellow
(b) insoluble in acid		(1)	
Test 2			
red/brown solution		(1)	
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 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]

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