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

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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International Examinations

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

(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]

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)	

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]