CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

1 **(a)** Titration

    <u>Accuracy</u>   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

    <u>Concordance</u>   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 $0.4\,cm^3$

    <u>Average</u>   1 mark

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

                                                                        [12]

Calculations
Assuming a $25.0\,cm^3$ pipette and a titre of $25.2\,cm^3$.

(b) concentration of iodine in **P**

    $= \dfrac{25.2 \times 0.1}{2 \times 25}$ (1)

    $= 0.0504$ (1)   [2]

(c) mole of oxygen

    $= \dfrac{0.0504}{2}$

    $= 0.0252$ (1)   [1]

(d) percentage by volume of oxygen

    volume of oxygen $=$ $0.0252 \times 24\,dm^3$

                                       $=$ $0.605\,dm^3$ (1)

    percentage by volume of oxygen $=$ $\dfrac{0.605 \times 100}{3}$

                                       $=$ 20.2 (1)   [2]

                                                         [Total: 17]

2   **R** is sodium hydroxide; **S** is copper(II) chloride

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.	
Test 1 **(a)** turns red (1) **(b)** turns yellow (1) [2]	accept orange
Test 2 white ppt (1) ppt disappears in excess of **R** (1) colourless solution (1) [3]	
Test 3 effervescence (1) gas pops with a lighted splint (1) hydrogen (1) all or some of metal disappears (1) [4]	to score hydrogen mark there must be some indication of a test e.g. 'popped with a splint', 'tested with a burning splint'
Test 4 **(a)** white ppt (1) **(b)** insoluble in acid (1) [2]	

Test 5 blue ppt (1) ppt soluble in excess ammonia (1) deep blue solution (1) [3]		
Test 6 effervescence (1) gas relights a glowing splint (1) oxygen (1) liquid turns black-brown (1) ppt formed (1) on standing deep blue solution formed (1) [6]	to score oxygen mark there must be some indication of a test e.g. 'tested with a glowing splint', 'relights a splint'	

[20]

Conclusions

Anion in **R** is OH$^-$ (test 1 colour change of indicator or test 2 white ppt soluble in excess) (1)

Cation in **S** is Cu^{2+} (test 5 blue ppt or deep blue solution in excess) (1)

Anion in **S** is Cl^- (test 4 white ppt which does not dissolve in nitric acid) (1)

Note: if correct name of any ion(s) given instead of formula, deduct one mark (therefore max 2 marks for conclusions.)

[3]

[Total: 23]