#### **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.

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## 1 (a) Titration

Accuracy 8 marks

For the two best titres give:

4 marks for a value within 0.2 cm<sup>3</sup> of supervisor

2 marks for a value within 0.3 cm<sup>3</sup> of supervisor

1 mark for a value within 0.4 cm<sup>3</sup> of supervisor

Concordance 3 marks

Give:

3 marks if all the ticked values are within 0.2 cm<sup>3</sup>

2 marks if all the ticked values are within 0.3 cm<sup>3</sup>

1 mark if all the ticked values are within 0.4 cm<sup>3</sup>

Average 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<sup>3</sup> pipette and a titre of 25.2 cm<sup>3</sup>.

(b) concentration of iodine in P

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

(c) mole of oxygen

$$=\frac{0.0504}{2}$$

(d) percentage by volume of oxygen

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

$$= 0.605 \,\mathrm{dm}^3 \,(1)$$

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

[Total: 17]

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# 2 $\mathbf{R}$ is sodium hydroxide; $\mathbf{S}$ 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	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)		to score hydrogen mark there must be	
all or some of metal disappears	(1)	[4]	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]		

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

### Conclusions

Anion in **R** is OH<sup>-</sup> (test 1 colour change of indicator or test 2 white ppt soluble in excess) (1)

Cation in **S** is Cu<sup>2+</sup> (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]

[20]

[Total: 23]