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

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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^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 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]

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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 **(b)** turns yellow	 (1) (1)	 [2]	 accept orange
Test 2 white ppt ppt disappears in excess of **R** colourless solution	 (1) (1) (1)	 [3]	
Test 3 effervescence gas pops with a lighted splint hydrogen all or some of metal disappears	 (1) (1) (1) (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 **(b)** insoluble in acid	 (1) (1)	 [2]	

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Test 5 blue ppt ppt soluble in excess ammonia deep blue solution	 (1) (1) (1)	 [3]	
Test 6 effervescence gas relights a glowing splint oxygen liquid turns black-brown ppt formed on standing deep blue solution formed	 (1) (1) (1) (1) (1) (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]

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