

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 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 cm³ of supervisor

2 marks for a value within 0.3 cm³ of supervisor

1 mark for a value within 0.4 cm³ of supervisor

Concordance 3 marks

Give:

3 marks if all the ticked values are within 0.2 cm³

2 marks if all the ticked values are within 0.3 cm³

1 mark if all the ticked values are within 0.4 cm³

Average 1 mark

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

[12]

Calculations

Assuming a 25.0 cm³ pipette and a titre of 20.2 cm³.

(b) moles of sodium hydroxide in 25.0 cm³ of **P**

$$= \frac{25.0 \times 0.0984}{1000}$$

$$= 0.00246$$

[1]

(c) concentration, in mol/dm³, of H₃PO₃ in **Q**

$$= \frac{5.04}{82}$$

$$= 0.0615$$

[1]

(d) moles of H₃PO₃ in average titre of **Q**

$$= \frac{20.2 \times 0.0615}{1000}$$

$$= 0.00124$$

[1]

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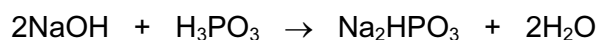
(e) moles of sodium hydroxide which react with 1 mole of H_3PO_3

$$= \frac{0.00246}{0.00124}$$

$$= 1.98$$

[1]

(f) balanced equation for the reaction



whole numbers consistent with answer in (e) on left hand side of equation (1)

correct formulae for products and balancing of the equation (1)

[2]

[Total: 18]

2 R is ammonia S is iron(II) sulfate

Test	Notes
<p>General points For ppt allow solid, suspension, powder</p> <p>For gases Name of gas requires test to be at least partially correct. Effervesces = bubbles = gas vigorously evolved, but not gas evolved.</p> <p>Solutions Colourless not equivalent to clear, clear not equivalent to colourless.</p>	
<p>1</p> <p>gas turns damp red litmus blue (1)</p> <p>ammonia (1)</p>	<p>to score ammonia mark there must be some indication of a test, i.e. smell of ammonia, alkaline gas, tested with litmus</p>
<p>2</p> <p>white ppt (1)</p> <p>soluble in excess (1)</p> <p>colourless solution (1)</p>	

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Test	Notes
3 (a) white ppt (1) (b) solid disappears (1) colourless solution (1)	
4 (a) no reaction (1) (b) bubbles (1) gas relights a glowing splint (1) oxygen (1) blue solution (1)	to score oxygen mark there must be some indication of a test, e.g. 'tested with a glowing splint', 'relights a splint'
5 (a) white ppt (1) (b) solid remains (1)	
6 green ppt (1) insoluble in excess (1) turns brown at surface (1)	

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Test	Notes
7	
(a) filtrate is yellow (1)	
(b) red-brown ppt (1)	
insoluble in excess (1)	

Any 20 of the 21 scoring points

[20]

Conclusions

R is ammonia/ NH_3 or ammonium hydroxide/ NH_4OH
(ammonia identified in test 1)

(1)

S is iron(II) sulfate/ FeSO_4
(in test 4 white ppt insoluble in acid and in test 6 green ppt)

(1)

[2]

[Total: 22]