## **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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5070	31

#### 1 (a) Titration

8 marks Accuracy

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>

1 mark Average

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 cm<sup>3</sup> pipette and a titre of 20.2 cm<sup>3</sup>.

**(b)** moles of sodium hydroxide in 25.0 cm<sup>3</sup> of **P** 

$$=\frac{25.0\times0.0984}{1000}$$

(c) concentration, in mol/dm<sup>3</sup>, of H<sub>3</sub>PO<sub>3</sub> in Q

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

(d) moles of H<sub>3</sub>PO<sub>3</sub> in average titre of Q

$$=\frac{20.2\times0.0615}{1000}$$

Page 3	Mark Scheme		Paper
	Cambridge O Level – May/June 2015		31

(e) moles of sodium hydroxide which react with 1 mole of H<sub>3</sub>PO<sub>3</sub>

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

(f) balanced equation for the reaction

$$2NaOH + H_3PO_3 \rightarrow Na_2HPO_3 + 2H_2O$$

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	
Foi	General points For ppt allow solid, suspension, powder			
Na	For gases Name of gas requires test to be at least partially correct. Effervesces = bubbles = gas vigorously evolved, but not gas evolved.			
	lutions lourless not equivalent to clear, cle	ar not equiva	alent to colourless.	
1				
	gas turns damp red litmus blue	(1)		
	ammonia	(1)	to score ammonia mark there must be some indication of a test, i.e. smell of ammonia, alkaline gas, tested with litmus	
2				
	white ppt	(1)		
	soluble in excess	(1)		
	colourless solution	(1)		

Page 4	Mark Scheme		Paper
	Cambridge O Level – May/June 2015		31

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)	to score oxygen mark there must be some indication of a test, e.g. 'tested with a glowing splint', 'relights a splint'
	blue solution	(1)	
5			
(a)	white ppt	(1)	
(b)	solid remains	(1)	
6			
	green ppt	(1)	
	insoluble in excess	(1)	
	turns brown at surface	(1)	

Page 5	Mark Scheme		Paper
	Cambridge O Level – May/June 2015		31

Tes	st		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<sub>3</sub> or ammonium hydroxide/NH<sub>4</sub>OH (ammonia identified in test 1)

(1)

(1)

S is iron(II) sulfate/FeSO<sub>4</sub>

(in test 4 white ppt insoluble in acid and in test 6 green ppt)

[2]

[Total: 22]