Cambridge
O Level

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Cambridge Ordinary Level

CHEMISTRY **5070/31**

Paper 3 Practical Test **May/June 2017**

MARK SCHEME

Maximum Mark: 40

Published

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Question	Answer	Marks
1(a)	**Titration** **Measurements (1)** Both readings (initial and final) are present for each titration, readings are recorded to 1dp, no reading is in excess of 50.0 and no initial reading is given as 50.0. **Titres (1)** All the titres are calculated correctly i.e. no subtraction errors. **Accuracy (6)** For each of the two best titres give: 3 marks for a titre within 0.2 cm^3 of the Supervisor's value. 2 marks for a titre within 0.3 cm^3 of the Supervisor's value. 1 mark for a titre within 0.4 cm^3 of the Supervisor's value. **Concordance (3)** Give 3 marks if all the ticked values are within 0.2 cm^3. Give 2 marks if all the ticked values are within 0.3 cm^3. Give 1 mark if all the ticked values are within 0.4 cm^3. **Average (1)** Give 1 mark if the candidate calculates a correct average of selected titres.	**12**
1(b)	Assuming a pipette of 25 cm^3 and the average volume of **Q** used = 20.3 cm^3 Moles of sodium thiosulfate = (20.3 × 0.0230) / 1000 = 0.000467	**1**
1(c)	Moles of iodine = **(b)** / 2 = 0.000467 / 2 = 0.000234	**1**
1(d)	Moles of iodine in 250 cm^3 of **P** = **(c)** × 250 / volume of **P** used = 0.000234 × 250 / 25 = 0.00234	**1**

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Question	Answer	Marks
1(e)	Moles of chlorine in 50 cm^3 of chlorine water = **(d)** = 0.00234	**1**
1(f)	Mass, in g, of chlorine in 1 dm^3 of chlorine water = **(e)** × 71 × 1000 / 50 = 0.00234 × 71 (1) × 1000 / 50 (1) = 3.32	**2**
Question 2 General points **R** is ammonium chromium(III) sulfate **S** is iron(III) chloride For gases: to gain credit for the name of the gas produced, the test must be at least partially correct. Solutions: colourless is not equivalent to clear and clear is not equivalent to colourless No credit is given for conclusions based upon incorrect observations.		
2(a) (test 1)	(a) White ppt (1) (b) Insoluble (1)	**18**
2(a) (test 2)	Green ppt (1) Insoluble in excess (1)	
2(a) (test 3)	(a) Green ppt (1) Soluble in excess (1) Green solution (1) (b) Gas turns damp red litmus paper blue (1) Ammonia (1)	
2(a) (test 4)	(a) White ppt (1) (b) Ppt remains (1)	
2(a) (test 5)	Red-brown ppt (1) Insoluble in excess (1)	

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Question	Answer	Marks
2(a) (test 6)	(a) Yellow colour fades / turns colourless (1) (b) Liquid turns green / black (1) Ppt (1)	
2(a) (test 7)	(a) Red–brown solution (1) (b) Liquid turns black-blue (1)	
2(b)	**Conclusions** **R** contains: ammonium / NH_4^+ (1) dependent on a mark being awarded in test 3(b) chromium(III) / Cr^{3+} (1) dependent on insoluble green ppt in test 2 and soluble in test 3 sulfate / SO_4^{2-} (1) dependent on white ppt insoluble in acid in test 1 The oxidising agent in **S** is iron(III) / Fe^{3+} (1)	**4**