Cambridge
O Level

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Cambridge Ordinary Level

CHEMISTRY **5070/31**

Paper 3 Practical Test **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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Question	Answer	Marks	Guidance
1(a)	**Titration** **Measurements (1)** Both readings, i.e. initial and final are present for each titration and readings are recorded to 1dp. **Titres (1)** All the titres are calculated correctly, i.e. no subtraction errors **Accuracy (6)** For 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 marks if all the ticked values are within 0.4 cm^3. **Average (1)** Give 1 mark for calculating the correct average of selected titres.	**12**	**Reject** final readings in excess of 50 **Reject** initial readings of 50 Accuracy marks are awarded using the candidate's correct values. Concordance marks are awarded using the uncorrected titres.
1(b)	Assuming a pipette volume of 25 cm^3 and the average volume of **P** used = 19.8 cm^3: Mole of iron(II) sulfate in the average volume $= (25.0 \times 0.0800) / 1000$ $= 0.002$	**1**	
1(c)	Answer from (b) / 5 $= 0.002 / 5$ $= 0.0004$	**1**	

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Question	Answer	Marks	Guidance
1(d)	Answer from (c) × 250/average volume of **P** = 0.0004 × 250 / 19.8 = 0.00505	**1**	
1(e)	Answer from (d) × 55 = 0.00505 × 55 = 0.278 g	**1**	
1(f)	Answer from (e) × 100/2.12 = 0.278 × 100 / 2.12 = 13.1%	**1**	

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Question	Answer	Marks	Guidance
Question 2 General points **R** is nitric acid **S** is calcium carbonate For ppt: **accept** solid / suspension / powder but **ignore** substance / particles / deposit / residue / sediment / gelatinous / insoluble **Ignore** cloudy / milky / white / gelatinous solution for ppt forms but **accept** cloudy / milky / white / gelatinous solution for ppt remains **Ignore** solution / ppt turns colourless for ppt dissolves but **accept** clears for ppt dissolves For gases: to gain credit for the name of the gas produced, the test must be at least partially correct. For the evolution of a gas in a liquid accept the observation effervescence / bubbles / fizz / gas vigorously evolved but **ignore** gas evolved. Solutions: colourless is **not** equivalent to clear and clear is **not** equivalent to colourless Marks awarded for conclusions are dependent on correct evidence.			
2 (test 1)	(a) solution turns red or pink (1) (b) solution turns blue (1)	**19**	
2 (test 2)	gas turns damp red litmus blue (1) ammonia (1)		To score ammonia mark there must be an indication of a test, i.e. a smell of ammonia, alkaline gas, tested with litmus.
2 (test 3)	(a) solution turns yellow (1) (b) red-brown ppt (1) insoluble in excess (1)		
2 (test 4)	bubbles (1) gas pops with a lighted splint (1) hydrogen (1) piece of metal disappears or dissolves (1)		To score hydrogen mark there must be an indication of a test, i.e. pops (with a splint)
2 (test 5)	bubbles (1) gas turns limewater milky (1) carbon dioxide (1) solid disappears or dissolves (allow to score 1 if mark missed in test 4)		To score carbon dioxide mark there must be an indication of a test, i.e. tested with limewater.

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Question	Answer	Marks	Guidance
2 (test 6)	white ppt (1) insoluble in excess (1)		
2 (test 7)	no reaction (1)		**Accept** very slight white ppt
2 (test 8)	gas turns damp red litmus blue (1) ammonia (1) **Allow** the test and identification of carbon dioxide marks if not awarded in test 5		To score ammonia mark there must be an indication of a test – see test 2.
Conclusions	Cation in **R** is H^+ (1) Anion in **R** is NO_3^- (1) Cation in **S** is Ca^{2+} (1) Anion in **S** is CO_3^{2-} (1)	**4**	Evidence: Test 1(a) red or pink with litmus Test 2 alkaline gas / ammonia In test 6 white ppt remains and in 7 no reaction Carbon dioxide identified in test 5 or 8

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