Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CHEMISTRY **5070/31**

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

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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**	

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**	

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.

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