
CHEMISTRY

5070/32

Paper 3 Practical Test

October/November 2016

MARK SCHEME

Maximum Mark: 40

Published

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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)	<p>Titration</p> <p>Measurements (1) Both readings i.e. initial and final are present for each titration and readings are recorded to 1dp.</p> <p>Titres (1) All the titres are calculated correctly i.e. no subtraction errors.</p> <p>Accuracy (6) For the two best titres give: 3 marks for a titre within 0.2 cm³ of the Supervisor's value. 2 marks for a titre within 0.3 cm³ of the Supervisor's value. 1 mark for a titre within 0.4 cm³ of the Supervisor's value.</p> <p>Concordance (3) Give 3 marks if all the ticked values are within 0.2 cm³. Give 2 marks if all the ticked values are within 0.3 cm³. Give 1 marks if all the ticked values are within 0.4 cm³.</p> <p>Average (1) Give 1 mark for calculating the correct average of selected titres.</p>	12	<p>Reject final readings in excess of 50.0 Reject initial readings of 50</p> <p>Accuracy marks are awarded using the candidate's correct values.</p> <p>Concordance marks are awarded using the uncorrected titres.</p>
1(b)	<p>Assuming a pipette volume of 25 cm³ and the average volume of Q used = 24.8 cm³:</p> <p>Mole of potassium manganate(VII) in the average volume = $(24.8 \times 0.0200) / 1000$ = 0.000496</p>	1	
1(c)	<p>Answer from (b) $\times 5$ = 0.000496×5 = 0.00248</p>	1	

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Question	Answer	Marks	Guidance
1(d)	$\begin{aligned} &\text{Answer from (c)} \times 500 / 25 \text{ (or 20)} \\ &= 0.00248 \times 500 / 25 \\ &= 0.0496 \end{aligned}$	1	
1(e)	$\begin{aligned} &\text{Answer from (d)} \times 56 \\ &= 0.0496 \times 56 \\ &= 2.78 \text{ g} \end{aligned}$	1	
1(f)	$\begin{aligned} &\text{Answer from (e)} \times 100 / 3.12 \\ &= 2.78 \times 100 / 3.12 \\ &= 89.1\% \end{aligned}$	1	

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Question	Answer	Mark	Guidance
<p>Question 2 General points</p> <p>R is nitric acid S is zinc carbonate</p> <p>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</p> <p>Marks awarded for conclusions are dependent on correct evidence.</p>			
2(test 1)	(a) solution turns red (1) (b) solution turns yellow (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. smell of ammonia, alkaline gas, tested with litmus
2(test 3)	(a) solution turns yellow (1) (b) solution turns blue or black (1)		
2(test 4)	solid disappears or dissolves (1) solution turns blue (1)		
2(test 5)	bubbles (1) gas turns limewater milky (1) carbon dioxide (1) Allow solid disappears or dissolves to score 1 if mark not awarded 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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2(test 6)	white ppt (1) soluble in excess (1) colourless solution (1)		
2(test 7)	white ppt (1) soluble in excess (1) colourless solution (1)		
2(test 8)	gas turns damp red litmus blue (1) ammonia (1) Allow the marks for the test and identification of carbon dioxide 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 Zn ²⁺ (1) Anion in S is CO ₃ ²⁻ (1)	4	Evidence: Test 1(a) red with methyl orange Test 2 alkaline gas/ammonia In both tests 6 & 7 white ppt which dissolves Carbon dioxide identified in test 5 or test 8