Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

CHEMISTRY **5070/31**

Paper 3 Practical Test **May/June 2019**

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.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)	**Titration** **Measurements (1)** Both readings i.e. initial and final are present for each titration and the readings are recorded to 1dp. **Titres (1)** All the titres are calculated correctly i.e. no subtraction errors and all recorded in the correct row i.e. volume of **Q** used **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. No marks for a titre more than 0.4 cm^3 from 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 if the candidate calculates a correct average of selected titres.	**12**
1(b)	Pipette volume = 25 cm^3 and the average volume of **Q** used = 20.2 cm^3 Moles of potassium manganate(VII) in the average volume = (20.2 × 0.0192) / 1000 = 0.000388	**1**
1(c)	Answer from **(b)** × 5 / 2 = 0.000388 × 5 / 2 = 0.000970	**1**
1(d)	Answer from **(c)** × 1000 / 25 (or 40) = 0.000970 × 1000 / 25 = 0.0388	**1**

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Question	Answer	Marks
1(e)	Answer from **(d)** × 126 = 0.0388 × 126 = 4.88 g	**1**
1(f)	The volume of acid added simply needs to be enough to ensure the solution is acidic/acidified. OWTTE.	**1**

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Question	Answer	Marks
General points **R** is zinc sulfate **S** is manganese(II) chloride 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 No credit is given for conclusions based upon incorrect observations.		
2	**R (test 1)** (a) white ppt (1) (b) soluble in excess (1) colourless solution (1)	**21**
	R (test 2) (a) white ppt (1) (b) soluble in excess (1) colourless solution (1) (c) no reaction (1)	
	R (test 3) (a) no reaction (1) (b) white ppt (1) (c) no reaction (1)	
	S (test 1) (a) off-white / cream / yellow/brown ppt (1) (b) insoluble in excess (1)	

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Question	Answer	Marks
2	**S (test 2)** (a) off-white / cream / yellow / brown ppt (1) (b) insoluble in excess (1) (c) bubbles (1) gas relights a glowing splint (1) oxygen (1) (darker) brown/black **solid** (1)	
	S (test 3) (a) no reaction (1) (b) no reaction (1) (c) white ppt (1)	
	Conclusions R is zinc sulfate / $ZnSO_4$ (1) The anion in S is chloride/Cl^- (1)	**2**

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