Cambridge Assessment International Education
Cambridge Ordinary Level

CHEMISTRY **5070/31**

Paper 3 Practical Test **October/November 2017**

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.

Cambridge International is publishing the mark schemes for the October/November 2017
series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

This document consists of **4** printed pages.

Question	Answer	Marks
1(a)	**Titration** **Measurements (1)** Both readings i.e. initial and final are present for each titration, readings are recorded to 1 dp, 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 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 if the candidate calculates a correct average of selected titres	**12**
1(b)	Pipette volume $25\,cm^3$ and assuming average volume of **P** used = $25.3\,cm^3$ Concentration of nitric acid in **P** in mol/dm^3 = $(25.0 \cdot 0.153 \cdot 2)/25.3$ (1) = 0.302 (1)	**2**

1(c)	Moles of nitric acid in $10\,cm^3$ of concentrated acid = **(b)** / 2 (1)
	      = 0.302 / 2
	      = 0.151
		1

1(d)	Concentration of concentrated nitric acid in mol/dm^3 = **(c)** $\cdot$ 100 (1)
	      = 0.151 $\cdot$ 100
	      = 15.1
		1

1(e)	Mass of nitric acid in $1\,dm^3$ of concentrated nitric acid in g = **(d)** $\cdot$ 63 (1)
	      = 15.1 $\cdot$ 63
	      = 951
		1

Question	Answer	Marks
General points **R** is zinc sulfate **S** is iron(II) sulfate 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 **R** (test 1)	(a) white ppt (1) (b) (ppt) dissolves / soluble (in excess) (1) colourless solution (1)	**21**
2 **R** (test 2)	(a) white ppt (1) (b) (ppt) dissolves / soluble (in excess) (1) colourless solution (1) (c) no reaction (1)	
2 **R** (test 3)	(a) no reaction (1) (b) white ppt (1) (c) no reaction (1)	
2 **S** (test 1)	(a) green ppt (1) (b) insoluble in excess (1)	

2
S (test 2)
	(a) green ppt (1)
	(b) insoluble in excess (1)
	(c) bubbles (1)
	    gas relights a glowing splint (1)
	    oxygen (1)
	    red/brown (solid) (1)	

2 **S** (test 3)	(a) no reaction (1) (b) white ppt (1) (c) no reaction (1)	

Question	Answer	Marks
Conclusions	**R** is zinc sulfate / $ZnSO_4$ / Zn^{2+} $SO4^{2-}$ (1) Evidence: Tests 1 and 2 white ppt which dissolves in excess and Test 3 correct in (a), (b) and (c) **S** is iron(II) sulfate / $FeSO_4$ / Fe^{2+} $SO4^{2-}$ (1) Evidence:Tests 1 and 2 green ppt insoluble in excess and Test 3 correct in (a), (b) and (c)	**2**