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**CHEMISTRY**

**5070/31**

Paper 3 Practical Test

**May/June 2016**

MARK SCHEME

Maximum Mark: 40

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**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
1(a)	<p><b>Titration Measurements (1)</b> Both readings i.e. initial and final are present for each titration and readings are recorded to 1dp.</p> <p><b>Titres (1)</b> All the titres are calculated correctly i.e. no subtraction errors</p> <p><b>Accuracy (6)</b> For each of the two best titres give: 3 marks for a titre within 0.2 cm<sup>3</sup> of the Supervisor's value. 2 marks for a titre within 0.3 cm<sup>3</sup> of the Supervisor's value. 1 mark for a titre within 0.4 cm<sup>3</sup> of the Supervisor's value. No marks for a titre more than 0.4 cm<sup>3</sup> from the Supervisor's value.</p> <p><b>Concordance (3)</b> Give 3 marks if all the ticked values are within 0.2 cm<sup>3</sup>. Give 2 marks if all the ticked values are within 0.3 cm<sup>3</sup>. Give 1 marks if all the ticked values are within 0.4 cm<sup>3</sup>.</p> <p><b>Average (1)</b> Give 1 mark if the candidate calculates a correct average.</p>	12
1(b)	<p>Assuming a pipette volume of 25 cm<sup>3</sup> and the average volume of <b>Q</b> used = 25.3 cm<sup>3</sup> Concentration of sodium carbonate = <math>(25.3 \times 0.100) / 2 \times 25.0</math> (1) = 0.0506 mol/dm<sup>3</sup> (1)</p>	2
1(c)	<p>Answer from <b>(b)</b> <math>\times 106</math> <math>0.0506 \times 106</math> = 5.36 g/dm<sup>3</sup></p>	1
1(d)	<p>7.85 – answer from <b>(c)</b> 7.85 – 5.36 = 2.49 g</p>	1
1(e)	<p>Value of x Mole of hydrogen peroxide = answer from <b>(d)</b> / 34 (1) <math>2.49 / 34 = 0.0732</math> Mole of hydrogen peroxide/mole of sodium carbonate (1) <math>0.0732 / 0.0506 = 1.45</math></p>	2

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
<b>Question 2 General points</b>	<p><b>R</b> is sodium sulfite</p> <p><b>S</b> is potassium manganate(VII)</p> <p>For ppt: accept solid/suspension/powder but ignore substance/particles/deposit/residue/sediment/gelatinous/insoluble</p> <p>Ignore cloudy/milky/white/gelatinous solution for ppt forms</p> <p>Ignore solution/ppt turns colourless for ppt dissolves but accept clears for ppt dissolves</p> <p>For gases: to gain credit for the name of the gas produced, the test must be at least partially correct.</p> <p>For the evolution of a gas in a liquid accept the observation effervescence/bubbles/fizz/gas vigorously evolved but ignore gas evolved.</p> <p>Solutions: colourless is not equivalent to clear and clear is not equivalent to colourless</p> <p>No credit is given for conclusions based upon incorrect observations.</p>	

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2	<p><b>Test 1</b> turns colourless/decolourised (1)</p> <p><b>Test 2</b> (a) white ppt (1) (b) ppt disappears (1)</p> <p><b>Test 4</b> (a) white ppt (1) (b) ppt disappears (1)</p> <p><b>Test 5</b> (a) solution turns red (1) (b) solution turns yellow (1) (c) green ppt (1) insoluble in excess (1)</p> <p><b>Test 6</b> turns colourless/decolourised (1)</p> <p><b>Test 7</b> bubbles (1) relights a glowing splint (1) oxygen (1) brown ppt (1)</p> <p><b>Test 8</b> (a) solution turns yellow/red/brown (1) (b) solution turns blue/black (1) (c) solution turns colourless (1)</p> <p><b>Test 9</b> solution turns green (1) then brown (1) solid forms (1)</p>	20

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2	<b>Conclusions</b> <b>R</b> is acting as a reducing agent (1) dependent on correct observation in test <b>1</b> or test <b>5 (c)</b> <b>S</b> is acting as an oxidising agent (1) dependent on an indication of iodine in test <b>8</b>	<b>2</b>