UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

5070 CHEMISTRY

5070/03 Paper 3 (Practical Test), maximum raw mark 40

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 must be read in conjunction with the question papers and the report on the examination.

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1 **(a)** Titration

Accuracy 8 marks

For the two best titres give:
4 marks for a value within 0.2 cm^3 of supervisor
2 marks for a value within 0.3 cm^3 of supervisor
1 mark for a value within 0.4 cm^3 of supervisor

Concordance 3 marks

Give:
3 marks if all the ticked values are within 0.2 cm^3
2 marks if all the ticked values are within 0.3 cm^3
1 mark if all the ticked values are within 0.4 cm^3

Average 1 mark

Give 1 mark if the candidate calculates a correct average (error not greater than 0.05) of all his ticked value. [12]

Assuming a 25 cm^3 pipette and a titre of 24.6 cm^3.

(b) moles of hydrogen ions in 1.00 dm^3 of P

$$= \frac{25.0 \times 0.1}{24.6} \quad (1)$$

= 0.102 (correct to 0.001) (1)

(c) moles of hydrogen ions in 150 of cm^3 vinegar.

= 0.102 (1)

Give 1 mark for the same answer as in **(b)**

(d) mass of ethanoic acid present in 150 of cm^3 vinegar.

= 0.102 × 60

= 6.12 g (1)

Give 1 mark for the result of multiplying the answer in **(c)** by 60.

(e) percentage by mass of ethanoic acid in vinegar.

$$= \frac{6.12 \times 100}{150}$$

= 4.08 % (1)

Give 1 mark for the result of multiplying the answer in **(d)** by 100 and dividing by 150. [5]

2 **R** is magnesium sulfate **S** is sodium hydrogencarbonate

Test	Notes
General points For ppt allow solid, suspension, powder For gases Name of gas requires test to be at least partially correct. Effervesces = bubbles = gas vigorously evolved (but not just gas evolved) Solutions Colourless not equivalent to clear, clear not equivalent to colourless	
Test 1 **2 marks** White ppt (1) Insoluble in excess (1)	 Ppt must be white Any indication ppt dissolves 0
Test 2 **2 marks** White ppt (1) Insoluble in excess (1)	 Ppt must be white Any indication ppt dissolves 0
Test 3 **2 marks** No reaction (1) No reaction (1)	
Test 4 **2 marks** No reaction (1) White ppt (1)	 Ppt must be white
Test 5 **3 marks** Effervesces (1) Gas turns limewater milky (1) Carbon dioxide (1)	

Test 6 **4 marks** Condensation (1) Gas turns limewater milky (1) Effervesces (1) Gas turns limewater milky (1)	 Accept carbon dioxide on its own if correctly tested for and identified in any other test. Accept carbon dioxide on its own if correctly tested for and identified in any other test.
Test 7 **3 marks** Effervesces (1) Gas turns limewater milky (1) Blue ppt (1)	 Accept carbon dioxide on its own if correctly tested for and identified in any other test. Accept all shades of blue e.g. light, pale, and blue-green
Test 8 **2 marks** Gas turns litmus blue (1) Ammonia (1)	 Allow ammonia mark if an indication of gas e.g. smell of ammonia, test gas with litmus.
Test 9 **4 marks** (a) Colourless solution/no reaction (1) (b) White ppt (1) Effervesces (1) Gas turns lime water turns milky (1)	 Accept carbon dioxide on its own if correctly tested for and identified in any other test.

R is sulphate or SO_4^{2-} (must be a white ppt in test 4) (1)
S contains carbon and oxygen (identification of CO_2 in an appropriate test) (1)

Note 26 marking points, maximum 23.