UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

5070 CHEMISTRY

5070/32 Paper 3 (Practical Test), maximum raw mark 40

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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 the ticked values. [12]

Assuming a 25 cm^3 pipette and a titre of 24.8 cm^3.

(b) moles of sodium hydroxide in 25 cm^3 of **P**

$= \frac{25 \times 0.3}{1000}$

= 0.0075 [1]

(c) concentration in mol/dm^3 of organic acid in **Q**

$= \frac{18.0}{120}$

= 0.15 [1]

(d) moles of organic acid in average titre of **Q**

$= \frac{24.8 \times 0.15}{1000}$

= 0.00372

Answers should be correct to + or – 1 in the third significant figure. [1]

(e) moles of sodium hydroxide which react with 1 mole of $C_3H_4O_5$

$= \frac{0.0075}{0.00372}$

= 2.02 [1]

(f) balanced equation for the reaction

$2NaOH + C_3H_4O_5 = C_3H_2O_5Na_2 + 2H_2O$

left hand side of equation i.e. whole numbers consistent with **(e)** (1)

right hand side of equation i.e. correct formulae and overall equation balanced (1) [2]

2 **R** is sodium carbonate **S** is potassium iodide **T** is potassium chromate(VI)

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	
Solution **R**	
Test 1 **4 marks** **(a)** Effervescence (1) Gas turns limewater milky (1) Carbon dioxide (1) **(b)** No reaction (1)	Alternatively marks for test on gas and identification can be awarded in **Test 2(b)** or **3(c)**.
Test 2 **3 marks** **(a)** Brown ppt (1) **(b)** Ppt disappears (1) Colourless solution (1)	Accept cream or yellow but not white. Alternatively this mark can be awarded in **Test 3(b)**.
Test 3 **2 marks** **(a)** White ppt (1) **(b)** Ppt disappears (1)	

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	
Solution **S**	
Test 1 **2 marks** **(a)** No reaction (1) **(b)** Solution turns red/brown or black solid formed (1)	
Test 2 **2 marks** **(a)** Yellow ppt (1) **(b)** Ppt remains (1)	
Test 3 **1 mark** No reaction (1)	Any indication of reaction in either **(a)** or **(b)** scores 0.

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	
Solution **T**	
Test 1 **6 marks** **(a)** Orange solution (1) **(b)** Blue solution (1) Effervescence (1) Gas relights a glowing splint (1) Oxygen (1) Green solution (1)	
Test 2 **3 marks** **(a)** Red or brown ppt (1) **(b)** Ppt disappears (1) Yellow or orange solution (1)	Alternatively this mark can be awarded in **Test 3(b)**.
Test 3 **2 marks** **(a)** Yellow ppt (1) **(b)** Ppt disappears (1)	

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R is CO_3^{2-} (carbon dioxide identified in test 1) (1)
S is I^- (test 1 correct or insoluble yellow ppt in test 2) (1)
T contains a transition metal (1) [3]

Note: 25 marking points, maximum 22.