# UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

# MARK SCHEME for the October/November 2007 question paper

# **5070 CHEMISTRY**

5070/03

Paper 3 (Practical Test), maximum raw mark 40

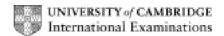
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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2007	5070	03

## 1 (a) Titration

## Accuracy 10 marks

For the two best titres give:

5 marks for a value within 0.2 cm³ of supervisor 3 marks for a value within 0.3 cm³ of supervisor 2 marks for a value within 0.4 cm³ of supervisor 1 mark for a value within 0.5 cm³ of supervisor

### Concordance 3 marks

#### Give:

3 marks if all the ticked values are within 0.2 cm<sup>3</sup> 2 marks if all the ticked values are within 0.3 cm<sup>3</sup> 1 mark if all the ticked values are within 0.4 cm<sup>3</sup>

#### Average 1 mark

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

[14]

Page 3	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2007	5070	03

# **(b)** Assuming a 25 cm<sup>3</sup> pipette and a titre of 24.6 cm<sup>3</sup>

Concentration of hydrochloric acid, in mol/dm<sup>3</sup>

conc = 
$$\frac{25.0 \times 0.1}{24.6}$$
 (1)  
= 0.102 (correct to 0.001) (1) [2]

## (c)(d) R + P

Effervesces (bubbles etc) (1)

Turns limewater milky etc. (1)

Carbon dioxide evolved (1)

Colourless or clear solution remains or partially soluble or some dissolves (1)

ZnCO<sub>3</sub> circled or indicated (1) Carbon dioxide named or tested for (with limewater) or effervesces etc.

[5]

Page 4	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2007	5070	03

# Question 2

**S** is  $Cu(NH_3)_4SO_4$  [23]

Test	Notes
General points	•
For ppt	
allow solid, suspension, powder	
For gases	
Name of gas requires test to be at least partially of	correct.
Effervesces = bubbles = gas vigorously evolved (	but not just gas evolved)
Solutions	
Colourless not equivalent to clear, clear not equiv	alent to colourless
Test 1	
4 marks	
Blue ppt (1)	Allow shades of blue here and elsewhere. Allow
	blue/green here but not elsewhere (for ppts)
Turns black (1)	Allow brown, no need to link to solid, allow brown 'stain'
	etc.
Gas turns litmus blue (1)	Allow turns litmus blue (without gas) if ammonia
	mentioned, fumes with HC1
Ammonia (1)	
Test 2	
4 marks	
Blue ppt (2)	Give one mark for ppt of whatever colour.
	Mixed coloured (white ppt + blue ppt) do not score the
	colour mark here or in Test 3
Soluble in acid (1)	
Blue solution (1)	Allow green but not colourless
	Allow paler blue solution even if ppt remains
Test 3	
4 marks	
White pat (2)	Cive and moult for any of whatever as laws
White ppt (2)	Give one mark for ppt of whatever colour.
Inaclubic in acid (1)	
Insoluble in acid (1)	
Solution becomes colourless (4)	Allow pole blue but not blue upless solution series is
Solution becomes colourless (1)	Allow pale blue but not blue unless solution earlier is dark blue
or paler	uaik blue

Page 5	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2007	5070	03

Test 4 9 marks	
No initial reaction with KI (1)	Allow slight colour change but not (turns) blue
+ acid	Any implication of a reaction effervesces loses this mark
White ppt (2)	Give one mark for a ppt of any colour. Give the colour of ppt mark for anything than is paler/yellower than brown. Ignore the order in which the colours appear and mixed colours. Not orange for colour of ppt
Yellow or brown solution (1)	Both colour and solution required if ppt mentioned but turns yellow/brown (1) if nothing else in part (b), allow orange for solution
+ thiosulphate	
White ppt (1)	Allow pale pink, pale lilac for white
Solution is now colourless (1)	
Ppt dissolves(1)	Forms a colourless solution (2)
Colourless solution (1)	
White ppt reforms (1)	Allow any pale colour ppt or even turns cloudy/milky or white solution at this stage i.e. after the earlier white ppt has dissolved
Conclusion 2 marks	
Allow any two of	
Cu <sup>2+</sup> or copper(II) (1)	
SO <sub>4</sub> <sup>2-</sup> or sulphate (1)	Ppt of any colour in Test 3
NH₄ <sup>†</sup> or ammonium (1)	Ammonia named or tested for in Test 1