

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**NOVEMBER 2001**

**ADVANCED SUBSIDIARY LEVEL**

**MARK SCHEME**

**MAXIMUM MARK : 25**

**SYLLABUS/COMPONENT : 8701/3**

**CHEMISTRY  
(Extended)**



Page 1 of 3	Mark Scheme	Syllabus	Paper
	AS Level Examinations – June 2001	8701	3

N.B. Boxed references within this marking scheme relate to the accompanying booklet of Standing Instructions

### 1 (a) Titration Table

#### Titration table

Give **two marks** if:

all final burette readings are to 2 decimal places,  
 at least two recorded volumes of **FC 2** added are within 0.10 cm<sup>3</sup>,  
 there is no error in subtraction in the table and an appropriate average has been calculated (a tick on a single titre is acceptable).

Deduct one mark for each error in the above (no negative marks).

**2**

Use (g) to calculate the Candidate's average, if this is necessary
--

#### Accuracy

See section (g).
------------------

Assign accuracy marks by comparing the candidate's average titre (corrected as necessary) with the

Supervisor's value.

Apply spread penalty as shown below

Accuracy marks		Spread Penalty	
Mark	Difference from Supervisor / cm <sup>3</sup>	Range used / cm <sup>3</sup>	Deduction
8	up to 0.10	0.20+ to 0.25	1
7	0.10+ to 0.15	0.25+ to 0.30	2
6	0.15+ to 0.20	0.30+ to 0.40	3
5	0.20+ to 0.30	0.40+ to 0.50	4
4	0.30+ to 0.40	0.50+ to 0.60	5
3	0.40+ to 0.60	0.60+ to 0.80	6
2	0.60+ to 0.80	0.80+ to 1.00	7
1	0.80+ to 1.00	Greater than 1.00	8
0	Greater than 1.00		

**8**

#### Suspect Supervisor Values

Adopt procedure (ii) in (h) for any suspect Supervisor results
--

<b>If there is not an obvious value from the Candidates' results, use 23.40 as the Standard Value. Report your action to Team Leader on the Centre Accuracy Return.</b>
---

In all calculations, ignore evaluation errors if working is shown
---

- (b) Give **one mark** for  $\frac{\text{Titre}}{1000} \times 0.125$  1
- (c) Give **one mark** for  $\text{Answer to (b)} \times 0.5$  1
- (d) Give **one mark** for  $\text{Answer to (c)} \times \frac{1000}{25}$  or  $\frac{\text{Titre} \times 0.125}{25.0 \times X} = \frac{2}{1}$  1
- (e) Give **one mark** for  $\text{Answer to (d)} \times 106.0$  1
- (f) Give **one mark** for  $16.75 - \text{Answer to (e)}$  1

**Total for Question 1 15**

<b>Page 3 of 3</b>	<b>Mark Scheme</b>	<b>Syllabus Paper</b>
	<b>AS Level Examinations – June 2001</b>	<b>8701 3</b>

2 **FC 5** is a solution containing  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{NO}_3^-$

<i>Test</i>	<i>Observations [5]</i>	<i>Deductions [4]</i>	
(a) To 2 cm depth of <b>FC 3</b> in a test-tube, add dilute nitric acid.	No reaction No colour change No precipitate No gas evolved <b>one mark</b>	Not $\text{CO}_3^{2-}$ , $\text{SO}_3^{2-}$ or $\text{NO}_2^-$ <b>one mark</b> <i>This deduction can only be made from no reaction or no gas (evolved)</i>  (No $\text{CrO}_4^{2-}$ is wrong – colour)	<b>2</b>
(b) To 2 cm depth of <b>FC 3</b> in a boiling-tube, add aqueous sodium hydroxide.  Warm the solution.	White precipitate Soluble in excess <i>(from both observations)</i> <b>one mark</b>  No ammonia <b>or</b> no positive test for ammonia described) <b>one mark</b>	$\text{Al}^{3+}$ , $\text{Pb}^{2+}$ or $\text{Zn}^{2+}$ <b>one mark</b> <i>(from both observations)</i>  No $\text{NH}_4^+$ <b>one mark</b> <i>Allow this deduction from no gas (evolved) or gas having no effect on litmus paper</i>	<b>4</b>
(c) Cool the solution remaining from test (b), add aluminium foil and cautiously warm again.	Ammonia <b>one mark</b>  Test for ammonia described <b>one mark</b>	$\text{NO}_3^-$ or $\text{NO}_2^-$ <b>one mark</b>	<b>3</b>
(d) To 2 cm depth of <b>FC 3</b> in a test-tube, add aqueous potassium iodide.	Yellow precipitate <b>one mark</b>	$\text{Pb}^{2+}$ <b>one mark</b>	<b>2</b>
(e) To 2 cm depth of <b>FC 3</b> in a boiling-tube, add dilute aqueous ammonia until in excess.  Filter the mixture and then add dilute nitric acid drop by drop to neutralise the solution and then in excess.	White precipitate. <b>one mark</b>  White precipitate.  Soluble or partially soluble (excess). <b>one mark</b> <i>(from both observations)</i>	<i>Ignore any ions from white precipitate</i>  $\text{Zn}^{2+}$ <b>one mark</b>	<b>3</b>

Give **one mark** if all three ions are correctly identified in the summary:

**Summary**      **FC 3** contains the cations       $\text{Pb}^{2+}$  and  $\text{Zn}^{2+}$   
and the anion       $\text{NO}_3^-$       **1**

**Total of 15 scoring points**

If the mark is in excess of **10** cross through the mark and record **10 max**.

**Total for Question 2 is 10 and for the Paper 25.**