

NOVEMBER 2001

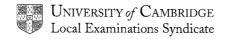
ADVANCED SUBSIDIARY LEVEL

MARK SCHEME

MAXIMUM MARK: 25

SYLLABUS/COMPONENT: 8701/3

CHEMISTRY (Extended)





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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 cm³, 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).

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		
Mark	Difference from Supervisor / cm ³		
8	up to 0.10		
7	0.10+ to 0.15		
6	0.15+ to 0.20		
5	0.20+ to 0.30		
4	0.30+ to 0.40		
3	0.40+ to 0.60		
2	0.60+ to 0.80		
1	0.80+ to 1.00		
0	Greater than 1.00		

Spread Penalty		
Range used / cm ³	Deduction	
0.20+ to 0.25	1	
0.25+ to 0.30	2	
0.30+ to 0.40	3	
0.40+ to 0.50	4	
0.50+ to 0.60	5	
0.60+ to 0.80	6	
0.80+ to 1.00	7	
Greater than 1.00	8	

8

Suspect Supervisor Values

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

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.



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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	Answer to (b) x 0.5	1
(d)	Give one mark for	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	Answer to (d) x 106.0	1
(f)	Give one mark for	16.75 - Answer to (e)	1

Total for Question 1 15



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2 FC 5 is a solution containing Pb²⁺, Zn²⁺, NO₃⁻

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

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

Summary FC 3 contains the cations Pb^{2+} and Zn^{2+} and the anion NO_3^-

Total of 15 scoring points

1

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.

