OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

Advanced Subsidiary GCE

F333

CHEMISTRY B (SALTERS)

Unit F333: Chemistry in Practice:
Skill II: Measurement

Specimen Task

For use from September 2008 to June 2009.

All items required by teachers and candidates for this task are included in this pack.

INFORMATION FOR CANDIDATES

- Chemistry in Practice: Skill II: Measurement Task.

INFORMATION FOR TEACHERS

- Mark scheme.
- Instructions for Teachers and Technicians.

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CHEMISTRY B (SALTERS)

Unit F333: Chemistry in Practice:
Skill II: Measurement

Specimen Task

For use from September 2008 to June 2009.

Candidates answer on this task sheet.

INSTRUCTIONS TO CANDIDATES

- Answer **all** parts of the task.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each part of the task.
- The total number of marks for this task is **12.**

ADVICE TO CANDIDATES

- Read each part carefully and make sure you know what you have to do before starting your answer.

FOR TEACHER'S USE		
Qu	**Max.**	**Mark = Assessment Mark**
TOTAL	**12**	

This task consists of **5** printed pages and **1** blank page.

  [Turn Over

Assessment of Skill II (Measurement)

Background

Natural gas and crude oil often contain unwanted sulfur compounds which must be removed before they are used as fuels or chemical feedstock. The sulfur compounds are converted to sulfuric(VI) acid which is sold as a useful by-product. You are given a sample of the acid solution, thought to have a concentration between 0.05 and 0.15 mol dm^{-3}, and asked to find out its accurate concentration.

Introduction

You are provided with a solution of sodium carbonate with a concentration of 0.10 mol dm^{-3}, a methyl orange indicator and access to laboratory glassware and equipment. The following method describes what you should do in general terms but you are expected to carry out the method in ways which are safe and are likely to ensure that your results are as precise and reliable as possible.

Two chemicals are supplied.

• Sulfuric acid solution	Irritant	
• Sodium carbonate solution	Irritant	

1 Set up a burette and fill it with the sulfuric acid solution.

2 Use a pipette filler and pipette to transfer 25 cm^3 of the sodium carbonate solution to a 250 cm^3 conical flask.

3 Add three drops of methyl orange indicator solution to the conical flask. Add the sulfuric acid solution from the burette until the indicator changes colour, this will allow you to find an approximate value for the volume of sulfuric acid needed to react with the sodium carbonate solution. Record your result in a suitable table. **[1]**

4 Repeat your titration a number of times until you feel that you have achieved results that will allow you to find the accurate concentration of the sulfuric acid solution. Record all results in your table. **[9]**

Calculate, showing your working, an average titre that you could use to calculate the concentration of the sulfuric acid solution. **[2]**

Total [12]

Candidate results and working

END OF TASK

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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

CHEMISTRY B (SALTERS) F333

Unit F333: Chemistry in Practice: Skill II (Measurement)

Specimen Mark Scheme + Instructions for Teachers and Technicians

The maximum mark for this task is **12**.

For use from September 2008 to June 2009.

It is expected that this Task can be completed in about 1 hour.

Students should have acquired the necessary practical skills and theoretical background before attempting this task.

Candidates may attempt more than one Measurement task with the best mark from this type of task being used to make up the overall mark for Unit F333.

Preparing candidates

At the start of the task the candidates should be given the task sheet.

Candidates must work on the task individually under controlled conditions with the completed task being submitted to the teacher at the end of the lesson. Completed tasks should be kept under secure conditions until results are issued by OCR.

Candidates should not be given the opportunity to redraft their work. If a teacher feels that a candidate has under-performed, the candidate may be given an **alternative** task. Candidates are permitted to take each task **once** only.

Assessing the candidate's work

The mark scheme supplied with this pack should be used to determine a candidate's mark out of a total of 12 marks. The cover sheet for the task contains a grid for ease of recording marks. To aid moderators, teachers should mark work using red ink, including any appropriate annotations to support the award of marks.

Notes to assist teachers with this task

Teachers must trial the task before candidates are given it, to ensure that the apparatus, materials, chemicals etc provided by the centre are appropriate.

Health and Safety

Attention is drawn to Appendix J of the Chemistry B (Salters) specification.

Answer	Max Mark
Table is drawn up showing initial and final burette readings and titres	[1]
All burette readings recorded to (choose **one** from the following):	
1 decimal place	[1]
2 decimal places	[2]
All data has appropriate units	[1]
Average titre is correctly calculated	[1]
Working for calculation of average titre is clearly shown	[1]
All accurate titres are within 0.3 cm^3 of each other	[1]
Average titre is within (choose **one** from the following):	
0.1 cm^3 of the supervisor titre	[5]
0.2 cm^3 of the supervisor titre	[4]
0.3 cm^3 of the supervisor titre	[3]
0.4 cm^3 of the supervisor titre	[2]
0.5 cm^3 of the supervisor titre	[1]
Total	**[12]**

Technicians' list

Students must not be told any information about these materials apart from what is given on the task sheets.

Materials

Candidates should be provided with:

- A candidate worksheet for Assessment Activity F333.1.skill II (Measurement)
- A 0.1 mol dm^{-3} solution of sulfuric acid labelled 'sulfuric acid, concentration between 0.05 and 0.15 mol dm^{-3}'. Allow each candidate 150 cm^3
- A 0.10 mol dm^{-3} solution of sodium carbonate labelled 'sodium carbonate, 0.10 mol dm^{-3}'. Allow each candidate 150 cm^3
- Dropping bottles of methyl orange indicator
- A burette and stand
- A 25 cm^3 pipette
- A pipette filler
- A white tile
- Additional glassware as required

CAUTION!

Sulfuric acid solution — Irritant 

Sodium carbonate solution — Irritant 

Teachers supervising this assessment activity should carry out a titration using the solutions available to candidates to obtain an accurate titre against which the titres obtained by candidates can be compared. Teacher results should be recorded on a spare copy of the Measurement task and submitted to the moderator (appropriately labelled) along with the requested sample for moderation.

This activity should be assessed by the teacher using the mark scheme for assessment activity F333.1.skill II (Measurement).

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