



General Certificate of Education  
Advanced Subsidiary Examination  
June 2013

**Chemistry**

**CHM3T/P13/TN**

Unit 3T AS Investigative Skills Assignment

**Teachers' Notes**

**Confidential**

**A copy should be given immediately to the teacher responsible for  
GCE Chemistry**

## Teachers' Notes

### Confidential

These notes must be read in conjunction with the *Instructions for the Administration of the Investigative Skills Assignment: GCE Chemistry* published on the AQA Website.

#### An investigation of the water of crystallisation in washing soda

The aim of this investigation is to determine the number of water molecules in the formula of a sample of hydrated sodium carbonate by titration.

#### Materials

Each candidate should be provided with the following reagents in suitable closed containers.

Reagents	Concentration / mol dm <sup>-3</sup>	Volume / cm <sup>3</sup>	Note
Sodium carbonate solution	0.0510 to 0.0530 (5.40 to 5.60 g dm <sup>-3</sup> of anhydrous Na <sub>2</sub> CO <sub>3</sub> )	150	Labelled ' <b>Solution Y</b> '
Hydrochloric acid	0.100	200	Labelled ' <b>Hydrochloric acid</b> '
Methyl orange	Standard indicator		Labelled ' <b>Methyl orange indicator</b> '. Individual supply not required

#### General

It is the responsibility of the centre to ensure that the investigation works with the materials provided to the candidates **before** candidates carry out the task.

Spare supplies of all solutions specified in these notes must be available.

If you have any queries about the practical work for the ISA, please contact your Assessment Adviser. Contact details for your Assessment Adviser can be obtained by e-mailing your centre name and number to [chemistry-gce@aqa.org.uk](mailto:chemistry-gce@aqa.org.uk)

## Apparatus

Each candidate will require the following:

Number	Apparatus
1	50 cm <sup>3</sup> burette and stand
1	funnel suitable for filling the burette
1	25 cm <sup>3</sup> pipette
1	pipette filler
1	250 cm <sup>3</sup> conical flask
1	dropping pipette
	a plentiful supply of distilled or deionised water
	eye protection

### Checking the burette reading

In the Task, candidates are instructed to have one of their final burette readings checked by their teacher in order to assess their ability to read the burette. If the candidate has not read the burette correctly, the teacher must tell the candidate the correct reading and not award this mark. This is to ensure that a candidate does not lose several accuracy marks because of an incorrect reading.

### Risk assessment and risk management

Risk assessment and risk management are the responsibility of the centre.

### Notes from CLEAPSS

Technicians/teachers should follow safety data sheets provided by the supplier for handling reagents. The worldwide regulations covering the labelling of reagents by suppliers are currently being changed. Details about these changes can be found in leaflet GL101, which is available on the CLEAPSS Website. You will need a CLEAPSS login.

## Teacher Results

A teacher must carry out the Task, using similar apparatus and samples of the same stock solutions/chemicals as the candidates, in order to obtain Teacher Results. This must **not** be done in the presence of candidates.

Teacher results

- are required for each group of candidates
- must be recorded on the Teacher Results Sheet
- are used to assess the accuracy of candidates' results
- must be included with the sample sent to the moderator.

In order to ensure that each candidate can be matched to the appropriate Teacher Result, teachers must

- complete all details on each Teacher Results Sheet
- ensure that all candidates complete all details on the Candidate Results Sheet, clearly identifying their teaching group and/or teacher.

## Centres with more than one teaching set

Centres may wish to divide their candidates into manageable groups and to conduct the task at different times. This is acceptable provided that candidates in a later session are given a solution of sodium carbonate whose concentration is slightly different from that given to candidates in the earlier sessions.

## Information to be given to candidates

Candidates **must not** be given information about an ISA assessment until one week before Stage 1. One week before Stage 1, candidates should be given the following information.

The aim of this task is to determine the formula of a hydrated carbonate by means of a titration.

The main area of the specification in the Written Test is Section 3.1.2 (Amount of Substance).

There **must** be no further discussion and candidates **must not** be given any further resources to prepare for the assessment.

## ISA CHM3T/P13 Teacher Results Sheet

Centre Number 

--	--	--	--	--

Teacher Name ..... Teacher Group .....

### Results

Record your results in the table below.

Final burette reading / cm <sup>3</sup>				
Initial burette reading / cm <sup>3</sup>				
Volume of acid used / cm <sup>3</sup>				
Tick the titres to be used in calculating the average titre				

Average titre / cm <sup>3</sup>	
---------------------------------	--

**This sheet may be photocopied**