General Certificate of Education
Advanced Subsidiary Examination
June 2013

Chemistry CHM3T/Q13/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.

To investigate how changes in the concentration of sodium thiosulfate solution affect its rate of reaction with dilute hydrochloric acid

Caution: the CLEAPSS Hazcard states 'sulfur dioxide is produced in this reaction' and 'known sufferers of asthma should be closely monitored'.

Disposal of waste solutions: Candidates should be instructed to pour their waste solutions into a large flask that contains an excess of 0.5 mol dm^{-3} sodium carbonate solution to which Universal or full range indicator has been added. This solution should be poured down a foul-water drain. [Note: the CLEAPSS Hazcard states that 'solutions should be poured into 0.5 mol dm^{-3} sodium carbonate solution before pouring down a foul-water drain'.]

Centres are advised to ensure that the investigation is carried out in a well-ventilated room and that appropriate measures are taken to dispose of waste solutions.

Materials

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

Reagents	Concentration / mol dm^{-3}	Volume / cm^3	Note
Hydrochloric acid	2.0	50	Labelled **'Hydrochloric acid'**
Sodium thiosulfate	0.20	300	Labelled **'Sodium thiosulfate'**

General

It is the responsibility of the centre to ensure that the investigation provides a sensible range of results using 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

Apparatus

Each candidate will require the following:

Number	Apparatus
1	250 cm^3 conical flask
1	50 cm^3 measuring cylinder
1	10 cm^3 measuring cylinder
1	timer / stopclock / stopwatch
1	card marked with an **X** standardised in the centre
	a plentiful supply of deionised or distilled water
	eye protection

Checking the measuring cylinder

In the Task, candidates are instructed to have one of their 5 cm^3 measuring cylinder volumes checked by the teacher in order to assess whether they have been precise in their use of this apparatus. If the candidate has not measured the volume correctly, the teacher should tell the candidate the correct reading. In this case, do not award the measuring mark (**M**) to the candidate.

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 of the changes can be found in leaflet GL101, available on the CLEAPSS Website. You will need to have a CLEAPSS login.

Teacher Results

A teacher must carry out the task, using similar apparatus and samples of the same stock solutions / chemicals, 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
- must be included with the sample sent to the moderator.

In order to ensure that each candidate can be matched with 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 and for this investigation it is not necessary to provide different solution concentrations to different groups since the accuracy of the candidates' results is determined by outcome further to processing the data - see the Marking Guidelines.

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 investigate how changes in the concentration of sodium thiosulfate solution affect its rate of reaction with dilute hydrochloric acid.

The main areas of the specification in the Written Test include Section 3.2.2 (Kinetics) and Section 3.2.6 (Group 2, the Alkaline Earth Metals).

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

ISA CHM3T/Q13 Teacher Results Sheet

Centre Number | | | | | |

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

Record your results in the table below.

Volume of $Na_2S_2O_3(aq)$ / cm^3	10	20	30	40	50
Volume of water / cm^3	40	30	20	10	0
Concentration of $Na_2S_2O_3(aq)$ / mol dm^{-3}	0.04	0.08	0.12	0.16	0.20
Time / s					

This sheet may be photocopied