



General Certificate of Education  
Advanced Level Examination  
June 2013

**Chemistry**

**CHM6T/Q13/TN**

Unit 6T A2 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 Investigative Skills Assignment: GCE Chemistry* published on the AQA Website.

**An investigation of some transition metal compounds**

The aim of this task is to investigate some transition metal ions by a series of observation exercises.

**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
Hydrated chromium(III) sulfate* see note below	0.2	10	Labelled ' <b>Solution P</b> '
Hydrated iron(III) chloride	0.2	10	Labelled ' <b>Solution Q</b> '
Hydrated copper(II) chloride	0.2	10	Labelled ' <b>Solution R</b> '

\* **Note** Potassium chromium(III) sulfate (chrome alum), of the same concentration, may be used in place of chromium(III) sulfate.

Candidates will also require access to the following reagents. Individual supplies are not required.

Reagents	Concentration / mol dm <sup>-3</sup>	Volume / cm <sup>3</sup>	Note
Sodium hydroxide	1.0	25	Labelled ' <b>Sodium hydroxide solution</b> '
Sodium carbonate	1.0	5	Labelled ' <b>Sodium carbonate solution</b> '
Silver nitrate	0.05	5	Labelled ' <b>Silver nitrate solution</b> '

**Note**

Centres are reminded that it is essential that contamination of shared reagents is avoided. One way to avoid cross-contamination is to attach a test tube containing a plastic dropping pipette to the reagent bottle using elastic bands or adhesive tape. This dropping pipette can then be returned to the test tube after use by the candidate.

## 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
9	test tube
6	dropping pipette
1	test-tube rack
1	250 cm <sup>3</sup> beaker
	hot water is needed for part of the task. Centres are advised to use an <b>electric kettle</b> to provide a convenient and quick supply of hot water. Alternatively, each candidate will need a <b>tripod, gauze and Bunsen burner</b> .
	a plentiful supply of distilled or deionised water
	eye protection

Only 3 dropping pipettes will be needed if the centre adopts the strategy to avoid contamination outlined in the note on page 2.

## 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 Results, 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.

## 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 some transition metal ions by a series of observation exercises.

The main areas of the specification in the Written Test include Section 3.1.2 (Amount of Substance), Section 3.5.4 (Transition Metals) and Section 3.5.5 (Reactions of Inorganic Compounds in Aqueous Solutions).

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

## ISA CHM6T/Q13 Teacher Results Sheet

Centre Number 

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 Teacher Group .....

**Results** Record your observations in the table below.

Teacher Name .....

Use a separate sample in each of the following tests.	Observations with Solution P (Chromium(III) sulfate)	Observations with Solution Q (Iron(III) chloride)	Observations with Solution R (Copper(II) chloride)
<b>Test 1 (a) Sodium hydroxide</b> Place about 10 drops of the sample in a test tube. Add sodium hydroxide solution, dropwise with gentle shaking, until in excess. Retain the mixture for use in the next test.			
<b>Test 1 (b) Heat mixture from 1 (a)</b> Half fill a 250 cm <sup>3</sup> beaker with the freshly boiled water provided. Allow the test tube containing the mixture from <b>Test 1 (a)</b> to stand in the beaker of hot water for about 10 minutes.			
<b>Test 2 Sodium carbonate</b> Place about 10 drops of sodium carbonate solution in a test tube. Add about 10 drops of the sample and shake the mixture gently.			
<b>Test 3 Silver nitrate</b> Place about 10 drops of the sample in a test tube. Add about 10 drops of silver nitrate solution and shake the mixture gently. Allow the test tube to stand for about 10 minutes.			

This sheet may be photocopied