



General Certificate of Education  
Advanced Level Examination  
June 2010

**Chemistry**

**CHM6T/Q10/TN**

Unit 6T A2 Investigative Skills Assignment

**Teachers' Notes**

**Confidential**

A copy should be given immediately to the teacher(s) responsible for  
GCE Chemistry

**Teachers' Notes****Confidential**

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

**The investigation of a rust remover**

The aim of this task is to determine the ethanedioic acid content of a rust remover by means of a titration of a solution of the rust remover with acidified potassium manganate(VII).

**Materials**

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

Reagents	Concentration	Volume	Note
Sodium ethanedioate	between 0.045 and 0.055 mol dm <sup>-3</sup>	150 cm <sup>3</sup>	Labelled ' <b>Rust remover</b> ' Ethanedioic acid or any other soluble ethanedioate salt can be used
Potassium manganate(VII)	between 0.0195 and 0.0205 mol dm <sup>-3</sup>	200 cm <sup>3</sup>	Labelled ' <b>Potassium manganate(VII)</b> '
Sulfuric acid	approximately 1 mol dm <sup>-3</sup> (0.95–1.05) This solution does not need to be accurately known	150 cm <sup>3</sup>	Labelled ' <b>Sulfuric acid</b> ' Individual supply not required

**General**

Reagents of good analytical quality should be used and spare supplies of all solutions specified in these notes must be available.

**Apparatus**

Each candidate will require the following:

Number	Apparatus
1	50 cm <sup>3</sup> burette and stand
1	funnel suitable for filling a burette
1	25 cm <sup>3</sup> pipette
1	pipette filler
1	250 cm <sup>3</sup> conical flask
1	measuring cylinder (25 cm <sup>3</sup> or 50 cm <sup>3</sup> )
1	tripod
1	gauze
1	Bunsen burner, or some other means to heat a 250 cm <sup>3</sup> conical flask to about 60 °C
1	thermometer (covers the range from room temperature to 70 °C or above)
	a plentiful supply of purified water (either distilled or de-ionised)
	suitable eye protection

### **Holding the hot flask – Teacher demonstration**

Before candidates begin the Task a teacher must demonstrate an appropriate method of holding the hot flask, eg a clamp around the neck of the flask, a strip of paper or cloth or a boiling tube holder.

### **Teacher Result**

A teacher must carry out the Task, using the same stock solutions, in order to obtain a value for the average titre. A teacher result is required for **each** group of candidates. The teacher's value for the titre, along with the Teacher Group, must be recorded in the space provided on the Teacher Results Sheet. This value will be used by the teacher to assess the accuracy of the candidates' results. The teacher must **not** carry out the task in the presence of the candidates.

In order to ensure that the appropriate Teacher Result can be matched with each candidate, teachers must ensure that candidates complete all the boxes on the Candidate Results Sheet, including 'Teacher Group'.

The Teacher Results Sheets must be included with the sample sent to the moderator.

### **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 sodium ethanedioate solution whose concentration is slightly different from that given to candidates in the earlier sessions.

### **One week before taking Stage 1 of the ISA teachers may give their candidates the following information.**

The aim of this task is to determine the ethanedioic acid content of a rust remover by means of a titration of a solution of the rust remover with acidified potassium manganate(VII).

There should be no further discussion of this topic.

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**ISA CHM6T/Q10 Teacher Results Sheet**Centre Number 

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

**Results**

Record your titration results in an appropriate table in the space below.

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