

Teacher Resource Bank

GCE Chemistry 2421

Investigative Skills Assessment

Teachers' Notes (on A2 specimen ISA)

CHM6T/TN



TEACHERS' NOTES (ON SPECIMEN ISA): CHM6T**CONFIDENTIAL****Materials**

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

Standard reagents

Label	Concentration	Amount /volume	Notes
Fehling's solution	standard laboratory preparation	10 cm ³	
Potassium manganate(VII)	See notes	10 cm ³	Prepare each dm ³ of reagent solution by adding 250 cm ³ of 0.02 mol dm ⁻³ potassium manganate(VII) to 750 cm ³ of 1.0 mol dm ⁻³ sulfuric acid
Sodium hydrogencarbonate	solid	1g	
Methyl orange	standard laboratory preparation	10 cm ³	

Centres may wish to use Benedict's reagent instead of Fehling's solution, as this reagent is easier to store. The reagent should still be labelled 'Fehling's solution'.

Unknowns

Label	Reagent	volume	Concentration	Notes
A	aqueous D-glucose	10 cm ³	100 g dm ⁻³	This can be made up a few days before the examination
B	aqueous ethanoic acid	10 cm ³	1 mol dm ⁻³	This can be made up a few days before the examination
C	aqueous methanoic acid	10 cm ³	3 mol dm ⁻³	This can be made up a few days before the examination

The strictest possible precautions must be taken to prevent the identity of these solutions becoming known to the candidates.

General

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

Apparatus

Each candidate will require:

Number	Apparatus	Notes
3 - 12	test tubes, labelled A , B and C	the number per candidate is at the centre's discretion, but a minimum of 3 test tubes will be needed. AQA recommends: four test tubes labelled A four test tubes labelled B four test tubes labelled C
7	dropping pipettes	the number per candidate is at the centre's discretion, to a maximum of 7
1	test tube rack	
2	250 cm ³ beakers	
1	wash bottle	
1	small spatula	
	a plentiful supply of purified water (either distilled or deionised)	
	suitable eye protection	
	disposable gloves	may be used if available

Candidates require hot water for **Tests 1** and **2**. Centres are advised to provide an electric kettle to provide a convenient and quick supply of hot water.

Supervisor Result

Teachers/Supervisors must carry out the task, using the same stock solutions, in order to obtain results (values or make observations). These will be used by the teacher to assess the accuracy of the candidate's results/observations. Supervisors must not carry out the exercises in the presence of the candidates.

Centres with large numbers of candidates

Centres with large numbers of candidates may wish to divide them into more manageable groups and to conduct assessments at different times. This is acceptable provided that candidates in a later sitting are given "unknowns" which have been coded differently (e.g. BCA).

One week before sitting stage 1 of the ISA you may inform your candidates:

The aim of this task is to identify an organic chemical by a series of observation exercises.

There should be no further discussion of this topic.

GENERAL GUIDANCE ON CARRYING OUT ISAs

NON-CONFIDENTIAL

Practical work should be carried out after candidates have practiced the necessary skills as outlined in the PSA guidance and after teaching the appropriate of specification sections. They should also be familiar with the apparatus they will be using.

It is the responsibility of the centre to ensure that practical activity works with the materials provided to the candidates.

RISK ASSESSMENT

It is the responsibility of the centre to ensure that a risk assessment is carried out before candidates carry out the practical work.

Stage 1: The Practical Work

At the start of Stage 1, you should give each candidate a copy of the Task Sheet and provide them with the appropriate apparatus and materials.

During Stage 1, the candidates will be required to carry out the reactions of solutions of three organic compounds with solutions of potassium manganate(VII), Fehling's reagent, methyl orange and solid sodium hydrogencarbonate.

The practical exercise should be carried out under controlled conditions in one practical session. Candidates must be allowed only one opportunity to carry out this exercise. Candidates must not be allowed to communicate their results to others whilst doing the practical.

Candidates should present their results on the *Candidates Results Sheet*. Their ability to present experimental results in an appropriate form is an important part of this assessment.

At the end of the practical session the Teacher must collect the Task Sheet with the *Candidate Results Sheet* and keep them securely until Stage 2.

The teacher must assess the candidates' work following the AQA marking guidelines.

Stage 2: The ISA written test (1 hour)

Stage 2 should be undertaken as soon as possible after the practical exercise. This stage consists of an ISA written test provided by AQA which candidates must complete under controlled conditions so that they cannot communicate with each other.

At Stage 2, you should provide each candidate with

- Their own Task Sheet
- Their *Candidate Result Sheet*
- A copy of the appropriate ISA written test.

It is the Teacher's responsibility to ensure that candidates are aware that they are not permitted to add to or amend their material from Stage 1.

At the end of the 1 hour, you should collect the work of all candidates.

The teacher must assess the candidates' work following the AQA marking guidelines.

Administration

Candidates must not bring any paper-based materials into any of the session(s) or remove anything from them. Anything they require must be provided during the session. Mobile phones are not allowed.

Redrafting

Redrafting is not allowed at any stage of the ISA.

Supervisor Result

Teachers/Supervisors must carry out the practical exercise, using the same stock solutions, in order to obtain a set of centre values or observations. These will be used by the teacher to assess the accuracy of the candidate's results/observations. Supervisors must not carry out the exercises in the presence of the candidates.

Modifications

The task sheet gives candidates an outline of the exercise. The Teacher may modify the task sheet to take account of the conditions and equipment available in the centre. Any changes must be agreed with the Assessment Adviser and notified to the moderator.

Discussion with candidates

Any discussion of the assessment with candidates must be of a general nature. Candidates must be left to make their own decisions about key questions on the Task Sheet.

Working in groups

Candidates are **not** allowed to work in groups.

Information provided to candidates

A Supervisor must not give any advice to candidates about the way they are conducting experiments unless it is to prevent personal injury to the candidates or damage to apparatus. Unless specific mention to the contrary is made in the instructions, Supervisors must not give any advice or information to candidates, whether it is asked for or not.

Candidates absent for the practical work

A candidate absent for the practical work (Stage 1) should be given an opportunity to carry out the practical work before they sit the ISA test (Stage 2). This may be with another group or at a different time. Only when this is not possible, can the teacher supply a candidate with class data. In this case candidates cannot be awarded marks for Stage 1, but can still be awarded marks for Stage 2. The use of class data should be notified to the moderator on the *Candidate Record Form*.

Can I discuss a completed 'live' ISA with a candidate?

Completed 'live' ISAs should be treated like examination papers and kept under secure conditions until the publication of results. Teachers may give candidates their unmoderated marks. Candidates must not be given access to their completed 'live' ISA.

Teachers may discuss issues relating to completed 'live' ISAs with candidates provided that

- the feedback is of a general nature
- no other candidates from the centre will be attempting the ISA and
- the discussion is with whole teaching groups.

Discussion, with individual candidates, of specific details of questions is not allowed.

Following publication of results ISAs which are no longer 'live' may be used for practice.