



Rewarding Learning

ADVANCED
General Certificate of Education
2017

Chemistry
Assessment Unit A2 3
assessing
Module 3: Practical Examination
Practical Booklet A
[AC233]
WEDNESDAY 10 MAY, MORNING

MARK
SCHEME

Annotation

1. Please do all marking in **red** ink.
2. All scripts should be checked for mathematical errors. Please adopt a system of one tick (✓) equals 1 mark, e.g. if you have awarded 4 marks for part of a question then 4 ticks (✓) should be on this candidate's answer.
3. The total mark for each question should be recorded in a circle placed opposite the question number in the teacher mark column.
4. As candidates have access to scripts please do not write any inappropriate comments on their scripts.

General points

- All calculations are marked according to the number of errors made.
- Errors can be carried through. If the wrong calculation is carried out then the incorrect answer can be carried through. One mistake at the start of a question does not always mean that all marks are lost.
- Any number of decimal places may be used provided the 'rounding' is correct.
- Listing is when more than one answer is given for a question that only requires one answer, e.g. the precipitate from a chloride with silver nitrate is a white solid; if the candidate states a white or a cream solid, one answer is correct and one answer is wrong. Hence they cancel out.
- Although names might be in the mark scheme it is generally accepted that formulae can replace them. Formulae and names are often interchangeable in chemistry.
- The marking of colours is defined in the 'CCEA GCE Chemistry Acceptable Colours' document.

MARKING GUIDELINES

Interpretation of the Mark Scheme

- **Carry error through**
This is where mistakes/wrong answers are penalised when made, but if carried into further steps of the question, then no further penalty is applied. This pertains to calculations and observational/deduction exercises. Please annotate candidates' answers by writing the letters c.e.t. on the appropriate place in the candidates' answers.
- **Oblique/forward slash**
This indicates an acceptable alternative answer(s).
- **Brackets**
Where an answer is given in the mark scheme and is followed by a word/words in brackets, this indicates that the information within the brackets is non-essential for awarding the mark(s).

Titration Exercise

1 Table [3]

The Table should be drawn as a boxed table. It should be labelled with the following: initial burette reading, final burette reading and the titre. It is not necessary to use exactly these words but there should be appropriate columns and rows.

The recorded readings should be checked for mathematical accuracy [1].

The rough titration value should be greater than the accurate values (no more than 2 cm^3) [1]. If rough less than accurate [-1].

Units, i.e. cm^3 , should be stated in each column/row [1].

Use of decimal places [2]

All burette readings should be to at least one decimal place – each mistake is penalised by one mark.

(However initial burette readings of 0 are penalised once only.)

If used, the second decimal place position should be 0 or 5 only – other values will be penalised by 1 mark for each.

Average titre [2]

Accurate titrations only should be used. All accurate titration values should be used.

The use of a rough value is [-1].

The average value can be calculated to two decimal places or more, e.g. 25.15 and 25.20 would average to 25.175.

If three (or more) accurate titres are recorded, then the average titre must be calculated using all three (or more) accurate titres.

Any error is [-1]. This might be an incorrect calculation or the omission of units. If the average titre is included in the table then the units indicated on the table apply.

Titration consistency [1]

This is the difference within the accurate titrations. If three (or more) accurate values are given then the difference between highest and lowest is used.

Difference	Mark
± 0.1	[1]
> 0.1	[0]

[8]

8

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Observation exercise

- 2 (a) You are provided with a solid, labelled **A**. Carry out the following tests on **A** and record your observations in the table below.

Test	Observations
1 Add 5 drops of sodium hydroxide solution to a test tube one quarter filled with the solution of A . Add a further 3cm ³ of sodium hydroxide solution to the test tube.	<i>green precipitate</i> [1]
	<i>precipitate remains</i> [1]
2 Add 5 drops of barium chloride solution to a test tube one quarter filled with the solution of A .	<i>white precipitate</i> [1]
3 (a) Add 6.0cm ³ of the solution of A to a test tube containing 4.0cm ³ of potassium manganate(VII) solution and 1.0cm ³ of sulfuric acid. Shake the mixture gently. Pour approximately half of the solution into another test tube. (b) Add 5 drops of potassium thiocyanate solution to one of the test tubes. (c) Add 5 drops of sodium hydroxide solution to the other test tube. Do not shake the test tube.	<i>purple [1] to (pale) yellow/colourless [1]</i> [2]
	<i>blood red [1] solution [1]</i> [2]
	<i>brown precipitate</i> [1]

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(b) Liquid **B** is approximately 30 cm³ of 2M ethanoic acid in a sample bottle.

Test	Observations
<p>1 Place 2 cm of magnesium ribbon in a test tube containing 10 cm³ of B and stir gently with a thermometer</p>	<p><i>fizz</i> [1] <i>initial and final temperatures</i> [1] <i>(must be an increase)</i></p> <p style="text-align: right;">[2]</p>
<p>2 Add a spatula measure of ammonium carbonate to a boiling tube containing 10 cm³ of B and stir gently with a thermometer</p>	<p><i>fizz</i> [1] <i>initial and final temperatures</i> [1] <i>(must be a decrease)</i></p> <p style="text-align: right;">[2]</p>

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12

Total

20