Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2015

Chemistry

Assessment Unit AS 3

assessing

Module 3: Practical Examination
Practical Booklet A

[AC133]

FRIDAY 8 MAY, MORNING

MARK SCHEME

Annotation

1. Please do all marking in **red** ink.

2. All scripts are 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.

- 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).

1 Titration

AVAILABLE MARKS

Table [3]
Decimal places [2]
Average titre [2]
Titration consistency [1] [8]

NOTES

Table [3]
The Table should be drawn **as an enclosed 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 2.0 cm^3 greater) [1].

Units, i.e. cm^3, should be stated [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 one mark each time used.

Average titre [2]
Accurate titrations only 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 average to 25.175.

If three accurate titres are recorded, then the average titre must be calculated using all three 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 accurate values are given then the difference between highest and lowest is used.

Difference	**Mark**
±0.2	[1]
>0.2	[0]

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2 Observation

AVAILABLE MARKS

You are provided with three unknown substances, solution **A**, solid **B** and liquid **C**. Carry out the tests described below and record your observations.

(a) Tests on solution **A**, $ZnSO_4(aq)$

	Test	Observations
1	Transfer 1 cm^3 of the solution **A** into each of three separate test tubes. **(a)** Add 5 drops of sodium hydroxide solution to the first test tube. **(b)** Add 5 cm^3 of sodium hydroxide solution to this test tube.	 *white* [1] *precipitate* [1] *precipitate disappears/colourless solution formed* [1]
2	Add 5 drops of barium chloride solution to the second test tube.	*white* [1] *precipitate* [1]
3	Add 5 drops of silver nitrate solution to the third test tube.	*no change/colourless solution* [1]

(b) Tests on solid **B**, $Na_2CO_3.10H_2O(s)$

	Test	Observations
1	Describe the appearance of **B**.	*white* [1] *solid*
2	**(a)** Add half a spatula measure of **B** to a test tube one quarter filled with dilute ethanoic acid. **(b)** Use limewater to test any gas that is produced.	*fizzing* [1] *solid disappears/colourless solution* [1] *turns cloudy/milky* [1]
3	Add a spatula measure of **B** to a dry boiling tube and heat.	*colourless liquid on sides of boiling tube* [1]
4	Dip a clean nichrome wire loop in concentrated hydrochloric acid; touch sample **B** with the wire, then hold it in a blue Bunsen flame.	*orange flame/* *yellow flame* [1]

(c) Tests on liquid **C**, $C_2H_5OH(l)$

	Test	Observations
1	To 1 cm^3 of **C** in a test tube add 1 cm^3 of water.	*mixes completely* [1]
2	Place 10 drops of **C** on a watch glass on a heatproof mat. Ignite it using a burning splint.	*clean flame/blue flame/no soot/no smoke* [1]
3	Add 10 drops of **C** to 2 cm^3 of acidified potassium dichromate solution in a test tube. Warm the mixture gently in a water bath.	*initial colour orange/change in smell* [1] *final colour green* [1]

AVAILABLE MARKS

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