Centre Number

Candidate Number

Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018

Chemistry

Assessment Unit AS 3
assessing
Module 3: Basic
Practical Chemistry

MV18

Practical Booklet A

[SCH31]

TUESDAY 1 MAY, MORNING

Time

1 hour 15 minutes, plus your additional time allowance.

Instructions to Candidates

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write on blank pages.
Complete in black ink only. Answer **all three** questions.

Information for Candidates

The total mark for this paper is 25.
Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.
A Periodic Table of Elements (including some data) is provided.
You may not have access to notes, textbooks and other material to assist you.
Safety glasses should be worn at all times and care should be taken during this practical examination.

1 You are provided with a compound, **A**.

(a) Why does the colour of **A** suggest it contains a Group I or Group II ion? [1 mark]

_____

(b) Perform a flame test on **A**. State the colour produced in the Bunsen flame. [1 mark]

_____

(c) Add 2 cm^3 of dilute ethanoic acid to a test tube. Add one spatula measure of **A** and test the gas evolved with an appropriate reagent. Describe how you tested the gas and give the result. [2 marks]

_____

_____

_____

(d) Dissolve one spatula measure of **A** in 10 cm^3 of deionised water in a small beaker.

(i) Transfer 1 cm^3 of the solution of **A** to a test tube. Add 5 drops of magnesium sulfate solution to the test tube and note any observations. [2 marks]

_____

_____

(ii) Add 1 cm^3 of dilute ethanoic acid to the test tube containing the mixture from **(d)(i)**. State **three** observations, apart from smell. [3 marks]

_____

_____

_____

(iii) Add 1 cm^3 of lead(II) nitrate solution to 1 cm^3 of the solution of **A** in a test tube. Note any observations. [2 marks]

_____

_____

2 You are provided with:

- approximately 2.5 g of zinc powder
- a solution of copper(II) sulfate of concentration 0.5 mol dm^{-3}

(a) Follow the procedure below:

- Use a measuring cylinder to transfer 25 cm^3 of the copper(II) sulfate solution into a polystyrene cup held in a 250 cm^3 beaker.
- Measure the temperature of the copper(II) sulfate solution to the nearest 1°C. Start a stopclock. Repeat the temperature measurement after one minute and record these temperatures in the table below.
- At exactly two minutes add the whole of the sample of zinc powder to the polystyrene cup and stir continuously with the thermometer.
- Continue stirring with the thermometer and measure and record the temperature at the time intervals shown in the table below. [2 marks]

time/min	temperature/°C
0	
1	
2	
3	
4	
5	
6	
7	
8	

(b) Filter the contents of the cup into a conical flask and record **one** observation each for the filtrate and for the residue. [2 marks]

3 You are provided with four colourless liquids, B, C, D and E. They may be acidic, alkaline or neutral. You are required to determine which solutions are acidic and investigate the reactivity of these solutions with magnesium.

(a) Add approximately 2 cm^3 of each liquid to four separate test tubes. Add four drops of Universal Indicator solution to each liquid and shake gently. Complete the table below. [4 marks]

liquid	**Universal Indicator colour**	**pH**
B		
C		
D		
E		

(b) Add 5 cm^3 of each **acidic** liquid identified in **(a)** to separate test tubes.

Add a 2 cm strip of magnesium to each acidic liquid and time, to the nearest second, how long it takes for the strip of magnesium to completely react. In the space below draw an appropriate table and record your results. [6 marks]

THIS IS THE END OF THE QUESTION PAPER

For Examiner's use only	
Question Number	Marks
1	
2	
3	
Total Marks	

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ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018

Chemistry

Assessment Unit AS 3
Basic Practical Chemistry
Practical Booklet A

[SCH31]

TUESDAY 1 MAY, MORNING

APPARATUS AND MATERIALS LIST

Advice for centres

- All chemicals used should be at least laboratory reagent specification and labelled with appropriate safety symbols, e.g. irritant.
- For centres running multiple sessions – candidates for the later session should be supplied with clean, dry glassware. If it is not feasible, then glassware from the first session should be thoroughly washed, rinsed with deionised water and allowed to drain.
- Ensure all chemicals are in date otherwise expected observations may not be seen.
- It is the responsibility of the centre to be cognisant of all health and safety issues and to carry out a thorough risk assessment. Up to date information can be obtained at www.cleapss.org.uk

Practical Examination

Each candidate must be supplied with safety goggles or glasses.

Question No. 1

Each candidate must be supplied with:

- four test tubes
- a test tube rack
- a piece of nichrome wire
- a spatula
- a delivery tube with stopper
- five droppers
- a 10 cm^3 measuring cylinder
- a 100 cm^3 beaker
- stirring rod
- deionised water
- Bunsen burner
- about 2 g of anhydrous sodium carbonate in a 50/100 cm^3 beaker labelled **A**.
- about 10 cm^3 of concentrated hydrochloric acid in a stoppered reagent bottle labelled **concentrated hydrochloric acid** and **corrosive**.
- about 10 cm^3 of dilute ethanoic acid in a stoppered reagent bottle labelled **ethanoic acid** and **handle with caution**. This solution should be approximately 1 mol dm^{-3}.
- about 10 cm^3 of a saturated solution of calcium hydroxide in a reagent bottle labelled **limewater**. This solution should be saturated.
- about 10 cm^3 of a solution of magnesium sulfate in a reagent bottle/beaker labelled **magnesium sulfate solution**. This solution should be approximately 0.5 mol dm^{-3}.
- about 10 cm^3 of a solution of lead(II) nitrate in a reagent bottle/beaker labelled **lead(II) nitrate solution**. This solution should be approximately 0.01 mol dm^{-3}.

Question No. 2

Each candidate must be supplied with:

- a 50 cm^3 measuring cylinder
- a polystyrene cup of approximately 200 cm^3 capacity
- a 250 cm^3 beaker
- a thermometer, –10 °C to 110 °C with 1°C graduations
- a stopclock/timer
- Approximately 2.5 g of zinc powder in a stoppered bottle, labelled **zinc** and **flammable**
- About 30 cm^3 of copper sulfate solution in a stoppered reagent bottle/beaker, labelled **copper sulfate solution**. This solution should be approximately 0.5 mol dm^{-3}
- filter paper
- 100 cm^3 conical flask
- filter funnel

Question No. 3

Each candidate must be supplied with:

- six test tubes
- a test tube rack
- six droppers
- about 15 cm^3 of hydrochloric acid in a reagent bottle labelled **B** and **handle with caution**. This solution should be approximately 2 mol dm^{-3}
- about 15 cm^3 of deionised water in a reagent bottle/beaker labelled **C**.
- about 15 cm^3 of hydrochloric acid in a reagent bottle labelled **D** and **handle with caution**. This solution should be approximately 1 mol dm^{-3}.
- about 15 cm^3 of sodium hydroxide in a reagent bottle labelled **E** and **handle with caution**. This solution should be approximately 0.1 mol dm^{-3}.
- four 1 cm lengths of magnesium ribbon.
- a stopclock/timer
- bottle of Universal Indicator solution with dropper and matching pH chart (1–11)

Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018

Chemistry

Assessment Unit AS 3

Practical Assessment

Practical Booklet A

[SCH31]

TUESDAY 1 MAY

Confidential Instructions to the Supervisor of the Practical Examination

INSTRUCTIONS TO THE SUPERVISOR OF THE PRACTICAL EXAMINATION

General

1. The instructions contained in this document are for the use of the Supervisor **and are strictly confidential**. Under no circumstances may information concerning apparatus or materials be given before the examination to a candidate or other unauthorised person.

2. In a centre with a large number of candidates it may be necessary for two or more examination sessions to be organised. **It is the responsibility of the schools to ensure that there should be no contact between candidates taking each session.**

3. A suitable laboratory must be reserved for the examination and kept locked throughout the period of preparation. Unauthorised persons not involved in the preparation for the examination must not be allowed to enter. Candidates must not be admitted until the specified time for commencement of the examination.

4. The Supervisor must ensure that the solutions provided for the candidates are of the nature and concentrations specified in the Apparatus and Materials List.

5. **The Supervisor is to be granted access to the Teacher's Copy of Practical Booklet A on Thursday 26 April 2018.** The Supervisor is asked to check, at the earliest opportunity, that the experiments and tests in the question paper may be completed satisfactorily using the apparatus, materials and solutions that have been assembled. **This question paper must then be returned to safe custody** at the earliest possible moment after the Supervisor has ensured that all is in order. **No access to the question paper should be allowed before 26 April 2018.**

6. Centres may need to carry out multiple sessions to accommodate all their candidates sitting Practical Booklet A in a laboratory. Supervision must take place from 30 minutes after the scheduled starting time of the examination, as set out in the timetable, until the time when the candidate(s) begin(s) their examination(s). This is in order to ensure that there is no contact with other candidates. The centre must appoint a member of staff from the centre to supervise the candidate(s) at all times while he/she is on the premises.

7. All apparatus should be checked before the examination, and there should be an adequate supply of spare apparatus in case of breakages. The Apparatus and Materials List should be regarded as a minimum and there is no objection to candidates being supplied with more than the minimum amount of apparatus and materials.

8. **Candidates may not use text books and laboratory notes for reference during the examination, and must be informed of this beforehand.**

9. Clear instructions must be given by the Supervisor to all candidates at the beginning of the examination concerning appropriate safety procedures and precautions. Supervisors are also advised to remind candidates that all substances in the examination must be treated with caution. **Only those tests specified in the question paper should be attempted. Candidates must not attempt any additional confirmatory tests**. Anything spilled on the skin should be washed off immediately with plenty of water. The use of appropriate eye protection is essential.

10. Supervisors are reminded that they may not assist candidates during the examination. However if, in the opinion of the Supervisor, a candidate is about to do something which may endanger him/herself or others, the Supervisor should intervene. A full written report must be sent to CCEA at once.

11. Upon request, a candidate may be given additional quantities of materials (answer paper, reagents and unknowns) without penalty. No notification need be sent to CCEA.

12. The examination room must be cleared of candidates immediately after the examination.

13. No materials will be supplied by CCEA.

14. All JCQ procedures for conducting examinations should be followed for this practical examination including displaying JCQ posters with examination information in the laboratory and removal of mobile phones. Posters should be available from your Examinations Officer.

Northern Ireland Council for the Curriculum, Examinations and Assessment

General Certificate of Education

Advanced Subsidiary

Chemistry

Practical Booklet A

[SCH31]

Tuesday 1 May 2018

Centre Number
71

Candidate Number

This report must be completed by the Supervisor during the examination. The complete report should include all candidates taking this Practical Examination. This Supervisor's Report should be copied and attached to **Each Advice Note** bundle and returned to CCEA in the normal way.

Comments:

Supervisor's Signature . . . . . Date . . . . . .

SYMBOLS OF SELECTED IONS

Positive ions

Name	Symbol
Ammonium	NH_4^+
Chromium(III)	Cr^{3+}
Copper(II)	Cu^{2+}
Iron(II)	Fe^{2+}
Iron(III)	Fe^{3+}
Lead(II)	Pb^{2+}
Silver	Ag^+
Zinc	Zn^{2+}

Negative ions

Name	Symbol
Butanoate	$C_3H_7COO^-$
Carbonate	CO_3^{2-}
Dichromate	$Cr_2O_7^{2-}$
Ethanoate	CH_3COO^-
Hydrogencarbonate	HCO_3^-
Hydroxide	OH^-
Methanoate	$HCOO^-$
Nitrate	NO_3^-
Propanoate	$C_2H_5COO^-$
Sulfate	SO_4^{2-}
Sulfite	SO_3^{2-}

SOLUBILITY IN COLD WATER OF COMMON SALTS, HYDROXIDES AND OXIDES

Soluble
All sodium, potassium and ammonium salts
All nitrates
Most chlorides, bromides and iodides EXCEPT silver and lead chlorides, bromides and iodides
Most sulfates EXCEPT lead and barium sulfates Calcium sulfate is slightly soluble

Insoluble
Most carbonates EXCEPT sodium, potassium and ammonium carbonates
Most hydroxides EXCEPT sodium, potassium and ammonium hydroxides
Most oxides EXCEPT sodium, potassium and calcium oxides which react with water

COUNCIL FOR THE **CURRICULUM, EXAMINATIONS** AND **ASSESSMENT**
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Rewarding Learning

New Specification

Rewarding Learning

Data Leaflet

Including the Periodic Table of the Elements

For the use of candidates taking
Science: Chemistry,
Science: Double Award
or Science: Single Award

Copies must be free from notes or additions of any kind. No other type of data booklet or information sheet is authorised for use in the examinations

gcse examinations

chemistry

For first teaching from September 2017

THE PERIODIC TABLE OF ELEMENTS

Group

1	2											3	4	5	6	7	0
							1 H Hydrogen 1										4 He Helium 2
7 Li Lithium 3	9 Be Beryllium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	98 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Caesium 55	137 Ba Barium 56	139 La* Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
223 Fr Francium 87	226 Ra Radium 88	227 Ac† Actinium 89	261 Rf Rutherfordium 104	262 Db Dubnium 105	266 Sg Seaborgium 106	264 Bh Bohrium 107	277 Hs Hassium 108	268 Mt Meitnerium 109	271 Ds Darmstadtium 110	272 Rg Roentgenium 111	285 Cn Copernicium 112						

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	145 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	231 Pa Protactinium 91	238 U Uranium 92	237 Np Neptunium 93	242 Pu Plutonium 94	243 Am Americium 95	247 Cm Curium 96	245 Bk Berkelium 97	251 Cf Californium 98	254 Es Einsteinium 99	253 Fm Fermium 100	256 Md Mendelevium 101	254 No Nobelium 102	257 Lr Lawrencium 103

* 58 – 71 Lanthanum series
† 90 – 103 Actinium series

a
X
b

a = relative atomic mass (approx)
x = atomic symbol
b = atomic number