

PROVISIONAL MARKING KEY
CHEMISTRY PAPER II



SOUTH EAST EDUCATION DIVISION

2024 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATION CHEMISTRY

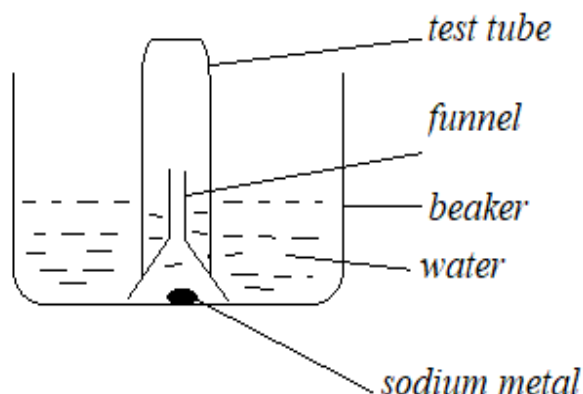
PAPER II

(PROVISIONAL MARKING KEY)

1. With the aid of a well labelled diagram, describe how you could determine that during the reaction between sodium metal and water, the gas produced is hydrogen.

a. Set up the apparatus as shown in the diagram below.

(1 mark for correct diagram, 1 mark for any one correct labelling)



- b. Put the measured volume of water into the beaker, 1
- c. Place a piece of sodium metal into the beaker containing water /1 under a funnel. 1
- d. Observe what happens as the reaction progresses. 1
- e. The gas produced during the reaction is collected in the test tube through the funnel. 1
- f. Remove the test tube. 1
- g. Introduce a burning splint to the mouth of the test tube. 1
- h. If a pop sound is produced /1, the gas evolved during the reaction is hydrogen.

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2. Describe an experiment which could be carried out to arrange metals namely X, Y and Z in order of their reactivity.

- a. Put 3cm³ of a sulphate / salt solution containing ions of metal X in each of the 3 test tubes, 1.
- b. Place a piece of metal X, Y and Z in separate test tubes containing a salt solution of metal X. 1.
- c. Observe and record the results /1 by indicating 'reaction' or 'no reaction' in the appropriate spaces in the table of results. 1
- d. Rinse the test tubes with distilled water. 1
- e. Repeat steps (a) to (d) using the sulphate / salt solutions containing ions of metal Y and Z. 1

Table of results

Metal/Solution	Sulphate of metal X	Sulphate of metal Y	Sulphate of metal Z
X			
Y			
Z			

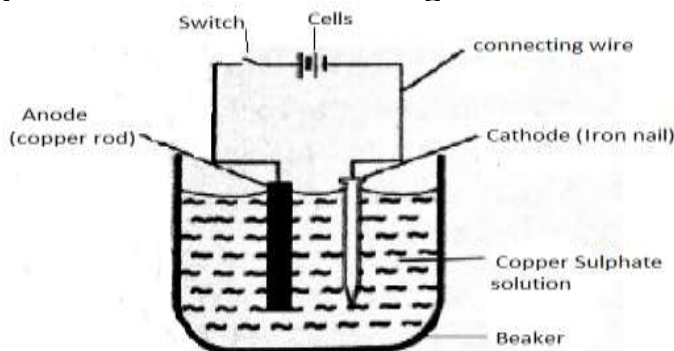
1

- f. The metal that reacts with most of the solutions is the most reactive metal /1 and the one that reacts with few of the solutions or do not react with any of the solutions is the least reactive metal. 1
- g. Arrange the metals in order of their reactivity. 1.

SECTION B (20 Marks)

3. You are provided with 2 cells, collecting wires, switch, copper metal, iron nail, copper sulphate solution and beaker.

a. Arrange the apparatus as shown in the diagram below,



- b. Put 60cm³ of copper sulphate solution into the beaker.
- c. Close the switch.
- d. Leave the set up to stand for 5 minutes.

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e. Open the switch and remove the copper metal and the iron nail from the solution.

f. What has happened to the copper metal and the iron metal?

Copper metal:

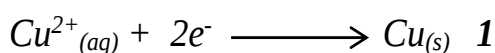
✓ *The copper metal has reduced in its size. It has been eaten up.* **1**

Iron nail:

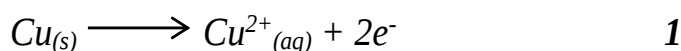
✓ *The iron nail has changed the colour. It has been coated with Copper.* **1**

g. With the aid of an equation, describe the process which was taking place at the cathode.

The copper ions from the solution gain electrons /1 to form copper atoms / 1 which get deposited to the iron nail /1 as shown in the equation:



h. Write the half equation for the reaction which was taking place at the anode.



i. Name the process demonstrated in this experiment.

✓ *Electroplating* **1**

j. State any two uses of the process taking place in the experiment.

- i. To make metals look attractive*
- ii. To protect metals from corrosion*
- iii. To make brittle materials stronger and more durable*

(1 mark each of any two)

- 4. You are provided with 3 test tubes in a rack, unknown organic substances labelled A, B and C which are ethanol, ethanoic acid and cyclohexane but not in that order. You are also provided with a measuring cylinder, droppers, dilute sodium hydroxide (NaOH), phenolphthalein indicator and distilled water in a wash bottle.**
- a. On each unknown compound, perform the tests shown in Table 1 and record your observations in the appropriate spaces. Remember to wash the test tubes after each test.**

Table 1



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Test	Substance A	Substance B	Substance C
To 3cm ³ of distilled water, add 2cm ³ of unknown substance	One layer 1	Two layers 1	One layer 1
To 15 drops of dilute NaOH in a test tube add 3 drops of phenolphthalein indicator. Now add 3cm ³ of unknown substance.	Purple colour 1	Purple colour 1	Colourless 1

(6 marks)

b. Identify the organic compounds labelled A, B and C.

A. Ethanol 1

B. Cyclohexane 1

C. Ethanoic acid 1

c. What name is given to the test where substances A, B and C are mixed with distilled water?

Solubility test 1

END OF PROVISIONAL MARKING KEY

NB: This paper contains 4 printed pages.

