



PROVISIONAL MARKING KEY
CHEMISTRY PAPER II

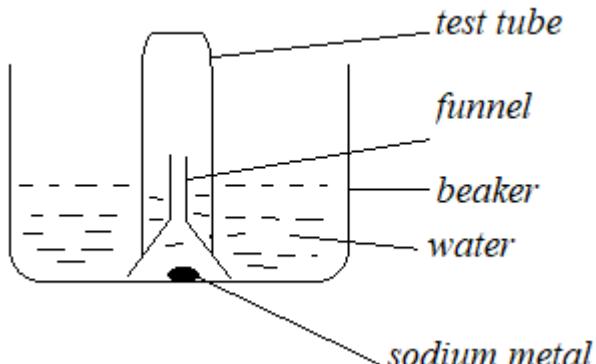
SOUTH EAST EDUCATION DIVISION

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			

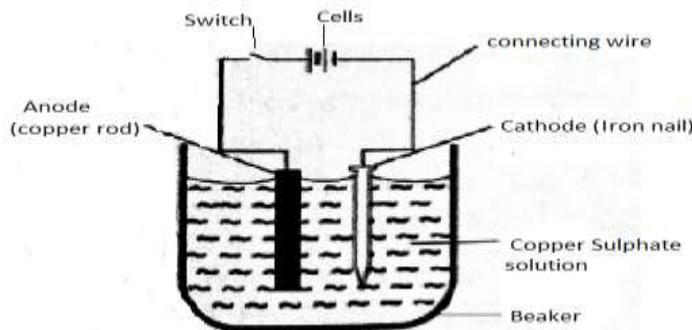
1

- 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:

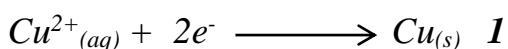
✓ *The copper metal has reduced in its size. It has been eaten up.* **I**

Iron nail:

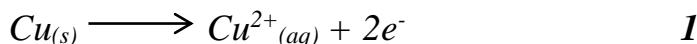
✓ *The iron nail has changed the colour. It has been coated with Copper.* **I**

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* **I**

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 3cm³ of distilled water, add 2cm³ of unknown substance	<i>One layer 1</i>	<i>Two layers 1</i>	<i>One layer 1</i>
To 15 drops of dilute NaOH in a test tube add 3 drops of phenolphthalein indicator. Now add 3cm³ of unknown substance.	<i>Purple colour 1</i>	<i>Purple colour 1</i>	<i>Colourless 1</i>

(6 marks)

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

A. *Ethanol* **I**

B. *Cycloexane* **I**

C. *Ethanoic acid* **I**

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.