

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
DIPLOMA IN SECONDARY EDUCATION EXAMINATION**

732/2B

**CHEMISTRY 2B
(ACTUAL PRACTICAL B)**

Time: 3 Hours

Wednesday, 12nd May 2010 a.m.

Instructions.

1. This paper consists of **three (3)** questions.
2. Answer **all** questions
3. Question number 1 carries 20 marks and the rest carry 30 marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **examination Number** on every page of your answer booklet(s).

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1. You are provided with the following:

Solution coded **H1**, which is a solution of sodium hydroxide of unknown concentration

Solution **H2**, a standard hydrochloric acid solution containing 3.65 g of HCl per dm³

Phenolphthalein indicator

Instruction:

Titrate **H2** (from the burette) against **H1** (in the conical flask) using phenolphthalein indicator. Record your results including one rough and three accurate titrations in a clear tabular form.

Questions

- (a) (i) What colour change was observed during the titration?
- (ii) State the volume of the pipette used.
- (iii) Calculate the average volume of solution H2 used to neutralize solution H1.
- (iv) Write a balanced chemical equation for the reaction between H1 and H2, including physical states.
- (v) Write the ionic equation for this neutralization reaction.
- (vi) Calculate the concentration of solution H1 in mol/dm³.

2. You are provided with:

0.1 M potassium iodide solution labeled **M1**

0.1 M hydrogen peroxide solution labeled **M2**

Dilute sulfuric acid labeled **M3**

A starch indicator solution

Stopwatch and thermometer

Follow the procedure below:

- (i) Mix 5 cm³ of **M1**, 5 cm³ of **M2**, and 5 cm³ of **M3** in a clean test tube.
- (ii) Add two drops of starch solution and quickly start the stopwatch.
- (iii) Record the time taken for the blue-black colour to appear.
- (iv) Repeat the procedure at different temperatures: 30°C, 40°C, 50°C, 60°C, and 70°C.
- (v) Record time and temperature readings in a table.

Questions

- (a) Record the room temperature in Kelvin.
- (b) Why did the blue-black colour appear?
- (c) Complete the table by filling in the temperature (K) and time (s) columns.
- (d) (i) Write a balanced chemical equation for the reaction between hydrogen peroxide and iodide ions in acid solution.
- (ii) Write the ionic equation showing the role of hydrogen peroxide.

- (e) Plot a graph of temperature (K) against time (s).
- (f) State the relationship between temperature and reaction time as seen on the graph.

3. You are given a salt coded **R** that contains one cation and one anion. Perform the following tests to identify the ions:

- (a) Observe and record the physical appearance of salt **R**.
- (b) Test the effect of heating the dry salt.
- (c) Test solubility of the salt in distilled water.
- (d) Add sodium hydroxide solution dropwise, then in excess, to the solution of **R**.
- (e) Add aqueous ammonia dropwise, then in excess.
- (f) Add dilute nitric acid, followed by barium chloride solution.
- (g) Add silver nitrate solution followed by dilute nitric acid.

Questions

- (i) Prepare a clear table showing observations and inferences from each test.
- (ii) Write the balanced chemical equation for the reaction in test (d).
- (iii) Identify the cation and anion present in salt **R**.
- (iv) Write a balanced chemical equation between salt **R** and sodium carbonate.