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 **note** allowed in the examination room.
5. Write your **examination Number** on every page of your answer booklet(s).

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 dm^3

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/dm^3.

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 cm^3 of **M1**, 5 cm^3 of **M2**, and 5 cm^3 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.