**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, 09th May 2012 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 **K1**, a solution of sulfuric acid of unknown concentration

Solution **K2**, a standard sodium hydroxide solution prepared by dissolving 4.00 g of NaOH in 1 $dm^3$ of solution

Phenolphthalein indicator

**Instruction:**

Titrate **K1** (from the burette) against **K2** (in the conical flask) using phenolphthalein as the indicator. Record your results including one rough and three accurate titrations.

**Questions**

(a) (i) State the colour change observed at the end point.

(ii) What is the volume of the pipette used in this titration?

(iii) Determine the average volume of solution K1 used to neutralize solution K2.

(iv) Write a balanced chemical equation for the reaction between K1 and K2 including state symbols.

(v) Write the ionic equation for the reaction.

(vi) Calculate the concentration of solution K1 in $mol/dm^3$.

**2.** You are provided with:

0.1 M hydrochloric acid labeled **Y1**

0.1 M magnesium ribbon labeled **Y2**

Stopwatch and thermometer

Follow the procedure below:

(i) Add 5 $cm^3$ of **Y1** into a clean test tube.

(ii) Add a fixed length of **Y2** magnesium ribbon into the acid and quickly start the stopwatch.

(iii) Record the time taken for the effervescence (bubbling) to stop.

(iv) Repeat steps (i)–(iii) using warmed **Y1** solutions at 40°C, 50°C, 60°C and 70°C.

(v) Record the temperature and time values for each trial.

**Questions**

(a) Record the room temperature in Kelvin.

(b) What causes the effervescence in the reaction?

(c) Complete a table with temperature (K) and time(s) for all readings.

(d) (i) Write a balanced chemical equation for the reaction between Y1 and Y2.

(ii) Write the ionic equation for the reaction.

(e) Plot a graph of temperature (K) against time (s).

(f) What conclusion can you draw about the effect of temperature on the rate of reaction?

**3.** You are given a salt labeled **W**, which contains one cation and one anion. Carry out the following tests to determine its identity:

(a) Describe the appearance of salt **W**.

(b) Heat a small amount of dry salt and observe any changes.

(c) Test solubility in water.

(d) Add aqueous sodium hydroxide dropwise, then in excess.

(e) Add aqueous ammonia dropwise, then in excess.

(f) Add dilute nitric acid, then barium nitrate solution.

(g) Add silver nitrate followed by dilute nitric acid.

**Questions**

(i) Construct a table to record your observations and inferences for each test.

(ii) Write the balanced chemical equation for the reaction between **W** and sodium hydroxide.

(iii) Identify the cation and anion present in salt **W**.

(iv) Write the balanced chemical equation for the reaction between salt **W** and sodium carbonate.