THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

032/2A **CHEMISTRY 2A**

ALTERNATIVE A PRACTICAL

(For Both School and Private Candidates)

Time: 2½ Hours **12 November 2002 a.m.**

Instructions

1. This paper consists of THREE (3) questions.
2. Answer **TWO (2)** questions including question **Number 1.**
3. Qualitative analysis guidance pamphlets may be used after a thorough check by the supervisor.
4. Cellular phones are **not** allowed in the examination room.
5. Electronic calculators are **not** allowed in the examination room.
6. Write your Examination Number on every page of your answer booklet(s).
7. The following constants may be useful:

   Atomic masses

   H = 1, O = 16, Na = 23, S = 32

   1 litre = 1 dm^3 = 1000 cm^3

This paper consists of 3 printed pages

1. You are provided with the following solutions:

1.1 Solution R containing 4 g of pure sodium hydroxide per cubic decimeter of solution.

1.2 Solution Q containing 5.2 g of impure sulphuric acid in 1 litre.

1.3 Methyl orange indicator

PROCEDURE:

Pipette 25.00 cm^3 (or 20.00 cm^3) of solution R into conical flask. Add few drops of methyl orange indicator. Titrate the solution against Q until a colour change is observed.

Repeat the procedure to obtain three more readings and record your results in tabular form as shown below:

(a) Table of results

TITRATION	PILOT	1	2	3
Final reading (cm^3)				
Initial reading (cm^3)				
Volume used (cm^3)				

(i) Volume of pipette used was ---- cm^3

(ii) Summary:

--- cm^3 of solution R required --- cm^3 of solution Q for complete reaction.

(b) (i) Write down a well balanced equation for this reaction.

(ii) Calculate the molarity of R.

(iii) Calculate the molarity of Q.

(c) (i) Calculate the concentration of pure sulphuric acid in g/dm^3

(ii) Calculate the percentage purity of sulphuric acid.

(d) The colour change during titration was from - - - - to - - - - (25 marks))

2. Sample Z is a pure salt containing ONE cation and ONE anion. Carry out carefully all the experiments described below. Record all your observations and make appropriate inferences to identify the ions present in sample Z.

	EXPERIMENTS	OBSERVATIONS	INFERENCES
1.1	Appearance of solid sample Z.		
1.2	Place a spatulaful of Z in a dry test tube and heat.		
1.3	To a little amount of sample Z in a test tube add concentrated sulphuric acid and warm gently with copper turnings or small piece of copper.		
1.4	To a solution of sample Z add ammonia solution dropwise till no further change (excess).		
1.5	To another solution of Z add potassium ferrocyanide solution.		
1.6	To another solution of sample Z add freshly prepared iron (II) sulphate solution followed by concentrated sulphuric acid down the side of test tube.		
1.7	To a solution of Z add Potassium thiocyanite solution.		

CONCLUSION:

Cation in sample Z is - - - - - - - -. Anion in sample Z is - - - - - - - -

The compound is _____ (25 marks)

3. Sample P is a simple salt containing ONE cation and ONE anion. Using systematic qualitative analysis procedures, carry out tests on sample P and make appropriate observations and inferences.

EXPERIMENTS	OBSERVATIONS	INFERENCES

CONCLUSION:

The cation in sample P is - - - - - - - -

The anion in sample P is - - - - - - - -

(25 marks)

Dianga/Baba Telly