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

032/2A

CHEMISTRY 2A
ACTUAL PRACTICAL A
(For Both School and Private Candidates)

Time: 2:30 Hours **Wednesday, 13th November 2019 a.m.**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Each question carries **twenty five (25)** marks.
3. Qualitative Analysis Guide Sheet authorised by NECTA and non-programmable calculators may be used.
4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. You may use the following constants:
   Atomic masses: H=1, C=12, O = 16, Na = 23, Cl =35.5.
   1 litre = 1 dm^3 = 1000 cm^3.



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1. You are required to determine the purity of an impure NaOH solution contaminated with NaCl by using pure HCl. Given the following solutions:

AA: 1.1 g of the impure NaOH dissolved in a 0.25 dm^3 of a solution and

BB: 0.73 g of a pure HCl present in a 0.2 dm^3 of a solution.

Proceed as follows:

Titrate the acid (in a burette) against the impure NaOH (in a conical flask) using two drops of methyl orange (**MO**) as an indicator. Record the volume of an acid used. Repeat the titration to obtain three more titre values and record your results in a tabular form.

Questions

(a) How much volume of the acid was required to neutralize completely 20 cm^3 or 25 cm^3 of the base?

(b) Write a balanced chemical equation for this reaction.

(c) Calculate the molarity of the acid and that of the base.

(d) Calculate the percentage purity of the base (NaOH).

(e) What is the percentage by mass of NaCl?

2. Sample **V** is a simple salt containing one cation and one anion. Carry out the experiments described in the experimental table. Carefully record your observations and make appropriate inferences to identify the anion and cation present in sample **V**.

Experimental table

S/N	Experiment	Observation	Inference
(a)	Appearance of sample V.		
(b)	To a small portion of a dry sample in a test tube add enough amount of distilled water, warm if insoluble.		
(c)	To a small portion of a dry sample in a test tube add concentrated H_2SO_4 acid.		
(d)	To a small portion of a dry sample in a dry test tube, heat gently and then strongly until no further change.		
(e)	Put a small portion of sample in a dry test tube followed by dilute HCl acid. Divide the solution into three portions.		
	(i) To one portion add NaOH till in excess.		
	(ii) To the second portion add a few drops of $MgSO_4$ solution. If no precipitate warm the contents.		
	(iii) To the third portion add ammonia solution till in excess.		

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Conclusion

(a) (i) The cation in sample **V** is_____ and anion is _____

(ii) The name of sample **V** is_____

(iii) The chemical formula of sample **V** is _____

(b) With the aid of a balanced ionic equation, explain the effect of the dilute HCl to the sample **V** in experiment (e).

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