

NAME OF SCHOOL:

NAME OF CANDIDATE:

INDEX NO: SIGNATURE:

545/3
CHEMISTRY
PAPER 3
JULY/AUGUST
2 HOURS



ELITE EXAMINATION BUREAU MOCK 2019
Uganda Certificate of Education

CHEMISTRY

Paper 3

2 hours

Instructions to Candidates:

- *Answer all the questions.*
- *Answers to these questions must be written in the space provided only.*

FOR OFFICIAL USE

<i>Question 1</i>	<i>Question 2</i>	<i>Total</i>

1. You are provided with the following solutions;
BA1, which is 0.1M sodium hydroxide.
BA2, which is prepared by dissolving 3.15g of a hydrated organic acid, $\text{H}_2(\text{CO}_2)_n \cdot 2\text{H}_2\text{O}$ to make 250cm^3 of solution.
You are required to determine the value of n .

Procedure

Pipette 25 or 20cm^3 of BA1 into a conical flask and add 2-3 drops of phenolphthalein indicator. Titrate the resultant solution with BA2 from the burette. Repeat the titration until you obtain consistent results.

Record your results in the table below.

Results

Volume of pipette used cm^3 .

Titration number	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of BA2 used (cm^3)			

Volumes of BA2 used for calculating average.

.....

Average volume of BA2 used

.....

Questions

- (a) Calculate the number of moles of;
 (i) Sodium hydroxide in BA1 that reacted.

.....

.....

.....

.....

.....

.....

- (ii) Organic acid in BA2 that reacted.
(2 moles of sodium hydroxide react with 1 mole of organic acid)

.....

.....

.....

.....

.....

- (b) Hence determine;
 (i) The molar concentration of BA2

.....

.....

.....

.....

.....

- (ii) The value of n

.....

.....

.....

.....

2. You are provided with substance **W**, which contains two cations and one anion. You are required to carry out tests below to identify the ions. Record your observations and deductions in the table below. Identify any gas(es) that may be evolved.

TESTS	OBSERVATIONS	DEDUCTIONS
(a) Put a spatula endful of W in a test tube and heat gently until there is no further change.		
(b) To the residue in (a) add about 5cm ³ of dilute nitric acid and warm to dissolve.		
(c) To the solution in (b) add sodium hydroxide solution dropwise until in excess. Shake well and filter. Keep both filtrate and residue.		

(d) To the filtrate in (b), add dilute nitric acid little at a time until the solution is just acidic. Divide the ACIDIC solution into four portions.		
(i) To the first portion, add sodium hydroxide solution drop wise until in excess.		
(ii) To the second portion, add ammonia solution drop wise until in excess.		
(iii) To the third portion, add 3-4 drops of dilute sulphuric acid.		
iv) Use the fourth portion for carrying out a test of your own to confirm the cation in the filtrate.		
(e) Wash the residue from (c) with distilled water and transfer it into a clean test tube. Add about 5cm ³ of dilute nitric acid to dissolve. Divide the solution into two portions.		
(i) To the first portion, add sodium hydroxide solution drop wise until in excess.		
(ii) To the second portion, add ammonia solution drop wise until in excess.		

(f) Identify;

- (i) The cations in W are.....and.....
- (ii) The anions in W is.....

END