

Name.....

Sign .....

Random No.						Personal No.		

(Do not write your school/Centre Name or Number anywhere on this booklet)

545/4

CHEMSITRY  
(PRACTICAL)

Paper 4

Jul/Aug 2022

2 hours



## BUSOGA REGION JOINT EXAMINATION BOARD

### Uganda Certificate of Education

#### CHEMISTRY PRACTICAL

Paper 4

#### INSTRUCTIONS TO CANDIDATES

Answer **both** questions. Answers are to be written in the spaces provided in this booklet  
All your working **must** be in **blue** or **black** ink. Any work done in pencil **except** drawings  
will **not** be marked

You are **not** allowed to use any reference books (i.e. text books, booklets on qualitative  
analysis etc.)

**All working must be clearly shown**

Mathematical tables and silent non – programable calculators may be used

For Examiner's Use Only		
Q.1		
Q.2		
Total		

1. You are provided with the following;

**BA1**, which is a solution containing a carbonate  $Y_nCO_3$  made by dissolving **7.42g** in a litre

**BA2**, which is a **0.2M** hydrochloric acid solution.

You are required to determine the value of  $n$  in  $Y_nCO_3$ .

**Procedure:**

Pipette **20 or 25** cm<sup>3</sup> of **BA1** into a clean conical flask.

Add 2 – 3 drops of phenolphthalein indicator and titrate the solution with **BA2** from the burette until the end point. Repeat the titration to obtain consistent results.

Record your results in the table below.

**Results:**

Volume of pipette used .....cm<sup>3</sup>

Titration number	1	2	3
Final burette reading(cm <sup>3</sup> )			
Initial burette reading(cm <sup>3</sup> )			
Volume of <b>BA2</b> used(cm <sup>3</sup> )			

Titre values used to calculate the average volume of **BA2** used

.....  
.....

Average volume of **BA2** used

.....  
.....  
.....  
.....

**Questions:**

(a) Calculate the number of moles of;

(i) ***BA2*** that reacted.

.....

.....

.....

.....

.....

.....

(ii) ***Y<sub>n</sub>CO<sub>3</sub>*** in 1000cm<sup>3</sup> of solution ***BA1***

(1 mole of ***Y<sub>n</sub>CO<sub>3</sub>*** reacts with 2 moles of hydrochloric acid)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Determine the

(i) Molar mass of  $Y_nCO_3$ .

.....

.....

.....

.....

.....

.....

.....

.....

.....

(ii) Value of  $n$  in  $Y_nCO_3$  (Y = 38, C = 12, O = 16)

.....

.....

.....

.....

.....

.....

.....

.....

2. You are provided with substance **Q** which contains **two** cations and **one** anion. Carry out the following test on **Q** to identify the cations and anion. Where any gas is evolved, it must be identified and tested. Record your observations and deductions in the table below.

TESTS	OBSERVATIONS	DEDUCTIONS
(a). Heat <b>one</b> spatula endful of <b>Q</b> strongly until there is no further change.		
(b). Dissolve two spatula endfuls of <b>Q</b> in about <b>3cm<sup>3</sup></b> of water. To the mixture add ammonia solution drop wise until in excess. Filter and keep both the filtrate and residue.		
(c ) To the filtrate, add dilute nitric acid drop wise until the solution is <b>just acidic</b> . Divide the solution into five portions		

(i)To the first portion of the acidified filtrate, add 2-3 drops of lead (ii) nitrate solution		
(ii)To the second portion of the acidified filtrate, add 2-3 drops of silver nitrate solution		
(iii)To the third portion of the acidified filtrate, add 2-3 drops of barium nitrate solution		
(iv).To the fourth portion of the acidified filtrate, add sodium hydroxide solution drop wise until in excess.		
(iv).To the fifth portion of the acidified filtrate, add ammonia solution drop wise until in excess.		

(d) Wash the residue with water and dissolve it in dilute sulphuric acid. Divide the resultant solution into three portions.		
(i).To the first portion of the solution, add sodium hydroxide solution drop wise until in excess.		
(ii) To the second portion of the solution, add ammonia solution drop-wise until in excess.		
(iii)To the third portion of the solution, add 2-3 drops of potassium iodide solution		

(e). (i) Cations in *Q*:..... and .....

(ii) Anion in *Q*:.....

**END**