

NAME:.....INDEX NO:.....

SCHOOL:.....SIGNATURE.....

545/3

CHEMISTRY  
PRACTICAL

SEPTEMBER 2023

TIME: 2HOURS



# PEAS NETWORK POST MOCK EXAMINATION 2023

UGANDA CERTIFICATE OF EDUCATION

TIME: 2 hours

PAPER 3

## INSTRUCTIONS TO CANDIDATES:

- Answer both questions. All answers must be written in the spaces provided in this booklet.
- You are not allowed to use any reference books (i.e., text books or handouts etc.)
- All working must be clearly shown.
- Mathematical tables and silent non-programmable scientific calculators may be used

FOR THE EXAMINER'S USE ONLY		
Q1	Q2	TOTAL

- You are provided with the following solutions  
BA1 which is a solution containing 5.0g of a hydrated metal carbonate  $YCO_3 \cdot 10H_2O$  per 250cm<sup>3</sup> of solution.

BA2 which is a 0.2M hydrochloric acid solution.

You are required to determine the value of Y hence its percentage in hydrated metal Carbonate  $YCO_3 \cdot 10H_2O$ .

### Procedure

Pipette 20/25cm<sup>3</sup> of BAI into a clean conical flask, then add 2-3 drops of Methyl orange indicator. Titrate BAI with BA2 from the burette.

Repeat the titration until you obtain consistent results. Record your results in the table below.

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

Experiment No.	1	2	3
Final burette reading (cm <sup>3</sup> )			
Initial burette reading(cm <sup>3</sup> )			
Volume of BA2 used (cm <sup>3</sup> )			

Values used to calculate the average volume of BA2 used

.....and ..... cm<sup>3</sup>

Average volume of BA2

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

### Questions

- Write an ionic equation for the reaction between the BA1 and BA2

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b) Calculate the number of moles of

i) BA2 used

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ii) BA1 per litre of solution

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c) Determine the

i) Formula mass of the hydrated metal carbonate  $YCO_3 \cdot H_2O$

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ii) Value of Y hence its percentage in the hydrated metal carbonate  
 $YCO_3 \cdot 10H_2O$  (H=1, C=12, O=16)

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2. You are provided with substance Q which contains two cations and one anion. Carryout the following tests on Q to identify the cations and anions present in Q. Identify any gas(s) that may be evolved.

Test	Observation	Deduction
(a) Heat a spatula endful of Q in a test tube until no further change.		
(b) To two spatula endful of Q in a test tube, add 7cm <sup>3</sup> of water, shake well then filter, keep both the filtrate and residue		
(c) Divide the residue into 3 portions i) To the first portion, add lead (II) nitrate solution and heat		
ii) To the second portion add acidified barium nitrate solution.		
iii) To the third portion carryout a test of your own choice to confirm the anion in the filtrate		

d) Wash the residue with water, then transfer it in a test tube and add dilute nitric acid dropwise while shaking until it dissolves. Then add sodium hydroxide solution dropwise until in excess, then filter, keep both the filtrate and the residue.		
e) To the filtrate add dilute nitric acid dropwise until the solution is just acidic. Divide the acidic solution into three portion i) To the first portion add sodium hydroxide dropwise until in excess.		
ii)To the second portion add ammonia solution dropwise until in excess		
e) Wash the residue with water and transfer it into a clean test tube and dilute nitric acid until it dissolves while shaking. Divide the resulting solution into 3 portions.		
i)To the first portion add sodium hydroxide solution dropwise until in excess		
ii)To the second portion add sodium carbonate solution		
iii)To the third portion add ammonia solution dropwise until in excess		

f) State the

i) Cations in Q ..... and .....

ii) Anion in Q .....

**END**