545/4

CHEMISTRY PRACTICAL

INSTRUCTION SHEET TO SCHOOLS

PRACTICAL INSTRUCTIONS

JULY/AUGUST, 2023

LANGO SECONDARY SCHOOLS MOCK EXAMINATIONS ASSOCIATION

UGANDA CERTIFICATE OF EDUCATION

CHEMISTRY PRACTICAL INSTRUCTIONS

CONFIDENTIAL:

Great care should be taken that the information given below does not reach the candidates either directly or indirectly.

INSTRUCTIONS FOR PREPARING CHEMICALS AND APPARATUS.

The head teacher must ensure that the teacher responsible for preparing the chemicals and apparatus hands in his / her trial results properly in a separate envelop and firmly fastened to the candidate scripts envelope(s).

1. The description of the reagents and chemicals listed or specified below does not necessarily correspond with the description in the question paper. Candidates must not be informed of the differences.

2. In addition to the fittings and substances ordinarily contained in a chemistry laboratory. Each candidate will require the following: -
   - 1 burette of $50cm^3$
   - 1 pipette of $25.0cm^3$ or $20.0cm^3$
   - 2 conical flasks
   - 1 beaker of $250cm^3$
   - 1 stop clock
   - 1 measuring cylinder of $100cm^3$
   - 1 thermometer
   - 2 boiling tubes
   - 5 test tubes
   - 1 piece of filter paper

- 2g of Z
- 100cm^3 of BA1
- 100cm^3 of BA2

Easy access to:-

- Heat source
- Methyl orange / phenolphthalein indicator
- Distilled water
- Common reagents for identifying cations and anions.
- BA_1 is prepared by diluting 43cm^3 of concentrated hydrochloric acid in distilled water to make 1 litre of the solutions.
- BA_2 is prepared by dissolving 31.8g of unhydrous sodium carbonate in distilled water to make 1 litre of the solutions.
- Substance Z is obtained by mixing iron (II) Sulphate together with aluminum sulphate in the ratio of 1 : 1

NAME: ---------- INDEX No. ----------

SIGNATURE: ----------

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CHEMISTRY

PRACTICAL

PAPER 4

JULY/AUGUST, 2023

TIME: 2 Hrs

LANGO SECONDARY SCHOOLS MOCK EXAMINATIONS ASSOCIATION

UGANDA CERTIFICATE OF EDUCATION

CHEMISTRY PRACTICAL

PAPER FOUR

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES:

- *Answer **all** 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, booklets on qualitative analysis etc).*
- ***All** working must be clearly shown.*
- *Mathematical tables, slide rules and non programmable calculators may be used.*

For Examiners Use Only.		
Question	Marks	Examiners No. and Signature.
1		
2		
TOTAL		

1. You are provided with the followings: -

BA_1 is a solution consisting of 0.5M hydrochloric acid.

BA_2 contains 7.95g of M_2CO_3 dissolved in 250cm³ of water to make the solution.

Aim: You are required to determine the value of **M** in **M_2CO_3**. The base reacts with the acid according to the ratio of 1 : 2 (C = 12, O = 16)

Procedure:

Pipette 25.0cm³ (or 20.0cm³) of **BA_2** into a conical flask. Add **3** drops of methyl orange indicator and titrate the mixture with **BA_1** from the burette. The end point is when the solution mixture first turn to pink colour.

Repeat the above procedure until you obtain consistent results. Enter your results in the table below.

Results

Volume of pipette used ..... cm³ *(1/2 Mk)*

Number of experiment	1	2	3
Final burette reading (cm³)			
Initial burette reading (cm³)			
Volume of BA_1 used (cm³)			

(7 ½ M

1. (a)(i) State the volume of **BA_1** used to calculate the average volume. *(1/2 Mk)*

.....

(ii) Calculate the average volume of **BA_1** used. *(2½ Mks)*

.....

.....

(b) Calculate the;

(i) Number of moles of hydrochloric acid in BA_1 that reacted. *(02 Mks)*

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(ii) Number of moles of the carbonate in BA_2 that reacted. *(02 Mks)*

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(iii) The concentration in mole per litre of the carbonate in BA_2 *(02 Mks)*

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(c)(i) Calculate the concentration of the carbonate in grams per litre. *(03 Mks)*

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.....

(ii) The value of M in M_2CO_3 *(05 Mks)*

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2. You are provided with substance Z, which contains two Cations and one anion. Carry out the tests in the table below to identify the Cations and the anion in Z. Identify any gas(es) that may be evolved .

Record your observations and deductions in the table below.

TESTS	OBSERVATRIONS	DEDUCTIONS
(a) Dissolve one spatula end-ful of Z in $6cm^3$ water. Add sodium hydroxide solution till excess. Shake and filter. Keep both the filtrate and residue.		
(b) To the filtrate, add dilute nitric acid until the solution is just acidic. Divide the resultant solution into five(5) parts.		

(i) To the first part of the acidic solution, add dilute sodium hydroxide solution dropwise until excess.		
(ii) To the second part of the acidic solution, add dilute aqueous ammonia solution dropwise until excess.		
(iii) To the third part of the acidic solution, add three drops of potassium iodide solution.		
(iv) To the fourth portion of the acidified solution, add Leads (II) nitrate solution and warm.		
(v) Use the fifth portion of the acidified solution to carry out a test of your own choice to confirm the anion presence in Z.		
(c) Dissolve the residue in a small amount of dilute sulphuric acid and divide the resultant solution into two parts. (i) To the first part of the solution, add dilute sodium hydroxide solution dropwise until in excess.		
(ii) To the second part of the solution, add dilute aqueous ammonia dropwise until in excess.		

Identify the: -

(i) The Cations present in Z .....

(ii) The anion present in Z .....

END