

Name..... Index No:/.....

Signature.....

545/3

CHEMISTRY

Paper 3

2 hours

RESOURCEFUL MOCK EXAMINATIONS 2016

Uganda Certificate of Education

CHEMISTRY PRACTICAL

Paper 3

2 hours

INSTRUCTIONS TO CANDIDATES

Answer **all** questions.

Record your answers on this question paper in the spaces provided **ONLY**

Mathematical tables, slide rules and silent non-programmable calculators may be used.

Reference books (i.e. text books, books on qualitative analysis, etc) should not be used

For Examiners use only			
Q.1			
Q.2			
Total			

1. You are provided with the following;

BA1 which is a solution containing 20.48g of an impure acid $H_2X \cdot 2H_2O$ per litre of solution

BA2 which is a 0.2M sodium hydroxide solution

You are required to determine the percentage of the acid in BA1.

Procedure:

Pipette 20 or 25 cm^3 of BA2 into a clean conical flask. Then add 2-3 drops of phenolphthalein indicator and titrate the solution with BA1 from the burette until the end point. Repeat the titration 2-3 times to obtain consistent results. Enter 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 BA1 used(cm^3)			

Titre values used to calculate the average volume of BA1 used

.....

Average volume of BA1 used..... cm^3

Questions:

(a) Calculate the;

(i) number of moles of sodium hydroxide in BA2 that reacted.

.....

(ii) number moles of acid in BA1 that reacted

(1mole of BA1 reacts with 2 moles of BA2)

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.....

(iii) concentration of acid in moles per litre of BA1.

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(b) Determine the;

(i) mass of acid, $H_2X \cdot 2H_2O$, in grams per litre of BA1 (**H=1, O=16, X=87**)

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.....

(ii) percentage by mass of acid in solution BA1

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2. You are provided with substance **R** which contains **two** cations and **one** anion. Carry out the following tests to identify the cations and anion in **R**. 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 a spatula endful of R strongly in a hard dry test tube until no further change.		
(b). Dissolve one spatula endful of R in about 5cm ³ of water. To the resultant solution add dilute sodium hydroxide solution drop wise until in excess and filter. Keep both the filtrate and residue.		
(c). To the filtrate, add dilute nitric acid drop wise until the solution is just acidic. Divide the resultant solution into six portions		

TESTS	OBSERVATIONS	DEDUCTIONS
(i). To the first portion of the acidic solution, add dilute sodium hydroxide solution drop wise until in excess		
(ii). To the second portion of the acidic solution, add dilute ammonia solution drop wise until in excess		
(iii). To the third portion of the acidic solution, add 2-3 drops of sodium sulphate solution.		
(iv). Use the fourth portion of the acidic solution to carry out a test of your own to confirm one of the cations in R . Test:		
(v). To the fifth portion of the acidic solution, add 2-3 drops of lead (ii) nitrate solution and warm.		

TESTS	OBSERVATIONS	DEDUCTIONS
(vi). Use the sixth portion of the acidic solution to carry out a test of your choice to confirm the anion in R . Test:		
(d) Dissolve the residue in about 4cm ³ of dilute nitric acid. Divide the resulting 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		

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

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

END

