Name.....Centre/Index No.....

School..... Signature.....

545/3
CHEMISTRY
(PRACTICAL)
Paper 3
July/August
2hours

# WAKISSHA JOINT MOCK EXAMINATIONS

## Uganda Certificate of Education

## CHEMISTRY PRACTICAL

**Paper 3**

**2hours**

**INSTRUCTIONS TO CANDIDATES.**

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

| For Examiner's use only | | |
|---|---|---|
| Q.1 | Q.2 | Total |
| | | |

1. You are provided with solutions **BA1** and **BA2.**

**BA1** was prepared by dissolving 1.0g of sodium hydroxide to make 250cm$^3$ of solution while **BA2** is a solution containing 3.15g of acid $H_2R.n\,H_2O$ per 250cm$^3$ of solution.

You are required to determine the percentage of water of crystillisation, n, in the acid $H_2R.nH_2O$.

**Procedure**

Transfer 20/25 cm$^3$ of **BA1** into a clean conical flask using a clean pipette. Add 3 drops of phenolphthalein indicator to the contents of the flask then titrate with **BA2** from the burette.

Repeat the titration to obtain at least 3 consistent results.

Record your results in the table 1 below.

Volume of pipette used = ..... cm$^3$ (1 mark)

| | 1 | 2 | 3 |
|---|---|---|---|
| Final Burette reading (cm$^3$) | | | |
| Initial Burette reading (cm$^3$) | | | |
| Volume of **BA2** used (cm$^3$) | | | |

(4½ marks)

Values for calculating average volume of **BA2** used;..... ;.....and ..... (3 marks)

Average volume of **BA2** used = ..... (02 marks)

.....

.....

(a) Calculate the number of moles of:

(i) **BA1** used: (03 marks)

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(ii) **BA2** that reacted with **BA1** (02½ marks)

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(b) Determine the:

(i) mass of one mole of the acid, $H_2R.nH_2O$. (05 marks)

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(ii) Value of n, hence percentage of water of crystallization in the $H_2R.nH_2O$. (R = 88) (04 marks)

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2. You are provided with substance M which contains two cations and a common anion.
Carry out the following tests on M to identify the cations and anion.
Test for any gas evolved. (25 marks)
Record your results in the table 2 below.

| TEST | OBSERVATION | DEDUCTION |
|---|---|---|
| a) To one spatula endful of M in a clean test tube, add dilute nitric acid drop by drop until all the solid has dissolved. | | |
| b) To $3cm^3$ of the solution from (a) above add aqueous sodium hydroxide solution drop wise until in excess. Filter the mixture and keep both filtrate and residue. | | |

| | | |
|---|---|---|
| c) To the filtrate from (b) add dilute nitric acid drop wise until the solution is just acidic. Divide the resultant solution into two equal portions. | | |
| (i) To the **first** potion from (c) above add aqueous sodium hydroxide solution drop wise until in excess. | | |
| (ii) To the **second** portion add aqueous ammonia solution drop wise until in excess | | |
| (d) To the residue from (b), put in a clean test tube, add dilute nitric acid drop by drop as you shake until the solid just dissolves. | | |
| (i) To 1 $cm^3$ of the resultant solution from (d) above, add aqueous sodium hydroxide solution until in excess. | | |
| (ii) Use 1$cm^3$ of the resultant solution from (d) above to carry out a test of your own choice to confirm one of the cations in M.<br>_____<br>_____<br>_____<br>_____ | | |

(e) Identify the

(i) Cations :..... and ..... (1 mark)

(ii) Anion ..... ($^1/_2$ mark)

END