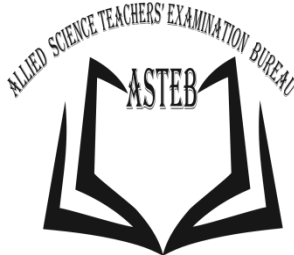


Name:.....Signature:.....

School.....Index no:.....

P525/3
CHEMISTRY
PRACTICAL
PAPER 3
JULY, 2019
3 ¼ HRS



ALLIED SCIENCE TEACHERS' EXAMINATION BUREAU

Uganda Advanced Certificate of Education

MOCK EXAMINATIONS JULY, 2019

CHEMISTRY PRACTICAL

Paper 3

3 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Answer ***all*** questions.

Record your answer on this question paper in the spaces provided.

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

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

Candidates are not allowed to start working with the apparatus for the first 15minutes. This time is to enable candidates to read the question paper and make sure they have all the apparatus and chemicals that they may need.

Where necessary use: (Na=23; O=16; C=12; H=1)

FOR EXAMINERS USE ONLY			
Q1	Q2	Q3	Total

1. You are provided with the following solutions;

BA₁ which is approximately **24.8 g** of metal thiosulphate; **X₂S₂O₃.nH₂O** per **500 cm³** of solution

BA₂ which is approximately **0.04 M** potassium permanganate solution.

BA₃ which is **0.5M** potassium iodide solution

BA₄ which is **2M** sulphuric acid

Y is solid sodium ethanedioate

You are required to determine the number of moles of water of crystallization in the metal thiosulphate from standardized potassium permanganate solution.

Theory

Manganate (VII) ions react with iodide ions in acidic medium according to the equation



Thiosulphate ions react with iodine in solution according to the following equation



Procedure 1

Weigh accurately about 3.25 g of Y add 100 cm³ of distilled water, shake vigorously then transfer to a 250 cm³ volumetric flask and fill with water upto its mark. Label the resultant solution BA₅.

Pipette **25cm³(20 cm³)** of **BA₅** to a clean conical flask, add equal volume of **BA₄** and heat the mixture to **67°C**, then titrate the hot mixture with **BA₂** from the burette until a permanent pale pink colour is obtained. Repeat the procedure to obtain consistent results and record them in the table below.

Mass of weighing bottle + **Y** g

Mass of weighing bottle g

Mass of solid **Y**..... g

Volume of pipette usedcm³

Titre number	1	2	3
Final burette reading/ cm ³			
Initial burette reading/cm ³			
Volume of BA ₂ used/cm ³			

Titre values for average volume of **BA₂** used are

..... and

Average volume of **BA₂**=

Questions;

a) Write the equation of the reaction that has taken place

.....

b) Calculate the;

i) Molar concentration of BA₅ with respect to Y

.....

[illegible]

Pipette **25cm³** or **20 cm³** of **BA₂** into a clean conical flask, add an equal volume of **BA₄** followed by **10cm³** of **BA₃** and titrate the resultant solution with **BA₁** from the burette using starch indicator.

Volume of pipette used cm³

Titre values for average volume of BA₁ used are and

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c) i) Calculate the moles of BA_1 with respect to metal thiosulphate in 500 cm^3 of solution.

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ii) Calculate the relative formula mass of metal thiosulphate

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iii) Value of n in the metal thiosulphate

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2. You are provided with substance **P** which contains **two** cations and **two** anions. You are required to identify them by carrying out the following chemical tests on **P**. Record relevant observations and deductions in the table below. Identify any gas(es) that may be evolved.

TEST	OBSERVATION	DEDUCTION
a) Heat a spatula endful of P in a dry hard test tube gently then strongly until there is no further change		
b) To spatula endful of P , add water and shake to dissolve, then filter and keep both the filtrate and the residue		
c) Divide the filtrate into six portions, i) To the first portion, add lead (II) nitrate solution.		
iii) To the second portion, add iron(III) chloride solution		

iii) To the third portion, add dilute sulphuric acid		
iv) To the fourth portion, add dilute sodium hydroxide solution drop wise until in excess		
v) To the fifth portion, add aqueous ammonia drop wise until in excess		
vi) Use the sixth portion, to confirm the cation in the filtrate of P <u>TEST</u>		
d) Wash the residue obtained in (b) above thoroughly with water followed by addition of dilute nitric acid. Divide the resultant solution into three portions		

i) To the first portion, add sodium hydroxide solution drop wise until in excess		
ii) To the second portion, add dilute ammonia solution drop wise until in excess		
iii) Use the third portion to carry out a test of your own to identify the cation in the residue of P <u>TEST</u>		

e) i) The cations in P are and

ii) The anions are and

3. You are provided with organic compound **V**. You are required to identify its nature by carrying out the chemical tests below on **V**. Record the relevant observations and deductions in the table below.

TEST	OBSERVATION	DEDUCTION
a) Burn a spatula endful of V		
b) To 1 cm ³ of V , add sodium hydroxide solution and shake vigorously		
c) To 5cm³ of V , add 10cm³ of water and to the resultant solution add universal indicator. Divide the resultant solution into five portions		
i) To the first portion, add sodium carbonate solution		
ii) To the second portion, add acidified potassium dichromate solution and heat		
iii) To the third portion, add 2,4-dinitrophenylhydrazine solution and warm		

iv) To the fourth portion, add ammoniacal silver nitrate solution and heat		
To the fifth portion, add concentrated sulphuric acid followed by ethanol and heat the mixture, then pour to a beaker of cold water		

d) Comment on the nature of V

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END