P525/3

CHEMISTRY

Paper 3

2022

3 ¼ Hours **PRIDE SECONDARY SCHOOL-MITYANA**

END OF TERM II EXAMINATIONS -2022

Uganda Advanced Certificate of Education

S.5 CHEMISTRY PRACTICAL

Paper 3

3 Hours 15 Minutes

INSTRUCTIONS TO STUDENTS

- ***The paper consists of three (3) compulsory questions***
- ***Answer all questions in the spaces provided.***
- ***No additional answer sheets will be provided.***

1. You are provided with the following;

   FA_1, which is a solution of NaOH and Na_2CO_3

   FA_2 which is a 0.05 H_2SO_4.

   You are required to determine the concentration in g/l of Na_2CO_3 in the mixture and hence their percentage compositions

   Procedure

   Pipette 20 or 25cm^3 of FA1 into a conical flask, then add 2-3 drops of phenolphalein indicator and titrate with FA_2 from the burrete. Record the burrete reading in table 1.

   Pipette another 20 or 25cm3 of FA1 into A clean conical flask, add 2-3 drops of methyl orange indicator and titrate it with FA2 from the burrete. Record the burrete reading in table 2.

   Repeat the same procedure for two more times to obtain consistent results.

TABLE 1

volume of pipette……cm3 ***(½ mark)***

Experiments	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of FA2 used (cm^3)			

(4.5marks)

Values used for calculating average volume of FA2 used: ***(½ marks each)***

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Average volume of FA2 ***(2 ½ marks)***

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TABLE 2

volume of pipette……cm3 ***(½ mark)***

Experiments	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of FA2 used (cm^3)			

(4.5marks)

Values used for calculating average volume of FA2 used: ***(½ marks each)***

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Average volume of FA2 ***(2 ½ marks)***

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Questions

(a) Determine the volume of the acid that reacted with,

(i) Sodium hydroxide (1 mark)

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(ii) Sodium carbonate (1 mark)

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(b) Calculate the number of moles of acid in FA2

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…… (1.5 marks)

(c) Calculate the number of moles of sodium hydroxide in FA1 that reacted with the acid in FA2

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…….. (3 marks)

(d) Determine the molarity of sodium hydroxide in FA1

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…….. (1.5 marks)

(e) Calculate the concentration in g/l of sodium hydroxide in FA1 (Na=23, O=16,H=1)

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…… (1.5 marks)

(f) Calculate the molarity of sodium carbonate in FA1 hence it's concentration in g/l (Na=23, O=16,C=12) (7.5 marks)

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2. You are provided with substance X which contains **two** cations and **two** anions. Carry out the following tests on X and record your results, in the table below. Where a gas is evolved, it must be identified (40 marks)

TESTS	OBSERVATIONS	DEDUCTIONS
a) Heat two spatula endfuls of X in a dry test tube strongly until there is no further change.		
b) Transfer three spatula endfuls of X in a dry test tube and add about $5cm^3$ of distilled water. Shake and filter. Keep both the filtrate and residue.		

Divide the filtrate into three portions. i) To the first portion add sodium hydroxide solution dropwise until in excess		
ii) To the second portion, add ammonia solution dropwise until in excess.		
iii) To the third portion, add reagent of your own choice to confirm the cation in filtrate. …….. …….. …….. …….. ……..		
c) Transfer the residue from part (b) into a test tube and add few drops of dilute nitric acid. Divide the resultant solution into 3 parts.		

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 choice to confirm the cation in residue of X …… …… …… …… ……		

Identify;

(i) Cations in X …….. and ……

(ii) Anions in X …… and ……..

3. You are provided with an organic substance Z. You are required to determine the nature of Z. carry out the following tests to identify Z. Record your observations and deductions in the table below.(19 marks)

Tests	Observations	Deductions
a) Burn a spatula endful of Z on a porcelain dish.		
b) To about 2-3 drops of Z in a test tube, add 1cm^3 of water and test with litmus.		
c) To about 0.5cm^3 of Z, add sodium hydrogen carbonate solution.		
d) To about 0.5cm^3 of Z, add 2 drops of iron (III) chloride solution.		
e) To about 1cm^3 of Z, add 3 – 4 drops of 2,4 dinitrophenyl hydrazine solution.		

f) To about 1cm^3 of Z, add acidified potassium dichromate solution and warm. Divide into 2 parts.		
i) To the 1st part, add 3-4 drops of Brady's reagent ii) To the 2nd part, add 3-4 drops Tollen's reagent		
g) To about 3 drops of Z, add a reagent of your own choice to confirm the functional group in Z. …… …… …… …… ……		

…….. …… (f) To 1 cm3 of Z carry out Iodoform test…….. …… …….. …….. ……..		

Comment on the nature of Z

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End-

"It is not yet done until it is done"