

REGISTRATION CENTER NUMBER		CENTER NAME	
CANDIDATE'S FULL NAME			
CANDIDATE'S IDENTIFICATION NUMBER		SUBJECT CODE 0715	PAPER NUMBER 3 Group Three
FOR OFFICIAL USE ONLY (Candidate Random Code)			
CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD ADVANCED LEVEL EXAMINATION			
SUBJECT TITLE CHEMISTRY		SUBJECT CODE 0715	PAPER NUMBER 3 Group Three
EXAMINATION DATE: JUNE 2020			

Three Hours

Enter the information required in the boxes above.
Do not write in pencil except for graphs.

You are reminded of the necessity for good English and orderly presentation in your answers.

Your results must be recorded in the spaces provided in this question booklet. No further descriptions of the experiments are required. Candidates must allow for themselves enough time to complete and check their calculations where these are required. In calculations you are advised to show all the steps in your working.

SAFETY SPECTACLES should be worn for all practical work. Candidates are reminded that many chemicals are POISONOUS. PIPETTE FILLERS should be used when appropriate.

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Answer BOTH Questions. They carry equal marks.

Calculators are allowed.

TURN OVER

FOR EXAMINERS'S USE ONLY			
Marked by:		SCORE	
Signature: Date:		1	45
		2	45
Checked by:		SBA	10
Signature: Date:		TOTAL	100

Turn over

Question 1.

You are provided with the following.
 Solution K, aqueous sodium hydroxide.
 Solution L, dilute sulphuric acid
 Solid sulphamic acid
 Phenolphthalein indicator

You are required to:

- Prepare a standard solution of sulphamic acid and use it to determine the concentration of sodium hydroxide.
- Use the hydroxide to determine the concentration of the sulphuric acid solution

Previous experience of this type of exercise is not required. Full details of the procedure are given below.

PROCEDURE

- Weigh accurately between 2.25 g and 2.35 g of sulphamic acid; dissolve it in distilled water and make up to the mark in a 250-cm³ volumetric flask. Record the masses in Table 1
- By means of a clean pipette transfer 25 cm³ of the sulphamic acid solution into a 250-cm³ conical flask. Add 2-3 drops phenolphthalein indicator and titrate with the solution K to the end-point. Record the results of two careful titrations in Table 2.
- Using a different burette, place 25 cm³ of solution L into a 250-cm³ conical flask. Add 2-3 drops of phenolphthalein indicator and titrate with the Solution K to the end-point. Record the results of two careful titrations in Table 3.

RESULTS

Table 1

Mass of weighing beaker and sulphamic acid = ...g
 Mass of weighing beaker alone = ...g
 Mass of sulphamic acid weighed = ...g

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Table 2

Burette reading	Approximate	Accurate	Accurate
Second burette reading			
First burette reading			
Titre/cm ³			

Mean titre, (t₁) = ...cm³ of aqueous sodium hydroxide reacts with 25 cm³ of aqueous sulphamic acid

Table 3

Burette reading	Approximate	Accurate	Accurate
Second burette reading			
First burette reading			
Titre/cm ³			

Mean titre, (t₂) = ...cm³ of aqueous sodium hydroxide reacts with 25 cm³ of aqueous sulphuric acid

CALCULATIONS

1. Calculate the concentration of the sulphamic acid solution?



(Sulphamic acid is a monobasic acid and has relative molecular mass of 97.1).

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2. Calculate concentration of the NaOH solution using titre t_1

(a) in mol dm^{-3}

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(b) in g dm^{-3}

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3. Using the titre t_2 , calculate the concentration of the sulphuric acid solution.

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2. You are provided with two inorganic salts M and N, and an organic compound O. Carry out the following tests on M, N and O, recording your observations and inferences in the tables provided. Then answer the questions which follow the tables.

(a) Carry out a flame test on small sample of M	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(b) Dissolve the rest of sample M in about 10 cm ³ of distilled water and use portions of the solution for the following tests.	
(i) To about 2 cm ³ of the solution of M, add about 2 cm ³ of dilute hydrochloric acid.	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(ii) To about 1 cm ³ of the solution of M, add aqueous silver nitrate	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(c) Dissolve half of sample N in about 5 cm ³ of distilled water.	
(i) To about 2 cm ³ of solution N, add aqueous Na ₂ CO ₃	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(ii) To about 2 cm ³ of the solution of N, add aqueous silver nitrate followed by dilute nitric acid and then aqueous ammonia.	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>

(d) Carry out a flame test on solid N	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(e) Place a little of sample O on an inverted crucible lid and ignite from above	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(f) THIS TEST SHOULD BE DONE IN A FUME CUPBOARD OR OUTSIDE THE ROOM. Place about 3-4 cm ³ of O in a boiling tube and add a little phosphorus pentachloride (PCl ₅).	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>
(g) To 2 cm ³ of O in a boiling tube, add about 3 cm ³ of aqueous potassium iodide and then about 8 cm ³ of sodium chlorate (I) (Sodium hypochlorite) solution warm the mixture.	
<u>OBSERVATIONS</u>	<u>INFERENCES</u>

Now answer the following:

1. Suggest the identities for compound M and N.

M.....

N.....

2. Give the structural features found in compound O.

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