CHEMISTRY PRACTICAL PAPER 3

JULY 2018

GATUNDU JOINT EVALUATION EXAMS

Name……Index number……

Candidate's Signature……Date……..

Instructions to the candidates

- **Write your name and index number in the spaces provided above**
- **Sign and write the date of examination in the spaces provided above.**
- **Answer all questions in the spaces provided in the question paper.**
- **You are not allowed to start working with the apparatus** for the first 15 minutes of $2\frac{1}{4}$ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.
- **All working MUST be clearly shown where necessary.**
- **KNEC mathematical tables and silent electronic calculators may be used.**
- **This paper consists of 8 printed pages.**
- **Candidates should check the question paper to ascertain that all pages are printed as indicated**

For Examiner use only

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1. You are provided with
    - Sulphuric (VI) acid solution **F**
    - 0.5M Sodium hydroxide solution **G**
    - Magnesium ribbon solid **H**

You are required to determine the concentration of sulphuric (VI) acid in moles per litre.

Procedure I

Measure 50cm^{3}of solution F using a 100cm^3 measuring cylinder and place it in a 100ml beaker. Stir the solution gently with a thermometer and take its temperature after every half – minute. Record your results in Table I

After one and half minutes add all of solid **H** at once .Stir the mixture gently with a thermometer and record the temperature of the mixture after every half – minute in table I up to the sixth minute.

Keep the solution for use in procedure II

a. Table I

min)		$\frac{1}{2}$											
rature(°C)													

(5marks)

b. Using the results in table I determine the highest change in temperature Δ T for the reaction.

Δ T =…… (1mark)

c. Calculate the heat change for the reaction .(specific heat capacity is 4.2J g^{-1}K^{-1} density of the solution = 1.0g/cm^3. (2marks)

d. Given that the molar heat of reaction of sulphuric (VI) with solid H is 323kJmol^{-1}, calculate the number of moles of sulphuric (VI) acid that were used during the reaction. (2marks)

Procedure II

Place all the solution obtained in procedure I in 100cm^3 measuring cylinder. Add distilled water to make 100cm^3 of solution. Transfer all the solution into a beaker and shake well. Label it solution K .Fill the burette with solution G . Pipette 25 cm^3 of solution K into a conical flask . Add 2-3 drops of phenolphthalein indicator and titrate with solution G from the burette. Record your readings in table II below.

Table II

Titration number	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution G used (cm^3)			

(5marks)

e. Calculate the average volume of solution G used.

f.

g. Calculate the number of moles of sodium hydroxide, solution G that were used. (1mark)

h. Determine

(i) The number of moles of sulphuric (VI) acid in 25.0 cm^3 of solution K. (1mark)

(ii) The number of moles of sulphuric (VI) acid in 100cm^3 of solution K. (1mark)

(iii) Using the results from (d) and g (i) above. Calculate the total number of moles of sulphuric (VI) acid in 50 cm^3 of solution F. (1mark)

(iv) Calculate the concentration of the original sulphuric (VI) acid solution F in moles per litre. (1mark)

2. You are provided with
   - Solid Q
   - Aqueous lead (II) nitrate
   - Distilled water
   - Red litmus paper
   - Source of heat

Solid Q is suspected to be Ammonium chloride.

a) From the reagents provided select and describe a test that can be carried out consecutively to confirm if solid Q is ammonium chloride. Write the tests and expected observations in the spaces provided.

I.

	ed observations
(1mark)	(2marks)

II.

Test 2	Expected observations

(2marks)	(1mark)

b. Carry out the tests described in (a) using solid Q and record the observations and inferences in the spaces provided below.

I. Test 1

Observation	inferences
(1mark)	(1mark)

II. Test 2

Observations	Inferences
(2marks)	(1mark)

3. You are provided with an organic compound solution M . Carry out the following tests. Record the observations and inferences in the spaces provided.

(a) Using a metallic spatula ignite solution M using a non-luminous flame

Observations	Inferences
(1mark)	(1mark)

(b) Divide the remaining solution into 4 portions.

I . To the first portion add 3 drops of acidified potassium manganate (VII)

Observations	Inferences
(1mark)	(2marks)

II. To the second portion, add 2 drops of bromine water.

Observations	Inferences
(1mark)	(1mark)

III. To the third portion add all solid sodium carbonate.

Observations	Inferences
(1mark)	(1mark)

IV. To the fourth portion determine the PH

Observations	Inferences
(1mark)	(1mark)