Name……. **Index No……/…….**

School…… **Candidates Signature……**

Date ……..

233/3
CHEMISTRY
(PRACTICAL)
Paper 3
July/August 2009
2 ¼ Hours

BORABU INTER - SECONDARY SCHOOL
JOINT EVALUATION TEST - 2009
Kenya Certificate of Secondary Education (K.C.S.E)

233/3
CHEMISTRY
(PRACTICAL)
Paper 3
July/August 2009
2 ¼ Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and Index Number 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 the 2 ¼ 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.
- Sign and write date of examination in the spaces provided above.
- Mathematical tables and silent electronic calculators may be used.
- All workings **MUST** be clearly shown where necessary.

For Examiners use only.

Question	Maximum Score	Candidates Score
1	23	
2	09	
3	08	
TOTAL	40	

This paper consists of 7 Printed pages.
Candidates should check the question paper to ensure that all the Papers are printed as indicated and no questions are missing

1. You are provided with:
   - Magnesium ribbon, solid E
   - 0.7M sodium hydroxide, solution F
   - Sulphuric acid, solution G

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

Procedure A

Using a burette, place 50.0cm^3 of sulphuric acid, solution G in a 100ml beaker. Stir the solution gently with a thermometer and measure its temperature after every half-minute. Record the values in table 1 below. Fold solid E once, at exactly **1 ½** minutes, place solid E into solution G. stir the mixture gently with the thermometer. Measure the temperature of the mixture after every half-minute and record values in table **1** ***(retain the mixture for use in procedure B)***

Table 1

Time (min)	0	½	1	1 ½	2	2 ½	3	3 ½	4	4 ½	5	5 ½	6
Temperature ^{0}C				X									

(4mks)

(i) Plot a graph of temperature (y-axis) against time on grid provided (3mks)

(ii) Using the graph, determine the highest change in temperature ΔT (1mk)

(iii) Calculate the heat change for the reaction given that the specific heat capacity of the mixture is $4.2kJg^{-1}k^{-1}$ and that the density of the resulting solution is $1g/cm^3$ (2mks)

(iv) Given that the molar heat of reaction of sulphiric acid with solid E is $323kJmol^{-1}$. Calculate the number of moles of sulphuric acid that were used during the reaction.(2mks)

Procedure B

Rinse the burette thoroughly and fill it with sodium hydroxide, solution **F**. Transfer all the contents of the 100ml beaker used in procedure A into a 250ml volumetric flask. Add distilled water to make up to the mark. Label this solution **H**. using a pipette and a pipette filler, place $25.0cm^3$ of solution **H** into a 250ml conical flask. Add two or three drops of phenolphthalein indicator and titrate against sodium hydroxide, solution **F**. Record your results in table **2**. Repeat titration two more times and complete table **2**

Table 2

	I	II	III
Final burette reading			
Initial burette reading			
Titre (cm^3)			

(4mks)

Calculate the:

(i) Average volume of solution F used (1mk)

(ii) The number of moles of:

I solution F used (1mk)

II sulphuric acid in 25.0cm^3 of solution H (1mk)

III Sulphuric acid in 250cm^3 of solution H (1mk)

(c) Calculate

(i) The total number of moles of sulphiric acid in 50cm^3 of solution G (2mks)

(ii) The concentration of the original sulphuric acid, solution G in moles per litre. (1mk)

2. You are provided with solid **K**. carry out the tests below and record your observations and inferences in the spaces provided. Divide solid **K** into two halves.

(a) Place one half of solid **K** in a clean dry test-tube. Heat it gently strongly.

Observations	Inferences
(1mk)	(1mk)

(b) Place the other half of solid **K,** in a boiling tube, add 10cm^3 of distilled water and shake well until the solid dissolves.

(i) To about 1cm^3 of the solution **K**, add 2M sodium hydroxide drop wise until in excess

Observations	Inferences
(1mk)	(1mk)

(ii) Place 1cm^3 of the solution **K**, in a test tube and add 2 to 3 drops of 2M sulphuric acid

Observations	Inferences
(1mk)	(1mk)

(iii) To about 1cm^3 of the solution **K**, add 4-5 drops of 2M Lead (II) Nitrate solution and heat to boiling.

Observations	Inferences
(2mks)	(1mk)

3. You are provided with liquid **J**. Carry out the tests below. Record your observations and inferences in he spaces provided.

(a) To about $1cm^3$ of liquid **J** in a test tube, add about $1cm^3$ of distilled water and shake thoroughly.

Observations	Inferences
(1mk)	(1mk)

(b) To about $1cm^3$ of liquid **J** in a test tube, add three drops of bromine water

Observations	Inferences
(1mk)	(1mk)

(c) To about $2cm^3$ of liquid **J** in a test tube add about $1cm^3$ of acidified potassium dichromate (VI). Warm the mixture gently and allow it to stand for a minute.

Observations	Inferences
(1mk)	(1mk)

(d) To about $2cm^3$ of liquid **J** in a test tube, add a small amout of solid sodium hydrogen carbonate

Observations	inferences
(1mk)	(1mk)