

Name.....

Index No...../.....

School.....

Date

Candidate's Signature.....

233/3

CHEMISTRY

Paper 3

(Practical)

July/August 2012

Time: 2 ¼ Hour

LOITOKITOK DISTRICT EVALUATION TEST– 2012

Kenya Certificate of Secondary Education (K.C.S.E)

233/3

CHEMISTRY

Paper 3

Practical

July/August 2012

2 Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above and sign
- Answer ALL the questions in the spaces provided.
- Mathematical tables and electronic calculators may be used
- All working MUST be clearly shown where necessary

FOR EXAMINER USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	15	
2	14	
3	11	
	40	

This paper consists of 8 printed pages.

Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. You are provided with :-
- Sulphuric (IV) solution P
 - 0.25M sodium hydroxide
 - Solid R
- You are required to determine the concentration of sulphuric (VI) acid in molar per litre

PROCEDURE I

Using a burette, place 50.0cm³ of sulphuric (VI) acid, solution P in a 100ml beaker. Measure the temperature of the solution after every half – minute and record the values in table 1. At exactly 1 ½ minute, add solid R to the acid. Stir, the mixture gently with the thermometer ensuring the solid is intake the solution and note the temperature of the mixture after every half – minute and record the values in table 1.

Time (minute)	0	½	1	1 ½	2	2 ½	3	3 ½	4	4 ½	5	5 ½	6
Temperature (°C)				X									

- b) Plot a graph of temperature (y – axis) against time. (3mks)

- ii) Using the graph, determine the highest change in temperature. (1mk)
- iii) Calculate the heat change for the reaction (Assume that the specific heat capacity of the mixture is $4.2\text{g}^{-1}\text{K}^{-1}$ and density of the mixture is $1\text{g}/\text{cm}^3$). (2mks)
- iv) Given that the molar heat of reaction of sulphuric (VI) acid with solid R is 320kJ mol^{-1} , calculate the number of moles of sulphuric acid that were used during the reaction. (2mks)

PROCEDURE II

Transfer ALL the contents of the 100 ml. beaker used in procedure I into a 250ml. Volumetric flask. Add distilled water to make up to the mark. Label this solution Q. Rinse the burette throughout it with sodium hydroxide. Using a pipette and a pipette filler, place 25.0 cm^3 of solution Q into a 250ml. Conical flask. Add two or three drops of phenolphthalein indicator and titrate against sodium hydroxide. Record your results in table 2. Repeat titration two more times and complete table 2.

	I	II	III
Final burette reading			
Initial burette reading			
Volume of sodium hydroxide used (cm^3)			

(4mks)

- c) Calculate the :-
 I i) Average volume of sodium hydroxide used

- ii) the number of moles of :-
I Sodium hydroxide used. (1mk)
- II Sulphuric (VI) acid in 250 cm³ of solution Q (2mks)
- III Sulphuric (VI) acid in 250cm³ of solution Q. (1mk)
- d) Use part b(iv) and C (III) above to calculate the total number of moles of sulphuric (VI) in 50cm³ of solution P.
- e) Calculate the concentration of the original sulphuric (VI) acid solution P in moles per litre' (2mks)

2. You are provided with solid S. Carry out the test below write your observation and inference in the spaces provided.

a) Place half of solid S in a clean dry test – tube and heat gently. Test any gases produced with both blue and red litmus papers.

Observation	Inference
(2mks)	(2mks)

b) i) Transfer all of the remaining solid S into a dry boiling tube. Add about 10cm³ of distilled water and shake well.

Observation	Inference
(2mks)	(2mks)

ii) To the 2nd portion add a few drops of lead (II) nitrate solution followed by

Observation	Inference
(2mks)	(2mks)

- iii) Place about 2cm³ of the solution in a test tube and add Barium Nitrate followed by 5 drops of Nitric (V) acid

Observation	Inference
(2mks)	(2mks)

- iv) To the third portion add sodium hydroxide until in excess

Observation	Inference
(2mks)	(2mks)

- v) To the fourth portion add 6 drops hydrogen peroxide add shake well

Observation	Inference
(2mks)	(2mks)

