Name ……..……

Index No…..……..……

School ……Candidate's Signature……...…..….Date:

……..

233/3
CHEMISTRY PRACTICALS
Paper 3
July 2013
Time: 2½ Hours

LARI DISTRICT MOCK- 2013

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

INSTRUCTION TO CANDIDATES

- Write your name, school and index number in the spaces provided.
- Sign and write the date in the spaces provided.
- Answer **all** the questions in the spaces provided.
- **Mathematical tables** and **electronic calculators** may be used.
- **All** working must be clearly shown.

FOR EXAMINER'S USE ONLY

Question	Maximum Score	Candidate's Score
1	23	
2	8	
3	9	
TOTAL	**40**	

This paper consists of 8 printed pages.
Candidates should check the question paper to ensure that all the Pages are printed as indicated and no questions are missing.

1. **(I)** You are provided with:
   - ✓ Solution **M** containing 3.95g Potassium Manganate (vii), ($KMnO_4$) per litre of solution.
   - ✓ Solution **N**, containing 49.0g of ammonium ferrous Sulphate $(NH_4)_2SO_4$. $FeSO_46H_2O$ per litre of solution.

   You are required to determine the reacting mole ratio of manganate (VII) Ions, MnO_4 with Iron (II) Ions Fe^{2+}.

PROCEDURE 1:

Using and pipette filter transfer 25.0cm^3 of solution N into a conical flask. Titrate with solution M in the burette. No indicator is required for this experiment. Record your results in the table below.

Repeat the procedure to obtain the accurate volumes.

Table I

	1st	2nd	3rd
Final burette readings cm^3			
Initial burette readings cm^3			
Volume of solution M used cm^3			

(4mks)

a) Determine the average volume of solution M used. (1mk)

b) Calculate:

i) The concentration of solution M in moles per litre. (K = 39, Mn = 55, O = 16) (1mks)

ii) The number of moles of solution M in the volume in (a) above. (1 mks)

iii) The concentration in moles per litre of solution N. (1 mks)

iv) The number of moles of solution N that reacted with solution M in this experiment (1mks)

c) Given that 1 mole of solution M gives 1 mole of MnO_4^- ions and 1 mole of solution N gives 1 mole of Fe^{2+} ions. Calculate the reaction mole ratio of Fe^{2+} ions to MnO_4^- ions. (1mks)

(II). You are provided with:

- ✓ 0.9M of sodium hydroxide solution X
- ✓ 0.5M of oxalic acid solution Y

You are required to determine the molar heat of neutralization of sodium hydroxide

PROCEDURE II:

Place six test tubes in a test tube rack. Using a $10cm^3$ measuring cylinder, measure $10cm^3$ of solution Y and place them into each of the test tubes.
Measure $50cm^3$ of solution X using a measuring cylinder and place into $200cm^3$ beaker. Measure the temperature of solution X in the beaker and record the steady value in table II below. Put the first portion of the $10cm^3$ of solution Y from the test tube into the beaker containing $50cm^3$ of solution X. Stir the mixture carefully using a thermometer and record the highest temperature in table II below.
Pour the second portion of solution Y **into the mixture in the beaker**, stir and record the highest temperature of this mixture in the table II. Continue this procedure using the remaining portions of solution Y to complete table II.

(i) Table II

Total volume of Y added (cm^3)	0	10	20	30	40	50	60
Volume of X (cm^3)							
Temperature (^0C)							

(4mks)

(ii) On the grid provided, plot a graph of temperature (Y axis) against volume of solution Y added. (3mks)

GRID

(iii) From the graph, find:

(a) The volume of solution Y required to neutralize $50cm^3$ of sodium hydroxide solution X (½mks)

(b) The highest temperature change ($\triangle T$) (½mk)

(iv). Calculate the heat change of reaction (Assume density of mixture = $1g/cm^3$ and specific heat capacity= $4.2Jg^{-1}k^{-1}$) (2mks)

(v) Find the number of moles of sodium hydroxide solution X used (1mk)

(vi) Determine the molar heat of neutralization of sodium hydroxide, solution X (2mks)

2. You are provided with solid Q. Carry out the test below and record your observations and inferences in the spaces provided.
Place the entire solid in a boiling tube. Add about $10cm^3$ of distilled water. Shake until all the solid dissolves. Divide the solution into four portions.

i) To the first portion, add aqueous sodium hydroxide drop wise until in excess.

Observation	Inference
(1mk)	(1mk)

ii) To the second portion, add aqueous ammonia drop wise until in excess.

Observation	Inference
(1mk)	(1mk)

iii) To the third portion, add 3 drops of barium nitrate solution.

Observation	Inference
(1mk)	(1mk)

iv) To the fourth portion, add about $2cm^3$ of lead II nitrate solution

Observation	Inference
(1mk)	(1mk)

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3. Your are provided with solid Z carry out the tests below and record your observations and inferences in the spaces provided.

i) Using a metallic spatula heat half a spatula end-ful of solid Q in a non luminous Bunsen flame for sometime then remove when it ignites.

Observation	Inference

(1mk)	(1mk)

(ii) Put a half spatula end-ful of Z in a boiling tube, add $10cm^3$ of distilled water and shake vigorously.

Observation	Inference
(½mk)	(½mk)

Divide the resulting solution into two portions.

(a) To portion one, dip a piece of universal indicator paper and determine its PH.

Observation	Inference
(1mk)	(1mk)

(b) To portion two add one or two drops of acidified potassium manganate VII solution and shake vigorously.

Observation	Inference
(1mk)	(1mk)

Put half spatula endful of Z into a boiling tube and add 5 drops of ethanol followed by 2 drops of concentrated sulphuric acid. Warm the mixture

Observation	Inference
(1mk)	(1mk)