

KAPSABET HIGH SCHOOL



233/2 -

CHEMISTRY -

Paper 2



MOCK 2023

Name: Adm No:

Class: Candidate's Sign:

Date:

233/3
CHEMISTRY
PAPER 3

TIME: 2 ¼ HOURS

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

Chemistry
Practical

INSTRUCTIONS TO THE CANDIDATES:-

- Write your name and index number in the spaces provided
- Sign and write the **date** of examination 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 where necessary.
- Use the first 15 minutes of the 2 ¼ hours to ascertain you have all the chemicals and apparatus that you may need.

For Examiners use Only

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

QUESTION 1

- You are provided with solution **K** and **L**
- Solution **K** is 1M H_2SO_4
- Solution **L** contains 8.7g of the hydroxide of metal **M** {with formulae MOH } in 600cm^3 of the solution
- You are required to carry out the experiment to determine;
 - i. Concentration of solution **L**
 - ii. R.A.M of metal **M**

Procedure

1. Measure 75cm^3 of solution **K** and put into a clean 250cm^3 volumetric flask and add distilled water up to the mark -label this solution **W**
2. Fill a clean burette with solution **W**
3. Pipette 25cm^3 of solution **L** into a clean conical flask and add 2 drops of phenolphthalein indicator
4. Titrate the solution **W** in the burette against solution **L** in the conical flask and record the results in the table below
5. Repeat {3} and {4} above as you fill the table below.

TABLE 1

	I	II	III
Final burette reading $\{\text{cm}^3\}$			
Initial burette reading $\{\text{cm}^3\}$			
Volume of solution W used $\{\text{cm}^3\}$			

[4mks]

{a} Calculate the;

{i} Average volume of solution **W** used

[1mk]

{ii} Concentration of solution **W**

[1mk]

{iii} Number of moles of solution **W** that reacted with each 25cm^3 portion of solution **L** {2mks]

{b} Calculate the;

{i} Number of moles of the metal hydroxide $\{\text{MOH}\}$ in solution **L** that reacted with each portion of solution **W** [2mks]

{ii} Concentration of solution L

[1mk]

{iii} Number of moles of the metal hydroxide [MOH] in 600cm³ of solution L

[2mks]

{iv} R.A.M of metal M
[O=16, H=1]

[2mks]

QUESTION 2

You are provided with solution N and P

- Solution N is 2M HCl
- Solution P is 0.16M sodium thiosulphate
- You are required to carry out the experiment below to determine how concentration affects the rate of reaction between HCl and sodium thiosulphate solutions

PROCEDURE

1. Fill a clean burette with solution P.
Measure 25cm³ of the solution P from the burette into a clean 100cm³ glass beaker and place on a white piece of paper with a cross [x] marked on it
2. Add 10cm³ of solution N into it and immediately start a stop watch and note the time taken for the cross beneath the mixture to become invisible
3. Clean the 100cm³ beaker and measure into it 20cm³ of solution P from the burette, and add 5cm³ of distilled water into the solution
4. Repeat step [2] above and note the time taken for the cross to become invisible
5. Repeat the experiment using volumes indicated on the table below and as you record the results

TABLE 2

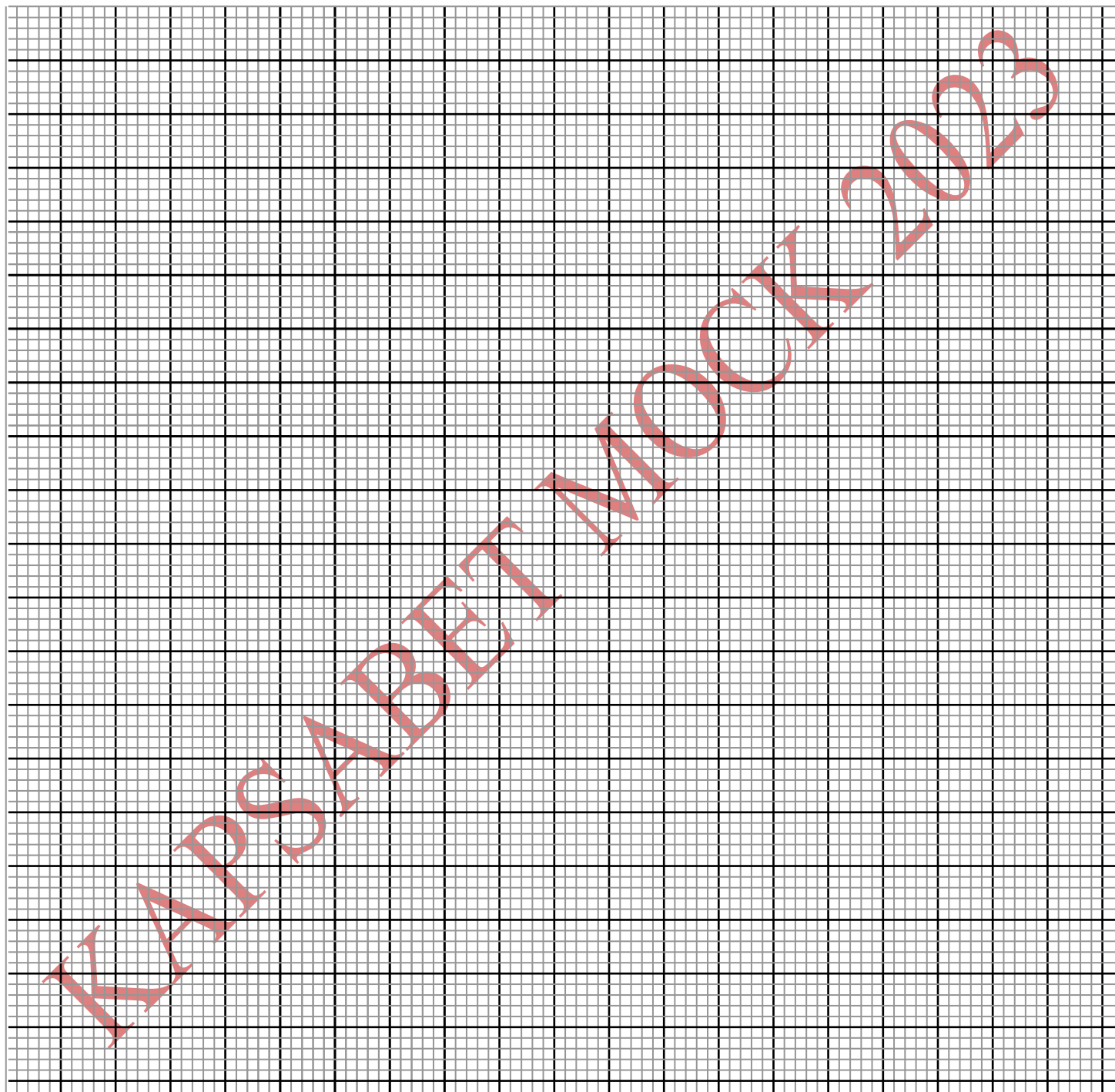
Expt	1	2	3	4	5
Volume of solution p(cm ³)	25	20	15	10	5
Volume of water added to solution p{cm ³ }	0	5	10	15	20
Volume of solution N	10	10	10	10	10
Time taken for the cross to become invisible [in seconds]					

$\frac{1}{t} \text{ s}^{-1}$					
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(4mks)

[a] plot a graph of $\frac{1}{t}$ against volume of solution P on the grid provided

[3mk]



{b} From the graph

{i} Determine the time taken for the cross to become invisible when 12.5cm^3 of solution P is used

[2mks]

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- {ii} Explain the effect of concentration on the rate of reaction between HCl and sodium thiosulphate solution [2mks]
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QUESTION 3

- You are provided with solids Q and R
- You are required to carry out the tests below as you record your observations and inferences

(i) **SOLID Q**

-Add about 5cm³ of distilled water to solid Q, shake the mixture thoroughly for a while and then filter it

NOTE: Retain both the filtrate and the residue for the tests below

	TEST	OBSERVATIONS	INFERENCES
(a){i}	Divide the filtrate into 4 portion -To the first portion, add 4 drops of NaOH	$\left(\frac{1}{2} \text{ mark}\right)$	(1mark)
{ii}	Scoop the 2 nd portion on a metallic spatula and ignite on a non-luminous flame	$\left(\frac{1}{2} \text{ mark}\right)$	$\left(\frac{1}{2} \text{ mark}\right)$
{iii}	To the 3 rd portion, add 2 drops of Pb{NO ₃ } _[aq]	$\left(\frac{1}{2} \text{ mark}\right)$	(1mark)
{iv}	To the 4 th portion ,add acidified KmnO ₄	$\left(\frac{1}{2} \text{ mark}\right)$	$\left(\frac{1}{2} \text{ mark}\right)$
b{i}	Put the residue in a test tube and add about 2cm ³ of HNO ₃	$\left(\frac{1}{2} \text{ mark}\right)$	(1mark)

{ii}	To the mixture in b{i} above, add 2 drops of KI solution		
		$\left(\frac{1}{2} \text{ mark}\right)$	$\left(\frac{1}{2} \text{ mark}\right)$

{ii}SOLID R

	TEST	OBSERVATIONS	INFERENCES
(a)	Scoop a portion of solid R on a Metallic spatula and burn on a Non-luminous flame		
		(1 mark)	(1 mark)
(b){i}	Put the remaining portion of solid R into a clean test tube and add about 3cm ³ of distilled water, shake and divide into 2 portions		
		(1 mark)	$\left(\frac{1}{2} \text{ mark}\right)$
{ii}	To the 1 st portion, add 2 drops of acidified KMnO ₄ and warm		
		$\left(\frac{1}{2} \text{ mark}\right)$	(1 mark)
{iii}	To the 2 nd portion add NaCO ₃		
		$\left(\frac{1}{2} \text{ mark}\right)$	(1 mark)

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