

**THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
NEWALA DISTRICT COUNCIL
FORM FOUR MID TERM TEST JOINT**

CHEMISTRY PRACTICAL 2A

TIME: 2:30 HOURS

MARCH 2024

INSTRUCTION:

1. This paper consists of two questions
2. Answer all questions
3. Each question carries 25 marks
4. Non-programmable calculator may be used
5. The following constant may be used
H=1, C=12, O=16, S=32, Na=23, Zn= 65, Cl= 35.5, K=39
1 Litre = 1 dm³ = 1000 cm³

1. You are provided with the following.
A: Solution M contains exactly 5.6g of potassium hydroxide per litre of solution
B: Solution K contain exactly 4.9g of solution H₂X per litre where X is an acidic radical
C: Phenolphthalein (p.o.p)

PROCEDURES.

Put solution K into burette, pipette 20 cm³ or 25 cm³ of solution M into titrating flask, add two drops of p.o.p indicator, titrate solution M against solution K until a colour is observed. Repeat the procedures to obtain three more reading and record your result in tabular form.

Question.

- (a) (i) ____ cm³ of M required ____ cm³ of K to reach the end point.
(ii) The colour change was from _____ to _____
- (b) Write the chemical equation for the reaction.
- (c) Calculate
 - (i) Number moles of substances H₂X per dm³ of solution K.
 - (ii) Molar mass of substance H₂X
 - (iii) Name the identity of X and its formula
2. You are provided with the following
HH: A solution of 0.13M OF Na₂S₂O₃ (sodium Thiosulphate).
NN: A solution of 2M HCL.
Distilled water

Stop watch

A sheet of white paper marked "x"

PROCEDURES:

- (i) Measure 20cm³ solution HH and put into 100cm³ beaker
- (ii) Place the beaker containing solution HH on top of letter "x" drawn on sheet of paper.
- (iii) Measure 10cm³ of NN, pour into beaker containing HH and immediately start the stopwatch. Swirl the beaker with control twice
- (iv) Look down vertically through the mouth of beaker so as to see the cross at the bottom of the beaker. Stop the clock when the letter "x" is invisible.
- (v) Record the time taken for the letter X to disappear completely.
- (vi) Repeat the experiment using the data shown in the following table.

Table: Experimental data.

Experiment no.	Volume of NN (cm)	Volume of HH (cm)	Volume distilled water	Time	1/t (sec ⁻¹)
1	10	20	0		
2	10	15	5		
3	10	10	10		
4	10	5	15		

Questions:

- (a) Complete filling the experimental table
- (b) What does 1/t represent in experimental table?
- (c) Write balanced chemical equation for reaction between HH and NN
- (d) How was the factor of concentration varied in experiment?
- (e) Plot a graph of volume of solution HH against 1/t
- (f) Use the graph you have drawn in (e) above to explain how variation of concentration affects the rate of chemical reaction.