

KAPSABET HIGH SCHOOL



233/3
CHEMISTRY
PAPER 3

TIME: 2 HOURS 15 MINUTES

2021 TRIAL 3 OCT/NOVEMBER INTERNAL EXAMINATION

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

233/3

CHEMISTRY PRACTICAL

PAPER 3

2 HRS 15 MINUTES

OCT/NOVEMBER 2021

Name.....

Adm No.....

Stream.....

Date

Sign

INSTRUCTIONS TO CANDIDATES

[a] Answer ALL questions in the spaces provided in each question.

[b] Mathematical tables and electronic calculators may be used for calculations.

[c] all working must be clearly shown where necessary.

FOR EXAMINERS ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	15	
2	13	
3	12	
Total	40	

1. You are provided with
- 2.0M NaOH solution labelled B
 - Sulphuric(VI) acid solution labelled A`

You are to:

- [a] Prepare a dilute solution of NaOH solution.
 [b] Determine the concentration of in moles per litre.

PROCEDURE 1

- Using a pipette 25.0cm^3 of solution B and place it into 250cm^3 volumetric flask.
 - Add about 200cm^3 of distilled water and shake well.
 - Add more water to make up to 250cm^3 mark. Label this solution C
- [a] Calculate the concentration of the dilute solution C in moles per litres. [2mks]
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PROCEDURE 2

- Fill the burette with solution A and record the readings in the table below.
- Pipette 25cm^3 of dilute solution C and place it into 250ml conical flask.
- Add 2-3 drops of phenolphthalein indicator.
- Titrate with solution A.
- Record your results in the table below.
- Repeat the titration two or more times and complete the table.

	I	II	III
Final burette reading (cm^3)			
Initial burette reading(cm^3)			
Volume of solution A(cm^3)			

[4mks]

- [a] Determine average volume of the acid (solution A) used. [1mk]
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[b] Determine moles of dilute solution C in the volume used. [2mks]

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[c] Write an equation for the reaction taking place. [1mk]

[d] Determine the number of moles of A used. [2mks]

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[e] Determine the concentration of A in moles per litre. [2mks]

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2. You are provided with the following

- 2M sodium hydroxide solution, solution B
- 2M hydrochloric acid, solution D

You are required to determine the molar enthalpy of neutralization of the acid using sodium hydroxide.

PROCEDURE

- [i] Measure out 20cm³ of acid into a clean plastic beaker.
- [ii] Record the temperature of this solution in the table below
- [iii] Measure 5cm³ of sodium hydroxide and add it to the hydrochloric acid.
- [iv] Stir with the thermometer and record the maximum temperature reached.

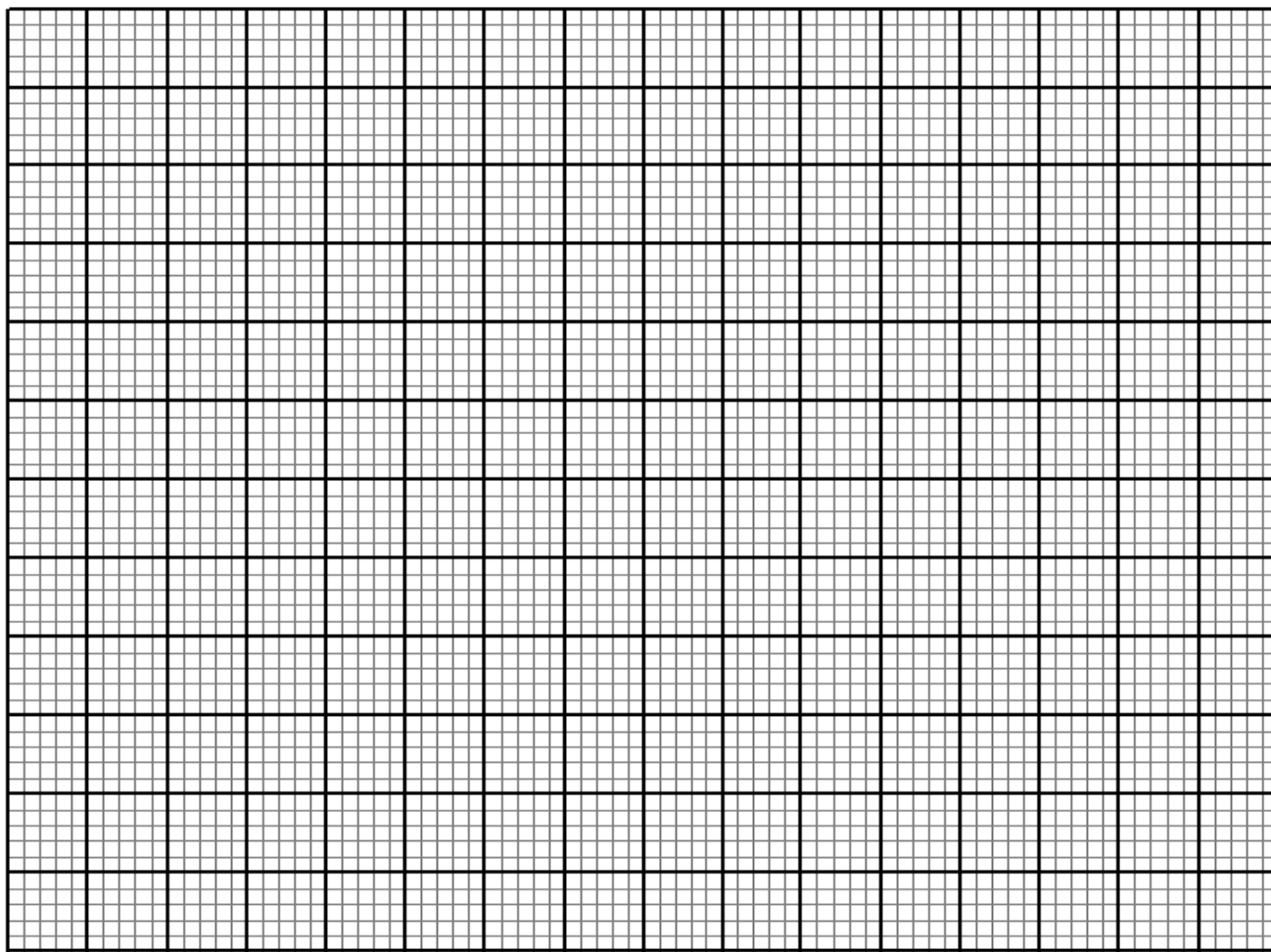
- [v] Repeat the above procedure adding 5cm^3 portions of sodium hydroxide until the total volume of the solution is 50cm^3 .

Volume of acid(cm^3)	20	20	20	20	20	20	20
Volume of NaOH added cm^3	0	5	10	15	20	25	30
Temperature($^{\circ}\text{C}$) of solution							

[3mks]

You are required to:

- [a]. Plot a graph of temperature rise against sodium hydroxide added. [3mks]



- [b] From your graph determine:

[i] maximum temperature change. [1mk]

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[ii] the volume of NaOH that is required for complete neutralization [1mk]

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[iii] Calculate the molar enthalpy of neutralization for this reaction. ($C=4.2\text{ J/g/K}$)
assume density of solution is 1 gcm^{-3} [2mks]

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[iii] The theoretical molar heat of neutralization is -57.2 kJ/mol . Compare your value in [ii] above with the theoretical value. Give the reasons for any differences noted between these two values. [2mks]

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3. You are provided with solid N carry out the tests below and record your observations and inferences.

[a] Place a spatula of N in a test tube and add 5cm³ of water and shake well divide the solution in to three portions.

OBSERVATION (1mk)	INFERENCE (1mk)

[b] Add sodium hydroxide to the first portion drop wise while observing till in excess

OBSERVATION (1mk)	INFERENCE (2mks)

[c] Add ammonia solution to the second portion drop wise until in excess.

OBSERVATION (1mk)	INFERENCE (1mk)

[d] Add four drops of potassium iodide solution to the third portion.

OBSERVATION (1mk)	INFERENCE (1mk)

[e] Add three drops of acid barium nitrate to the fourth followed by 5 drops of nitric acid.

OBSERVATION (2mks)	INFERENCE (1mk)