# 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 CHEMISTRYPRACTICAL 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	

You	are provided with				
	<ul> <li>2.0M NaoH solution labelled</li> </ul>	l B			
	Sulphuric(VI) acid solution la	abelled A`			
You	are to:				
[a]	Prepare a dilute solution of N	NaoH solution.			
[b]	Determine the concentration		· litre.		
PRO	OCEDURE 1	-			
i.	Using a pipette 25.0cm <sup>3</sup> of so	lution B and pl	ace it into 250c	m³ volumetric f	ilask.
ii.	Add about 200cm <sup>3</sup> of distilled	d water and sha	are well.		
iii.	Add more water to make up	to 250cm <sup>3</sup> mark	Label this sol	ution C	
[a]	Calculate the concentration of	of the dilute sol	ution C in mol	es per litres.	[2mks]
PRO	OCEDURE 2				
i.	Fill the burette with solution	A and record t	he readings in	the table below.	
ii.	Pipette 25cm <sup>3</sup> of dilute soluti	on C and place	it into 250ml o	onical flask.	
iii.	Add 2-3 drops of phenolphth	nalein indicator			
iv.	Titrate with solution A.				
v.	Record your results in the tal	ble below.			
vi.	Repeat the titration two or m	nore times and o	complete the ta	ble.	
					_
		I	II	III	
	l burette reading (cm³)				_
Initi	al burette reading(cm³)				]

Determine average volume of the acid (solution A) used.

Volume of solution A(cm<sup>3</sup>)

[a]

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[4mks]

[1mk]

2

[b]	Determine moles of dilute solution C in the volume used.	[2mks]
[c]	Write an equation for the reaction taking place.	[1mk]
[d]	Determine the number of moles of A used.	[2mks]
		•••••
[e]	Determine the concentration of A in moles per litre.	[2mks]
		•••••

- 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 20cm<sup>3</sup> of acid into a clean plastic beaker.
- [ii] Record the temperature of this solution in the table below
- [iii] Measure 5cm<sup>3</sup> 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<sup>3</sup> portions of sodium hydroxide until the total volume of the solution is 50cm<sup>3</sup>.

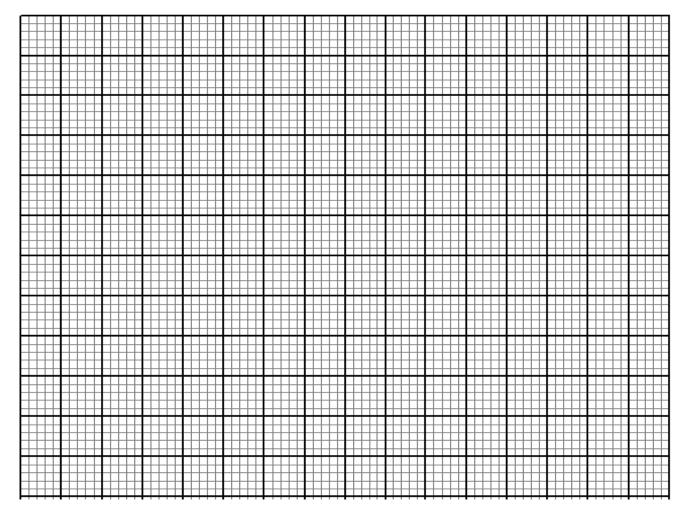
Volume of acid(cm3)	20	20	20	20	20	20	20
Volume of NaoH added cm <sup>3</sup>	0	5	10	15	20	25	30
Temperature(°C)of solution							

[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]
[ii]	the volume of NaOH that is required for complete neutralization	[1mk]
[iii]	Calculate the molar enthalpy of neutralization for this reaction. (C=4.2J/g assume density of solution is 1gcm <sup>-3</sup> )	g/ <i>K</i> ) [2mks]
[iii]	The theoretical molar heat of neutralization is -57.2kj/mol-1.Compare you [ii] above with the theoretical value. Give the reasons for any differences between these two values.	

[a] Place a spatula solution in to the		d add 5cm <sup>3</sup> of water and	shake well divid
OBSERVATION	(1mk)	INFERENCE	(1mk)
[b] Add sodium hy	droxide to the first po	ortion drop wise while o	bserving till in ex
OBSERVATION	(1mk)	INFERENCE	(2mks
		portion drop wise until	in excess.
[c] Add ammonia s	solution to the second	portion drop wise until	in excess. (1mk)
OBSERVATION	(1mk)	INFERENCE	(1mk)
OBSERVATION	(1mk)		(1mk)
OBSERVATION  [d] Add four drops	(1mk) of potassium iodide	INFERENCE solution to the third port	(1mk)
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