

KENYA HIGH SCHOOL

POST MOCK EXAMINATIONS CHEMISTRY PAPER 3 FORM 4, 2021

Kenya Certificate of Secondary Education

1. Solution A is prepared by dissolving 6.3g of the organic acid $\text{H}_2\text{C}_2\text{O}_4 \cdot n\text{H}_2\text{O}$ in water to make a litre of the solution.

Solution B: 0.1M NaOH solution

Phenolphthalein indicator

Clamp and stand

Burette and pipette.

You are required to determine the value of n in the organic acid $\text{H}_2\text{C}_2\text{O}_4 \cdot n\text{H}_2\text{O}$

Procedure.

Fill the burette with solution A and adjust the volume to zero mark.

Add 2 to 3 drops of phenolphthalein indicator and titrate solution A against solution B until the colour just permanently changes. Record your results in the table below. Repeat the procedure two more times to obtain concordant results.

a)

Titration	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution A used (cm^3)			

4marks

1mark

- b) Calculate the average volume of solution A used.

- c) Calculate the moles of sodium hydroxide in the volume of solution B used.

2marks

- d) Given that solution B - Sodium hydroxide and solution A organic acid react in the ratio of 2:1, calculate the number of moles of the organic acid –solution A used?

2marks

e) Calculate the moles of organic acid solution A used per litre of solution **2marks**

f) Calculate the relative formula masses of the organic acid solution A **3marks**

g) Calculate the value of n in $\text{H}_2\text{C}_2\text{O}_4 \cdot n\text{H}_2\text{O}$ (H=1, C=12, O=16) **3marks**

2. You are provided with CBI. Carry out the test below. Write your observation and inferences in the spaces provided.

a) Using a clean spatula, heat about one third of the solid CBI in a non- luminous Bunsen burner flame.

Observation	Inferences

- b) Put a half spatula endful of CBI in a test tube. Heat gently and then strongly. Test for any gas produced using litmus papers.

Observation	Inferences
1mark	1mark

- c) Put 2cm³ of dilute hydrochloric acid into a test tube. Add ¼ endful of CBI into the test tube. Test for any gas procedure.

Observation	Inferences
2marks	2marks

3. You are provided with solid Q, carry out the test below. Record your observations and inferences in the table. Identify any gas (es) evolved.

Place all the solid Q provided into boiling tube and add distilled water until the tube is ¼ full. Divide it into five portions.

- a) To the 1st portion add ammonia solution drop wise until excess.

Observation	Inferences

- b) (i) To the 2nd portion add sodium hydroxide solution dropwise until in excess. Keep the resulting mixture for the next test.

Observation	Inferences
1mark	1mark

- ii) Warm the preserved mixture from b (i) above

Observation	Inferences
1mark	1mark

- c) i) To the 3rd portion add silver nitrate solution. Preserve the mixture for the next test.

Observation	Inferences
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1mark**1mark**

ii) To the preserved mixture in c (i) above add diluted nitric acid.

Observation	Inferences
1mark	1mark

d) To the 4th portion add dilute Barium nitrate solution followed by dilute nitric acid.

Observation	Inferences
1mark	1mark

e) To the 5th portion add 2-3 drops of conc. Nitric acid.
Warm the mixture and allow to cool. Add sodium hydroxide solution dropwise until in excess.

Observation	Inferences

1mark

1mark