

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
KIBAHA DISTRICT COUNCIL



FORM FOUR PRE – NATIONAL EXAMINATION – 2019

CHEMISTRY 2A

CODE: 032/2A

TIME: 2:30 HOURS

THURSDAY 22TH AUGUST, 2019. AM

INSTRUCTIONS

1. This paper consists of Two (2) questions. Answer all questions
2. Each Question carries twenty (25) marks
3. Non programmable calculators are allowed during examination .
4. Cellular phones, and any unauthorized materials are not allowed in the examination room
5. Write your examination number on every page of your answer booklet.
6. The following atomic masses may be used

H=1, C=12, O=16, Na=23

1 liter = 1 dm³ = 1000 cm³

1. You are provided with the following
MM: A solution of 0.2M nitric acid
NN: A solution of 4.2g Na₂CO₃ per 0.5dm³ of solution
MO: Methyl orange indicator

Procedure

Put a solution MM into the burette. Pipette (20 or 25) cm³ of solution NN in a titration flask. Add two drops of methyl orange indicator. Titrate solution MM against solution NN until the end point is reached. Record the burette readings. Repeat the procedure to obtain three more readings and record your results in a tabular form.

Questions

- a) i). Calculate the average titre volume
 ii). _____ cm³ of solution NN required _____ cm³ of solution MM for complete reaction
- b) If the ratio for the reaction is 1:1 find
 i). Concentration of NaXCO₃ in mol/dm³
 ii). Molecular mass of NaXCO₃
 iii). Atomic mass of X and replace the element in the formula NaXCO₃
- c) Formulate the ionic equation from the balanced chemical equation of this experiment
- d) What is the significance of the indicator in this experiment?
- e) If oxalic acid was used on behalf of nitric acid in this experiment what could be the appropriate indicator to use?

2. You are provided with the following materials:

KK: A solution of 0.13M -Na₂S₂O₃ (sodium thiosulphate)

PP: A solution of 2M-HCl (hydrochloric acid)

Thermometer, Heat source and Stop watch

Procedure

- i). Place 500 cm³ beaker, which is half filled with water, on the heat sources as a water bath.
- ii). Measure 10cm³ of KK and 10cm³ of PP into two separate test tubes
- iii). Put the two test tubes containing KK and PP solutions into a water bath
- iv). Heat the solutions to a temperature of 60°C, remove the solution from the water bath and mix into 100cm³ empty beaker and immediately start the stop watch
- v). Place the beaker with the content on top of a piece of paper marked X
- vi). Note the time taken for mark X to disappear.
- vii). Repeat step i) to vi) at a temperature of 70°C, 80°C and 90°C
- viii). Record your results as in Table 1

Table 1

Experiment	Temperature °C	Time (sec)	Rate (sec ⁻¹)
1	60		
2	70		
3	80		
4	90		

Questions

- a) What was the aim of experiment?
- b) i) Write the balanced chemical equation for reaction between KK and PP
 ii) write ionic equation for the reaction between KK and PP
- c) Name the product that causes the solution to cloud letter X
- d) Plot the graph of temperature against time
- e) According to the graph write conclusion.
- f) Write three importance of the product that causes clouding of letter X in our daily life.

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