

SC5053/C  
WASSCE 2020  
CHEMISTRY 3  
Practical  
ALTERNATIVE C  
2 hours

C

Name .....

Index Number .....

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination  
for School Candidates

SC 2020

CHEMISTRY 3

2 hours

PRACTICAL

ALTERNATIVE C

[50 marks]

Write your **name and index number in ink** in the spaces provided above.

On the front page of your answer booklet record your **index number, your serial number, and the number and letter** of every substance supplied to you. These substances should all bear your **serial number**; if this is not so, inform the Supervisor immediately.

Answer **all the questions in ink**.

Answer **all** questions.

All your burette readings (initial and final) as well as the volume of your pipette must be recorded but **no** account of experimental procedure is required. All calculations **must** be done in your answer booklet.

1. **G** is  $0.045 \text{ mol dm}^{-3} \text{ H}_2\text{SO}_4$ .

**H** was prepared by dissolving a sample of  $\text{NH}_4\text{Cl}$  in excess of  $0.092 \text{ mol dm}^{-3} \text{ NaOH}$  solution.

(a) Put **G** into the burette and titrate it against  $20.0 \text{ cm}^3$  or  $25.0 \text{ cm}^3$  portions of **H** using methyl orange as indicator.

Repeat the titration to obtain **concordant** titre values.

Tabulate your results and calculate the average volume of **G** used.

The equations for the reactions are:



(b) From your results and the information provided, calculate the:

- (i) concentration of NaOH in **H** in  $\text{mol dm}^{-3}$ ;
- (ii) amount of NaOH that reacted with  $\text{NH}_4\text{Cl}$ ;
- (iii) amount of  $\text{NH}_4\text{Cl}$  added;
- (iv) mass of  $\text{NH}_4\text{Cl}$  added;
- (v) volume of  $\text{NH}_3$  evolved.

[H = 1.0; N = 14.0; O = 16.0; Na = 23.0; Cl = 35.5;  $V_m = 22.4 \text{ dm}^3$ ]

[23 marks]

Credit will be given for strict adherence to the instructions, for observations precisely recorded and for accurate inferences. All tests, observations and inferences **must** be clearly entered in your answer booklet, in **ink** at the time they are made.

2. **J** is a mixture of **two** salts. Carry out the following exercises on **J**.

Record your observations and identify any gas(es) evolved.

State the conclusions you draw from the result of **each** test.

(a) Put all of **J** into a boiling tube and add about  $10 \text{ cm}^3$  of distilled water. Stir the mixture thoroughly and filter. Keep both the filtrate and the residue.

- (b) (i) To about  $2 \text{ cm}^3$  portion of the filtrate, add  $\text{NH}_3(\text{aq})$  in drops and then in excess.
- (ii) To another  $2 \text{ cm}^3$  portion of the filtrate, add  $\text{BaCl}_2(\text{aq})$  and then add dilute HCl.

- (c) Divide the residue into **two** portions.
- (i) Heat the first portion strongly in a boiling tube.
  - (ii) Add dilute HCl to the second portion in a test tube
- [19 marks]

3. (a) Give **one** example of **each** of the following substances:
- (i) a gas that turns damp red litmus paper blue;
  - (ii) a compound of calcium used to neutralize soil acidity.
  - (iii) a gas other than oxygen that can relight a glowing splint.
- [3 marks]

- (b) State what would be observed, when
- (i) sodium hydroxide pellets are exposed to the atmosphere for sometime.
  - (ii) ethene is passed through bromine water.
- [3 marks]

- (c) Explain **briefly** why when carbon(IV) oxide is bubbled through lime water, it turns milky, but the milkyness disappears when the gas is bubbled for a long time.
- [2 marks]

**END OF PAPER**