# WASSCE / WAEC MAY / JUNE 2011 CHEMISTRY PAPER 3 (TEST OF PRACTICAL WORK)



P5053 WASSCE
November 2011
CHEMISTRY 3
Test of Practical Work
2 hours

3

Name .....

Index Number .....

## THE WEST AFRICAN EXAMINATIONS COUNCIL

### West African Senior School Certificate Examination

November 2011 — CHEMISTRY 3 — 2 hours

TEST OF PRACTICAL WORK

[50 marks]

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

*Answer* **all** *the questions in your answer booklet in* **ink**.

*Marks will be awarded mainly for details that show that you have had the required practical experience in the laboratory and for clarity of expression and orderly presentation of material.*

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1. **D** is a solution of HCl containing 0.025 mol in 500 $cm^3$ of solution.
**E** was obtained by passing ammonia gas, $NH_3$ through 1.0 $dm^3$ of **D**.
**F** is 0.100 mol $dm^{-3}$ NaOH solution.
The following table gives the burette readings when 25.0 $cm^3$ portions of **E** were titrated against **F** using phenolphthalein as indicator. The equations of the reaction involved are:

$HCl_{(aq)} + NH_{3(g)} \rightarrow NH_4Cl_{(aq)}$

$HCl_{(aq)} + NaOH_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$

[H = 1.00; N = 14.0]

| *Burette reading* | 1 | 2 | 3 |
|---|---|---|---|
| Final reading/$cm^3$ | 10.70 | 20.40 | |
| Initial reading/$cm^3$ | 0.10 | | 30.45 |
| Volume of **F** used/$cm^3$ | | 10.10 | 10.30 |

(*a*) (i) Copy and complete the table.
(ii) Calculate the average volume of **F** used.

[5 marks]

(*b*) From the information provided, calculate the:
(i) concentration of **D** in mol $dm^{-3}$;
(ii) concentration of excess HCl in **E** in mol $dm^{-3}$;
(iii) number of moles of HCl used when $NH_3$ gas was passed through 1.0 $dm^3$ of **D**;
(iv) mass of $NH_3$(g) produced.

[12 marks]

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2. **G** was a simple salt.
The tests recorded in the table below were performed as indicated.
Copy and complete the table.

| | | Test | Observation | Inference |
|---|---|---|---|---|
| (a) | (i) | G + heat | Colourless, odourless gas evolved | ..... |
| | (ii) | Gas tested with glowing splint | Glowing splint rekindled | ..... |
| | (iii) | G + strong heating | Brown gas evolved which turned damp blue litmus paper red<br><br>Residue was yellow when hot and white when cold | .....<br>.....<br><br>..... |
| (b) | (i) | Solution of **G** + $FeSO_4(aq)$ + conc. $H_2SO_4$ | ..... | ..... |
| | (ii) | Solution of **G** + $NH_3(aq)$ in drops and then in excess | White gelatinous precipitate formed<br><br>Precipitate dissolved | .....<br><br>..... |

(c) Name **G** and write its formula.

[13 marks]

3. (*a*) State **one** reagent with the necessary condition that can be used to distinguish between
   (i) secondary alkanol and tertiary alkanol,
   (ii) terminal alkyne and non-terminal alkyne.

[4 marks]

(*b*) What would be observed when **each** of the following salts is heated:
   (i) sodium chloride crystals;
   (ii) zinc trioxocarbonate (IV) powder;
   (iii) sodium trioxocarbonate (IV) decahydrate crystals.

[7 marks]

(*c*) Outline the technique that could be used to purify a sample of potassium chloride contaminated with sand.

[4 marks]

(*d*) Give **one** use of **each** of the following pieces of apparatus:
   (i) spatula;
   (ii) stirrer;
   (iii) crucible;
   (iv) water bath;
   (v) fume chamber.

[5 marks]

***END OF PAPER***