THE PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GORVERNMENT

SHINYANGA REGION

FORM FOUR REGIONAL MOCK EXAMINATION, MAY 2024

032/2B **CHEMISTRY 2B**
MARKING SCHEME

1.

Burette reading

Experiments	Pilot	1	2	3
Final burette reading (cm^3)	25.10	25.00	25.00	25.00
Initial burette reading (cm^3)	0.00	0.00	0.00	0.00
Volume used (cm^3)	25.10	25.00	25.00	25.00

(0**4marks)**

Pipette used was $25cm^3$ **(01 mark**)

Note: if $20.00cm^3$ pipette was used the volume of acid will be $12.00cm^3$

(i) Average volume = $\frac{V_1 + V_2 + V_3}{3}$ **(00 $\frac{1}{2}$ mārks)**

$= \frac{25.00cm^3 + 25.00cm^3 + 25.00cm^3}{3}$ **(00 $\frac{1}{2}$ marks)**

$\frac{75}{3}$ **(00 $\frac{1}{2}$ marks)**

$= 25.00cm^3$

Therefore, the mean titre volume is = $25.00cm^3$ **(00 $\frac{1}{2}$ marks)**

(ii) 25.00cm^3 of solution J required 25.00cm^3 of solution B for complete reaction (**01 marks)**

(iii) The colour change from Yellow to Pink **(01 marks)**

(iv) $H_2SO_{4(aq)} + 2NaOH_{(aq)} \rightarrow Na_2SO_{4(aq)} + 2H_2O_{(l)}$ **(02 mark)**

(v) Concentration of pure NaOH

From

100% $\rightarrow 15g/dm^3$

66.67% → ?

$$= \frac{66.67 \times 15 g/dm^3}{100}$$

= 10g/dm^3 of pure NaOH (03 Marks)

Since; Molarity = $\frac{\text{Concentration g/dm}^3}{\text{Molar Mass g/m}}$ (01 Marks)

$$= \frac{\text{o l}}{10\text{ g}} \quad \frac{\text{/ d m}^3}{40}$$

= 0.25 Mol/dm^3 of NaOH

(vi) Concentration of H_2SO_4 in g/dm^3 Given:

Data , Mb = 0.25mol/dm^3 (Molarity of base)
Va = 25.00cm^3 (volume of acid)
Ma = ? (molarity of base)
Vb = 25cm^3 (volume of base) na = 1 (number of acid)
nb = 2 (number of base)

from the formula

$\frac{ma}{Mb} \times \frac{va}{vb}$ = $\frac{mbvbna}{mavanb}$ nb (01 marks)

$= \frac{0.25 \times 25 \times 1}{25 \times 2}$

= 0.125M of H_2SO_4

therefore, the Molarity of solution B(base) = 0.125mol/dm^3 **(03 marks)**

From
Molarity = $\frac{\text{concentration}}{\text{Molar mass}}$
Molarity x molar mass = concentration

Concentration = 0.125mol/dm^3 x 98g/mol

= 12.25g/dm^3

The concentration of pure NaOH = 12.25g/dm^3 **(02 marks**

2. solution

a) The room temperature is $25^{O}C$ (depends on the environment). **(01mark)**

b) **Table of results**

Temperature (^{0}C)	Time "t" (sec)	Rate of reaction 1/t (sec^{-1})
30	30	0.03
40	14	0.07
50	12	0.08
60	8	0.13
70	6	0.17
	(2 marks)	(2 marks)

c) The balanced ionic equation for the reaction between **AA** and **BB** is:

$2HCl\ (aq) + Na_2S_2O_3(\ aq) \longrightarrow 2NaCl_2\ (aq) + S\ (s) + H_2O\ (l) + SO_2\ (g)$

(01mark)

$2H^{+}(aq)+2Cl^{-}(aq)+2Na^{+}(aq)+S_2O_3^{2-}(aq) \longrightarrow 2Na^{+}(aq)+2Cl^{-}(aq)+S(s)+H_2O(l)+SO_2(g)$

(01mark)

The net ionic equation is $2H^{+}\ (aq) + S_2O_3^{2-}\ (aq) \longrightarrow S\ (s) + H_2O\ (l) + SO_2\ (g)$

(01mark)

d) The fine particles of **Sulphur deposits** formed during the reaction are the ones that make the

reaction mixture to turn cloud and obscure the cross (x). **(02marks)**

e) The substance that causes cloudiness in the reaction above is Sulphur and its uses are: -

a. Most of the Sulphur produced in the world is used to make sulphuric acid.
b. It is used as a component in gun powder.
c. It is used to manufacture various organic compounds like plastics and Sulphur medicines.
d. It is used to dust vines to prevent the growth of fungus.
e. It is used in the vulcanization of natural rubber.
f. It is used to manufacture Sulphur dioxide gas.

Any three uses @ 02marks =
06marks

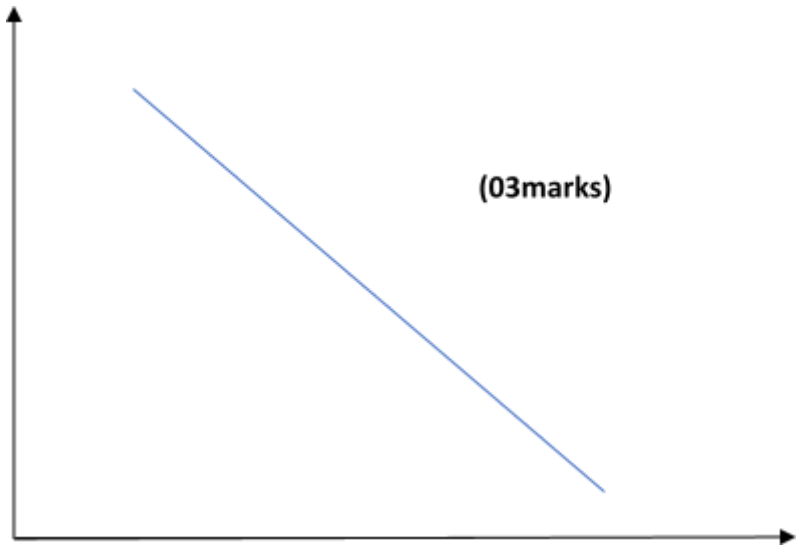
(b) THE GRAPH OF TEMPERATURE AGAINST RATE. **(01mark)**

Scale

Vertical Scale: 1cm to represent 5°C. **(0.5mark)**

Horizontal Scale: 1cm to represent 3sec **(0.5mark)**

Temperature (°C) **(01mark)**



Time (sec) **(01mark)**

(c) The graph shows that as the temperature increases, the Time of a chemical reaction decreases. Thus Temperature is inversely directly proportional to the Time of chemical reaction. **(02marks)**