

THE UNITED REPUBLIC OF TANZANIA
DODOMA REGION
FORM FOUR MOCK EXAMINATION AUGUST, 2023
ACTUAL PRACTICAL
CHEMISTRY 2B - MARKING SCHEME

SOLUTION

1 (a) (4MARKS)

Burette reading in cm ³	pilot	1	2	3
Final volume	25.50	50.00	25.00	50.00
Initial volume	00.00	25.00	00.00	25.00
Volume used	25.50	25.00	25.00	25.00

(b) (i) 25 cm³ of R required 25 cm³ of A (1 MARK)

(ii) Yellow to orange (1 MARK)

(iii) $2\text{NaOH}_{(aq)} + \text{H}_2\text{SO}_{4(aq)} \longrightarrow \text{Na}_2\text{SO}_{4(aq)} + 2\text{H}_2\text{O}_{(aq)}$ (2 MARK)

(c) Given:

Volume of base (V_b) = 25 cm³

Volume of acid (V_a) = 25 cm³

Concentration of base = 4g/L (1 MARK)

Mole ratio of acid (n_a) = 1

Moles ratio of base (n_b) = 2

The molarity of base is given by

$$\begin{aligned}
 \text{Molarity} &= \frac{\text{concentration in g/L}}{\text{Molar mass}} \quad (1 \text{ MARK}) \\
 &= \frac{4\text{g/L}}{40\text{g/mol}} \quad (2 \text{ MARK}) \\
 &= \underline{0.1\text{M}} \quad (1 \text{ MARK})
 \end{aligned}$$

From the relation

$$\begin{aligned}
 \frac{M_a V_a}{M_b V_b} &= \frac{n_a}{n_b} \quad (1 \text{ MARK}) \\
 M_a &= \frac{M_b V_b n_a}{V_a n_b}
 \end{aligned}$$

$$M_a = \frac{(0.1 \times 25 \times 1)}{25 \times 2} \quad (2 \text{ MARKS})$$

$$= 0.05 \text{ M} \quad (1 \text{ MARK})$$

The pure concentration of the acid = molarity x molar mass (1 MARK)

$$= 0.05 \text{ M} \times 98 \text{ g/mol} \quad (2 \text{ MARKS})$$

$$= 4.9 \text{ g/L} \quad (1 \text{ MARK})$$

$$\% \text{Purity of sulphuric acid} = \frac{\text{pure concentration}}{\text{Impure concentration}} \times 100\% \quad (1 \text{ MARK})$$

$$= \frac{4.9 \text{ g/L}}{5.2 \text{ g/L}} \times 100\% \quad (1 \text{ MARK})$$

$$\% \text{Purity of sulphuric acid} = 94\% \quad (2 \text{ MARKS})$$

2. (a)

Volume of M (cm ³)	Volume of N (cm ³)	Volume of distilled water (cm ³)	Time taken for the mark x to be obscured (seconds)
30	10	00	15
25	10	5	36
20	10	10	72
15	10	15	152
10	10	20	280

(05 marks)

(b) (i) Graph (07 marks)

(ii) Volume is inversely proportion to time (03 marks)



marks)

(d) Formation of sulphur (S) (02 marks)

(e) –Vulcanization of rubber

- Manufacture of gunpowder

-Manufacture of sulphuric acid

-Manufacture of medicine and fungicides

(any two points @ 1 mark

=02 marks)

(f) To investigate the effect of concentration to the rate of chemical reaction. (03 marks)