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DEPARTMENT: NURSING

MATRIC NUMBER: 19/MHS02/021

COURSE: CHEM 102

ASSIGNMENT ON STEREOCHEMISTRY

Q1. Name the functional group present in each of the following molecules; (i) $\text{CH}_2=\text{C}(\text{OH})\text{HCHO}$ (ii) $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)\text{COCH}_3$ (iii) $\text{CH}_3\text{C}=\text{CHCH}(\text{OH})\text{CHO}$

(i) Functional group present;

- a) Alkene
- b) Hydroxyl group
- c) Alkanal

(ii) Functional group present;

- a) Phenyl group
- b) Amine
- c) Alkanone/ketone

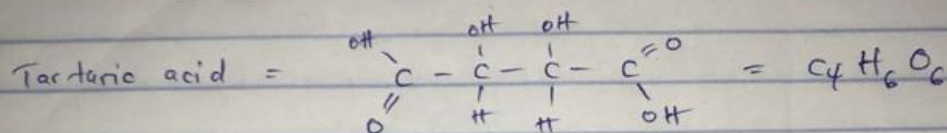
(iii) Functional group present;

- a) Alkene
- b) Hydroxyl group
- c) Alkanal

Q2. A 0.85g sample of pure (2R,3R)- tartaric acid was diluted to 10cm^3 with water and placed in a 1.0dm polarimeter tube. The observed rotation at 20°C was $+1.0^\circ$. Calculate the specific rotation of (2R,3R)- tartaric acid.

$$\text{Concentration (mol dm}^{-3}\text{)} = \frac{\text{conc (g/dm}^3\text{)}}{\text{Molar mass (g/mol)}}$$

$$[\alpha]_D^{25} = \frac{\alpha}{c \cdot l}$$



$$\text{Molar mass} = 150 \text{ g/mol}$$

$$\begin{array}{lcl} 0.856 \text{ g} & \text{---} & 10 \text{ cm}^3 \\ x & \text{---} & 1000 \text{ cm}^3 \end{array}$$

$$\frac{0.856 \times 1000}{10} = 85.6 \text{ g/dm}^3$$

$$\begin{aligned} \text{conc. in g/cm}^3 &= \frac{\text{conc. in (g/dm}^3\text{)}}{1000} \\ &= \frac{85.6}{1000} = 0.0856 \text{ g/cm}^3 \end{aligned}$$

$$\begin{aligned} [\alpha]_D^{25} &= \frac{\alpha}{c \cdot l}, \quad \alpha = +1.0^\circ, \quad c = \frac{0.856}{10} = 0.0856 \text{ g/cm}^3 \\ &= \frac{+1.0}{0.0856} = 11.68^\circ \end{aligned}$$

Q3. Draw the possible geometric isomers (where possible) for each of the following compounds: (i) Hexa-2,4-diene (ii) 2,3-Dimethylbut-2-ene

