Name: **OGBOGU CHIDUBEM CHRISTIAN**

Mat. No.: **19/MHS11/100**

Dept.: **PHARMACY**

Course: **CHM102**

ASSIGNMENT

1. Name the functional groups present in each of the following molecules.
   (i) $CH_2=C(OH)HCHO$ (ii) $C_6H_5CH(NH_2)COCH_3$
   (iii) $CH_3C=CHCH(OH)CHO$
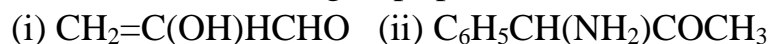
   Answer

   a) **$CH_2 = C(OH)HCHO$**
      Functional group present are;
      - Double bond chain (Alkene)
      - OH (Hydroxyl group)
      - $C = O$ (Alkanol)
        |
        H

   b) **$C_6H_5CH(NH_2)COCH_3$**
      Functional group present are;
      - Phenol group with double bonds
      - Amine (NH_2)
      - Alkanone / Ketone ($C = O$)
                             \
                              R

   c) **$CH_3C=CHCH(OH)CHO$**
      Functional group present are;
      - Double bond (=)
      - $C = O$ (Alkanol)
        |
        H

      - OH (Hydroxyl group)

2. A 0.856g sample of pure (2R, 3R) – tartaric acid was diluted to 10cm3 with water and placed in a 1.0dm polarimeter tube. The observed rotation at 20^0C was $+1.0^0$. Calculate the specific rotation of (2R, 3R)-tartaric acid.

Answer

Mass of tartaric acid = 0.856g
Vol. of water diluted in = 10cm³
Recall;

Mass Conc. (C) = $\dfrac{mass}{vol.}$ = $\dfrac{0.856g}{10cm^3}$

Vol. of Polarimeter tube = 1dm³
Therefore; Length of tube = 1dm
Observed rotation (α) = ?

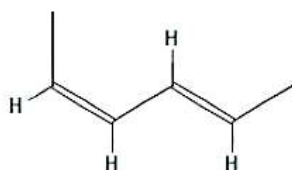$$(\alpha) = \frac{\alpha}{C \times L}$$

$$= \frac{+1.0^0}{0.0856gcm^{-3} \times 1dm}$$

$$(\alpha) = \frac{+1.0^0}{0.0856} = +11.6822^0$$

3. Draw the possible geometric isomers (where possible) for each of the following compounds;

   (i) Hexa-2,4-diene (ii) 2, 3-Dimethylbut-2-ene

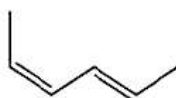   **Answer**

   (i) Hexa-2,4-diene – has only 3 isomers

   Isomers

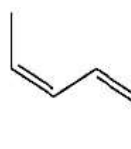 | trans-trans isomer | cis-trans isomer | cis-cis isomer |
   | --- | --- | --- |
   | (2E,4E)-hexa-2,4-diene | (2E,4Z)-hexa-2,4-diene
(2Z,4E)-hexa-2,4-diene | (2Z,4Z)-hexa-2,4-diene |

(ii) 2,3 dimethylbut-2-ene – does not have geometric isomers because there are two identical group attached to the same carbon of the double bond

$$CH_3 \diagdown C = C \diagup CH_3$$
$$CH_3 \diagup \qquad \diagdown CH_3$$

2,3-dimethylbut-2-ene