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CHM 102 ASSIGNMENT ON STEREOCHEMISTRY AND FUNCTIONAL GROUP

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

ANSWER:
i $CH_2=C(OH)HCHO \longrightarrow -COH$ aldehyde
ii $C_6H_5-CH(NH_2)COCH_3 \longrightarrow -NH_2$ amine
iii $CH_3C=CHCH(OH)CHO \longrightarrow -COH$ aldehyde

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

Solution

Specific rotation, $\alpha^T_\lambda = \frac{\alpha}{C.l}$

$\alpha = +1.0^\circ$, $C = \frac{0.856\,g}{10\,cm^3} = 0.0856\,g\,cm^{-3}$, $L = 1.0\,dm$

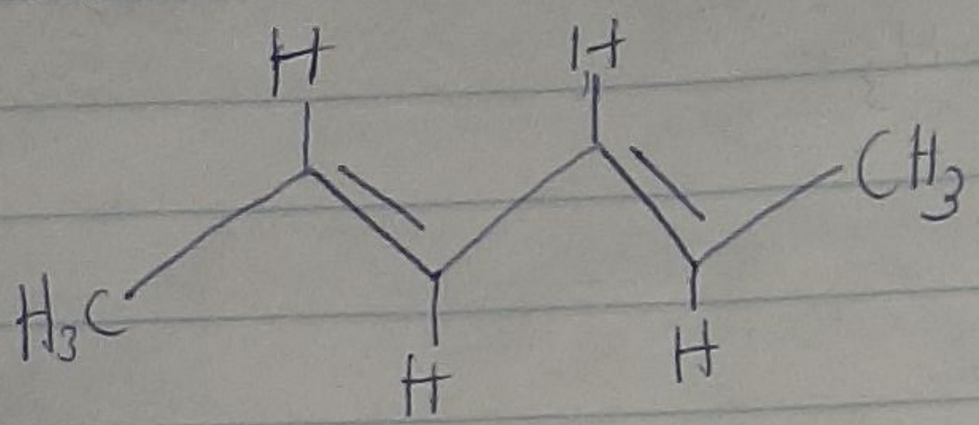
$\alpha^T_\lambda = \frac{1.0^\circ}{0.0856\,g/cm^3 \times 1.0\,dm} = 11.68^\circ g^{-1} cm^3 dm^{-1}$

∴ The Specific rotation of (2R,3R)-tartaric acid is $11.68^\circ g^{-1} cm^3 dm^{-1}$

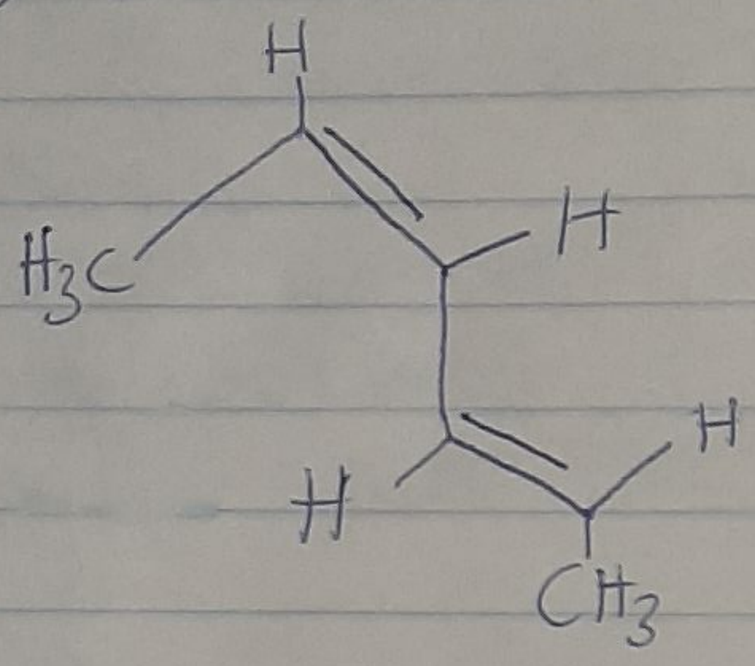
3. Draw the possible geometric isomers (where possible) for each of the following compounds. (i) Hexa-2,4-diene
(ii) 2,3-Dimethylbut-2-ene

i. Hex-2,4-diene

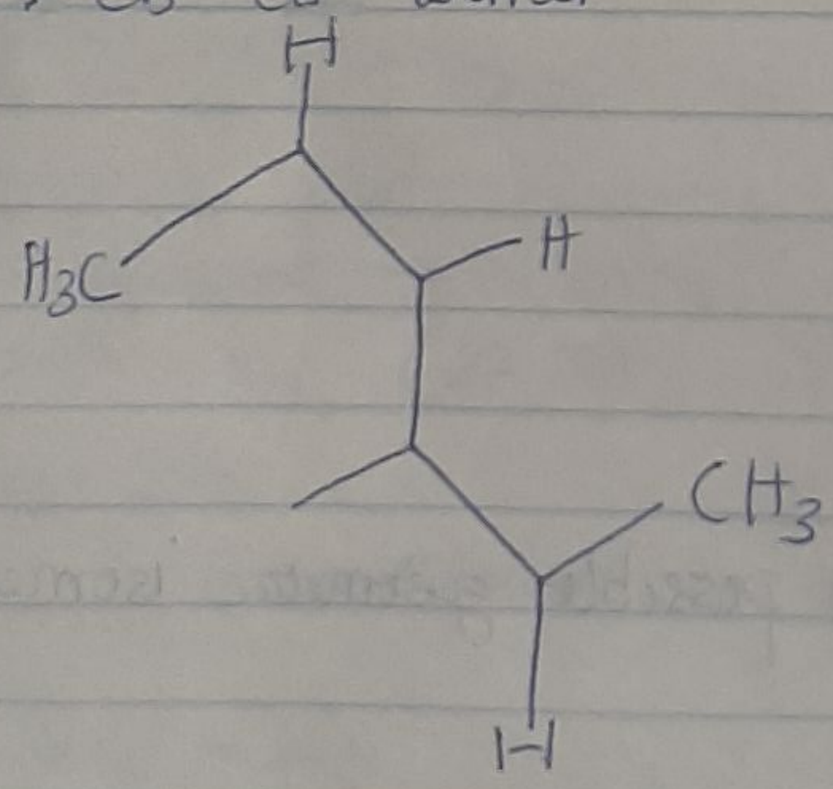
a) Trans-Trans Isomer



b) Cis trans isomer



c] Cis-Cis Isomer



ii. 2,3-Dimethylbut-2-ene has no possible geometric isomer