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Dept: MOBS
Course Code: Chem102
Matric No: 19/MHS01/261

1. Name the functional groups present in each of the following molecules (a) $CH_2=C(OH)HCHO$
(b) $C_6H_5CH(NH_2)COCH_3$
(c) $CH_3C=CHCH(OH)CHO$

2. A 0.856g 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°. Calculate the specific rotation of (2R,3R)-tartaric acid

3. Draw the possible geometric isomers (where possible) for each of the following Compounds: (a) Hexa-2,4-diene
(b) 3-Dimethyl but-2-ene

Answer

(a) Aldehyde, Alkanol
(b) Amines, Ketones
(c) Aldehyde, Alkanol

2. Specific rotation = $\frac{\text{Observed rotation}(°)}{(\text{Concentration } g/cm^3) \times \text{Path length of Sample cell (dm)}}$

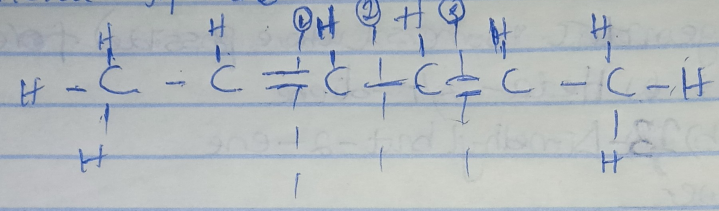
Observed rotation = +1.0°
Path length of Sample cell = $1.0dm^3$
Concentration $(g/cm^3) = \frac{0.856}{10} = 0.0856g/cm^3$

Specific rotation = $\frac{1}{0.0856 \times 1}$

$= +11.682° g^{-1} cm^3 dm^{-1}$

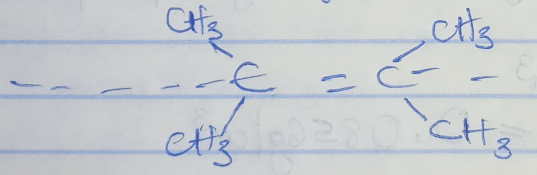
$\therefore$ Specific rotation $[\alpha]^{20°C} = +11.682° g^{-1} cm^3 dm^{-1}$

3a) Hexa-2,4-diene



Hexa-2,4-diene cannot undergo geometric isomerism because division of ① and ③ will not yield a symmetric compound and the division at ② is not at the double bond.

(b) 2,3-dimethyl but-2-ene



2,3 dimethyl but-2-ene will not undergo geometric isomerism because the differenil spatial arrangement will yield the same groups ($-CH_3$) on either Half.