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MATRIC NUMBER: 19/MHS02/015

DEPARTMENT: NURSING

COURSE CODE: CHM 102

1. Name the functional group present in each of the following molecules.
 - i. $\text{CH}_2=\text{C}(\text{OH})\text{HCHO}$
Double bond chain (alkene)
Alkanol
Aldehyde
 - ii. $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)\text{COCH}_3$
Phenyl group
Amides
Alkanone
 - iii. $\text{CH}_3\text{C}=\text{CHCH}(\text{OH})\text{CHO}$
Double bond (Alkene)
Alkanol
Aldehyde
2. A 0.856g sample of pure (2R, 3R)- tartaric acid was diluted to 10cm^3 with water and placed in a 1.0 dm polarimeter tube. The observed rotation at 20°C was $+1.0^\circ$. calculate the specific rotation

of (2R, 3R)- tartaric acid.

$$[\alpha]_D^T = \frac{\alpha}{C \cdot L}$$

Where
 L = length of sample tube
 C = $\frac{\text{mass}}{\text{volume}}$ ($\frac{\text{g}}{\text{dm}^3}$) or ($\frac{\text{g}}{\text{ml}}$)

α = observed rotation

$0.856 \text{ g} \longrightarrow 10 \text{ cm}^3$
 $x \text{ g} \longrightarrow 1000 \text{ cm}^3$

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

$$\text{Conc in g/cm}^3 = \frac{(\text{Con in g/dm}^3)}{1000}$$

$$= \frac{85.6}{1000} = 0.0856 \text{ g/cm}^3$$

where $\alpha = +1.0^\circ$

$$[\alpha]_D^T = \frac{\alpha}{C \cdot L}$$

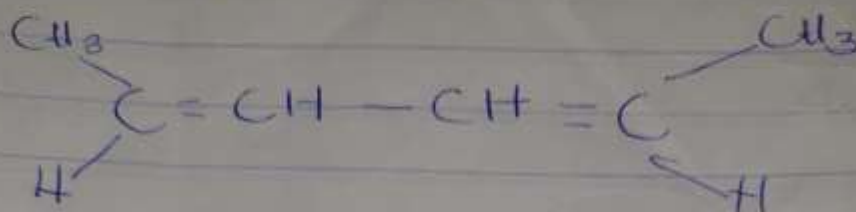
where $C = \frac{0.856}{10} = 0.0856 \text{ g/cm}^3$

$$[\alpha] = \frac{+1.0}{0.0856} = 11.68^\circ$$

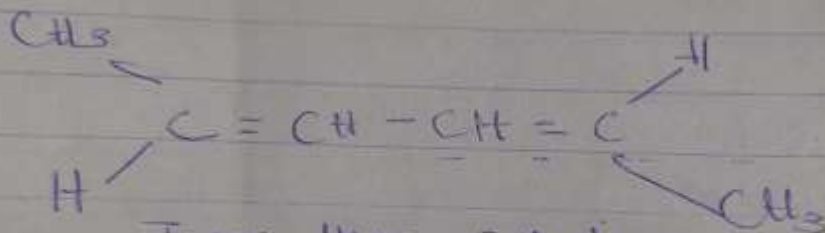
3. Draw the possible geometric isomers (where possible) for each of the following compounds.
- Hexa-2,4-diene

ii. 2,3dimethylbut-2-ene

i) Hexa-2,4-diene

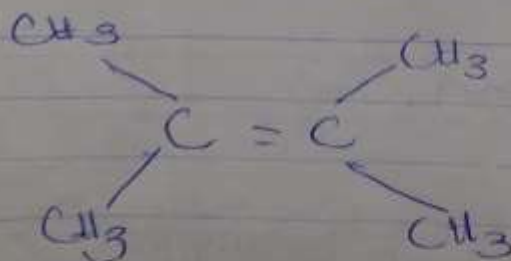


Cis Hexa-2,4-diene



Trans Hexa-2,4-diene

ii) 2,3-Dimethylbut-2-ene



Geometric isomers is not possible for 2,3-dimethylbut-2-ene.