AZEEZ ASHRAF OLASUBOMI
MECHATRONICS ENGINEERING
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CHM102
Assignment on Stereochemistry and functional Group

Name the functional groups present in each of the following molecules

i. $CH_2=C(OH)HCHO$: Alkene (=), Alkanol (OH) Alkanal (CHO)

ii. $C_6H_5CH(NH_2)COCH_3$: Amines (RNH_2), Alkanones ($RCOR'$)

iii. $CH_3C=CHCH(OH)CHO$; Alkene (=), Alkanol (OH) Alkanal (COH)

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.

Solution

mass = 0.856g
Volume = $10cm^3$
$l = 1\ dm^{-1}$
Observed rotation α = +1.0 (a Dextrorotary)
Specific rotation = ?

But,

$$\text{Specific rotation} = \frac{\text{Observed rotation}(^\circ)}{\text{Concentration}(g\,cm) \cdot \text{Pathlength}(dm)}$$

$$\alpha_x^T = \frac{\alpha}{c.l}$$

$$\text{Concentration} = \frac{\text{mass}}{\text{Volume}}$$

$$= \frac{0.856}{10}$$

Concentration = $0.0856\ g/cm^3$

$$\alpha_{\lambda}^{20^{\circ}C} = +1.0^{\circ}$$

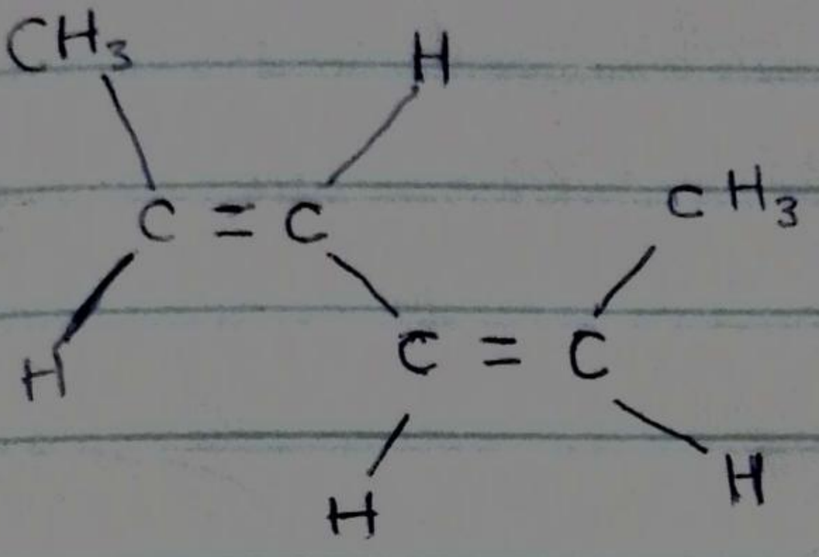
$$0.0856 \cdot 1$$

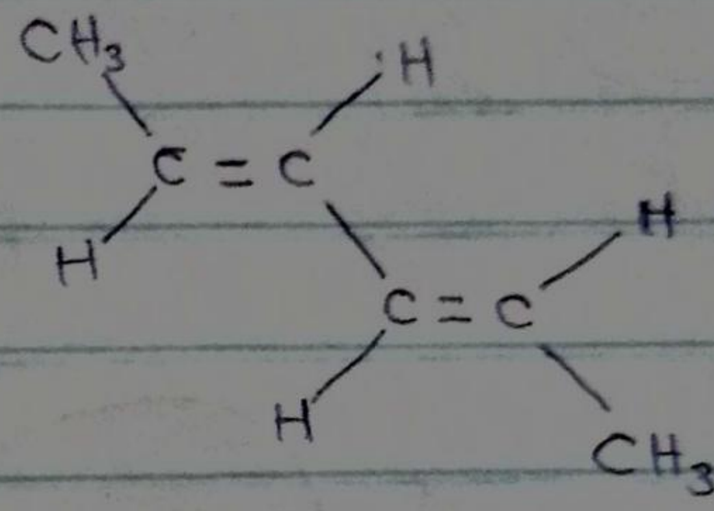
$$\alpha_{\lambda}^{20^{\circ}C} = 11.68^{\circ} g^{-1} cm^{3} dm^{-1}$$

5. Draw the possible geometric isomers [where possible] for each of the following compounds

1 Hexa-2,4-diene

The possible geomtric isomers are Three (3) isomers



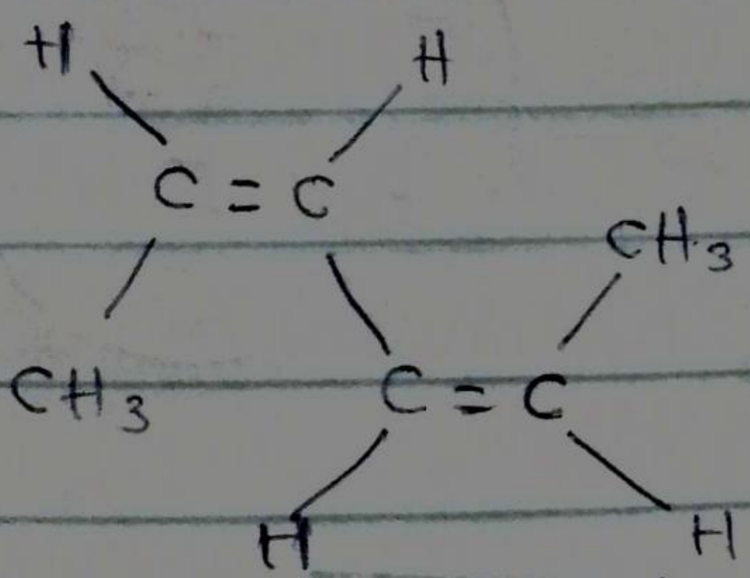


trans-trans - Hexa-2,4-diene

(2E, 4Z) - Hexa-2,4-diene

trans, trans - Hexa-2,4-diene

(2E, 4E) Hexa-2-4-diene



Cis, Cis) Hexa-2,4-diene

C2Z, 4Z) Hexa-2,4-diene

2. 2,3-Dimethyl but-2-ene