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19/MHS01/272
100 LEVEL

Solution

1. Functional groups present in each molecule are

i $CH_2=C(OH)HCHO$ → Alkene (=) & Alcohol (OH)

ii $C_6H_5CH(NH_2)COOH_3$ → Amines (NH_2) & Esters (COO)

iii $CH_3C=CHCH(OH)CHO$ → Alkene (=) & Alcohol (OH).

2 Specific rotation $= a_\lambda^T$ where

$a_\lambda^T = \dfrac{\alpha}{c \cdot l}$

T = temperature (°C)

λ = wavelength.

where α = observed rotation in degree

c_{obs} = concentration of optically active solute in gcm^{-3}

l = path length in dm.

$\alpha = 1.0°$

$c = \dfrac{0.856}{10} = 0.0856\ gcm^{-3}$

$l = 1.0\ dm$

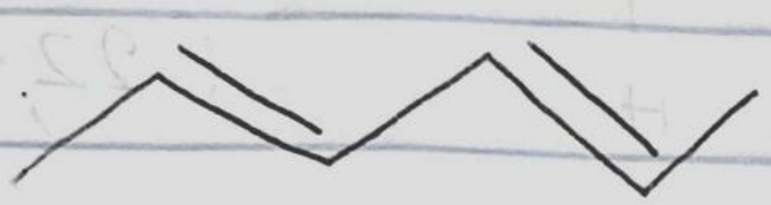
$$a_\lambda^T = \frac{\alpha}{c \cdot l} = \frac{1.0^\circ}{0.0856 \times 1}$$

$$= 11.682$$

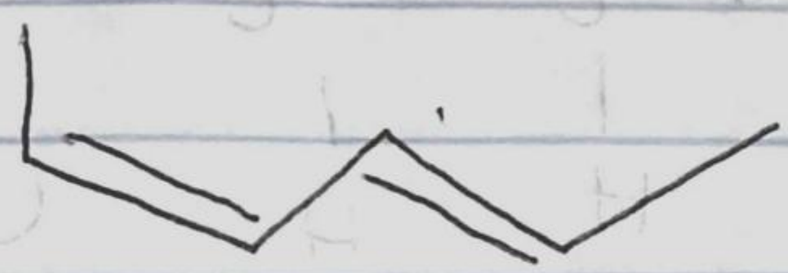
$$\therefore a_\lambda^T = 11.682^\circ g^{-1} cm^3 dm^{-1}$$

3.

(i) Hexa-2,4-diene

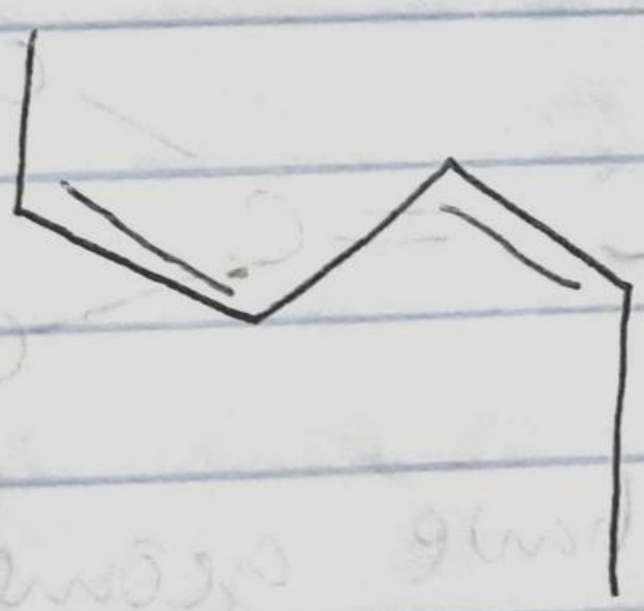
a.  trans-trans isomer.

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

b  cis-trans isomer

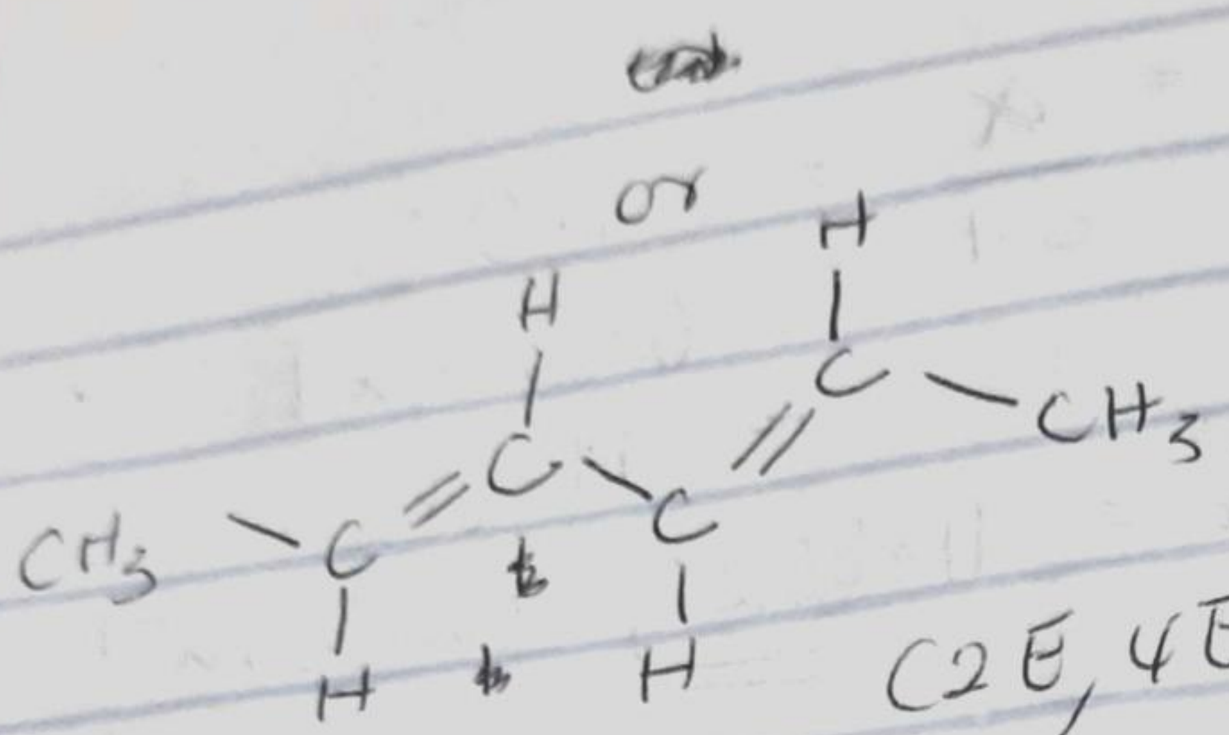
(2E, 4Z)-hexa-2,4-diene

(2Z, 4E)-hexa-2,4 diene.

c.  cis-cis isomer.

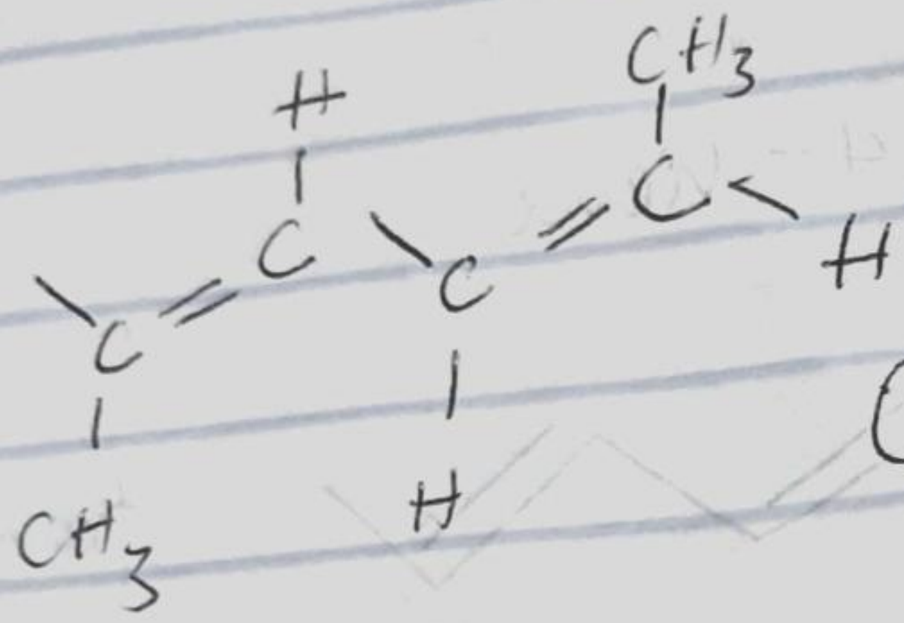
(2Z, 4Z)-hexa-2-4-diene.

a



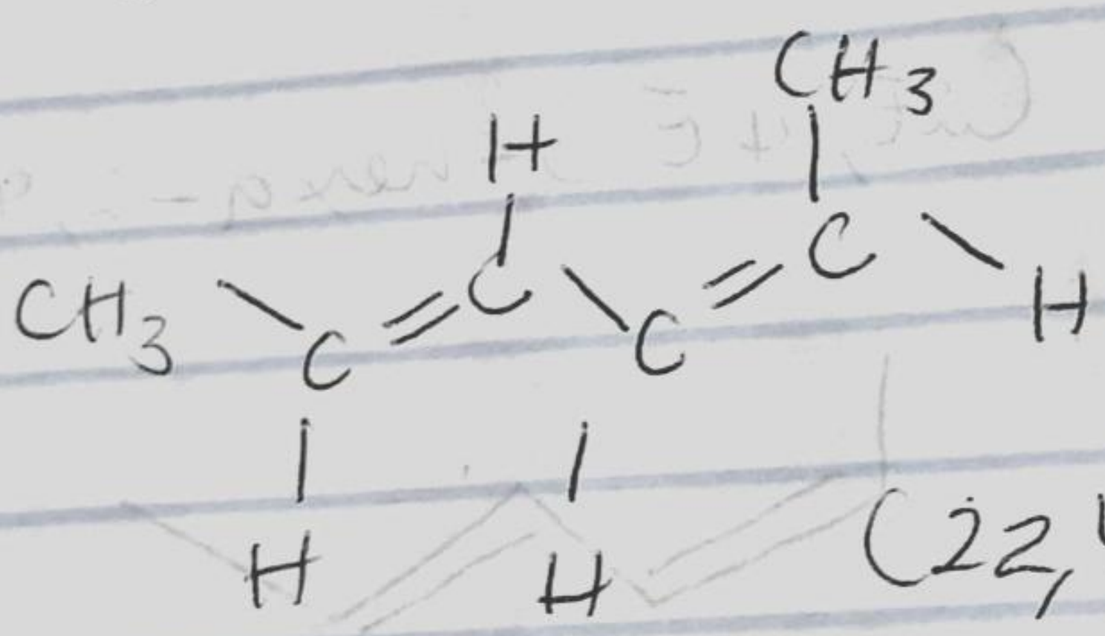
(2E, 4E) - hexa-2,4-diene

b



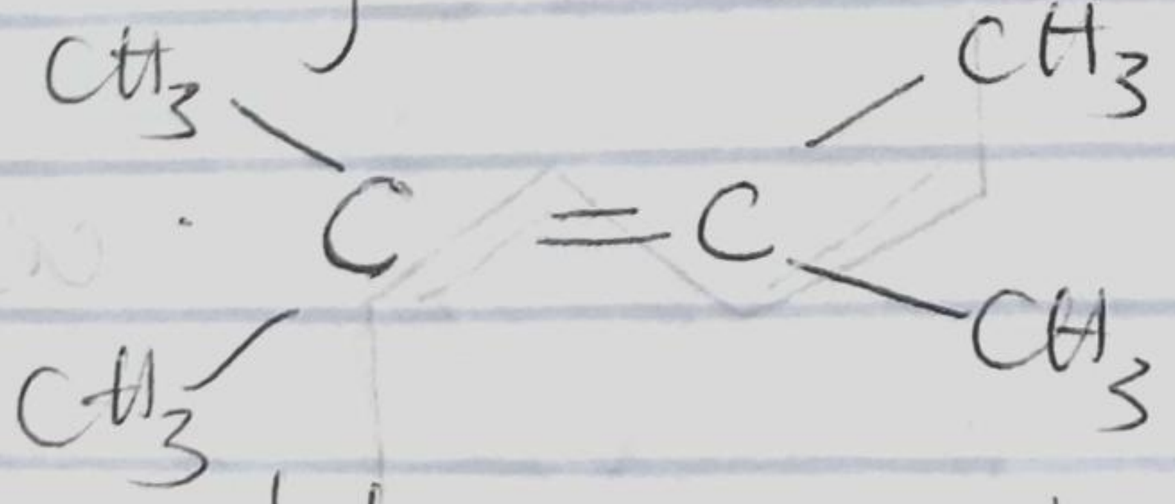
(2Z, 4Z) - hexa-2,4-diene

c



(2Z, 4E) - hexa-2,4-diene.

11) 2,3-Dimethylbut-2-ene.



Does not have geometric isomers because there are two identical groups attached to the same carbon of the double bond.