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MATRIC NO: 19/MHS01/408

DEPARTMENT: MEDICINE AND SURGERY

COURSE CODE: CHM102

ASSIGNMENT

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ASSIGNMENT

1 Name the functional groups present in each of this following molecules

a) $CH_2=C(OH)HCHO$

b) $C_6H_5CH(NH_2)COCH_3$

c) $CH_3C=CHCH(OH)CHO$

ANSWER

MOLECULES	FUNCTIONAL GROUPS
$CH_2=C(OH)HCHO$	- Aldehyde ($-CHO$) - Hydroxyl group ($-OH$) - Alkene
$C_6H_5CH(NH_2)COCH_3$	- Carbonyl group ($-CO$) - Amine ($-NH_2$)
$CH_3C=CHCH(OH)CHO$	- Hydroxyl group ($-OH$) - Aldehyde ($-CHO$)

2. A 0.556g sample of pure (2R, 3R)- tatrtaric 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) - tatrtaric acid

ANSWER

$$[\alpha] = \frac{\alpha}{cL}$$

Where $[\alpha]$ is specific optical rotation

α observed rotation

c concentration in gcm^{-3}

L pathlength in (dm)

$\alpha = +1.0°$

$L = 1.0dm$

$c = ?$

b)

concentration in $gcm^{-3} = \frac{0.856g}{10cm^3} = 0.0856 g/cm^3$

2) specific rotation $= \frac{\text{observed rotation (degrees)}}{\text{(conc in } g/cm^3) \times \text{(path length of sample cell in dm)}}$

$[\alpha]^T_\lambda = \frac{\alpha}{cL}$

$[\alpha]^T_\lambda = \frac{+1.0^\circ}{0.0856 g cm^{-3} \times 1.0 dm} = +11.682^\circ g^{-1} cm^3 dm^{-1}$

or $11.7^\circ g^{-1} cm^3 dm^{-1}$

Therefore the specific rotation of (2R,3R)-tartaric acid is $11.682^\circ g^{-1} cm^3 dm^{-1}$

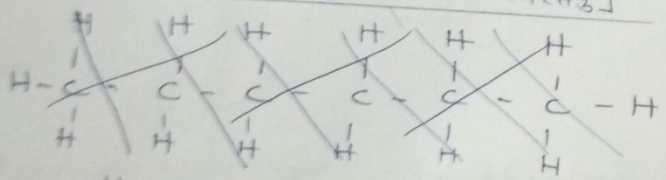
3. Draw the possible geometric isomers (where possible for each of the following compounds

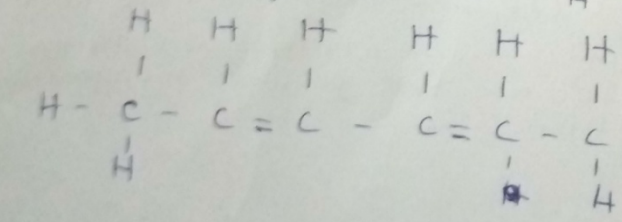
i) Hexa-2,4-diene

ii) 2,3-Dimethylbut-2-ene

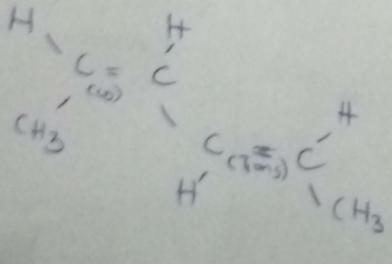
POSSIBLE ISOMERS

Hexa-2,4,diene $[CH_3CH=CHCH=CHCH_3]$



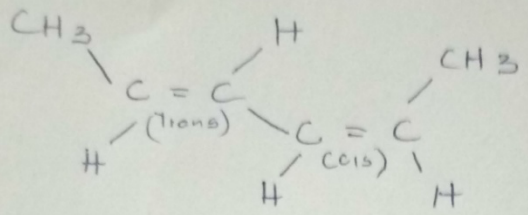


: Hexa-2,4-diene

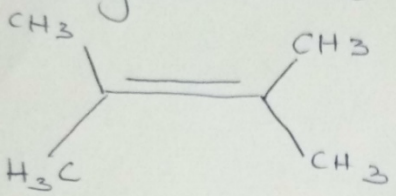


: (is-1, trans-4-dimethylbut-2-ene

b) Trans-1,cis-4-dimethylbut-2-ene



2) 2,3-Dimethylbut-2-ene



There are no isomers for the compound.