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19/ENG05/048
MECHATRONICS ENGINEERING
CHM102 ASSIGNMENT

(1) Name the functional groups present in each of the following molecules

(i) $CH_2 = C(OH)HCHO$ ⟶ OH (Alcohol) & CHO (Aldehyde)

(ii) $C_6H_5CH(NH_2)COCH_3$ ⟶ NH_2 (Amines) & CO (Ketones)

iii $CH_3C=CHCH(OH)CHO$ ⟶ OH (Alcohol) & CHO (Aldehyde)

(2) A 0.856g sample of pure (2R, 3R) - tatetaric acid was diluted to $10\,cm^3$ with water and placed in a 1.0 dm polarimeter tube. The Observed rotation at 25°C was +1.0°. Calculate the specific rotation of (2R,3R) tartaric acids.

Soln

$$\text{Concentration} = \frac{0.865g}{10cm^3}$$

$$= 0.0865\,g/cm^3$$

Path length = 1 dm

Observed rotation = +1.0°

$$\text{Specific Rotation} = \frac{\text{Observed Rotation (°)}}{\text{Concentration} \times \text{path length}}$$

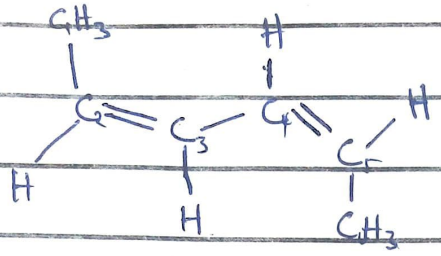
$$S.R = \frac{1.0°}{0.0865 \times 1\,dm}$$

Specific Rotation = $11.560°\,g^{-1}\,cm^3\,dm^{-1}$

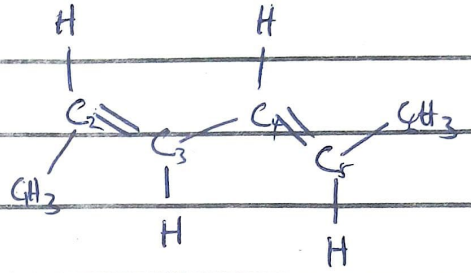
(3) Draw the possible geometric isomers for each of the following compounds.

(i) Hexa-2,4-diene.

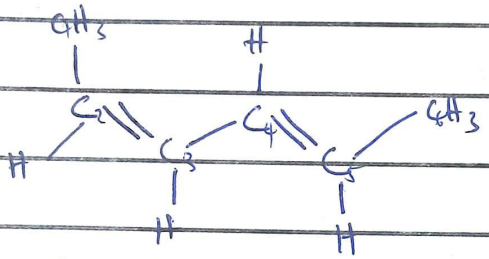
$CH_3CH=CHCH=CHCH_3$



Cis-Cis 2,4 Hexadiene.



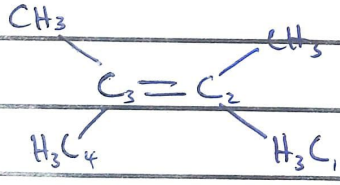
Trans, Trans 2,4 Hexadiene



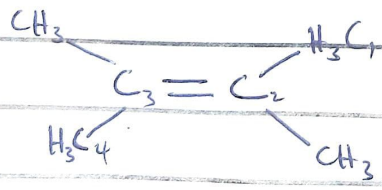
Cis, Trans 2,4 Hexadiene.

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

$CH_3C(CH_3)=C(CH_3)CH_3$



Cis 2,3 dimethyl but-2-ene.



Trans 2,3 dimethyl but-2-ene.