NZEGWU RALUCHUKWU CHIMLE FREDA
MHS
DENTISTRY
19/MHS09/016
08/05/2020

CHEM 102

STEREOCHEMISTRY AND FUNCTIONAL GROUP.

1. Name the functional groups present in each of the following molecules:

i $CH_2=C(OH)HCHO$ ii $C_6H_5CH(NH_2)COCH_3$

iii $CH_3C=CHCH(OH)CHO$

Ans:

i $CH_2=C(OH)HCHO$ ⟶ (a) -OH (Alkanol)
(b) -COH (Alkanal)
(c) double bond (Alkene)

ii $C_6H_5CH(NH_2)COCH_3$ ⟶ (a) $-NH_2$ (Amine)
(b) -C=O (Alkanone)

iii $CH_3C=CHCH(OH)CHO$ ⟶ (a) -OH (Alkanol)
(b) -CHO (Alkanal)
(c) double bond (Alkene)

2. A 0.856 g sample of pure (2R, 3R)-tartaric acid was diluted to 10 cm^3 with water and placed in a 1-dm polarimeter tube. The observed rotation at 20°C was 1.0°. Calculate the specific rotation of (2R, 3R)-tartaric acid.

Ans:

Specific rotation = $\frac{\text{Observed rotation (degrees)}}{\text{conc. g/cm}^3 \times \text{path length of sample}}$

Given: Observed rotation = 1.0°

path length of sample = 1 dm

conc. g/cm^3 = ?

$$\text{Conc. } g/dm^3 = \frac{\text{Size of sample (g)}}{\text{Volume } (cm^3)}$$

$$\text{Conc. } g/cm^3 = \frac{0.856g}{10\,cm^3}$$

$$\text{Conc. } g/cm^3 = 0.0856\,g/cm^3$$

$$\text{Specific rotation} = \frac{1.0^\circ}{0.0856\,g/cm^3 \times 1\,dm}$$

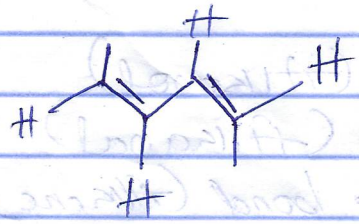
$$= 11.68^\circ\, g^{-1} cm^3 dm^{-1}$$

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

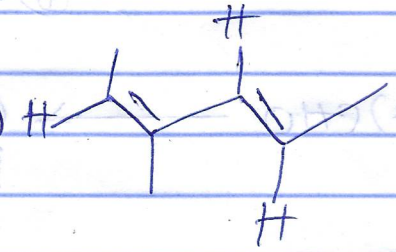
i Hexa-2,4-diene ii) Dimethyl but-2-ene.

Ans

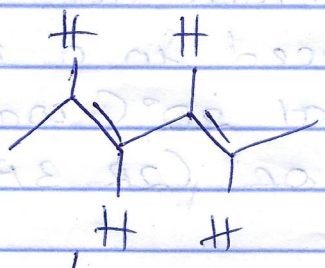
i

a 

cis-cis

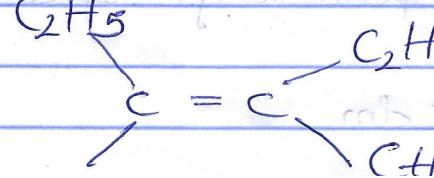
b 

cis-trans

c 

trans-trans

ii

a 

b