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Dept: MBBS
Course: CHM 102
Reg No: 19/MHS01/325

Stereochemistry and functional group

1) Name the functional group present in the following molecule

a) $CH_2 - C(OH)HCHO$ (ii) $C_6H_5CH(NH_2)COCH_3$ (iii) $CH_3C = CHCH(OH)CHO$

Molecules	Functional groups
i) $CH_2 - C(OH)HCHO$	Hydroxyl group (-OH)
	Aldehyde -(CHO)
ii) $C_6H_5CH(NH_2)COCH_3$	Amine ($-NH_3$)
	Carbonyl group (CO)
iii) $CH_3C = CHCH(OH)CHO$	Aldehyde (-CHO)
	Hydroxyl group (-OH)

2) A 0.856 g sample of pure (2R, 3R) tartaric acid and was ~~dissolved~~ diluted to 10cm³ with water and placed in a 1.0 dm Polarimeter tube; the observed rotation at 20°C was + 10°. Calculate the specific rotation of (2R. 3R) - tartaric acid.

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

where $[\alpha]$ = Specific optical rotation

α = Observed rotation ~~+10~~ = +1.0°

C = Concentration in g/ml = ?

L = Path length (in dm) = 1.0 dm

The concentration is always measured in g/ml. From the question the mass is in g. So therefore, the volume of water will be converted from (10 cm³ to ml, where;

1 ml = 1000cm³ . 1 cm³ = 1ml = $\frac{10cm^3 \times 1ml}{1cm^3}$

1 ml = 1cm³ 10cm³ = ? 1 cm³

∴ Conc in g/ml = 10/g ml

$$\therefore [\alpha] = \frac{\alpha}{cl} = \frac{1.0}{10 \times 10} = \frac{1}{10}$$

$$[\alpha] = \frac{1}{10} = 0.1^{\circ}$$

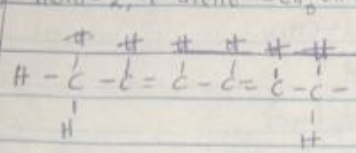
∴ Specific rotation of (2R,3R)-tartaric acid is 0.1°

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

i) Hexa-2,4-diene ii) 2,3-Dimethyl but-2-ene

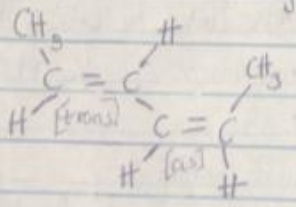
i) Hexa-2,4-diene $[CH_3CH=CH-CH=CHCH_3]$

a)

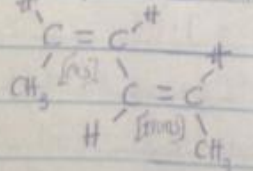


Hexa-2,4-diene

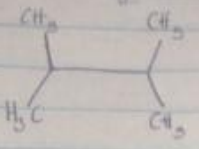
b) Trans-1, Cis-4-dimethyl but-2-ene



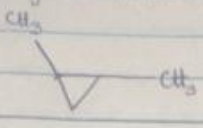
c) Cis-1, trans-4-dimethyl but-2-ene



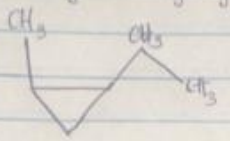
ii. 2,3 - Dimethyl but-2-ene



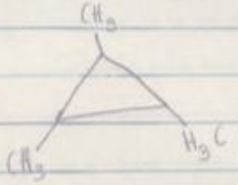
a) 1-methyl - trans-2-ethyl cyclopropane



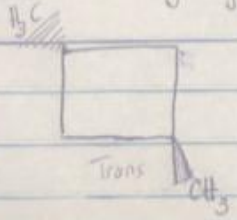
b) Cis - 1-methyl - 2-ethyl cyclopropane



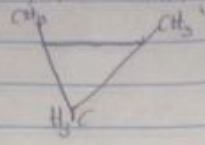
c) 1-Cis -2-trans - 3 - trimethyl cyclopropane



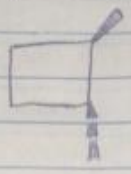
d) Trans-1,3-dimethyl cyclobutane



e Cis-1,2,3-trimethyl cyclopropane



f Trans-1,2-dimethyl cyclobutane



g Cis-1,3-dimethyl cyclobutane