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19/MHS01/048

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

(i) $CH_2 = C(OH)HCHO$ - [Double bond (=), Hydroxyl group (-OH), and carbonyl group (-C=O)]

(ii) $C_6H_5CH(NH_2)COCH_3$ - [Amino group ($-NH_2$) and carbonyl group (-C=O)]

(iii) $CH_3C=CHCH(OH)CHO$ - [Double bond (=), Hydroxyl group (-OH) and carbonyl group (-C=O)]

2. A 0.856g sample of Pure (2R, 3R) - tartaric acid was diluted to 10cm³ 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) - tartaric acid

Using $[\alpha]_\lambda^T = \frac{\alpha}{lc}$

Where $[\alpha]_\lambda^T$ = Specific rotation in degrees

α = Observed rotation in degrees

l = Cell path length in decimeters

C = concentration in g/ml

∴ Concentration in g/ml

If 0.856 g is 10 ml of solution,

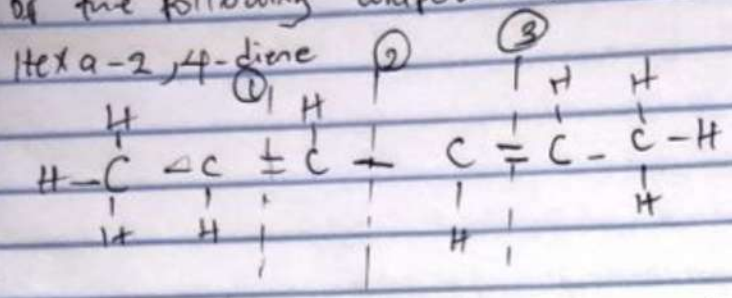
∴ 0.0856g will be present in 1ml

$$\therefore [\alpha]_\lambda^{20°C} = \frac{+1.0}{1.0 \times 0.856}$$

$$\therefore [\alpha]_\lambda^{20°C} = +11.68°$$

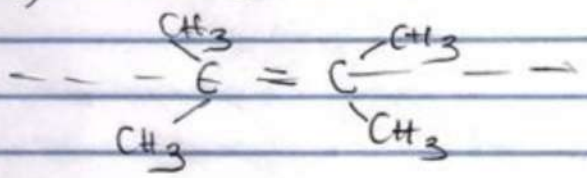
3.) Draw the possible geometric isomers (where possible) for each of the following compounds:

(i) Hexa-2,4-diene



Hexan-2,4-diene cannot undergo geometric isomerism because divisions of (1) and (3) will not yield a symmetric compound and the division at (2) is not at the double bond

ii) 2,3-Dimethylbut-2-ene



2,3-dimethylbut-2ene will also not undergo geometric isomerism because the different spatial arrangement will yield the same groups ($-CH_3$) on either half.