

CHM 102

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

- $\text{CH}_2=\text{C}(\text{OH})\text{HCHO}$ - Aldehydes.
- $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)\text{COCH}_3$ - Amine.
- $\text{CH}_2\text{C}=\text{CHCH}(\text{OH})\text{CHO}$ - Aldehydes.

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

Solution.

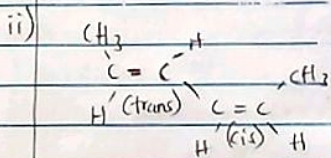
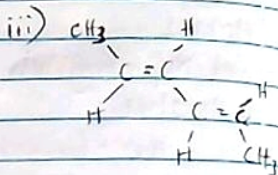
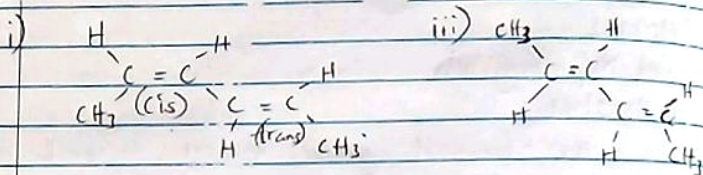
$$\begin{aligned}\text{Specific rotation} &= \frac{\text{observed rotation (degrees)}}{(\text{concentration g/cm}^3)(\text{path length of sample (dm)})} \\ &= \frac{1^\circ}{(0.856/10\text{cm}^3)(1\text{dm})} = \frac{1^\circ}{0.0856\text{g/cm}^3} \\ &= 11.7^\circ\text{g}^{-1}\text{cm}^3\text{dm}^{-1}.\end{aligned}$$

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

i) ③ Hexa-2,4-diene -

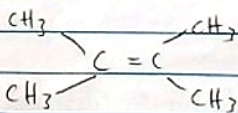
possible
isomers

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(It gives 3 possible geometrical isomer)

i) 2,3-dimethylbut-2-ene



It does not have a geometrical isomer because there are two identical groups attached to the same carbon of the double bond.