

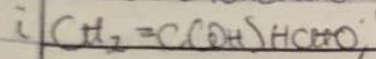
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Department: MBES

Course code: Chem 102

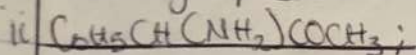
1. Name the functional groups present in each of the following molecules.



⇒ Formyl group (Aldehyde group) (CHO)

⇒ Hydroxyl group (OH)

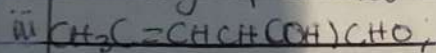
⇒ Alkene group (double bonds)



⇒ Keto group (Carbonyl group)

⇒ Aromatic group (Phenyl group)

⇒ Amino group (NH_2)



⇒ Double bond (Alkene group)

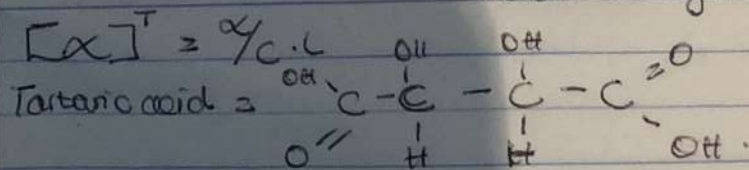
⇒ Aldehyde group

⇒ Hydroxyl group

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

Solution

$$\text{Concentration (mol dm}^{-3}\text{)} = \frac{\text{conc. (g dm}^{-3}\text{)}}{\text{molar mass (g/mol)}}$$



$$\text{molar mass} = 150 \text{ g/mol}$$

$$0.856 \text{ g} \rightarrow 10 \text{ cm}^3$$

$$2 \text{ g} \rightarrow 1000 \text{ cm}^3$$

$$\frac{0.856 \times 1000}{10} = 85.6 \text{ g/dm}^3$$

10

$$\text{Concentration in g/cm}^3 = \frac{\text{Concentration (g/dm}^3\text{)}}{1000}$$

1000

$$\frac{85.6}{1000} = 0.0856 \text{ g/cm}^3$$

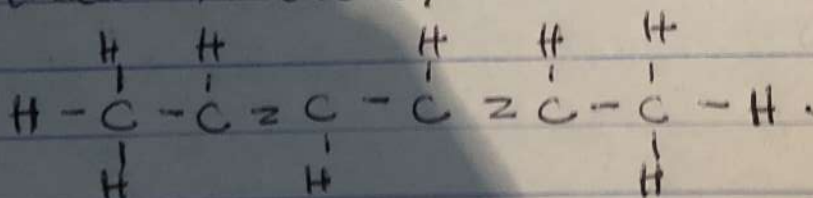
1000

$$[\alpha]_D^{25} = \frac{\alpha}{C \cdot l} = \frac{+1.0}{0.0856 \times 1} = +11.68$$

$\alpha: +1.0^\circ, C = 0.0856 \text{ g/cm}^3$
 $l = 1 \text{ cm}$
 $2 + 1.0 = 11.68^\circ$
 0.0856

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

i Hexa-2,4-diene;



ii 2,3-Dimethylbut-2-ene;

