Name: Opoola Daniel Oluwaseyi.
Matric Number: 19/ENG05/056.
Department: Mechatronics.
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1.
(i) Alkene group and hydroxyl group.
(ii) Amide & carbonyl.

2. Specific Rotation = $\frac{\text{observed rotation in degrees}}{(\text{Conc g/cm}^3) \times \text{path length of sample in dm}}$

Conc of tataric acid = $\frac{0.856\text{g}}{10\text{cm}^3} = 0.0856\ \text{g/cm}^3$

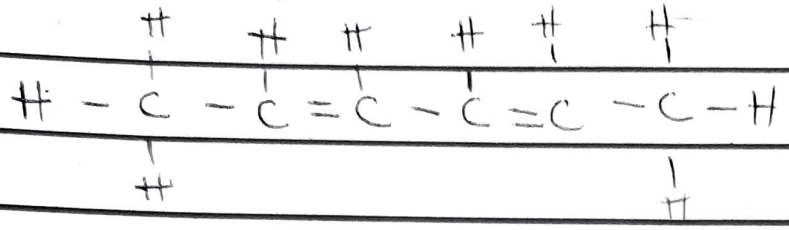
Observed rotation (°) = $20° + 1° = 21°$

Specific Rotation = $\frac{21°}{(0.0856\ \text{g/cm}^3) \times (1\text{dm})}$

Specific Rotation of (2R,3R)-tataric acid = $245.3271 \approx 245.33\ \text{g}^{-1}\text{cm}^3\text{dm}^{-1}$

3)

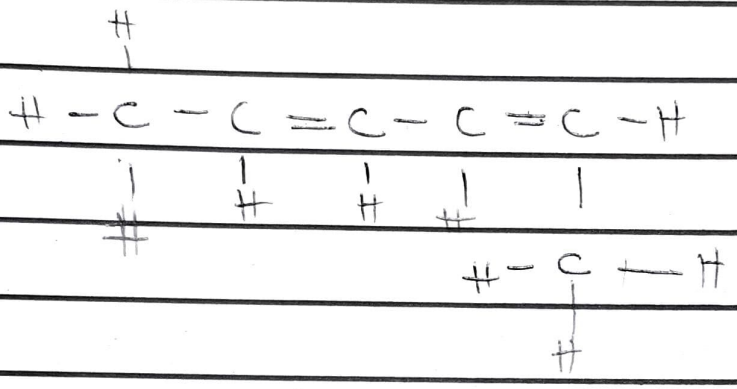
(i) Hexa-2,4-diene



Hexa-2,4-diene

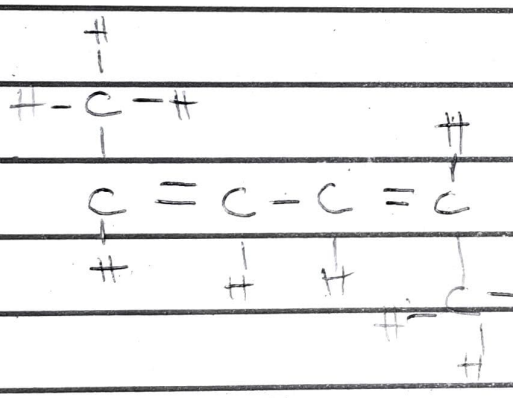
Isomers

(a)



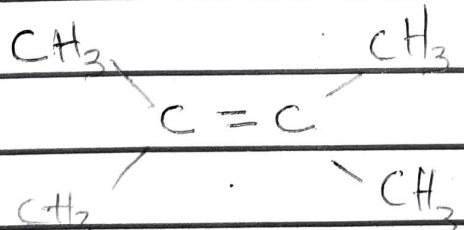
1-Methyl pent-1,3-diene.

(b)



1,4-dimethyl but-1,3-diene

(ii) 2,3-Dimethyl but-2-ene



2,3-dimethy but-2-ene does not have geometrical isomers because there are two identical groups attached to the same carbon of the double bond.