

NAME: PRINCEWILL OLMATE ANDREA

DEPARTMENT: MBBS

COURSE: CHM 102

MATRIC NO: 19/MHS01/385

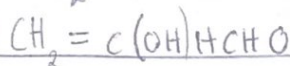
### Stereochemistry and Functional Group

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

i)  $\text{CH}_2 = \text{C}(\text{OH})\text{HCHO}$  ii)  $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)\text{COCH}_3$  iii)  $\text{H}_2\text{C} = \text{CH}(\text{H}(\text{OH}))\text{CHO}$

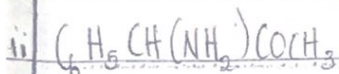
Molecules

Functional groups



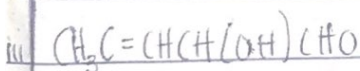
Hydroxyl group (-OH)

Aldehyde (-CHO)



Amine (-NH<sub>2</sub>)

Carbonyl group (-CO)



Aldehyde (-CHO)

Hydroxyl group (-OH)

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

$$[\alpha] = \frac{\alpha}{cl} \quad \text{where } [\alpha] = \text{specific optical rotation}$$

cl

$$\alpha = \text{observed rotation} = +1.0^\circ$$

$$c = \text{concentration in g/ml} = ?$$

$$l = \text{path length (in dm)} = 1.0 \text{ dm}$$

The concentration is always measured in g/ml. From the question the mass is 0.856g, so therefore the volume of water will be converted from (10cm<sup>3</sup>) to ml

$$\text{where } 1 \text{ litre} = 1000 \text{ cm}^3$$

$$1 \text{ ml} = 1 \text{ cm}^3$$

$$1 \text{ cm}^3 = 1 \text{ ml} = \frac{10 \text{ cm}^3 \times 1 \text{ ml}}{1 \text{ cm}^3}$$

$$10 \text{ cm}^3 = ?$$

$$1 \text{ cm}^3$$

$$\therefore \text{concentration in g/ml} = 10 \text{ g/ml}$$

$$\therefore [\alpha] = \frac{\alpha}{c \cdot l} = \frac{1.0}{10 \times 1.0} = \frac{1}{10}$$

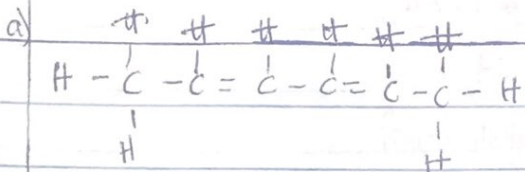
$$[\alpha] = \frac{1}{10} = 0.1^\circ$$

$\therefore$  Specific rotation of (2R,3R)-tartaric acid is  $0.1^\circ$

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

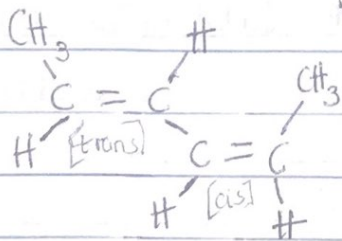
i) Hexa-2,4-diene ii) 2,3-Dimethylbut-2-ene

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

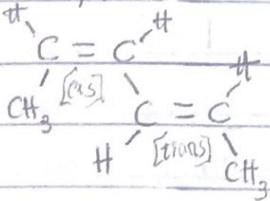


Hexa-2,4-diene

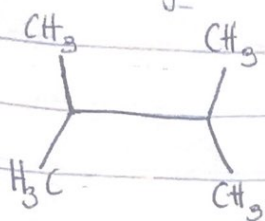
b) Trans-1, Cis-4-dimethylbut-2-ene



c) Cis-1, trans-4-dimethylbut-2-ene



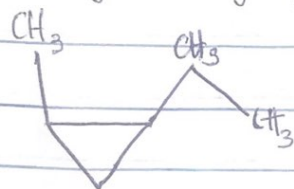
ii 2,3-Dimethyl but-2-ene



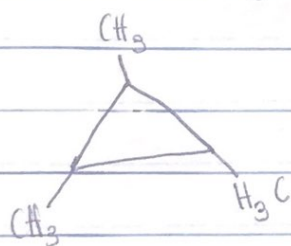
a) 1-methyl-trans-2-ethyl cyclopropane



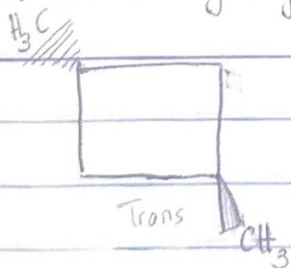
b) Cis-1-methyl-2-ethyl cyclopropane



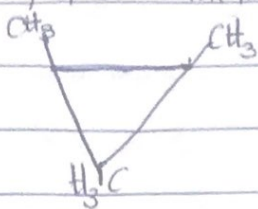
c) 1-(cis-2-trans-3-trimethyl) cyclopropane



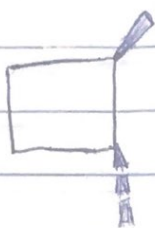
d) Trans-1,3-dimethyl cyclobutane



e Cis-1,2,3-trimethyl cyclopropane



f Trans-1,2-dimethyl cyclobutane



g Cis-1,3-dimethyl cyclobutane

