CHM 102 ASSIGNMENT

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ASSINGMENT

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

i. CH_2=C(OH)HCHO: Hydroxyl group or alkanol (OH) and aldehyde , alkanal (CHO) and alkene(double bond)

ii. $C_6H_5CH(NH_2)COCH_3$: Amine(NH_2) and ketones(c=o)

iii.CH_3C=CHCH(OH)CHO: Hydroxyl group or alkanol (OH), aldehyde or alkanal (CHO) and alkene(double bond)

2.A O.856g sample of pure (2R,3R) – tartaric acid was diluted to 10cm3 with water and placed in a 1.0 dm polarimetre tube the observed rotation at 20^0C was $+1.0^0$ calculate the specific rotation of (2R,3R) tartaric acid.

i. Specific rotation is given by[α] in g^{-1} cm^3 dm^{-1}

ii. α= observed rotation in degree

iii .c=concentration of optically active solute in gcm^{-3}

iv. L=path length in dm

Recall that,

$$[\alpha] = \alpha \backslash CL$$

C=O.0856g\cm^3,

L=1.0 dm,

$\alpha=1.0^0$,

T=20°c , wavelength=589nm

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$[\alpha]$ = Specific rotation in $g^{-1} cm^3 dm^{-1}$

α = Observed rotation in degree

C = Concentration of optically active solute in g/cm^3

L = Path length in dm

Recall that

T = Temperature

λ = Wave length used = 589nm

N.B The most common wavelength used is 589nm

0.8569 —— $100cm^3$

x g —— $1000cm^3$

$\frac{0.856 \times 1000}{10} = 85.69\ g/dm^3$

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

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

$[\alpha]^{20}_{589} = \frac{\alpha}{CL}$

$[\alpha] = \frac{[redacted] + 1^\circ}{0.0856 \times 1} = 11.68^\circ g^{-1} cm^3 dm^{-1}$

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

i. Hexa-2,4 diene

ii.2,3 di methyl but 2-ene