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MATRIC NO: 19/mhs01/324
CHEM 102

1) Discuss 2 major classification of Alkanols and list 2 examples of each class:

- Classification based on the number of hydrogen atoms ~~based~~ attached to the carbon atom containing the hydroxyl group

Eg $CH_3CH(OH)CH_3$ propan-2-ol (2°)
CH_3OH (Methanol 1°)

b) based on the number of hydrogen group they possess
$CH_3CH_2CH_2OH$ propanol (Monohydric)
$HOCH_2CH_2OH$ Ethane-1,-2diol (Dihydric alcohol)

2) ~~Inth~~ Gringard Reagent - CH_3CH_2MgCl (ethyl magnesium chloride)

$$CH_3CH_2MgCl + CH_3CH_2CH_2CH_2C{=}OCH_2CH_2CH_3 \longrightarrow$$

~~Gringard~~

$$CH_3CH_2CH_2CH_2-\underset{\underset{CH_2CH_2CH_3}{\|}}{\overset{CH_3CH_2}{C}}{=}OMgCl \xrightarrow{H^+OH^-} CH_3CH_2CH_2CH_2-\underset{\underset{CH_2CH_2CH_3}{|}}{\overset{CH_3CH_2}{C}}-OH + Mg(OH)Br$$

3) Starch are a major group of natural compounds that yields ethanol by fermentation. The biological catalysts is break down the Carbohydral molecules into ethanol to give 95% yield

Starch containing materials like cereals are warmed with malt to 60°C for a specific period of time it is then convert to maltose by the enzyme diatose, containing malt

$$\underset{\text{Starch}}{2(C_6H_{10}O_5)_n} + \underset{\text{water}}{nH_2O} \xrightarrow[60°C/\text{diatose}]{} \underset{\text{maltose}}{nC_{12}H_{22}O_{11}}$$

The maltose is broken down to glucose by adding yeast which contains maltase. It is done at a temperature of 15°C

$$\underset{\text{Maltose}}{C_{12}H_{22}O_{11}} + \underset{\text{water}}{H_2O} \xrightarrow[15°C/\text{maltase}]{} \underset{\text{glucose}}{2C_6H_{12}O_6}$$

Glucose is then converted to Alcohol at a temperature of 15°C by an enzyme zymase found in yeast

$$C_6H_{12}O_6 \xrightarrow[15°C/\text{zymase}]{} \underset{\text{Ethanol}}{2CH_3CH_2OH} + \underset{\text{Carbon(iv) oxide}}{2CO_2\uparrow}$$

4.) Using Meerwein. Pondor reaction

<u>Alkanol</u>

$$\underset{\text{Butanol}}{CH_3CH_2CH_2(H)C=O} \xrightarrow{H_2(Ni \text{ or } Pt)} \underset{\text{Butanol}}{CH_3CH_2CH_2OH}$$

<u>Alkanone</u>

$$(CH_3CH_2CH_2)(CH_3CH_2)C=O \xrightarrow{H_2(Ni \text{ or } Pt)\text{ etc}} CH_3CH_2CH_2-\underset{\underset{OH}{|}}{CH}-CH_2CH_3$$

Hexan-3-one

Hexan-3-ol