Name Alexandra Briggs 3rd
Curse Chem 102
Dept MBBS
M/N 19/mhs01/122

1) Discuss two major classes of alkanols. Give two majore examples 3)
Alkanols belong to the alcohol group. They have a functional group. >
OH. They are divided into 3 (Primary, secondary, tertiary)

A **Primary Alcohols / Alkanols (1°)**

They are those alkanols where the carbon atom of the hydroxyl group (OH) is attached to only a single alkyl group. Examples are

CH_3-CH_2-OH and $CH_3CH_2-CH_2-OH$

ethanol propan-1-ol

Note that methanol CH_3OH is counted as a primary alcohol. >
Also if the numbe of hydrogen atom attached to the (OH) bearing carbon atom is two or three then it is a primary alcohol.

B) **Secondary alkanols (2°)**

They passes two hydroxyl groups. They are called Glycols. They are also known as Dihydric alcohols.

$CH_3-\underset{\underset{OH}{|}}{CH}-CH_3$ $CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-CH_3$

propan-2-ol butan-2-ol

2) In the Grignard synthesis of Alkanols ; react $CH_3CH_2CH_2CH_2C=OCH_2CH_2CH_3$ with a named Grignard reagent.

Butyl magnesium bromide

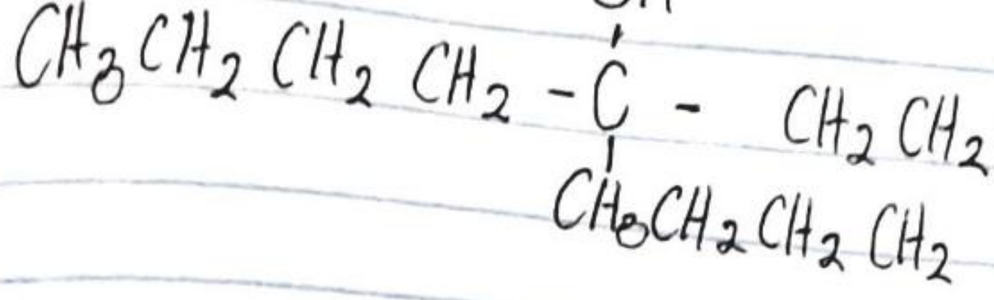
1st $CH_3CH_2CH_2C=OCH_2CH_2CH_3 + CH_3CH_2CH_2CH_2MgBr \rightarrow$

$CH_3CH_2CH_2CH_2C=OCH_2CH_2CH_3 + CH_3CH_2CH_2MgBr$

2nd $CH_3CH_2CH_2CH_2-\underset{\underset{CH_2CH_2CH_2CH_3}{|}}{\overset{\overset{OMgBr}{|}}{C}}-CH_2CH_2CH_3 + \xrightarrow[H_2O]{\text{dilute acid}}$

Alexandra Bnygs 19/mhs011122

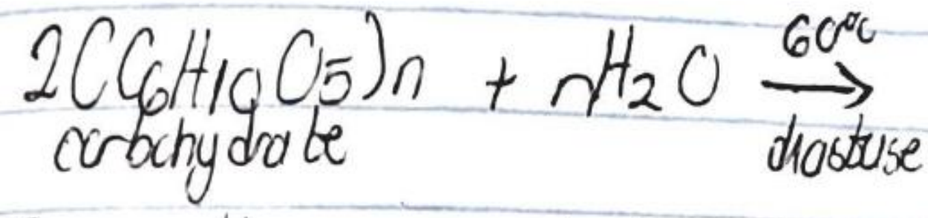
3rd



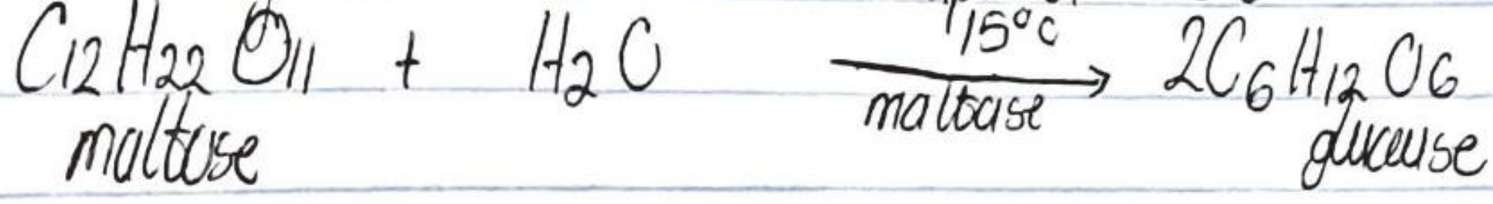
3)

Discuss the industrial manufacture of ethanol showing all reactions equations. The temperature and enzymes at those steps.

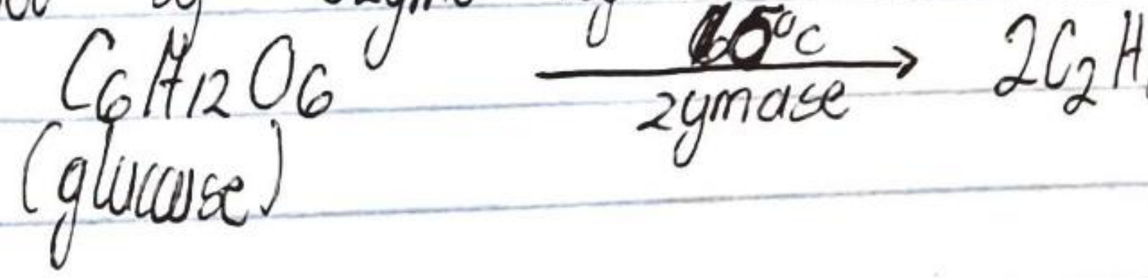
Carbohydrates such as starch are the compunds that yield ethyl by the biological process of fermentation. The starch containing materials include molasses and on warming with malt at 60°c for a specific period of time are converted into maltose by the enzyme diastase in the malt.



The maltose is broken down into glucose on addition of yeast which contains enzyme maltose at temp of 15°c.



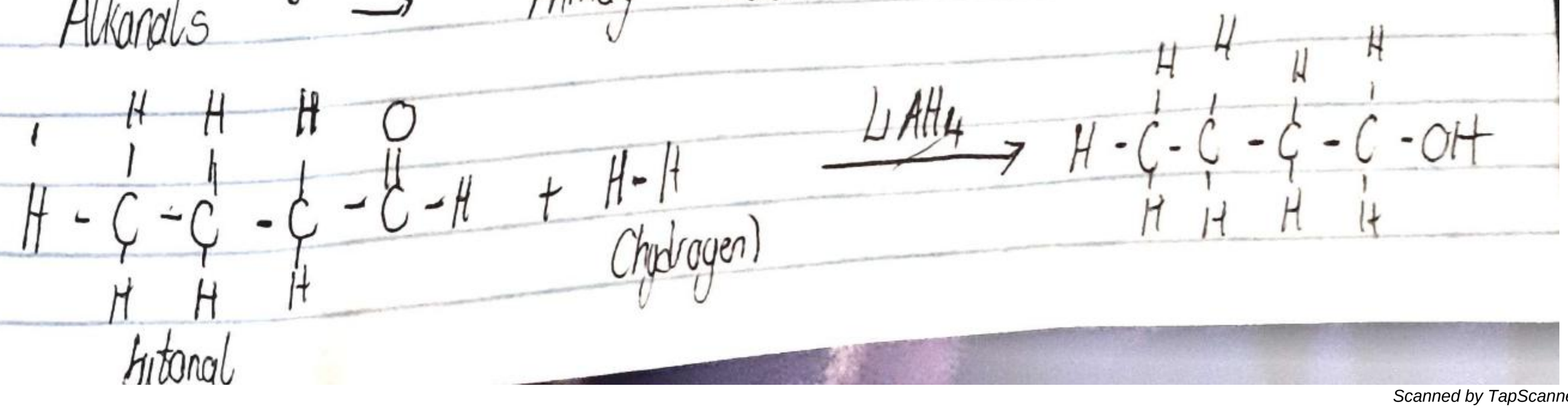
The glucose at constant temperature of 15°c is then converted to alcohol by enzyme zymase also contained in yeast



Determine the product obtained in the reduction of Alkanone and Alkanal use a specific example for each and show the equation of reaction.

Alkanal and alkanone are reduced to primary and secondary alcohols respectively in the presecence of ($LiAlH_4$) and hydrogen reacting.

Alkanals → Primary alcohols



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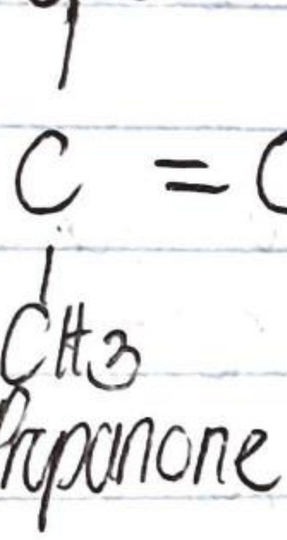
$C_4H_8O + H_2 \xrightarrow{LiAlH_4} C_4H_9OH$

~~Aldehyde~~ KETONE REDUCTION

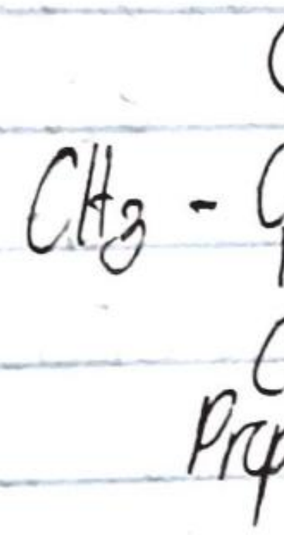
Ketone → secondary alcohol

~~Butanone~~ Propanone + H_2 → ~~Butan-2-ol~~ Propan-2-ol



Propanone

$+ 2[H] \longrightarrow$



Propan(-2)ol