

NAME: Ayim Fortune Ntireshowo

DEPARTMENT: Dentistry

MATRIC NUMBER: 19/MHS09/004

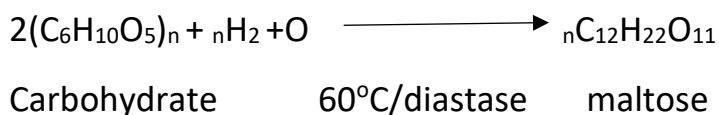
COURSE: CHM 102

Assignment:

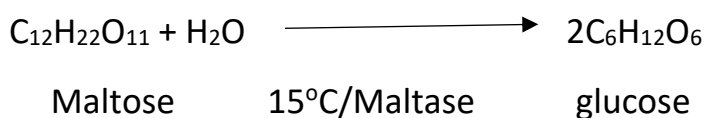
1. Classification of alcohols:

- I. Classification based on number of hydrogen atoms attached to the carbon atom containing the hydroxyl group: If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a **Primary alcohol (1°)**. If it has one hydrogen atom it is called a **Secondary alcohol (2°)** and if it has no hydrogen atom attached it is called a **Tertiary alcohol (3°)**. Example: CH_3OH Methanol (1°).
 - II. Based on the number of hydroxyl group they possess: **Monohydric alcohols** have one hydroxyl group present in the alcohol structure. **Dihydric alcohols**, also known as Glycols have two hydroxyl groups present in the alcohol structure while **Trihydric alcohols** or triols have three hydroxyl groups present in the structure of the alcohol. **Polyhydric alcohols** or polyols have more than three hydroxyl groups present in the structure of the alcohol. Example: $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ Propanol.
2. Solubility of alcohols in water: Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.
3. Industrial manufacture of Ethanol: Carbohydrates such as major group of natural compounds that can be made to yield ethanol by biological process of **fermentation**. The biological catalysts, enzymes found in yeast break down to the carbohydrate molecules into ethanol to give a yield of 95%.

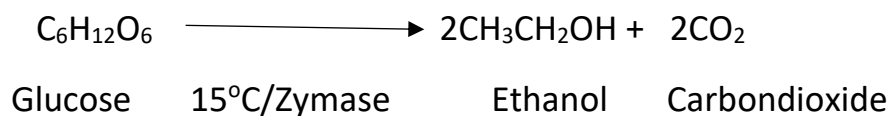
The starch containing materials include molasses, potatoes, cereals, rice and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase containing malt.



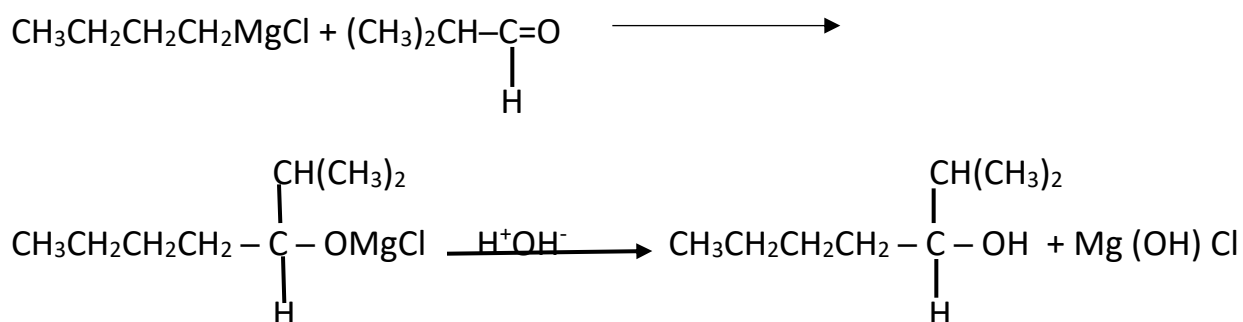
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at room temperature of 15°C.



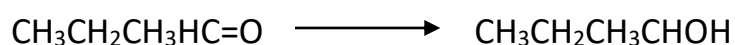
The glucose at constant temperature is 15°C is then converted into alcohol by the enzyme Zymase converted also into yeast.



4. Reaction of 2-methyl propanal and butylmagnesiumchloride



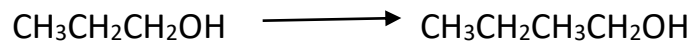
6 Reduction of 2-Methylpropanone



2-Methylpropanone secondary alcohol

LiAlH₄/(C₂H₅)₂O as a reducing agent

7. Reduction of 2-Methylpropanal



2-Methylpropanal primary alcohol

$\text{LiAlH}_4/(\text{C}_2\text{H}_5)_2\text{O}$ as reducing agent

8. Conversion of propan-1-ol to propan-2-ol



Propan-1-ol

