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MATRIC NO.: 19/MH501/041

DEPARTMENT: MIBBS

Classification of Alkanols:

(a) Classification based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group: If the number of the attached hydrogen atoms are three or two, it is a Primary alcohol, if it is one, it is called secondary alcohol/alkanol and if no hydrogen atom, it is a tertiary alkanol.

Examples: $\text{CH}_3\text{CH}_2\text{OH}$ (Ethanol) $\rightarrow$ Primary Alkanol

$\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ (Propan-2-ol) $\rightarrow$ Secondary Alkanol.

(b) Classification based on the number of hydroxyl groups: Alkanols with one hydroxyl group present in their structure are called monohydric. Dihydric alkanols or Glycols have two hydroxyl groups, trihydric alkanols or triols have three hydroxyl groups and Polyhydric alkanols or Polyols have more than three.

Examples: $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (Propanol) $\rightarrow$ Monohydric alcohol

$\text{HOCH}_2\text{CH}_2\text{OH}$ (Ethane-1,2-diol) $\rightarrow$ Dihydric Alkanol.

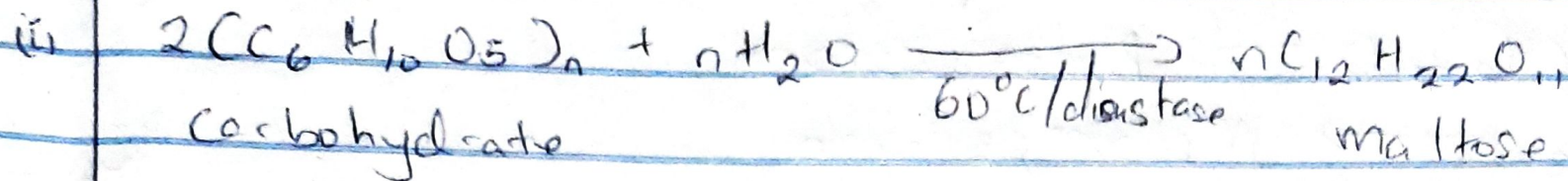
2. Solubility of alcohols in water and organic solvents:

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.

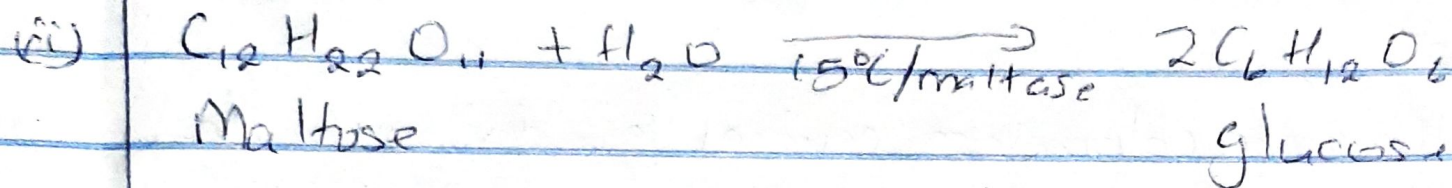
All monohydric alcohols are soluble in organic solvents. The solubility of single alcohols and Polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3. Industrial Manufacture of Ethanol $[CH_3CH_2OH]$:

Carbohydrates are major group of natural compounds that can be made to yield ethanol through the biological process of fermentation. The biological catalysts, enzymes found in yeast are used to carry out this process under specific temperatures over a period of time.



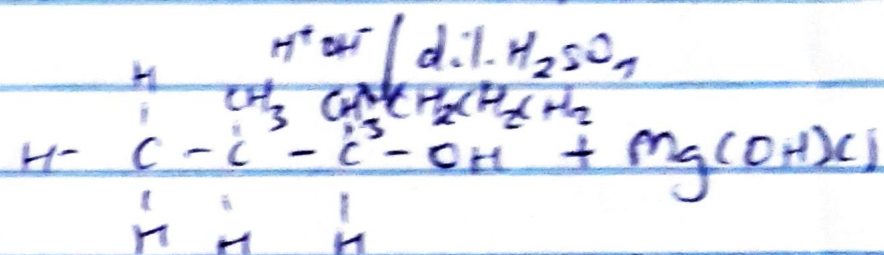
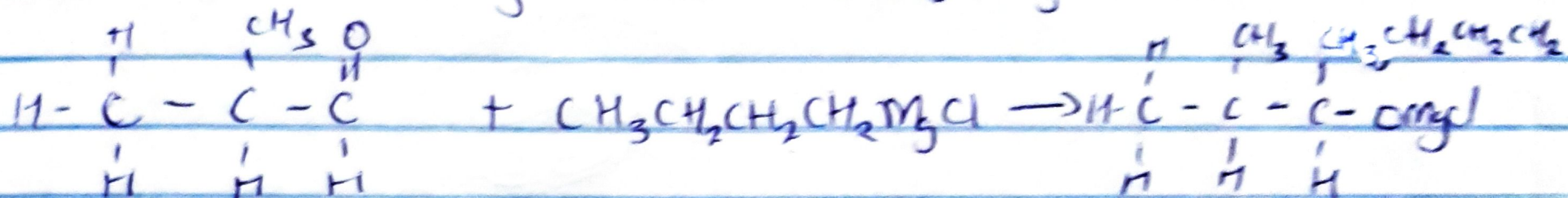
The carbohydrate (starch) is first converted into maltose with the enzyme (diastase).



Maltose is then converted into glucose with the enzyme maltase.

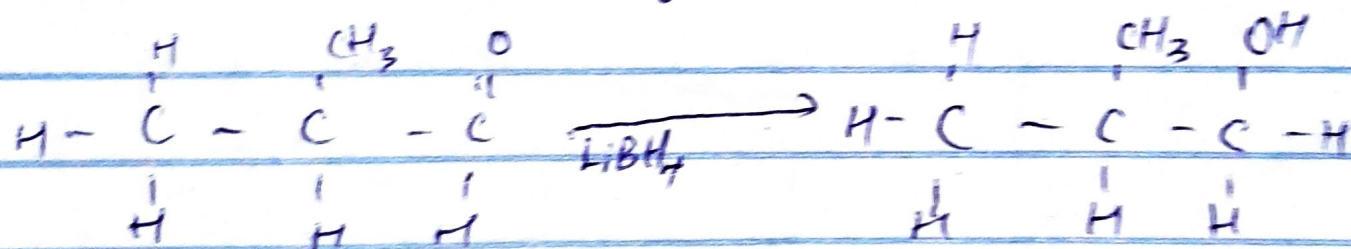


4. Reaction b/w 2-methyl Propanal & butyl magnesium chloride.



1-butyl 2-methyl Propanol & Magnesium hydroxy chloride

5. Reduction of 2-methyl Propanal



2-methyl Propanal

2-methyl Propanol

Aldehyde

Primary Alcohol

6. Conversion of Propan-1-ol to Propan-2-ol

