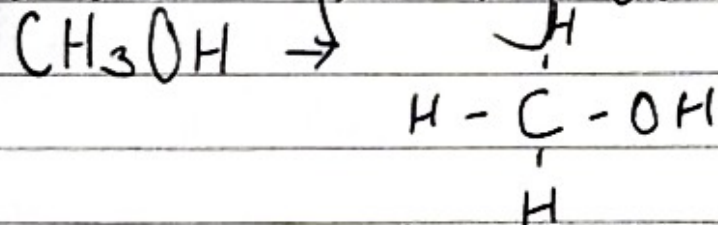


Course Code: CHM 102

1. Alcohols can be classified based on;

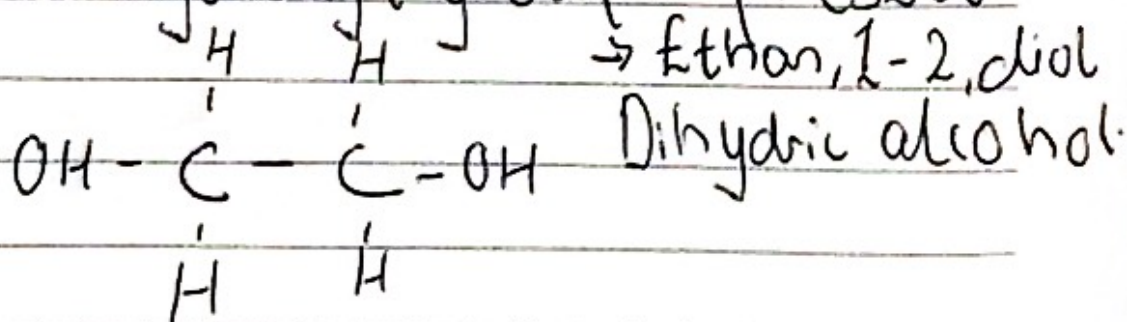
i. Number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If ~~one~~ hydrogen atom is attached it is called a tertiary alcohol, one hydrogen atom attached is a secondary alcohol ( $2^\circ$ ) and two or three hydrogen atoms attached is called primary alcohol ( $1^\circ$ ) e.g



Methanol ( $1^\circ$ )

ii. Number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group, dihydric alcohols / glycols have two hydroxyl groups while trihydric alcohols or triols have three hydroxyl groups present.

Example:



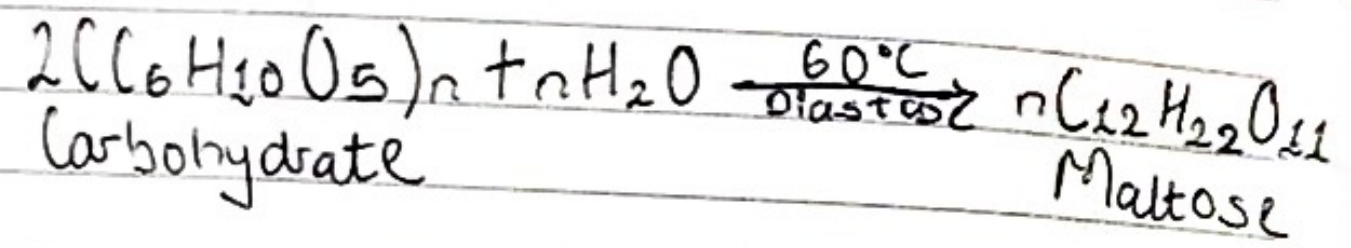
## 2. Water

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.

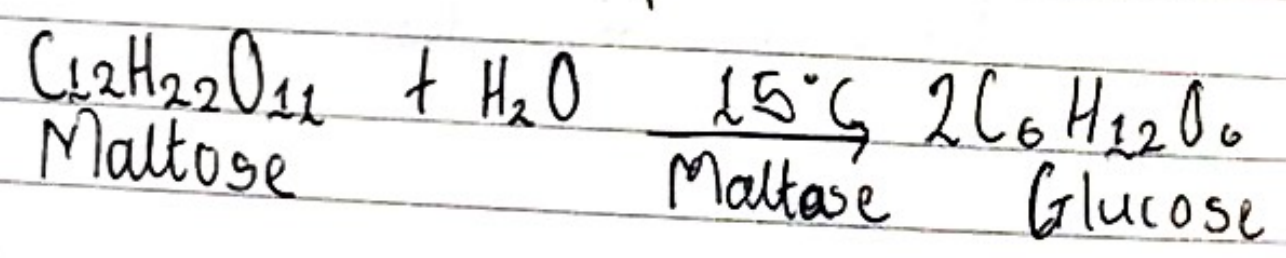
## Organic Solvents

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.

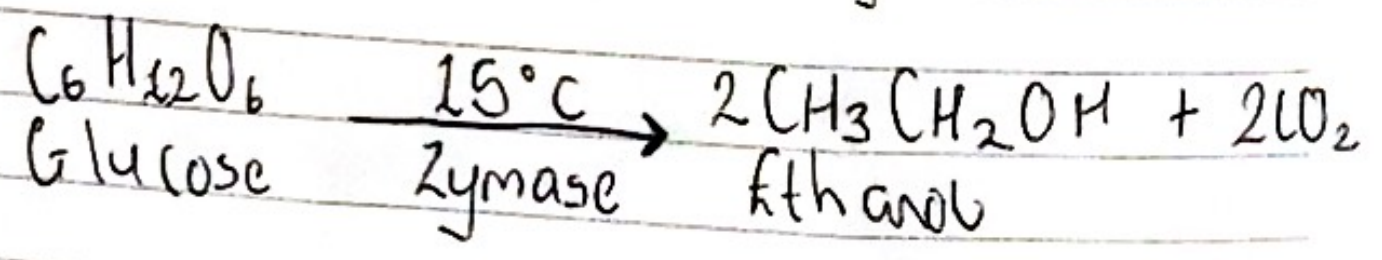
3. Manufacture of Ethanol Industrially  
Starch containing materials including molasses, potatoes, cereals, rice are warmed with malt at 60°C for a specific period of time and converted into maltose by the enzyme diastase contained in the malt.



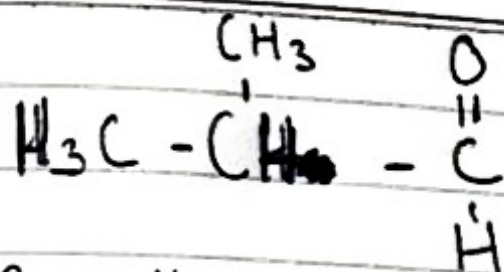
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C.



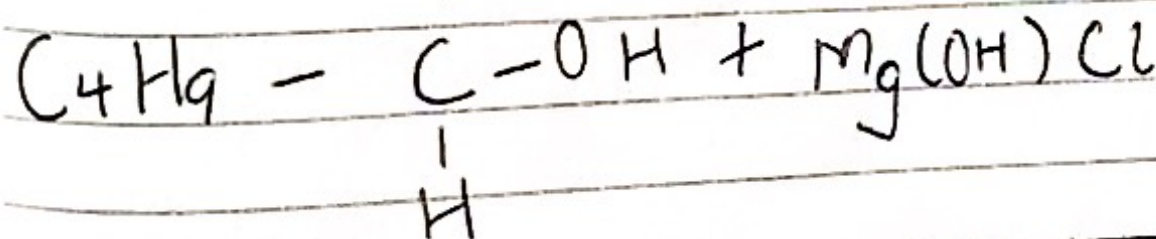
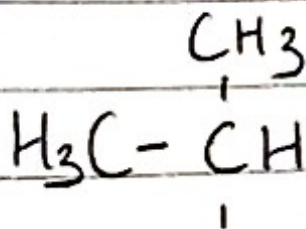
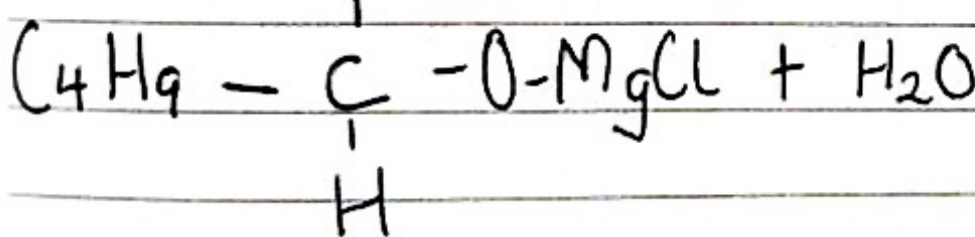
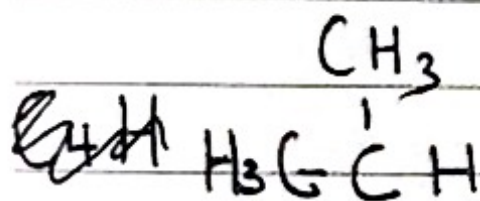
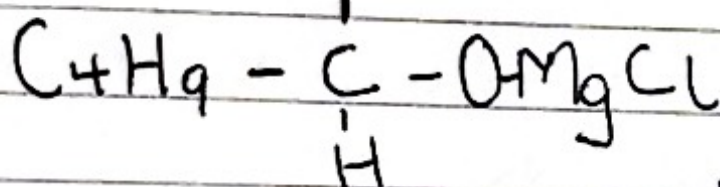
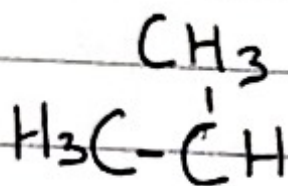
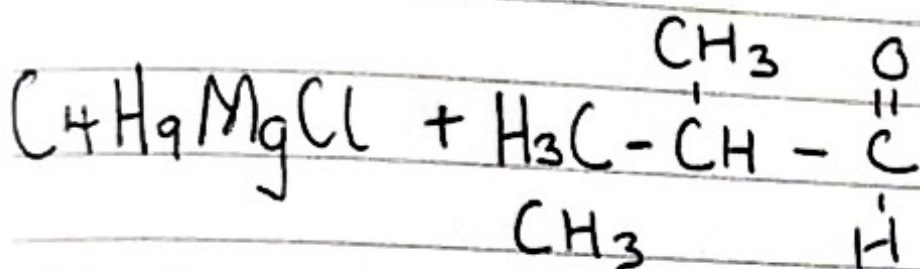
The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme Zymase contained also in yeast.



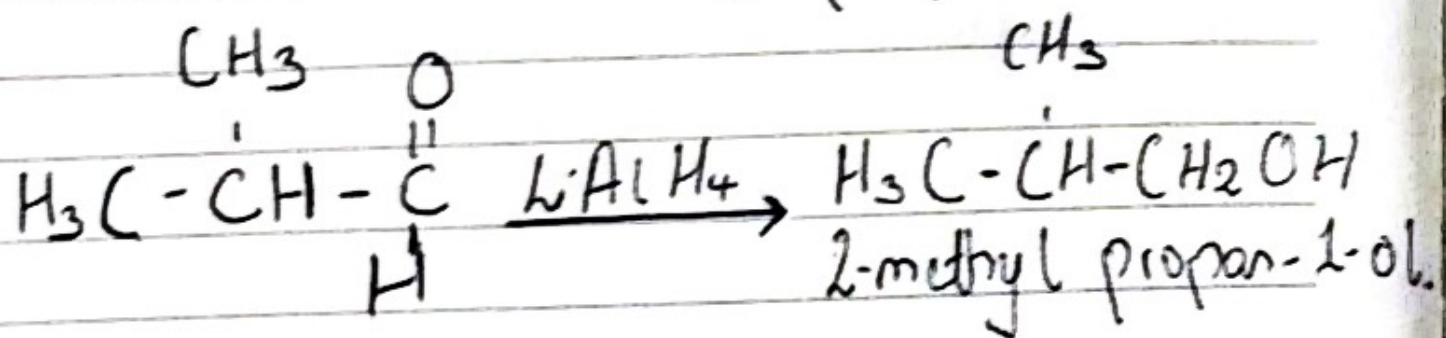
4.



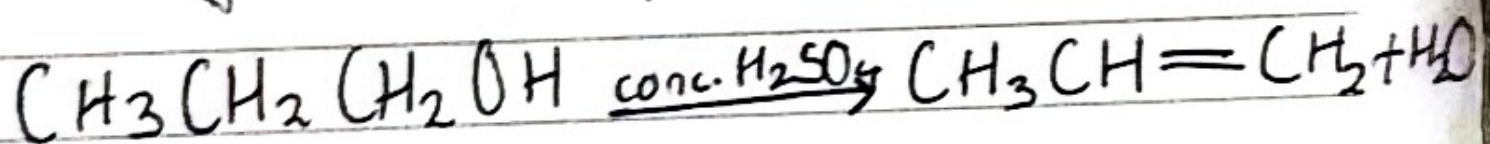
2-methyl propanal

 $\text{C}_4\text{H}_9-\text{MgCl}$   
 Butylmagnesiumchloride


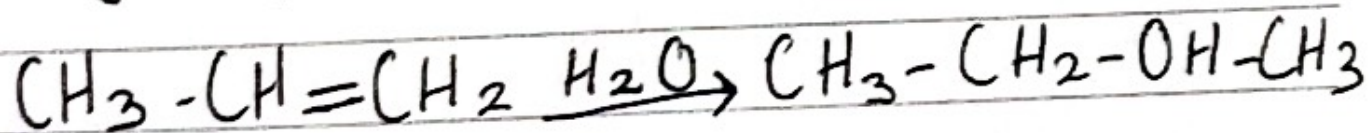
## 7. Reduction of 2-methyl propanal:



## 8. Dehydration of propan-1-ol



## ii. Hydrolysis of propene



Propene is hydrolyzed to propan-2-ol in accordance with Markovnikov's addition which states that ~~water~~ an unsymmetrical reagent the negative part of the reagent gets attached itself to the carbon atom of the alkene which has less number of hydrogen atoms.