

Name: Alanza Juma Shalom
Matric No: 181510101016
Department: Computer Engineering
Course code: CHE 102
CHEMISTRY ASSIGNMENT

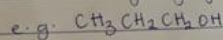
1. CLASSIFICATIONS OF ALCOHOLS

a. Based on which carbon atom is bonded to the hydroxyl group:

- i. If this carbon is primary (1° ; bonded to only one other carbon atom), the compound is a primary alcohol: e.g. CH_3OH (1°)
- ii. A secondary alcohol has the hydroxyl group on a secondary (2°) carbon atom, which is bonded to two other carbon atoms: e.g. $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ (2°)
- iii. A tertiary alcohol has the hydroxyl group on a tertiary (3°) carbon atom, which is bonded to three other carbons: e.g. $(\text{CH}_3)_3\text{C}-\text{OH}$ (3°)

b. Based on the number of hydroxyl groups they possess

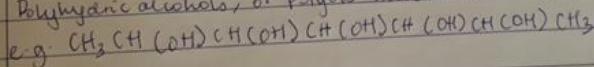
- Monohydric alcohols: have one hydroxyl group present in the alcoholic structure.



- Dihydric alcohols: also known as Glycols have two hydroxyl groups present in their alcoholic structure: e.g. $\text{OHCH}_2\text{CH}_2\text{OH}$

- Trihydric alcohols: also known as triols have three hydroxyl groups present in their alcoholic structure: e.g. $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$

- Polyhydric alcohols, or polyols have more than three hydroxyl groups



2. SOLUBILITY OF ALCOHOLS IN WATER, ORGANIC SOLVENTS

a. In water: Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bonds with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

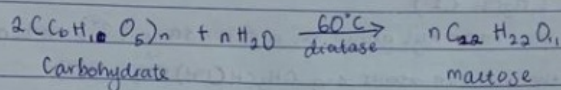
b. In organic solvent: All monohydric alcohols are soluble. The solubility of simple alcohols and polyhydric alcohols, is largely due to their ability to form hydrogen bonds with water molecules.

5 Steps in the industrial manufacture of ethanol

Carbohydrates like starch are major group of natural compounds that can be made to yield ethanol by the biologic process of fermentation

Step 1:

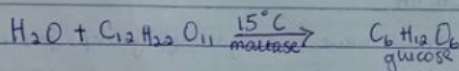
The starch containing contents are warmed with malt to 60°C for a specific period of time and are converted to maltose



NB: where n is large

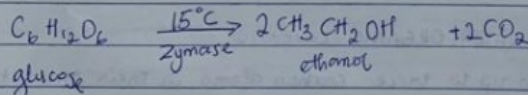
Step 2:

The maltose is broken down to glucose on addition of yeast (maltose) at temperature 15°C



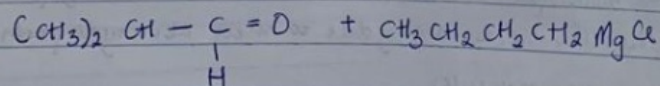
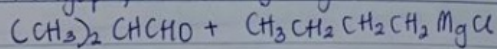
Step 3:

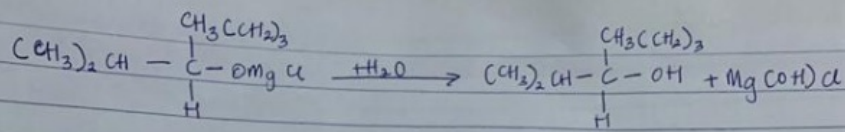
The glucose at constant temperature 15°C is then converted into alcohol by the enzyme Zymase contained also in yeast



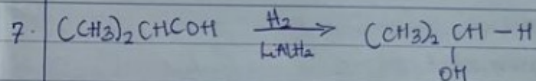
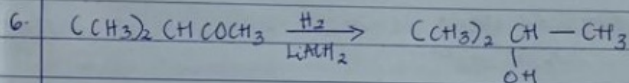
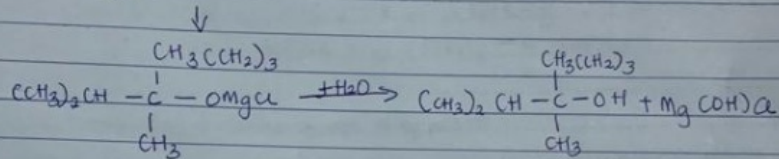
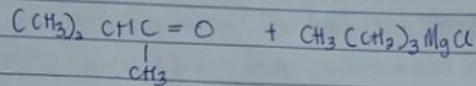
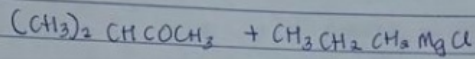
Therefore ethanol is produced.

4 2-methylpropanal, butylmagnesium chloride





5. 2-methyl propanone, butylmagnesium chloride



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

