

MONDAY - JERUMEH IBUEBUE

19/MHS01/246

MHS

MBBS 1001

CHM 102 new assignment.

1) Classification of alcohols.

i) Based on the number of hydrogen atoms attached to the carbon atom containing hydroxyl group: If the number 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 is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°).

Example: CH_3OH methanol - Primary alcohol (1°)

$\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ - Propan-2-ol - Secondary (2°)

$(\text{CH}_3)_3\text{C}-\text{OH}$ 2-Methylpropan-2-ol - Tertiary (3°)

ii) Based on the number of hydroxyl groups they possess:

Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols / Glycols have two hydroxyl groups present in the alcohol structure.

Trihydric alcohols or triols have three hydroxyl groups and

Polyhydric alcohols or polyols have more than three hydroxyl

groups. Examples: - $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ - Propanol (monohydric alcohol)

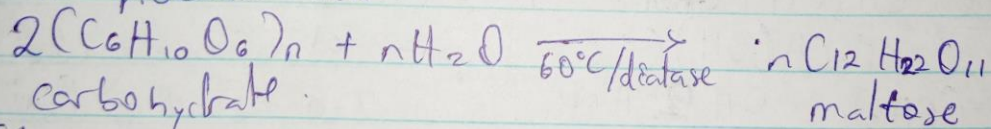
- $\text{HOCH}_2\text{CH}_2\text{OH}$ Ethane-1,2-diol (Dihydric alcohol), - $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ -

Propane-1,2,3-triol (Trihydric), Heptane-2,3,4,5,6-pentanol (polyhydric)

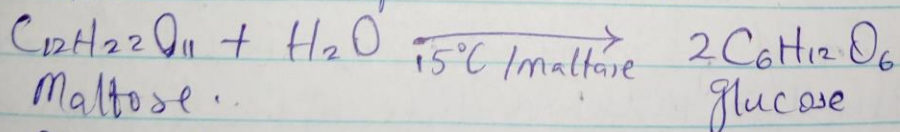
2) Solubility of alcohols: Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohols are soluble 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

Step 1: The starch containing material is heated with malt which contains an enzyme diastase at 60°C to produce maltose.

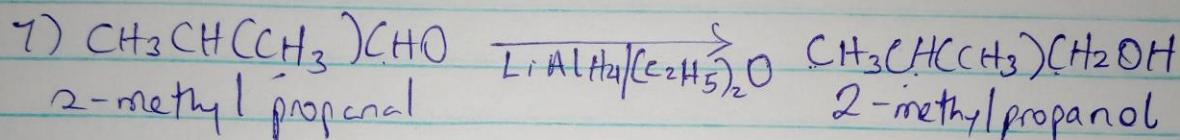
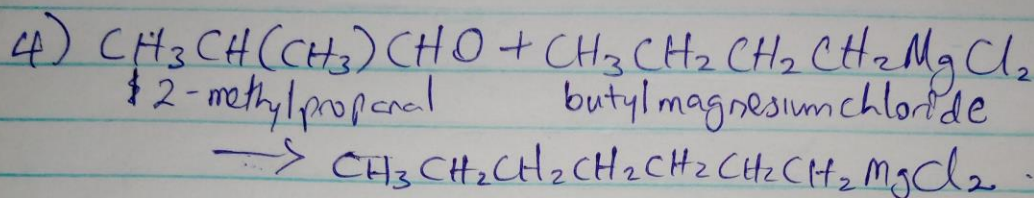
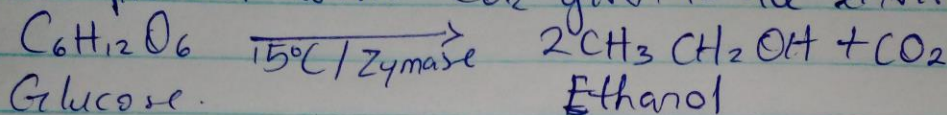


Step 2: The maltose produced is then broken down to glucose due to the addition of yeast with the enzyme maltase at a temperature of 15°C.



Step 3: The glucose is then kept to ferment at a constant temperature of 15°C. The fermentation is due to the other enzyme present in yeast (Zymase). When the fermentation is completed, ethanol is the

end product with CO_2 given to the environment.



8) Through hydrogenation.

