

CHM 102; ASSIGNMENT

1. CLASSIFICATION OF ALCOHOLS

Alcohols are classified based on two things;
 a.) They are classified based on the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group. If the number of the 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.

Example are;

CH_3OH Methanol (1°), $\text{CH}_3\text{CH}_2\text{OH}$ Ethanol (1°), $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ propan-2-ol (2°)
 $(\text{CH}_3)_3\text{C}-\text{OH}$ 2-Methylpropan-2-ol (3°).

b.) This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure example; $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ propanol. Dihydric alcohols are also called Glycols they have two hydroxyl groups present in the alcohol structure ~~where~~ Example; $\text{HOCH}_2\text{CH}_2\text{OH}$ Ethane-1,2-diol. Trihydric alcohols have three hydroxyl groups present in the structure of the alcohol example; propan-1,2,3-triol. Polyhydric alcohols or polyols have more than three hydroxyl groups Example; Heptane-2,3,4,5,6-pentaol.

2. Solubility of Alcohols in Water

Alcohols are soluble in water. This is due to the hydroxyl group in the alcohol which is able to form hydrogen bonds with water molecules. Alcohols with smaller hydrocarbon chain are very soluble. As the length of the hydrocarbon chain increases, the solubility in water decreases.

All monohydric alcohols are soluble in organic solvents.

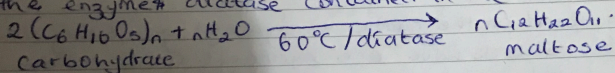
3 INDUSTRIAL MANUFACTURE OF ALCOHOLS;

production of Ethanol;

Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%.

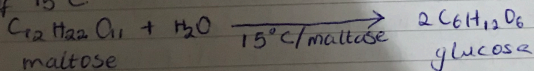
STEP I

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 α -diastase contained in the malt.



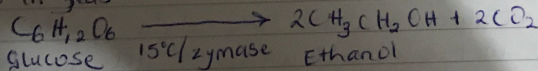
STEP II

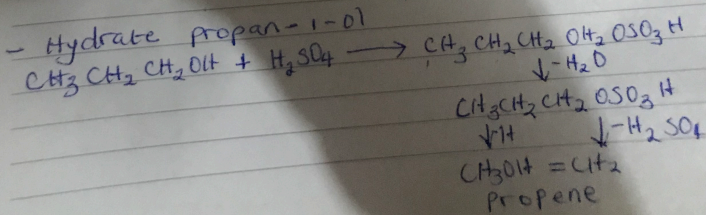
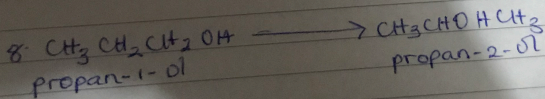
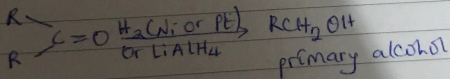
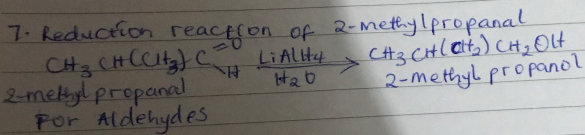
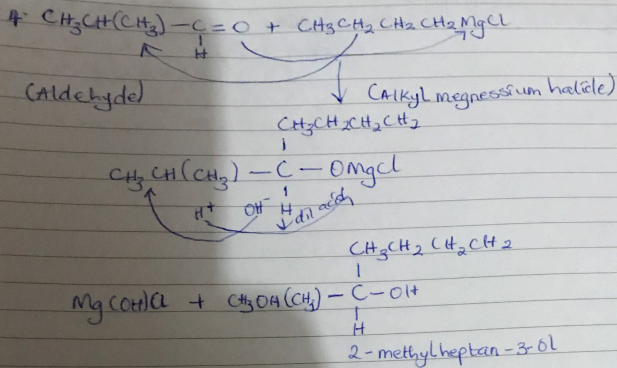
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C .



STEP III

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





19/11/2014/405

Hydrate alkene (propene)

