

CHUKWUEMEKA EVANGEL
MEDICINE AND SURGERY
19/MHS01/130
CHM 102.

1. Classification of Alcohols:

i. Classification based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group: If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are 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 OH hydroxyl group, it is called tertiary alcohol (3°). Example include: Methanol.

ii. Classification based on the number of hydroxyl groups they possess: Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols have two hydroxyl groups present in the alcohol structure. Trihydric alcohols have three hydroxyl groups present in the alcohol structure. Example include Ethane-1, 2-diol.

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 hydrocarbon chain increases, the solubility in water decreases. With four carbon in hydrocarbon chain and higher, the decrease in solubility becomes visible as the mixture forms two

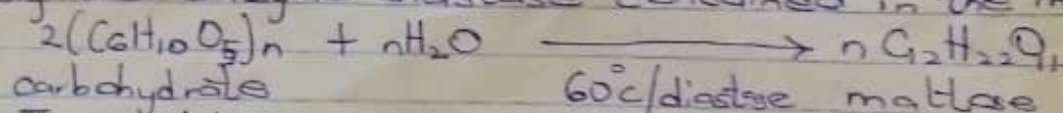
immiscible layers of liquid. The reason why the solubility decreases as the length of hydrocarbon chain increases is because it requires more energy to overcome the hydrocarbon bonds between the alcohol molecules and the molecules are more tightly packed together as the size and mass increases.

Solubility of Alcohols in Organic Solvents:

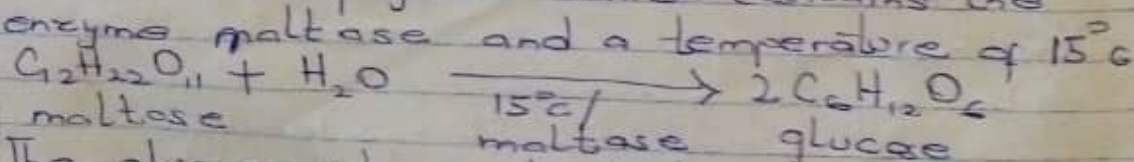
All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3 INDUSTRIAL MANUFACTURE OF ETHANOL

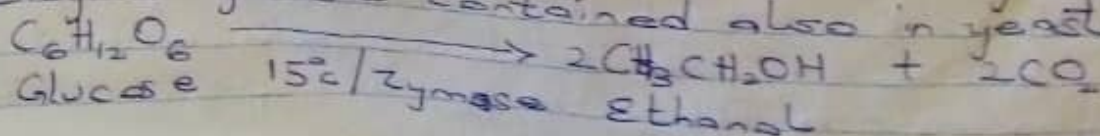
Carbohydrates are major group of natural compounds that can be made to yield ethanol by biological process of fermentation. The starch containing materials include molasses, potatoes, cereals on warming with malt to 60°C for a specific period of time are converted to maltose by the enzyme diastase contained in the malt:



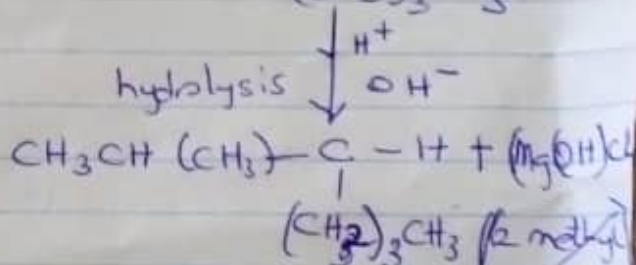
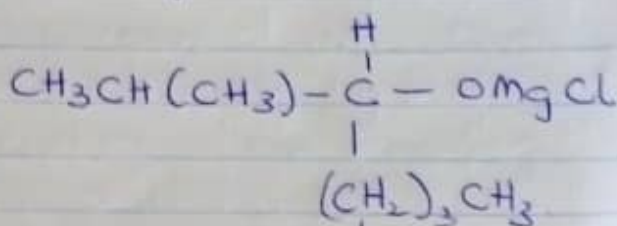
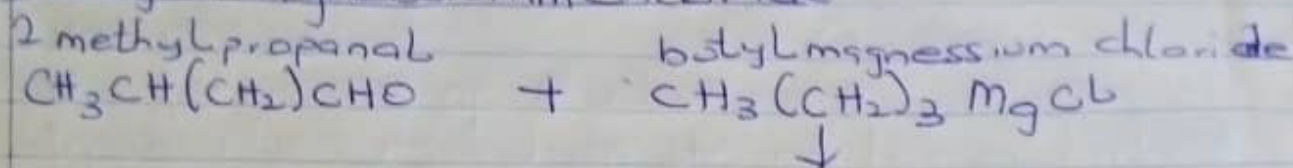
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and a temperature of 15°C



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



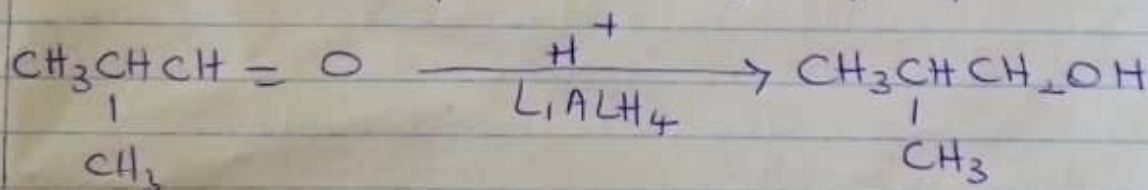
4 Reaction between 2-methyl propanal and butylmagnesium chloride



(2 methyl heptan-3-ol)

5 ~~out~~

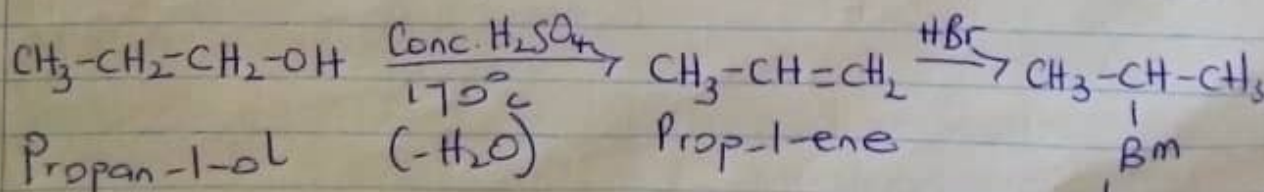
7 Reduction of 2-methyl propanal



2 methyl propanal

2 methyl propanol

8 Reduction of Propan-1-ol to Propan-2-ol

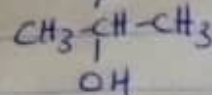


Propan-1-ol

Prop-1-ene

Bm

KOH(aq) / 2-bromopropane



Propan-2-ol