Name : Aliyu Mariam Omotayo
Course : CHM102
Department : MBBS Medicine and Surgery
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1. i) This is 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 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 the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°). Examples are : CH_3OH Methanol (1°), CH_3CH_3OH Ethanol (1°).

ii) This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called Glycols have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Polyhydric alcohols or polyols have more than three hydroxyl groups. Examples are: $CH_3CH_2CH_2OH$ Propanol (Monohydric alcohol) $HOCH_2CH_2OH$ Ethane-1,2-diol (Dihydric alcohol).

2. $CH_3CH_2CH_2CH_2C{=}OCH_2CH_2CH_3 + C_2H_5MgBr \longrightarrow$

$CH_3CH_2CH_2CH_2CH_2CH_2CH_3C{-}OH + Mg(OH)Br \xleftarrow[\text{dil. acid}]{H^+\ OH^-} CH_3CH_2CH_2CH_2CH_2CH_2CH_3C{-}OMgBr$

3. 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 diatase contained in the malt.

$$\underset{\text{Carbohydrate}}{2(C_6H_{10}O_5)_n} + nH_2O \xrightarrow[60°C/\text{diatase}]{} \underset{\text{maltose}}{nC_{12}H_{22}O_{11}}$$

ii) The maltose is broken down into glucose on addition of yeast which contains

the enzyme maltase and at a temperature of 15°C

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow[15°C/\text{Maltase}]{} 2C_6H_{12}O_6$$

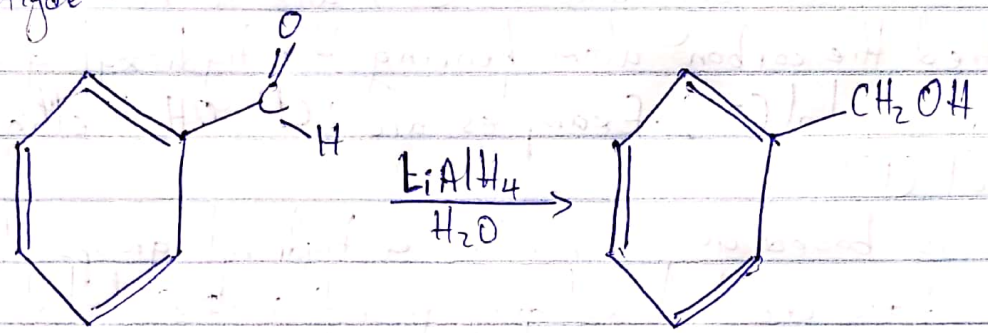
Maltose — glucose

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

$$C_6H_{12}O_6 \xrightarrow[15°C/\text{Zymase}]{} 2CH_3CH_2OH + 2CO_2$$

Glucose — Ethanol

4. Reduction of aldehyde:



Reduction of Ketone.