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19/MHS/11/095 PHARMACY CHM 102

1) classification of Alcohols

a) classification based on the number of hydrogen atoms attached to the carbon atom containing the OH group

i) If 2 or 3 hydrogen atom are attached to the carbon atom bearing the OH group, it is called a primary alcohol (1°)

ii) If one hydrogen atom is attached, it is called a secondary alcohol (2°)

iii) If no hydrogen atom is attached to the carbon atom, it is a tertiary alcohol (3°) - Examples are;

Primary Alcohol - Methanol (CH_3OH)

Ethanol ($\text{C}_2\text{H}_5\text{OH}$)

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

Tertiary Alcohol \rightarrow 2 Methyl propan-2-ol ($(\text{CH}_3)_3\text{C-OH}$)

\rightarrow 2 Methyl butan-2-ol ($(\text{CH}_3)_2\text{CH}-\text{C}(\text{OH})(\text{CH}_3)\text{CH}_2\text{CH}_3$)

B Classification Based on the number of hydroxyl groups they possess. Monohydric alcohol have one OH group present in the alcohol structure. Dihydric alcohols are called glycols, they have 2 hydroxyl group present in the structure. Trihydric alcohols or triols have 3 OH groups present in the structure of the alcohol. Polyhydric alcohols or Polyols have more than 3 OH groups - Examples are;

Monohydric alcohol - Propanol ($\text{C}_3\text{H}_7\text{OH}$)

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

Trihydric alcohol - Propane-1,2,3-triol ($\text{C}_3\text{H}_8\text{O}_3$)

Polyhydric alcohol - Heptane-2,3,4,5,6-pentol

2) Grignard Synthesis of Alcohols:

Grignard reagent - $\text{C}_2\text{H}_5\text{MgBr}$

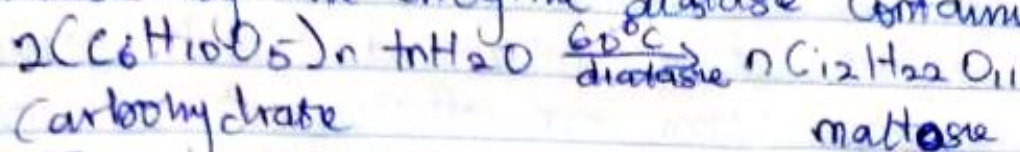
$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{C}=\text{O} + \text{CH}_2\text{CH}_2\text{CH}_3 + \text{C}_2\text{H}_5\text{MgBr} \rightarrow \text{C}_7\text{H}_{15}\text{O}$

$-\text{C}-\text{OMgBr} \xrightarrow[\text{dil acid}]{\text{H}^+ \text{ OH}^-} \text{C}_7\text{H}_{15}\text{O} + \text{Mg}(\text{OH})\text{Br}$

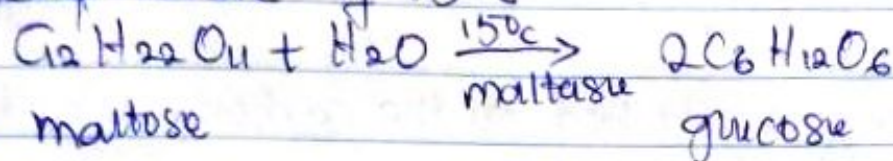
3) Grignard Industrial Manufacture of Ethanol

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 breaks down the

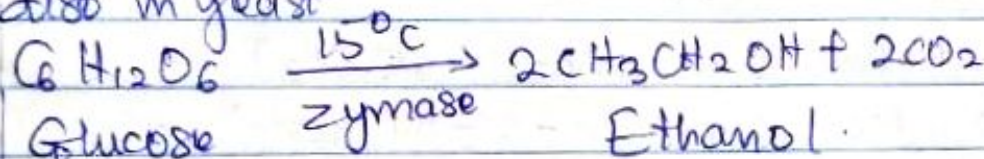
Carbohydrate molecules into ethanol to give a yield of 95%
 The starch containing materials includes molasses, cereals etc and on warming with malt to 60°C and converted into maltose by the enzyme diastase contained in the malt.



The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at 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



REDUCTION OF ALKANALS AND ALKANONES

