

ADEFEMI OMOJALEWA OPEFEMI

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MBS - CHM102

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 atoms are attached to the carbon atom bearing the OH group, it is called a primary alcohol ( $1^\circ$ )

ii If one hydrogen atom is attached, it is called a secondary alcohol ( $2^\circ$ )

iii If no hydrogen atom is attached to the carbon atom, it is a tertiary alcohol ( $3^\circ$ ).

Examples are; Primary Alcohol - Methanol ( $\text{CH}_3\text{OH}$ )

Ethanol ( $\text{CH}_2\text{CH}_2\text{OH}$ )

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

Tertiary Alcohol  $\rightarrow$  2-methylpropan-2-ol  $[(\text{CH}_3)_3\text{C}-\text{OH}]$

$\rightarrow$  2-methylbutan-2-ol  $[(\text{CH}_3)_3\text{CH}_2\text{C}-\text{OH}]$

b classification based on the number of hydroxyl group (OH) they possess. Monohydric alcohols have only one OH group present in the alcohol structure. Dihydric alcohols also called Glycols, have 2 hydroxyl group present in the structure. Trihydric alcohols or Triols have 3 hydroxyl groups present in the structure of the alcohol. Polyhydric alcohols or Polyols have more than 3 hydroxyl groups.

Examples are: Monohydric Alcohol  $\rightarrow$  propanol ( $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ )

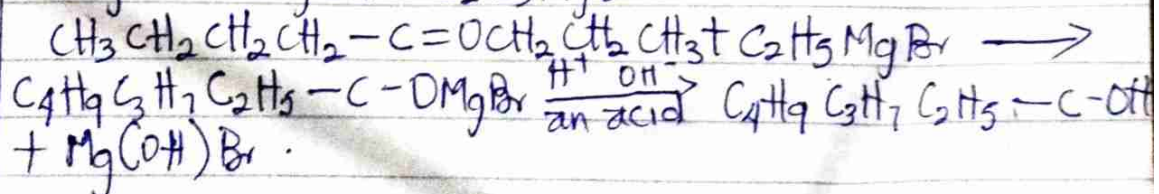
Dihydric Alcohol - Ethane-1,2-diol ( $\text{HOCH}_2-\text{CH}_2\text{OH}$ )

Trihydric Alcohol  $\rightarrow$  Propane-1,2,3-triol ( $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ )

Polyhydric Alcohol  $\rightarrow$  Heptane-2,3,4,5,6-pentanol

2] Grignard Synthesis of Alkanols.

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

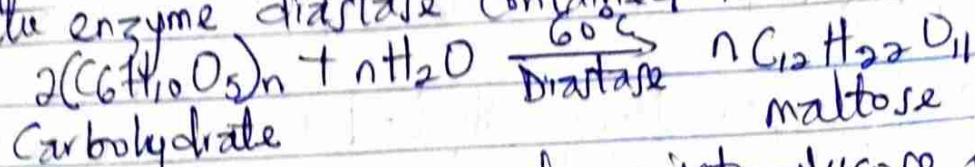




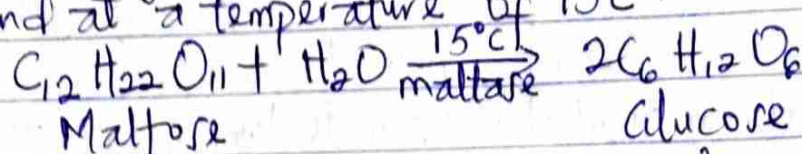
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## INDUSTRIAL MANUFACTURE OF ETHANOL

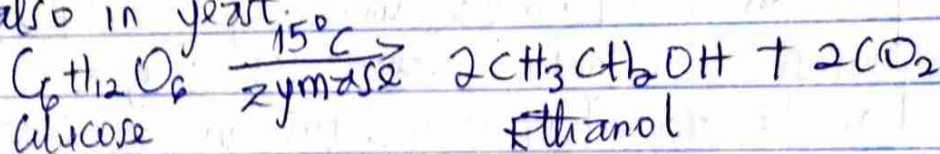
Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalyst, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include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



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## REDUCTIONS OF ALKANALS AND ALKANONES

