

CHEM 102

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MATRIC NO: 19/MASCI/181

1 Classification of alcohols

a Primary alcohols, the carbon which carries the $-OH$ group is only attached to one alkyl group. We also have secondary and tertiary alcohols which are all based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group.

Examples are

CH_3OH Methanol (1°), CH_3CH_2OH Ethanol (1°)

b 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 group present in alcohol structure while the trihydric alcohols or triols have three hydroxyl group.

Examples are

$CH_3CH_2CH_2OH$ Propanol (Monohydric alcohol)

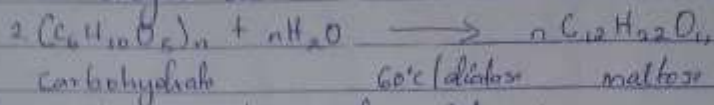
$HOCH_2CH_2OH$ Ethane-1,2-diol (Dihydric alcohol)

2 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. Lower alcohols can form hydrogen bond with water molecules.

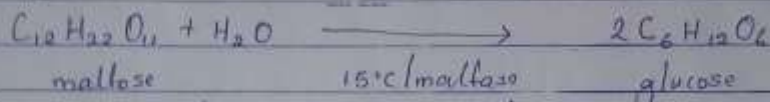
All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to the ability to form hydrogen bonds with water molecules.

3 Steps in production of ethanol

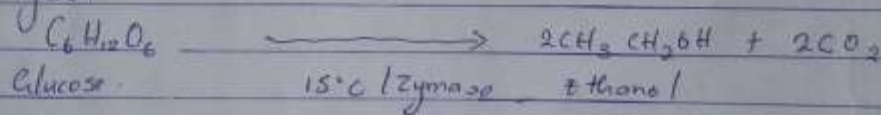
The starch containing materials include molasses, potatoes, cereals, etc and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



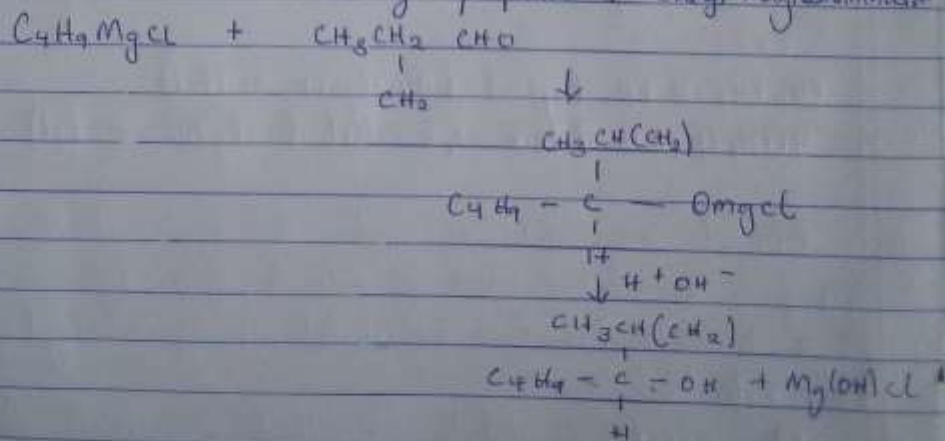
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C



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

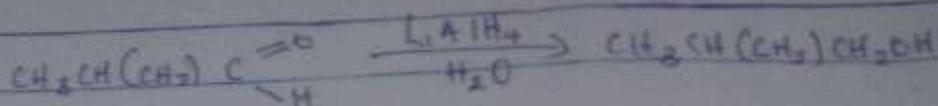


4 Reaction between 2 methyl propanal & butyl magnesium chloride



7 Reduction reaction of two 2 methyl propanal

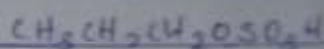
Reduction of an aldehyde gives a 1° alcohol.



8 Conversion of propan-1-ol to Propan-2-ol

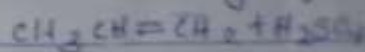


↓ - H₂O

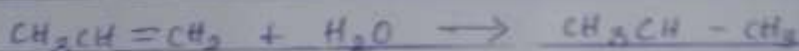


(Propyl hydrogen sulphate)

dil. acid ↓ by hydrolysis



Propene



OH

Propan-2-ol