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1) Classification of Alcohol.

→ It is based on the number of hydrogen atoms attached to the carbon carrying the "OH" functional group.

If the number of H is 2 or 3, it is a primary alcohol.

If 1 - A secondary alcohol and if none is attached to the carbon at all, it is called tertiary alcohol.

Examples: CH_3OH - primary alcohol.

$\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ - secondary alcohol

$(\text{CH}_3)_3\text{C}-\text{OH}$ - tertiary alcohol.

2) This is based on the number of "OH" present in the structure of the alcohol.

1, OH - monohydric alcohol, 2, OH - dihydric alcohol

3, OH - trihydric alcohol, more than 3, OH - polyhydric alcohol

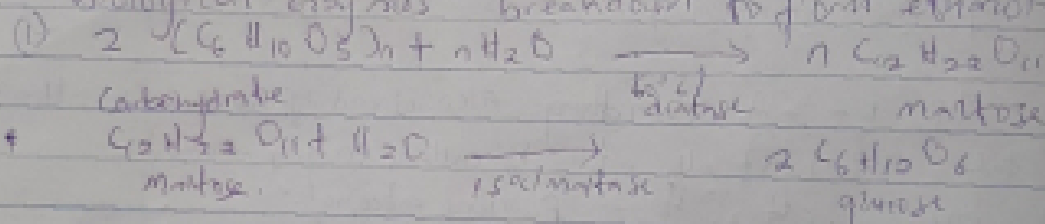
2) Solubility - Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these have alcohols conform hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

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.

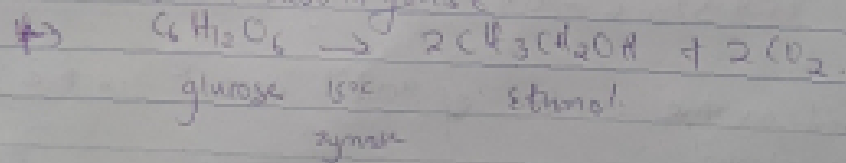
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3) Industrial preparation of ethanol : ethanol is derived by a process called Fermentation

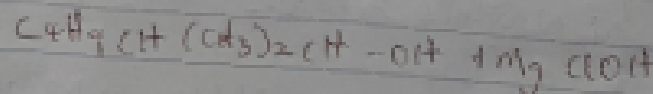
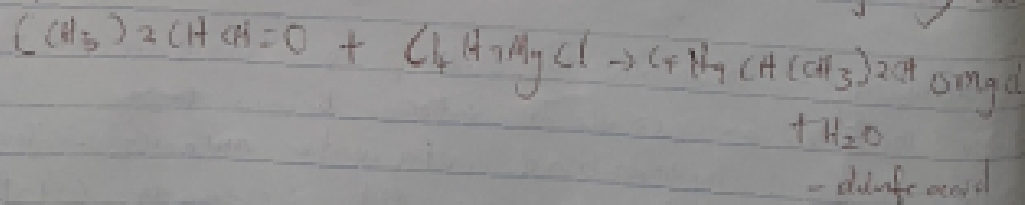
Carbohydrate such as starch is a major natural compound which can be used to make ethanol by fermentation. It occurs by a process whereby biological enzymes breakdown to form ethanol.



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



4) Reaction between acetylpropional and acetylmagnesium chloride



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7) Show the reduction of 2-methyl propanal
 $(\text{CH}_3)_2\text{CHCHO} \rightarrow (\text{CH}_3)_2\text{CHCH}_2\text{OH}$

8) Show the conversion of propan-1-ol to propan-2-ol
 $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH}$ (propan-1-ol)
heat in the presence of concentrated H_2SO_4 , to
dehydrate it and form propene
 $(\text{CH}_2=\text{CH-CH}_3)$

$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_2=\text{CH-CH}_3$ (after
heating with concentrated H_2SO_4
now to propene add water (you may use mercuric acetate
as it favours Markovnikov addition)
 $\text{CH}_3\text{-CH}=\text{CH}_2 + \text{H}_2\text{O} \rightarrow \text{CH}_3\text{-CH(OH)-CH}_3$ (propan-2-ol)