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MBS

Chem 102

① Two major classification of Alkanols

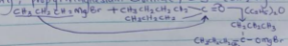
Ⓐ Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. For secondary alcohols, the carbon atom contains one hydrogen atom eg $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$. The primary alcohols has the carbon atom that contains the OH has 2 or 3 hydrogen atoms eg CH_3OH . then for the tertiary alcohol, the carbon atom has no hydrogen atom eg $(\text{CH}_3)_3\text{C}-\text{OH}$

Ⓑ Based on the number of hydroxyl group they possess. Alcohols that have one hydroxyl group present in the structure are called Monohydric alcohols eg $\text{CH}_3\text{CH}_2\text{OH}$, CH_3OH . Alcohols that have 2 hydroxyl groups present in the structure are called Dihydric alcohol / glycol eg $\text{HOCH}_2\text{CH}_2\text{OH}$, $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$. Alcohols that have 3 hydroxyl groups present are called Trihydric alcohols / triols. eg $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$. Alcohols that have more than 3 hydroxyl groups are called polyhydric alcohol or polyols eg $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$

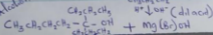
2) A named Grignard reagent with $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO} \text{CH}_2\text{CH}_2\text{CH}_3$

A named Grignard reagent + ketone \rightarrow 3° alcohol

Using, Propylmagnesium Bromide; $\text{CH}_3\text{CH}_2\text{CH}_2\text{MgBr}$

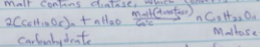


A tertiary alcohol

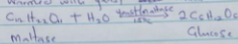


3. Industrial Manufacture of Ethanol showing all Equations:

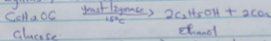
Ethanol is produced industrially by the process of fermentation. This is the chemical breaking of carbohydrates such as starch through series of enzymatic reactions to produce Ethanol. Firstly, the starch containing compound is warmed with malt at 60°C for some time. The malt contains diastase, which converts it to maltose



The maltose is then broken down to glucose when it is warmed with yeast which contains maltase at 15°C



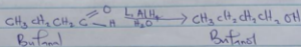
After, the glucose at the same 15°C, is warmed with enzyme, Zymase, which converts it to Alcohol (Ethanol)



Ethanol (C₂H₅OH) is the final product.

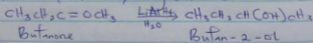
4. Reduction of Alkanone and Alkanal.

Reduction of Alkanal, using Butanal



Reducing an Alkanal gives a primary alcohol

Reduction of Alkanone, using Butanone



Reducing an alkanone gives a secondary alcohol