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Chemistry Assignment

1) Classification of Alkanols

a) They can be classified based on the number of hydrogen atom attached to the carbon atom carrying the hydroxyl group. If the number of hydrogen atom attached to the carbon atom carrying the hydroxyl group are $\frac{3}{2}^{\circ}$, $\frac{2}{1}^{\circ}$, it is called primary alcohol. If its $\frac{1}{0}$ hydrogen atom it is called secondary alcohol and if there is no hydrogen atom it is called tertiary alcohols.

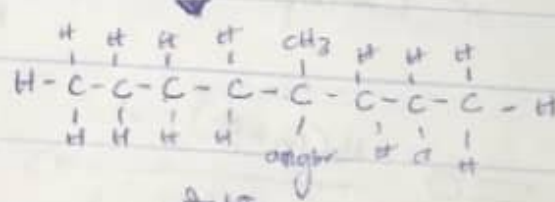
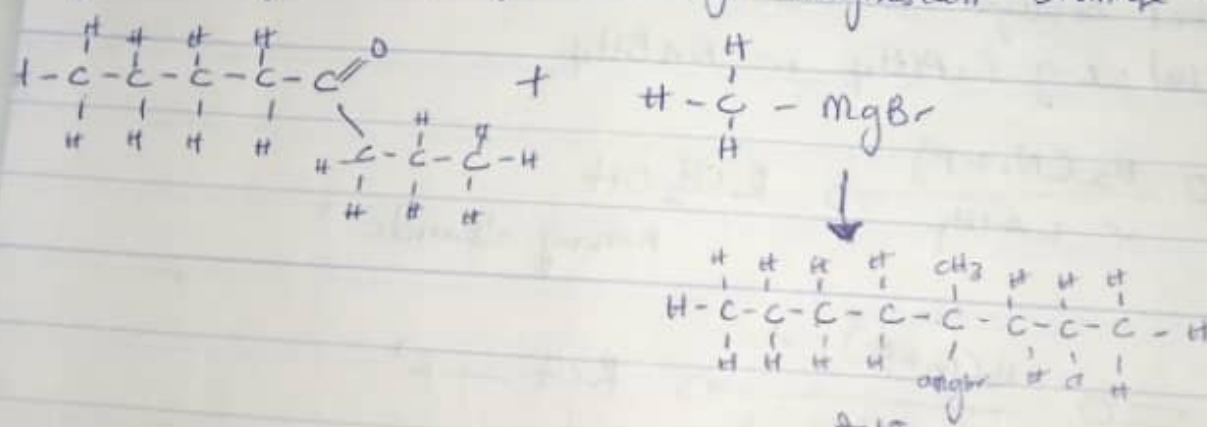
E.g $\text{CH}_3\text{OH} \rightarrow$ methanol (1°) $\text{CH}_3\text{CH}_2\text{OH}$ ethanol, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ propan-1-ol, $(\text{CH}_3)_2\text{CH}-\text{OH} \rightarrow$ 2-methylpropan-2-ol (3°).

b) They can also be classified on the number of hydroxyl group they possess. Monohydric alcohol has one hydroxyl group present in the alcohol structure. Dihydric alcohols have 2 hydroxyl group while trihydric have more than three hydroxyl group. while polyhydric have more than three.

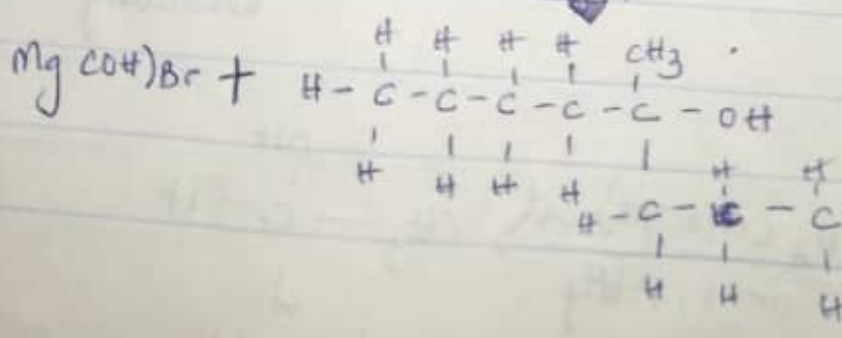
E.g $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ Monohydric
 $\text{HOCH}_2\text{CH}_2\text{OH}$ Dihydric
 $\text{CH}_2\text{OHCH}_2\text{CH}_2\text{OH}$ trihydric

2) Grignard Synthesis of Alcohols

Grignard Agent: CH_3MgBr (methyl magnesium bromide)



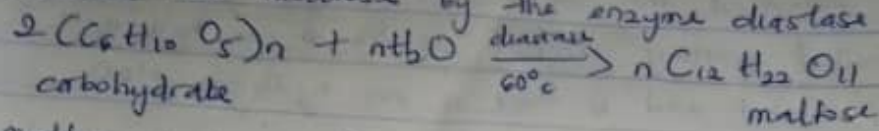
$\xrightarrow[\text{dil. acid}]{\text{H}^+}$



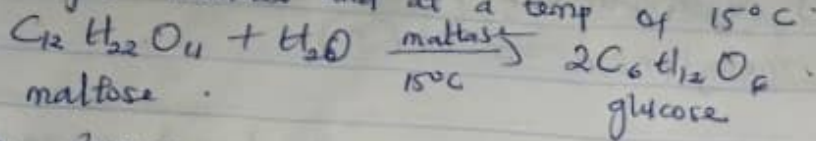
3) Production of Ethanol

This is done through the process of fermentation. The biological catalysts, enzymes found in yeast break down carbohydrate molecules into ethanol to give a yield of 95%.

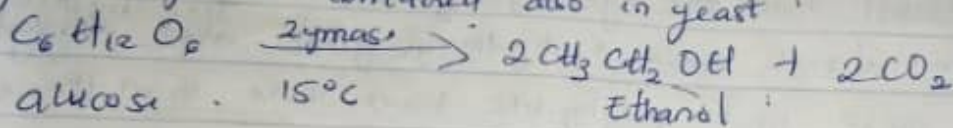
The starch containing material e.g. rice, cereals (containing) and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase



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

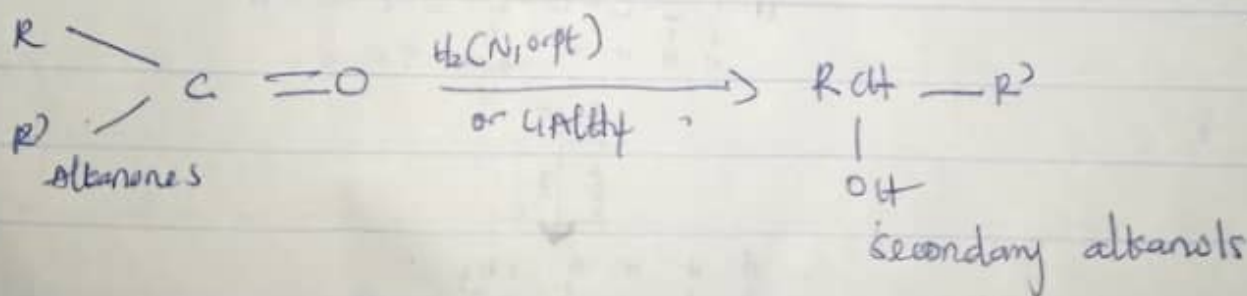
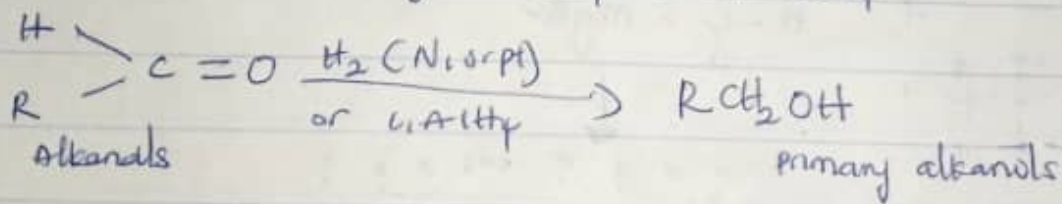


the glucose at constant temperature of 15°C is then converted into alcohols by the zymase contained also in yeast.

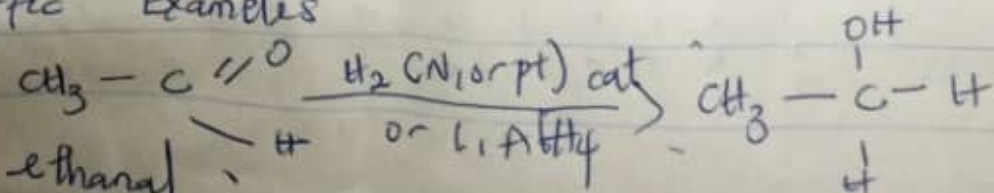


4) Reduction of Alkanones and Alkanals

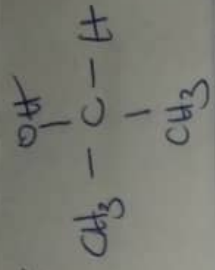
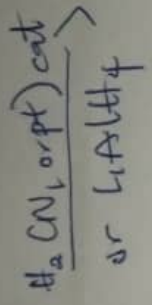
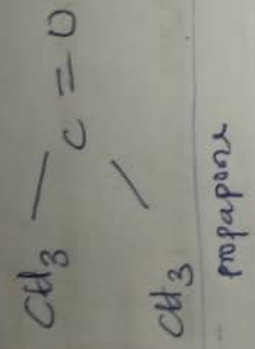
Alkanals and Alkanones are reduced by primary and secondary oxidation alkanols respectively by the reaction with hydrogen in the presence of a platinum or nickel catalyst or with aluminium isopropoxide or with complex metal e.g. $LiAlH_4$ or $NaBH_4$



Specific Examples



120
CH₃



propan-2-ol