

Q.1. Discuss the classification of alcohols. Give two examples for each class.

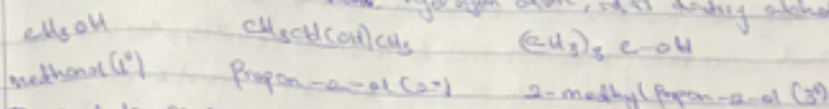
Questions

- Discuss the industrial manufacture of ethanol showing all reaction and necessary enzymes and temperature of reaction.
- Determine the product obtained in reduction of alkyne and of alcohol. Use a specific example to each and show the equation of reaction.

Answers

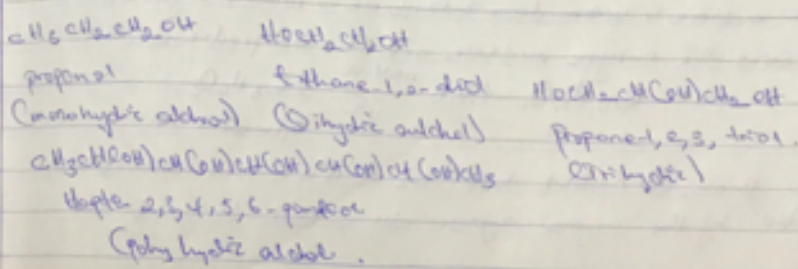
Alcohols can be classified in 4 major ways:

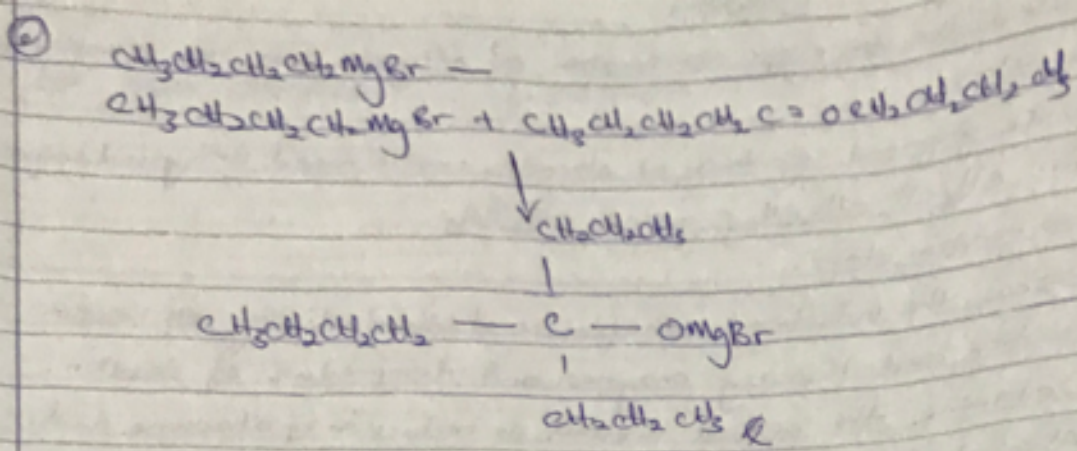
(1) They may be classified as primary (1°) secondary (2°) and tertiary (3°) depending on number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group is two or three, it is a primary alcohol, if it is one hydrogen atom, it is secondary alcohol and if it is none hydrogen atom, it is tertiary alcohol.



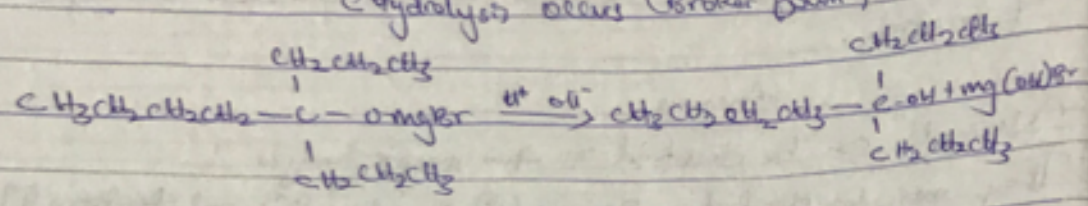
(2) Alcohols can be classified into as mono-, di-, tri- or poly- depending upon the number of hydroxyl group they possess. Alcohols containing one hydroxyl group are described as monohydric alcohols, those containing two hydroxyl groups are Dihydric Alcohol and so on...

Examples



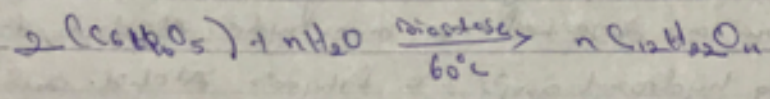


(Hydrolysis occurs (Bromine Oxide))

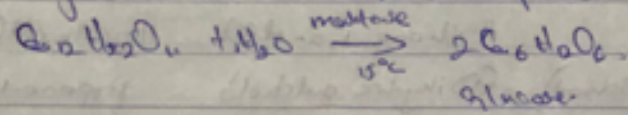


③ Production of ethanol.

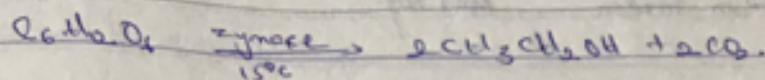
Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalyst, enzymes, found in the yeast breaks down the carbohydrate molecules into ethanol to give a yield of 95%. The starch - containing materials include molasses potatoes, cereals, rice etc and on warming with malt to 60°C for a specific period of time, and converted into maltose by enzyme diastase contained in malt.



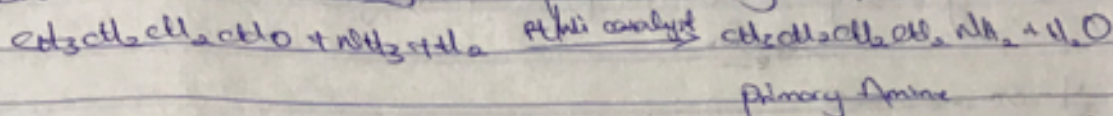
The maltose is broken down into glucose on addition of yeast, which contains the enzyme maltase and at a temperature of 15°C



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



① Alkenes can be reduced to primary amines with hydrogen in the presence of ammonia; NH_3 , using platinum or nickel catalyst. It is used commercially, to produce many important amines.



② Alkanones can be reduced to secondary alcohols by the reaction with hydrogen. In the presence of platinum or nickel catalyst.

