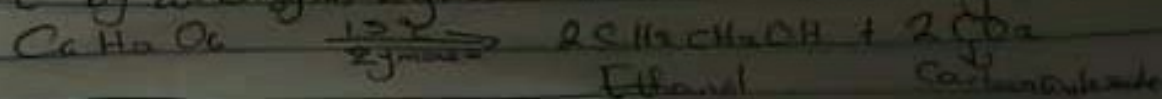


of 15°C by an enzyme zymase which is found in yeast.

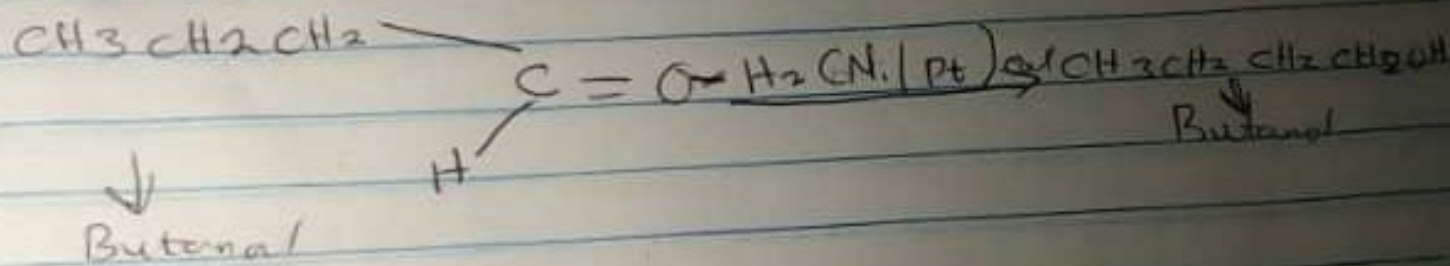


4. Determine the product obtained in the reduction of alkanone and alkanal. Use a specific example for each and show the equation of reaction.

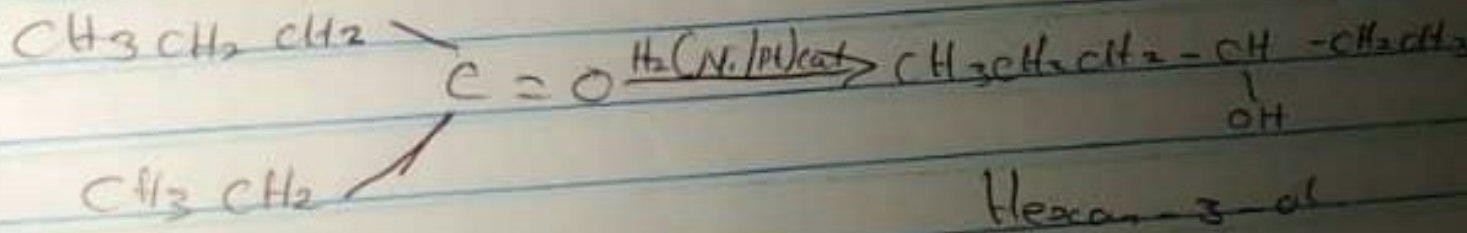
Solution

Using Meerwein, Ponder's reaction

Alkanal :



Alkanone



Name: Onyiah Angel Mwanuzi O
Dept: MBBS
Level: 100
Course: CHM 102

Assignment

1. Discuss the two major types of Alkanols and give examples each

Answer

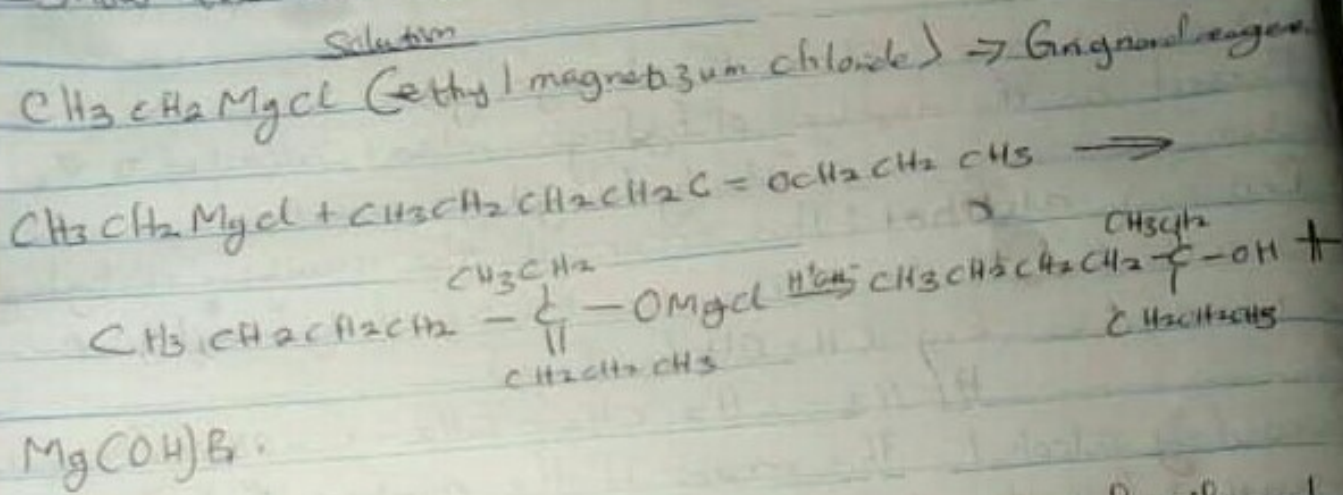
Alkanols are classified majorly;

- i) Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group, we have:
 - a) Primary alcohol: This occurs if the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are two or three. e.g. CH_3OH (methanol)
 $\text{H} | \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{C} - \text{OH} | \text{H}$ (pentan-1-ol)
 - b) Secondary alcohol: This occurs if the numbers of hydrogen atoms attached to the carbon atom just once, it is called a secondary alcohol. e.g. $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$ (Pentan-2-ol)
 $\text{OH} | \text{CH}_3 - \text{CH}_2 - \text{C} - \text{CH}_2 - \text{CH}_3 | \text{H}$ (Pentan-3-ol)
 - c) Tertiary alcohol: No hydrogen is been attached to the carbon atom bearing the hydroxyl group. e.g. Methyl Propan-2-ol, methyl-3-pentanol

(ii) Based on the number of hydroxyl group, they possess

- a) Monohydric alcohols: have one hydroxyl group present in the alcohol structure e.g. methyl alcohol, Propanol
- b) Dihydric alcohols: They have two hydroxyl groups present in the alcohol structure e.g. ethane-1, 2-diol, heptane-2, 4-diol
- c) Trihydric alcohol: They have three hydroxyl groups e.g. Propan-1, 2, 3-triol
- d) Polyhydric alcohol: They have more than three hydroxyl group e.g. Pentanol

2. In the Grignard synthesis of Alkanols, name the named Grignard reagent with $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_3$ of 15°C . Show the reaction steps.

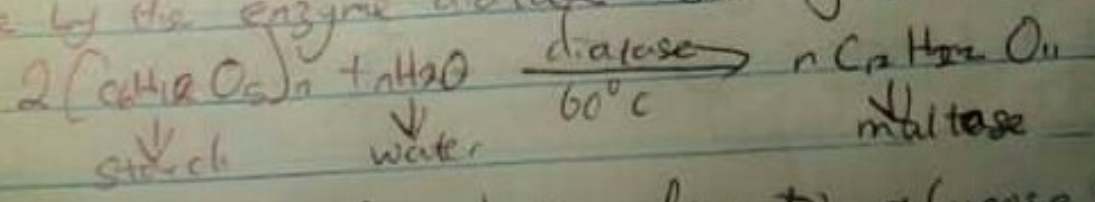


3. Describe and discuss the industrial manufacture of ethanol showing all reaction equations & necessary enzymes and temperature of reaction.

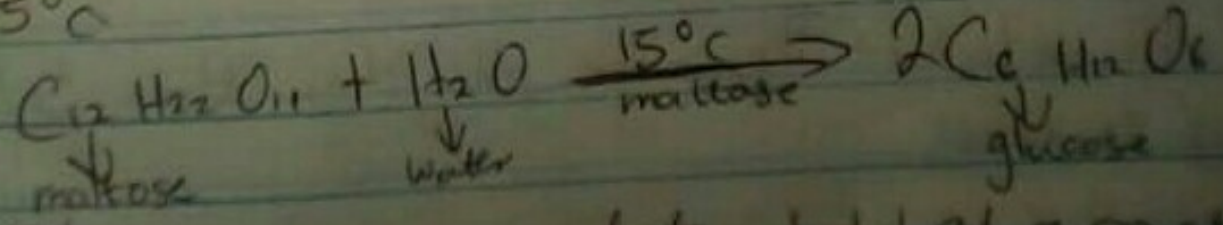
Solution

Starch is a major group of natural compounds that yield ethanol by fermentation, the biological catalyst breaks down the carbohydrate molecule into ethanol to give 95% yield.

Starch containing materials e.g. cereals are warmed with malt to 65°C for a specific period of time, all is converted to maltose by the enzyme diastase containing malt.



The maltose is then broken down to glucose by adding yeast which contains maltase (enzyme) at a temperature of 15°C .



Glucose is converted to alcohol at a constant temperature.