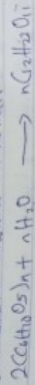
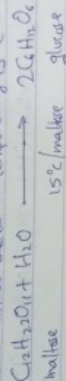


Production of Ethanol

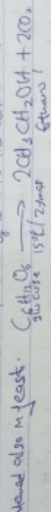
a) The starch containing materials include molasses, potatoes, cereals and in some cases malt to 60°C for a specific period of time are converted into maltose by enzyme diastase contained in the malt.



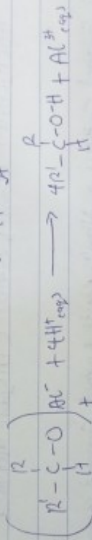
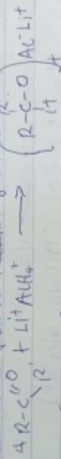
b) The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C



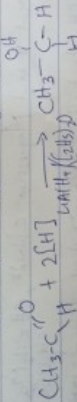
c) The glucose at cool temperature of 15°C is then converted into alcohol by the enzyme zymase contained also in yeast.



10) Product obtained from the Reduction of Aldehyde.



b) Product obtained from the Reduction of Alkylal



> Reduction of Alkylal produces a secondary alcohol

> Reduction of Alkylal gives a primary alcohol

> Reduction of Alkylal is done by using reducing agent such as:

- 1) Lithium tri-tert-butoxyaluminum hydride (LiAlH₄) in ether solution (LiAlH₄ (C₂H₅)₂O)
- 2) Lithium tetrahydroaluminate (Li) in ether solution (LiAlH₄ (C₂H₅)₂O)
- 3) Sodium tetrahydroborate (NaBH₄) in water or methanol (NaBH₄ (H₂O))

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13th Date: 13th April, 2020

Assignment

1a This is based on the number of hydrogen atoms attached to the carbon atoms containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon bearing the hydroxyl group are three or two, it is called a primary alcohol (1°). If it is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°) e.g. CH_3OH Methanol (1°), $\text{C}_2\text{H}_5\text{OH}$ Ethanol (1°).

b 2 This is based on the number of hydroxyl groups they possess. Monohydric alcohols one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called glycols have two hydroxyl groups present in the structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Polyhydric alcohols or polyols have more than three hydroxyl groups.
e.g.: $\text{C}_3\text{H}_7\text{OH}$ Propanol (Monohydric alcohol)
 $\text{HOCH}_2\text{CH}_2\text{OH}$ Ethane-1,2-diol (Dihydric alcohol)

2 In the Grignard Synthesis of Alcohols, react a named Grignard reagent with $\text{CH}_3\text{CH}_2\text{CH}_2\text{COCH}_3 = \text{O}$ $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_3$. Show the reaction steps.

Solution

