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COURSE: CHM 102

DEPT: NURSING

MAT No: 19/MHS02/061

Question

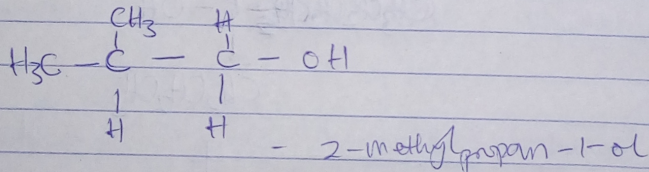
- 1 Discuss the two major classification of Alkanols.  
Give two examples each for each class.

Answer

- (1) Primary Alkanols: A primary alkanol is one of the major classification of Alkanols. A primary alkanol has only one alkyl group attached to the carbon atom that carries the hydroxyl group. It is denoted by  $(1^{\circ})$ . Examples of primary alkanols are as follows:  
The alkyl group is denoted by R.

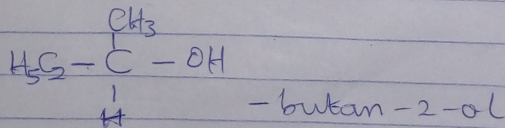
(a)  $\text{CH}_3\text{CH}_2\text{OH}$  - Ethanol

(b)

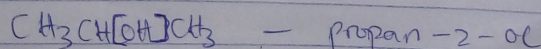


- (2) Secondary Alkanols: A secondary alkanol has two alkyl group attached to the carbon atoms that carries the hydroxyl groups. The alkyl group is represented by R and R'. Examples include:

a)



(b)

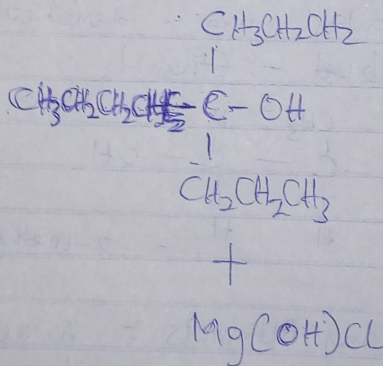
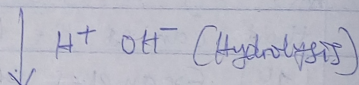
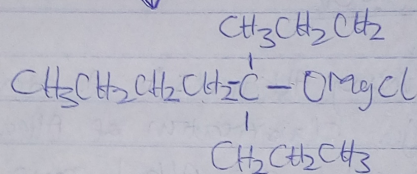
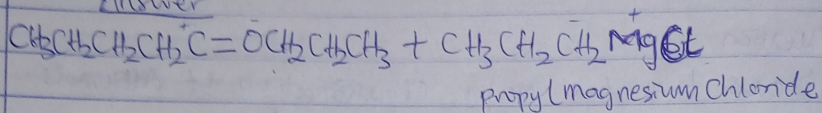




2 In the Grignard synthesis of Alkanols, react a named Grignard reagent with:

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3$ . Show the reaction steps.

Answer



1-propyl-1-propyl-pentanol

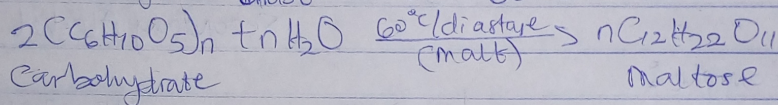


③ Discuss the industrial manufacture of ethanol showing all reaction equations and necessary enzymes and temperature of reaction.

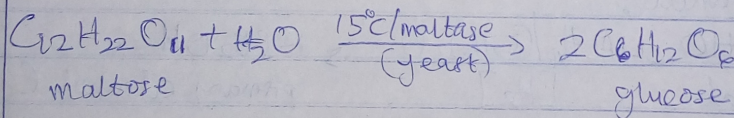
Answer

The industrial manufacture of ethanol involves three steps are as follows:

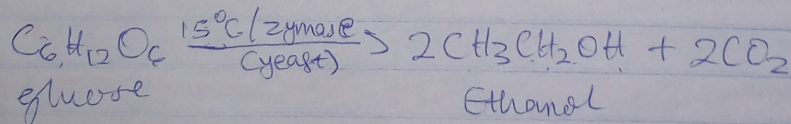
1) The conversion of carbohydrate into maltose by the enzyme ~~diastase~~ at  $60^{\circ}\text{C}$



2 The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of  $15^{\circ}\text{C}$



3 The glucose converts to alcohol (Ethanol) at constant temperature of  $15^{\circ}\text{C}$  by the enzyme zymase contained also in yeast.

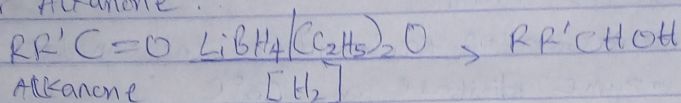




4 Determine the product obtained in the reduction of alkanone and alkanal. Use a specific example for each and show the equation of reaction.

Answer :

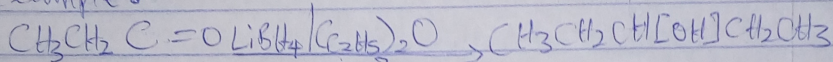
(1) For Alkanone :



Alkanone

Secondary Alcohol ( $2^\circ$ )

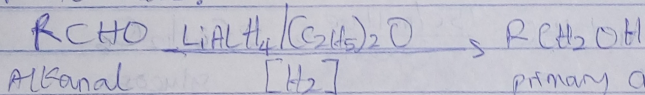
Example :



$\text{CH}_2\text{CH}_3$

Pentan-3-ol

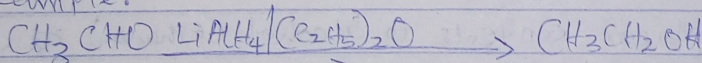
(2) For Alkanal :



Alkanal

primary alcohol ( $1^\circ$ )

Example :



ethanal

primary alcohol ( $1^\circ$ )

ethanol