

b Generally

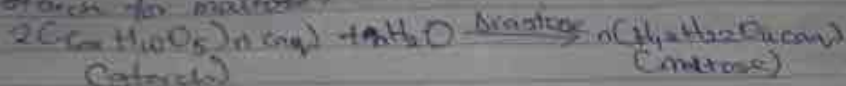


This reaction shows that alkanals are oxidizing agent.

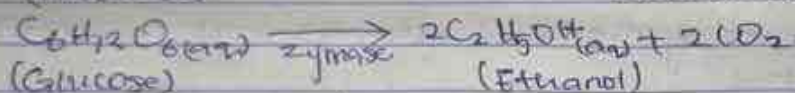
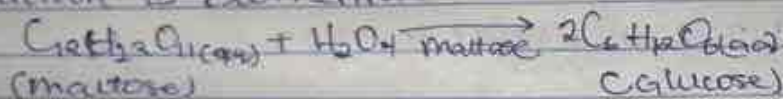
Alkanones are reduced to the corresponding second alkanol.  $LiAlH_4$  reduced propanone  $CH_3-CO-CH_3 + 2[H] \rightarrow CH_3-CH(OH)-CH_3 + \text{propan-2-ol}$ . The reducing agent provides the nascent hydrogen atom as  $[H]$ .

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b) The mash is treated with malt yeast, and covered at 50°C for 48 hours. Enzyme diastase in the malt hydrolyses starch to maltose.



c) Yeast containing enzymes maltase and zymase is added to the mixture and kept at room temperature (about 27°C) for 48 hours. Glucose is extracted with water about three days. During this period, enzyme zymase permits glucose to ethanol with the evolution of carbon dioxide. The reaction is exothermic.

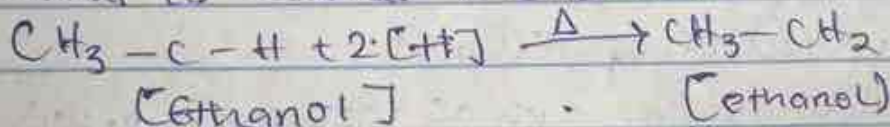


The mixture is distilled, to obtain 95% ethanol that boils at 78°C.

#### 4 Production obtained in the reduction of alkanone and Alkanol.

Ans → Alkanols are reduced to the corresponding primary alkanols by reducing agents such as lithium tetrahydridoaluminate(III),  $LiAlH_4$ , that provides the nascent hydrogen,  $[H]$ , which causes reduction.

(a) Ethanal is reduced to ethanol



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Generally  
R-COOH  
Alkanol  
This reaction  
agent  
Alkanol  
ethanol  
CO<sub>2</sub> - eth  
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ASSIGNMENT

1. Two major classification of Alkanols with two examples each.  
 Ans. Primary Alkanols: are those alkanol that the hydroxyl group is attached to a primary (terminal) carbon atom in the molecule it is characterized by  $\text{RCH}_2\text{OH}$ .

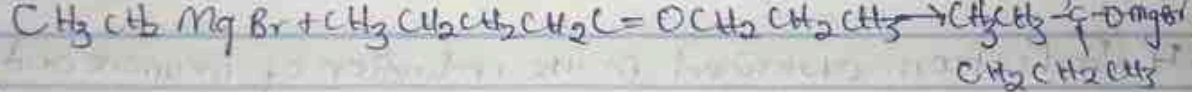
- Examples
- i)  $\text{CH}_3\text{OH}$  Methanol
  - ii)  $\text{CH}_3\text{CH}_2\text{OH}$  Ethanol.

Secondary Alkanol: In a secondary alkanol the OH group is on a secondary carbon atom characterized by  $\text{R}_2\text{CHOH}$

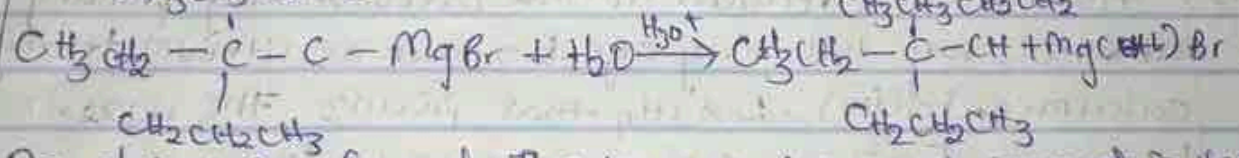
- Examples
- i)  $\text{CH}_3\text{CH(OH)CH}_3$  Propan-2-ol
  - ii)  $\text{C(CH}_3)_2\text{OH}$  2-methylpropan-2-ol

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.



Dilute acid is then added to this to hydrolyze it



An alcohol is formed. The key of Grignard reagent is the ability to make complicated alcohols easily.

3. Industrial preparation of Ethanol.

(a) The starch containing crop such as cassava, is peeled, crushed and steam-heated or pressure cooked to release with water, to obtain a mash.

