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Dept: Medical Laboratory Science

Coor: CHM 102

### Assignment

1. Primary Alcohol: In a primary alcohol, the hydroxyl group is attached to a primary (terminal) carbon atom in the molecule, it is characterized by  $-CH_2OH$

Examples

i.  $CH_3OH$  Methanol

ii.  $CH_3CH_2OH$  Ethanol

b. Secondary Alcohol: In a secondary alcohol, the  $-OH$  group is on a secondary carbon atom, characterized by  $-CH(OH)-$

Examples

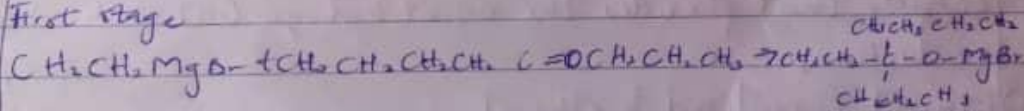
i.  $CH_3CH(OH)CH_3$  Propan-2-ol

ii.  $(CH_3)_2CH-OH$  2-Methylpropan-2-ol

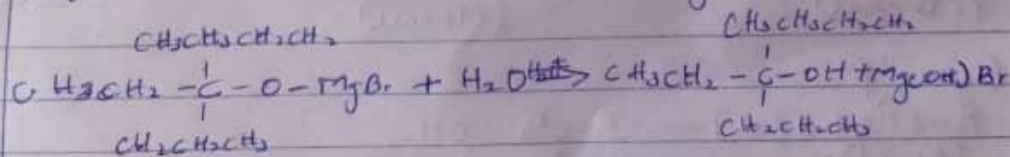
2. In the Grignard synthesis of Alcohols, react a named Grignard reagent with

$CH_3CH_2CH_2CH_2-C=OCH_2CH_2CH_3$  - show the reaction steps.

First stage



Dilute acid is then added to this to hydrolyze it



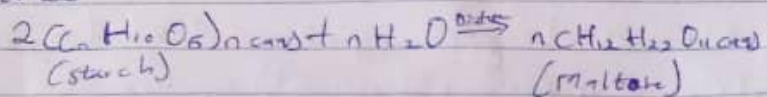
An alcohol is formed. The key use of Grignard reagent is the ability to make complicated alcohols easily.

3) Industrial preparation of ethanol

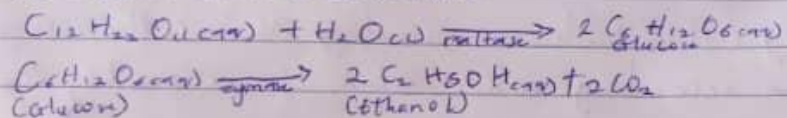
a) The starch containing crops, such as Cassava is peeled, crushed and steam-heated or pressure-cooked to release with water to

obtain a mash

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



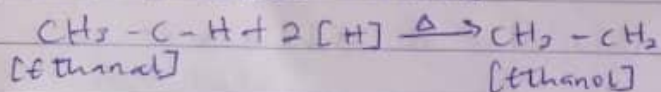
c) Yeast containing enzymes maltase and zymase is added to mixture and kept at room temperature (about 27°C) for formation of glucose to ethanol with the evolution of carbon dioxide. The reaction is exothermic.



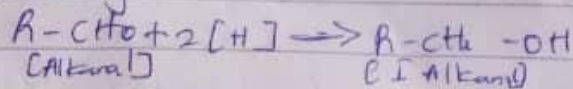
The mixture is distilled to obtain 95% ethanol that boils at 78°C.

4. Products obtained in the reduction of Alkanone and Alkanol Alkanals are reduced to the corresponding primary alkanols by reducing agents such as lithium tetrahydridoaluminate (LiAlH<sub>4</sub>) that provides the nascent hydrogen [H], which causes reduction;

a) Ethanal is reduced to ethanol



b) Generally



This reaction shows that alkanals are oxidizing agents.

Alkanones are reduced to the corresponding secondary alkanol.

LiAlH<sub>4</sub> reduced propanone  $CH_3 - CO - CH_3 + 2 [H]$

$CH_3 - C(O) - CH_3$  to Propan-2-ol. The reducing agent provides the nascent hydrogen atoms as [H].