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MATRIC NO.: 19/MHSD/211

1 Discuss the two major classification of alkanol.
Give two examples each for each.

9 CLASSIFICATION BASED ON THE NUMBER OF HYDROGEN ATOMS ATTACHED TO THE CARBON CARRYING THE OH FUNCTIONAL GROUP

- (1°) Primary Alkanol: 3 hydrogen atoms attached
(2°) Secondary alkanol: 2 hydrogen atom attached
(3°) Tertiary alkanol: 1 hydrogen atom attached

Example of

- I Primary Alkanol: Ethanol, propan-1-ol
- II Secondary Alkanol: Butan-2-ol
- III Tertiary Alkanol:

b CLASSIFICATION BASED ON THE NO OF OH FUNCTIONAL GROUP PRESENT IN THE STRUCTURE OF THE ALCOHOL.

1-OH present in the structure (Monohydric)

2-OH present in the structure (Dihydric or Glycol)

3-OH present in the structure (Trihydric or Triol)

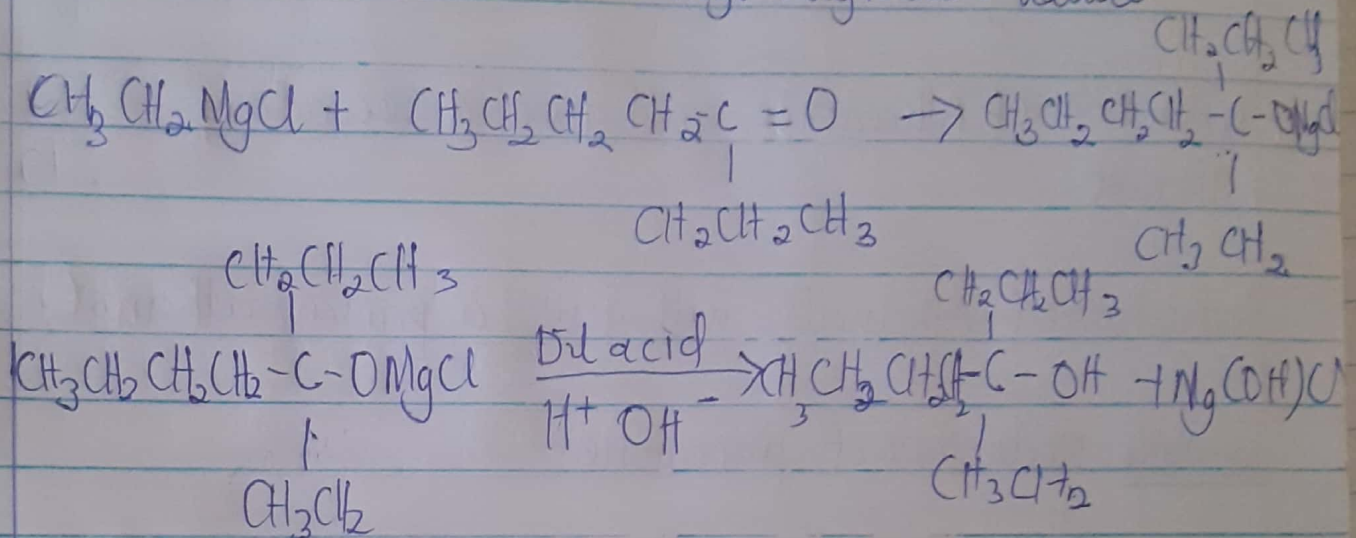
More than 3-OH (Polyhydric or Polyol)

Example

- (i) Monohydric: Ethanol, Propanol, Butanol
- (ii) Dihydric: Ethane-1,2-diol, Butane-1,2-diol
- (iii) Trihydric: (PAGE 1) Propan-1,2,3-triol

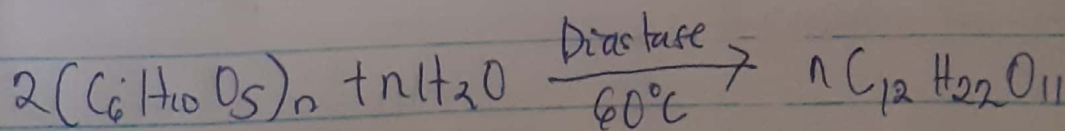
2 In the Grignard synthesis of Alkanol, react a named Grignard reagent with $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3$. Show the reaction steps.

Named Grignard reagent: $\text{CH}_3\text{CH}_2\text{MgCl}$
Ethyl magnesium chloride

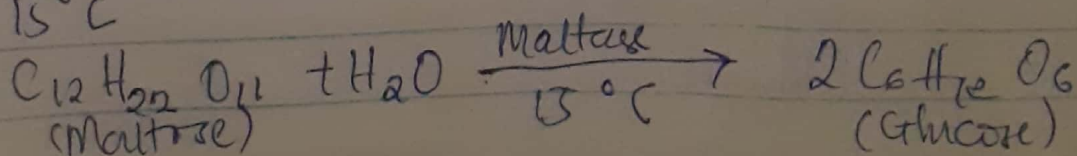


3 Discuss the industrial manufacture of Ethanol showing all reaction equations and necessary enzymes and temperature of the reaction.

STEP 1: Starch is converted into maltose at a temperature of 60°C by enzyme diastase (which is found in malt)

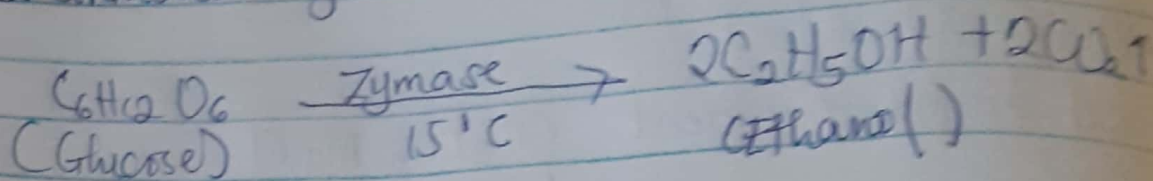


STEP 2: Maltose is then broken down into glucose on addition of yeast which contains the enzyme maltase at 15°C



STEP 3: Glucose at constant temperature 15°C

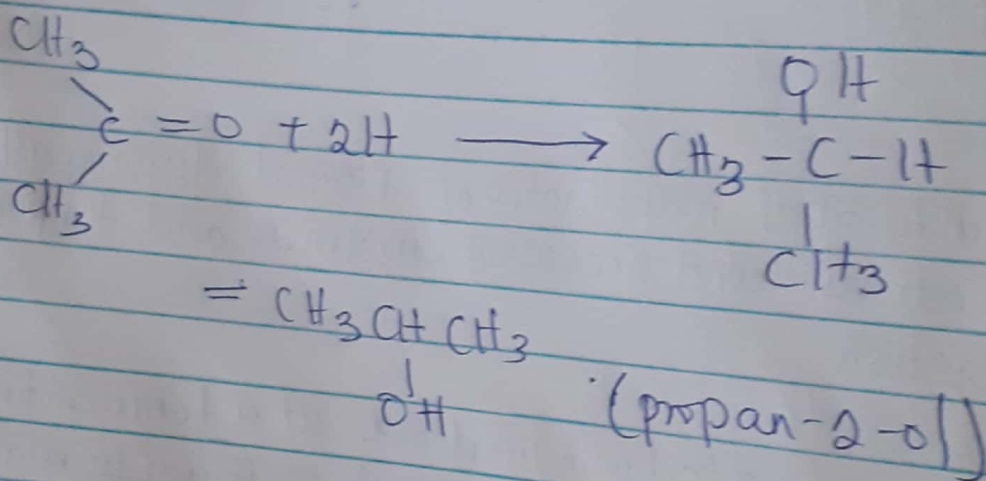
converted into alcohol (ethanol) with enzyme zymase also contained in yeast



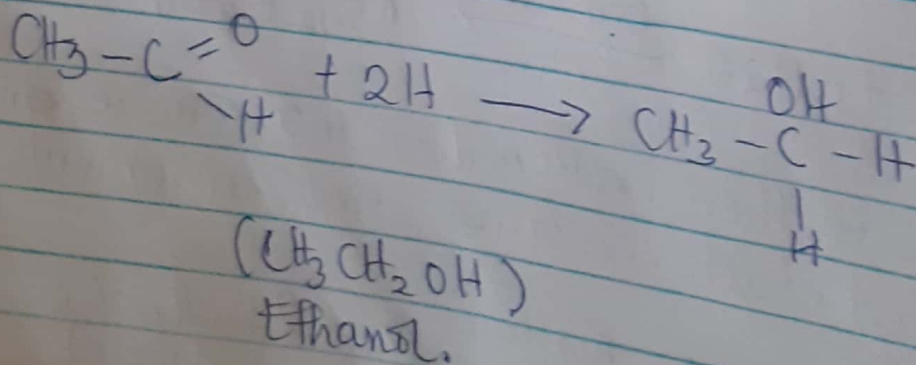
4 Reduction of Alkanones will give a secondary alcohol

Reduction of Alkanals will give a primary alcohol

Example: Reduction of propanone



Reduction of ethanal



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