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1.) Major classification of Alkanols

a) Alkanols are classified based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are two or three, it is called a primary alcohol. If it is on hydrogen atom it is called a secondary ~~alcho~~ alcohol. a if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group it is called a tertiary alcohol.

Primary Alcohol (1°) — Methanol $CH_3OH$

Butan-2-ol — Secondary Alcohol (2°)

Tertiary alcohol — Methylpropane-2-ol $(CH_3)_3C-OH$

b) They are also classified based on the number of ~~hydrogen~~ hydroxyl groups they possess. Monohydric alcohols have one hydroxy group in the alcohol structures. Dihydric alcohols, also called glycols, have two hydroxyl group in their structure.

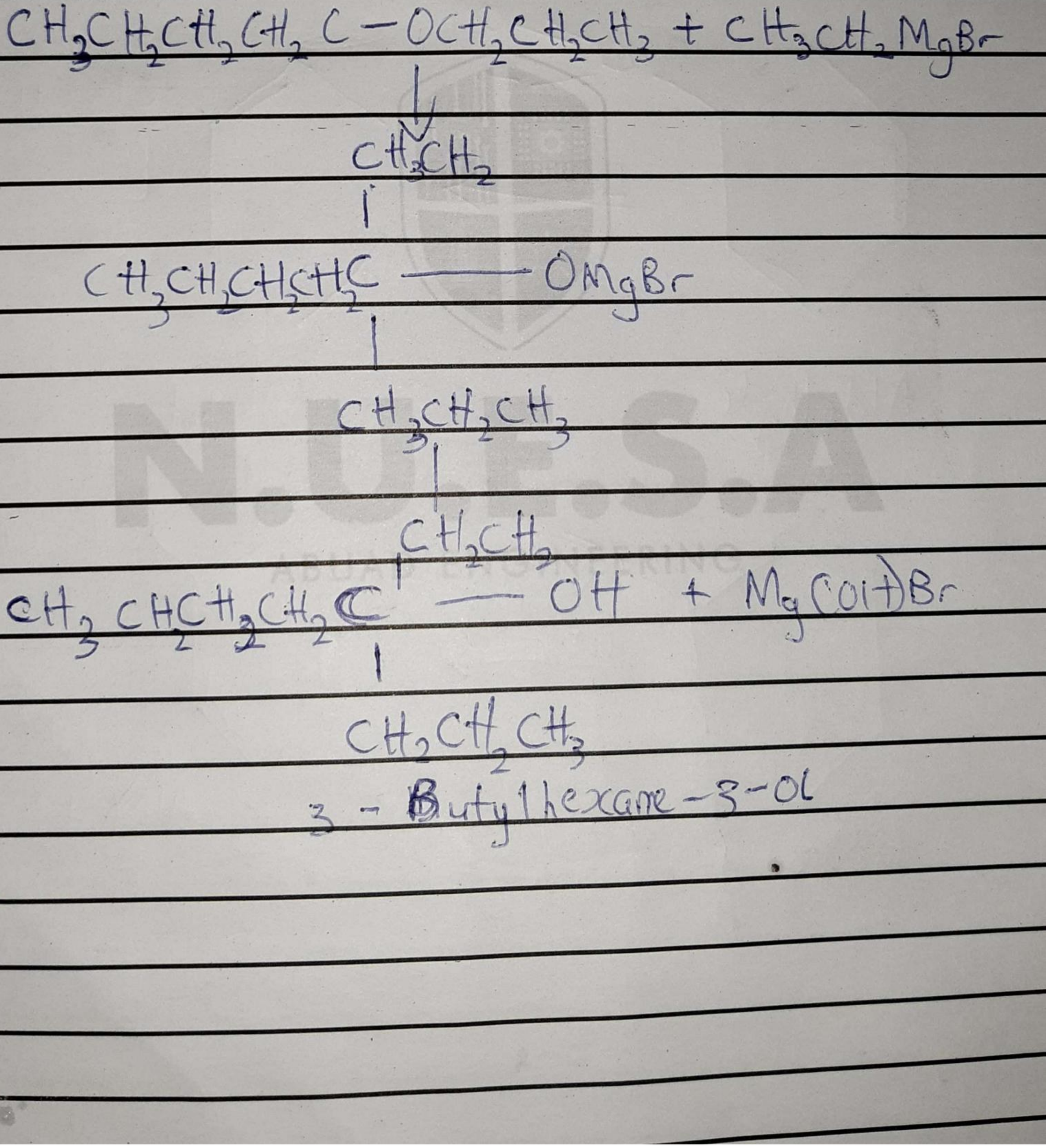
Polyhydric alcohols or polyols have more than three hydroxyl group. Trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol.

E.g. Propanol (Monohydric alcohol) — $CH_3CH_2CH_2OH$

Ethane-1,2-diol (glycols) — $HOCH_2CH_2OH$

Propan-1,2,3-triol (Tryhdroc) — $OHCH_2CH(OH)CH_2OH$

2.) Grinard synthesis of an Alkanol Using $CH_3CH_2MgBr$ as a Grinard Reagent:




3 - Butylhexane-3-ol

3.)

# Method # 1 By the fermentation of starch

## WHAT IS STARCH

Starch is carbohydrate and is an important source of ethanol. Generally potato, rice, maize or barley are used as source of starch. Use of potato for starch is very common.

**STEPS OF PREPARATION**

**EXTRACTION OF STARCH** The crushed potato is steamed at 140OC to 150OC under pressure to prepare starch solution known as MASH.

GERMINATION Before hydrolysis, starch is first undergo germination at 10OC to 13OC for few days. This germinated starch is called MALT.

**HYDROLYSIS OF STARCH** Satrch is hydrolysed to maltose by an enzyme known as diastase.

$2(C_6H_{10}O_5) + nH_2O \longrightarrow n(C_{12}H_{22}O_{11})$

Starch Maltose

**FERMENTATION** Finally yeast is added to maltose.

Yeast secrets two enzymes:

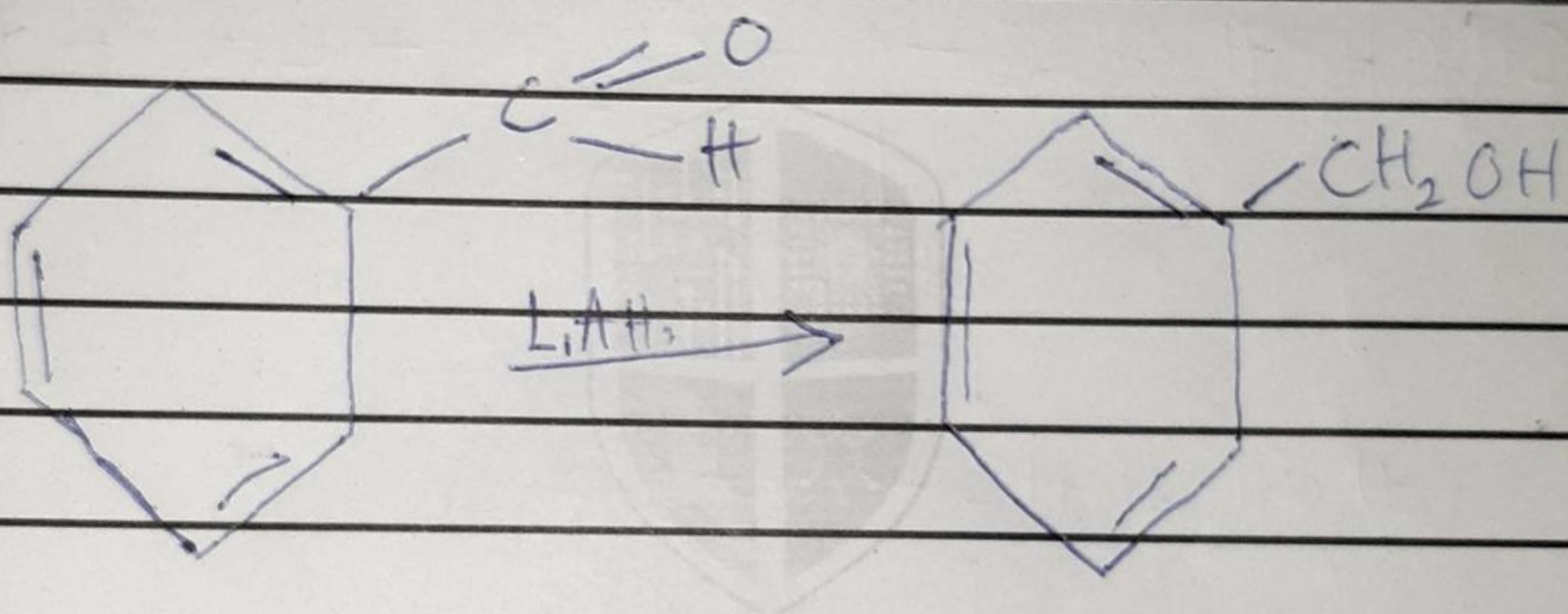
1. Maltase: converts maltose into glucose.
2. Zymase: converts glucose into ethanol..

$C_{12}H_{22}O_{11} + H_2O \longrightarrow 2C_6H_{12}O_6$

$C_6H_{12}O_6 \longrightarrow C_2H_5OH + 2CO_2$

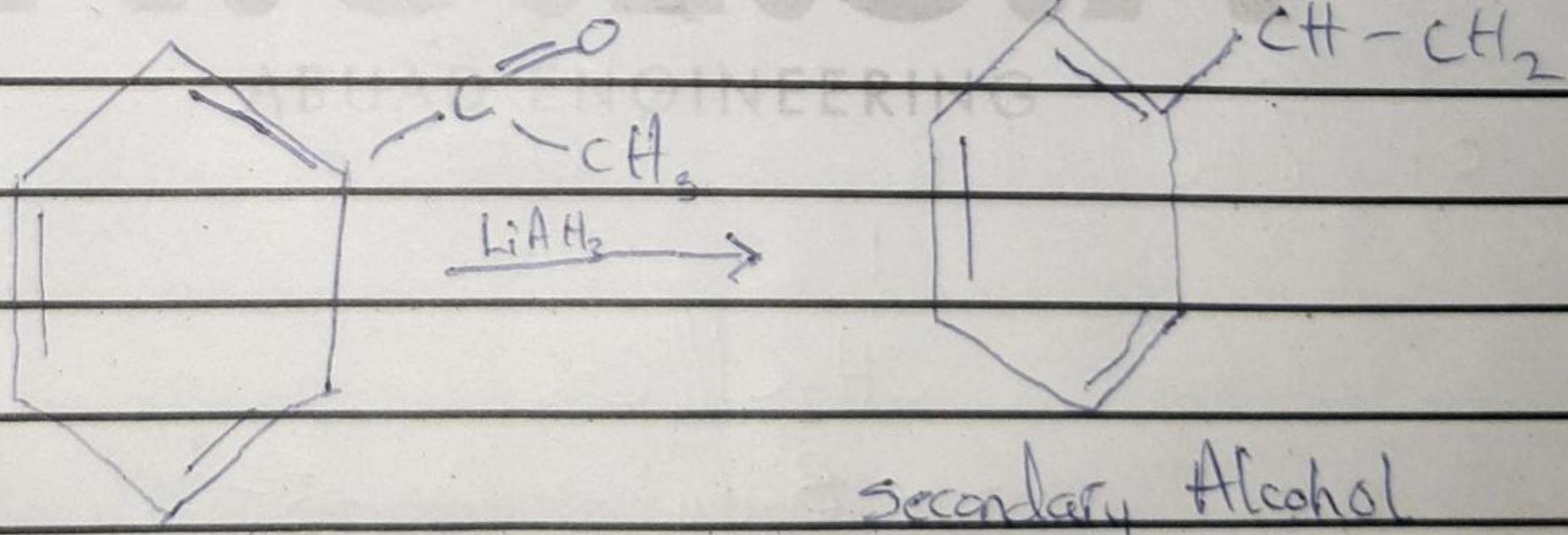
4) Product Obtained in the Reduction of Alkanal and Alkanone.

Aldehydes and Ketones are reduced to primary and secondary alcohols respectively by reacting with hydrogen in the presence of a platinium or nickel catalyst or with aluminium isopropoxide or with complex metal hydride, such as Lithiumtetrahydridoaluminate(III) or Sodiumhydridoborate(III)




Aldelhyde

Primary Alcohol.




Ketone

Secondary Alcohol