Name: Mbre Stefan Marshall
Matric No: 19/ENG05/037
Dept: Mechatronics Engineering
Course code: GNM102

Assignment Solution.

1. A-) Based on the number of hydrogen attached to the carbon carrying the functional group.

a. Primary alcohols: If the number of hydrogen attached to the Carbon carrying the -OH is 2 or 3. E.g

CH_3CH_2OH - Ethanol

b.) Secondary alcohols: If the number of hydrogen attached to the carbon carrying the -OH is just 1. E.g. $CH_3CHOHCH_3$ - PROPAN-2-OL

B) Based on the number of hydroxyl groups present in the compound.

a) Monohydric alcohols: they are alcohols with just one hydroxyl group. E.g

$CH_3CH_2CH_2OH$ - PROPANOL

b.) Dihydric alcohols: they have 2 hydroxyl groups E.g $CH_2(OH)CH_2(OH)$ - ETHAN-1,2-DIOL

c. Trihydric alcohols : they have 3 hydroxyl groups.
Eg PROPAN 1,2,3- TRIOL ---- $CH_2(OH)CH(OH)CH_2(OH)$

2. Alcohols especially those with 3 and less number of Carbon atoms in their molecules are soluble in water because they can form hydrogen with water molecules. Also all monohydric alcohols are soluble in organic solvents.

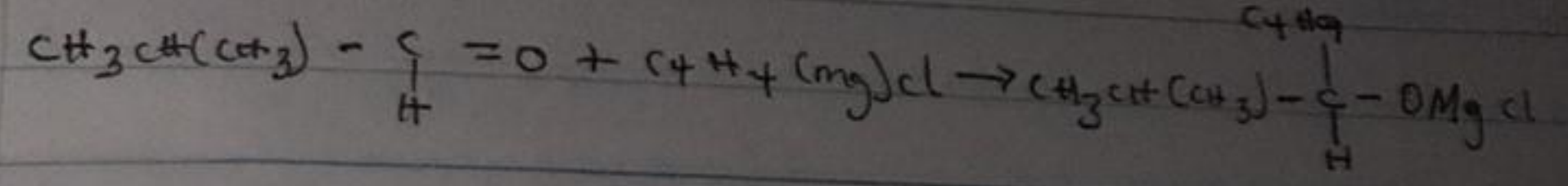
3. Industrial Preparation of Alcohol

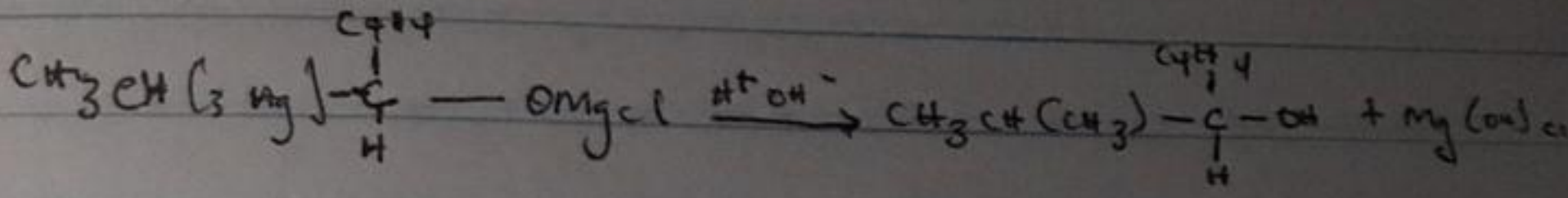
$2(C_6H_{10}O_5)_n + 2H_2O \xrightarrow[60^\circ C]{\text{Diastase}} C_{12}H_{22}O_{11}$
starch maltose

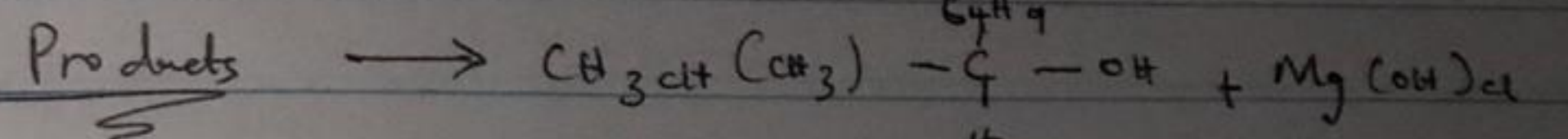
$C_{12}H_{22}O_{11} + H_2O \xrightarrow[18^\circ C]{\text{maltase}} 2C_6H_{12}O_6$
Maltose glucose

$C_6H_{12}O_6 \xrightarrow[15^\circ C]{\text{zymase}} 2C_2H_5OH + 2CO_2$
glucose Ethanol Carbon

4. 2-methyl propanal and butylmagnesium chloride



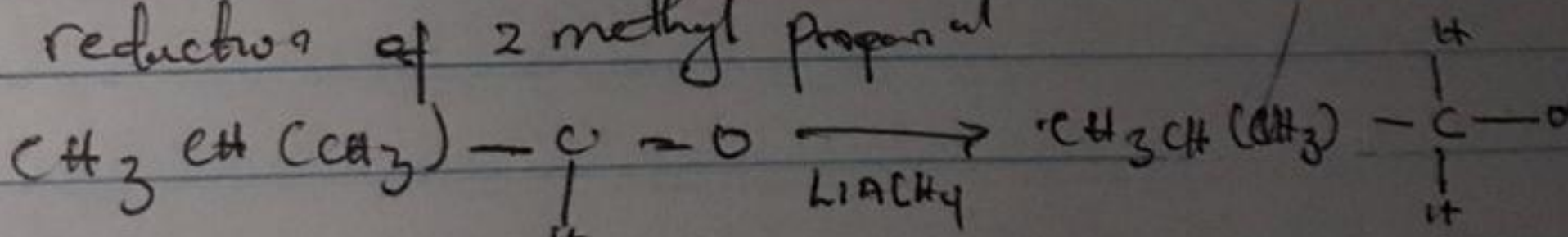




Products

2 methyl - heptan - 2 - ol

7. reduction of 2 methyl propanal



Aldehyde

Primary alcohol

8. Conversion of propan-1-ol to Propan-2-ol

$CH_3CH_2CH_2OH + H_2SO_4 \longrightarrow CH_3CH(OSO_3H)CH_3 + H_2O$

Propan-1-ol

$CH_3CH(OSO_3H)CH_3 \xrightarrow{-H_2SO_4} CH_3CH{=}CH_2 + H_2O$

$CH_3CH{=}CH_2 \xrightarrow{+H_2O} CH_3C(OH){=}CH_2$

$CH_3CH(OH)CH_3$

Propain - 2-ol