

1. Alcohols are very important organic compounds. Their classification with examples each are:

(i) The classification based on the number of hydrogen atoms attached to the carbon atom containing the OH functional group. If the number of hydrogen atoms attached to the carbon atom bearing the OH group is two, it is called a primary alcohol (1°). If it is the hydrogen atom, it's called a secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the OH group, it is called a tertiary alcohol (3°).

Examples: $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ Propan-2-ol (2°)

(ii) Classification based on the number of OH functional groups present in the structure of the alcohol. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Polyhydric alcohols have more than three hydroxyl groups.

Examples: $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ Propane-1,2,3-triol.
(Trihydric alcohol)

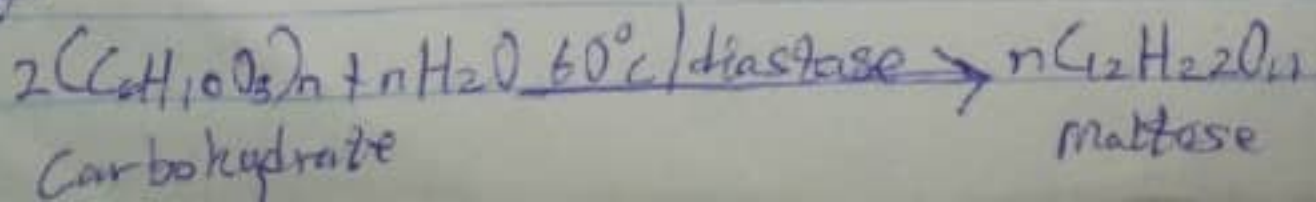
2. The solubility of alcohols in

i. Water: Lower alcohols with up to three carbon atoms in their molecules are soluble in water.

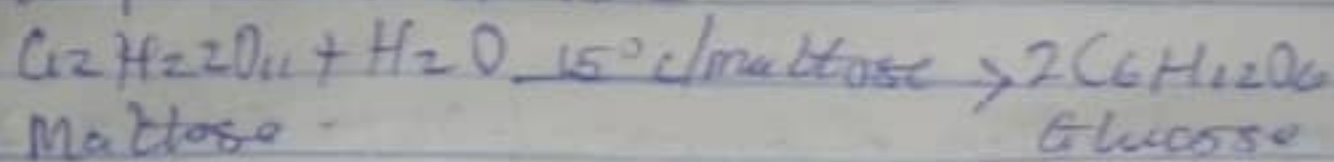
ii. Organic solvents: All monohydroxyl alcohols (OH) group without increasing the number of carbon atoms increases in water and decreases the solubility in ether and ethanol.

3. The steps in the industrial manufacture of ethanol with mandatory equations are:

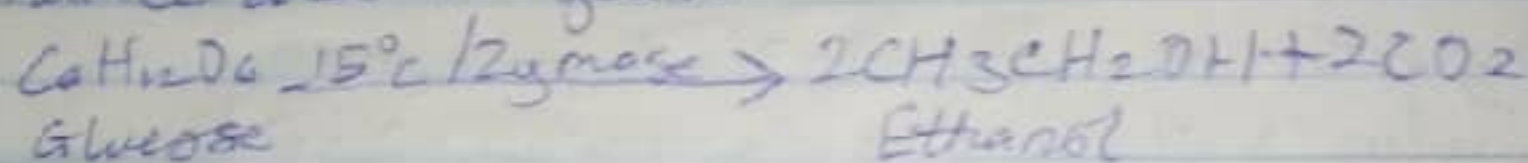
(A) The starch containing materials on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



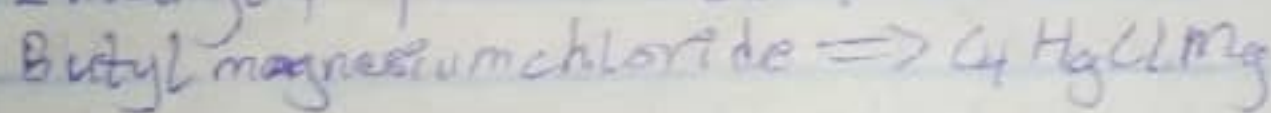
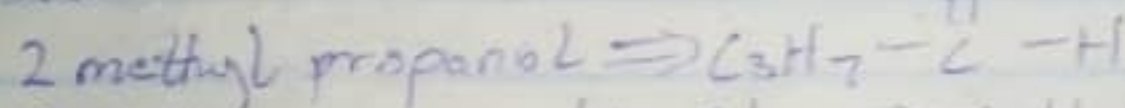
B The maltose is broken down into glucose on the addition of yeast which contains the enzyme maltase at a temperature of 15°C



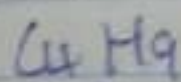
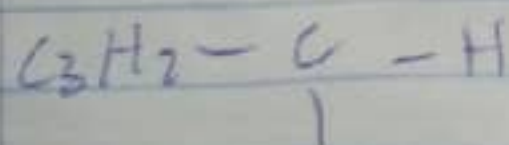
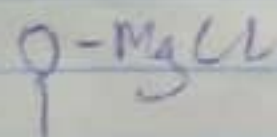
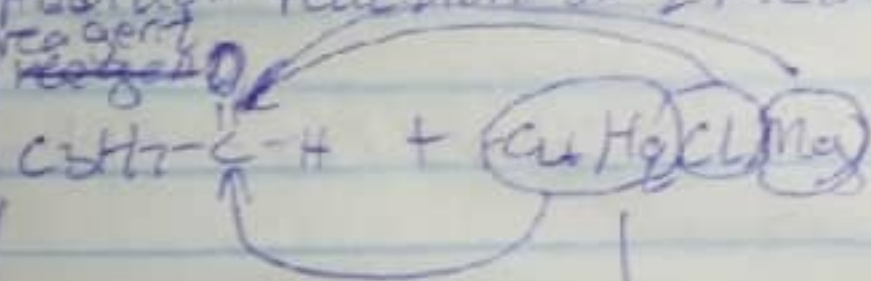
C The glucose when at a constant temperature of 15°C is then converted into ethanol by the enzyme zymase contained also in yeast.



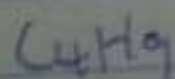
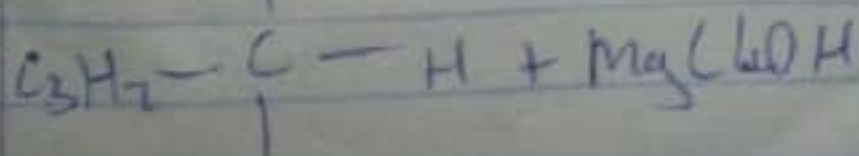
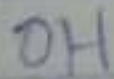
4 Reaction between 2 methyl propanal and butyl magnesium



Addition reaction of 2 methyl propanal and grignard



$\downarrow \text{H}_2\text{O}/\text{H}^+$ (hydrolysis in an acidic medium)



7 Reduction reaction of 2-methyl propanal.
 $C_3H_7CHO \xrightarrow{LiAlH_4 / (C_2H_5)_2O} C_3H_7CH_2OH$

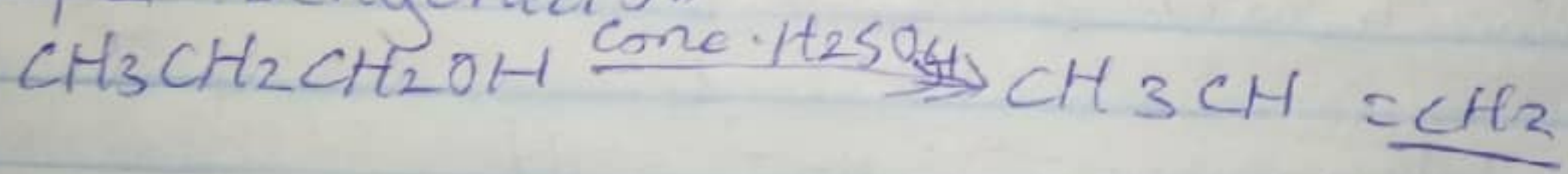
8. For the concentration of propan-1-ol to propan-2-ol,
Things required are,

- a) Conc- H_2SO_4
- b) H_2O (water)

Process:

- i) Dehydration of propan-1-ol to propene
- ii) Hydrolysis of propene to propan-2-ol

Step 1: Dehydration



Step 2: Hydrolysis of Propene to Propan-2-ol

Propene can be hydrolyzed to propan-2-ol in accordance with mechanism called as Markownikoff's reaction.

