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Department: MBBS (Medicine and Surgery)

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Answers

1. Classification of Alcohols:

(a) based on number of Hydrogen atoms attached to the carbon atom containing the hydroxyl group. Example

Primary alcohol (1°) \rightarrow CH_3OH (Methanol); Secondary alcohol (2°) \rightarrow $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ (Propan-2-ol); Tertiary alcohol (3°) \rightarrow $(\text{CH}_3)_3\text{C}-\text{OH}$ (2-Methylpropan-2-ol)

(b) based on number of hydroxyl groups they possess. Example

Monohydric alcohol \rightarrow $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (Propanol)

Dihydric alcohol \rightarrow $\text{HOCH}_2\text{CH}_2\text{OH}$ (Ethane-1,2-diol)

Triols \rightarrow $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ (Propane-1,2,3-triol)

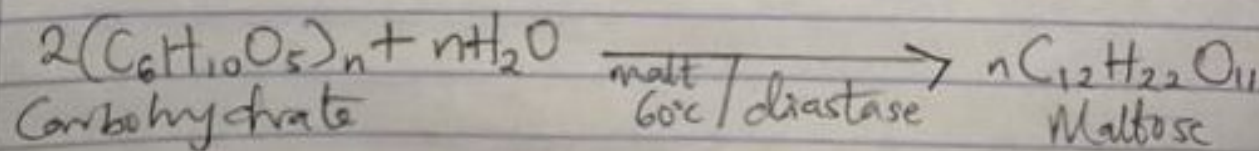
Polyols \rightarrow more than three hydroxyl groups.

2. Solubility of alcohols in water: lower alcohols with up to three carbon atoms in their molecules are soluble in water due to hydrogen bond with water molecules; solubility decreases with increasing relative molecular mass

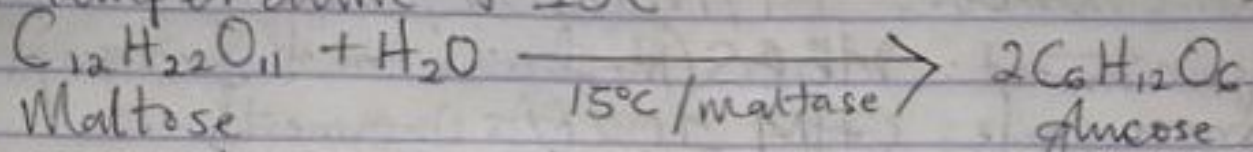
Solubility in organic solvents: all monohydric alcohols are soluble in organic solvents

3. Steps involved in the industrial manufacture of Ethanol.

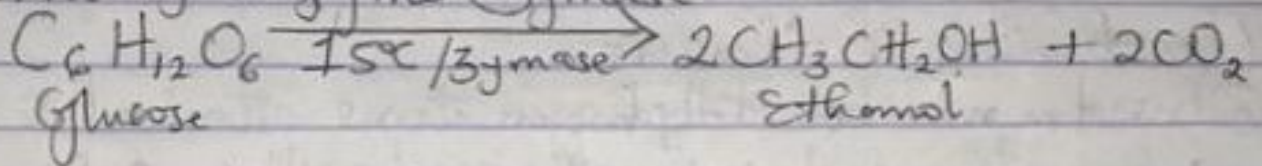
Starch containing materials or warming with malt to 60°C converts it into maltose by enzyme diastase



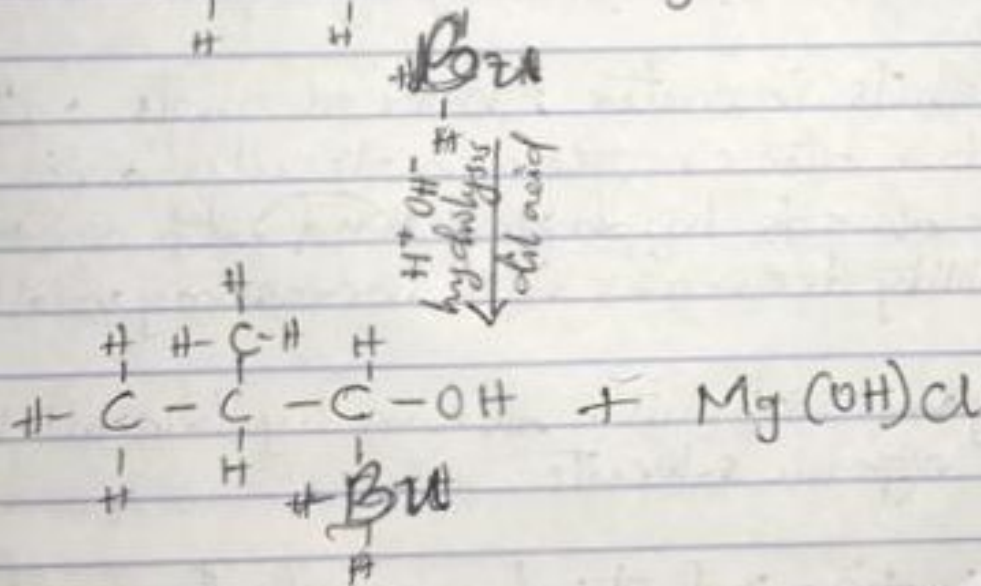
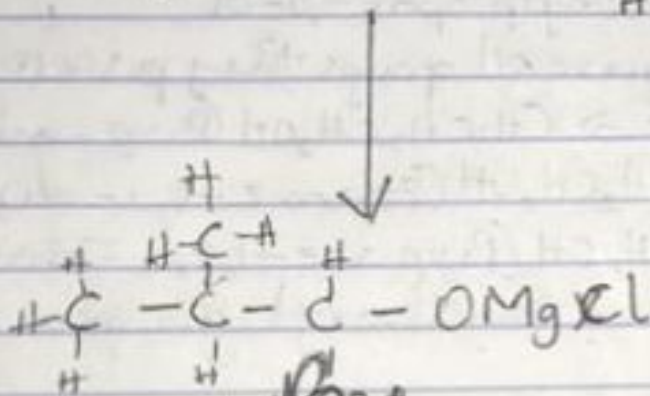
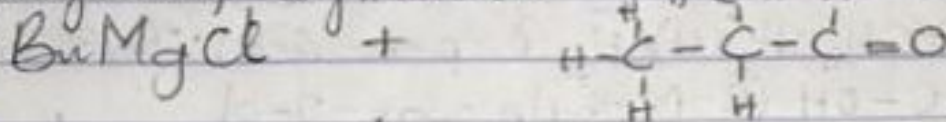
Maltose is broken down into glucose by enzyme maltase at temperature of 15°C



Glucose at temperature 15°C is converted into alcohol by enzyme Zymase

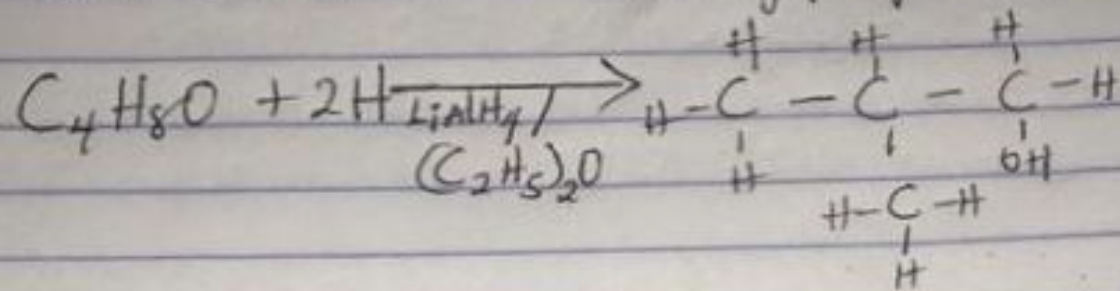


4 Grignard Synthesis



Where BuMgCl is Grignard reagent

7 Reduction Process of 2-Methylpropanal



2-Methylpropan-1-ol

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

