

1 Classification of Alcohols

There are two major ways to classify Alcohols. They are:

- a) Number of Hydrogen present on the carbon carrying the functional group (Ott).

- i) Primary Alcohol (1°): With two or three hydrogens

Example: $\text{CH}_3\text{CH}_2\text{OH}$

- ii) Secondary Alcohol (2°): With just one hydrogen

Example: $\begin{array}{c} \text{CH}_3\text{CH} \\ | \\ \text{OH} \end{array}$

- iii) Tertiary Alcohol (3°): With no hydrogen

Example: $(\text{CH}_3)_3\text{C}-\text{OH}$

- b) Number of Ott (functional group) present in the compound

- i) Monohydric Alcohol - With just one (Ott)

Example: $\text{C}_2\text{H}_5\text{OH}$ - Ethanol

- ii) Dihydric Alcohol or Diols - With two (Ott)s

Example: $\text{HOCH}_2\text{CH}_2\text{OH}$
Ethane-1,2-diol

- iii) Trihydric Alcohol or Triols - With three (Ott)s

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

- iv) Polyhydric Alcohol or Polyols - With more than three (Ott)s

Example

$\text{CH}_3\text{CH(OH)CH(OH)CH(OH)CH(OH)CH}_3$
Heptane-2,3,4,5,6-pentaol

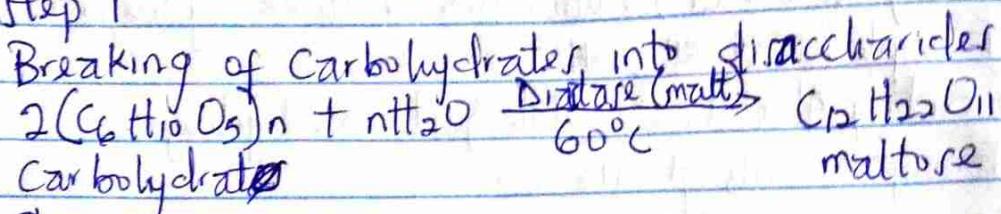
2 Solubility of Alcohols

- a) In Water: Alcohols are soluble in water due to hydrogen bonding. This only applies to alcohols with low molecular mass (up to three carbon atoms) because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

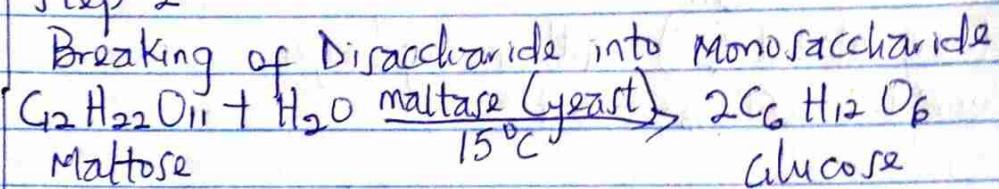
b) In Organic solvents: All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohol and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3 Industrial manufacture of ethanol (Fermentation)

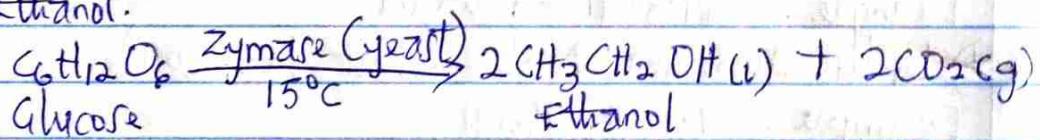
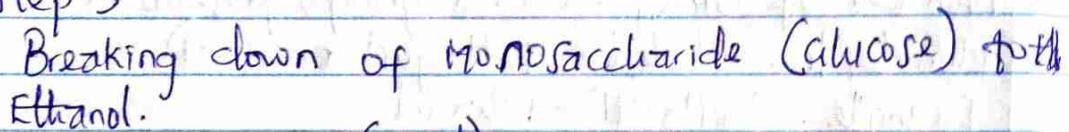
- Step 1



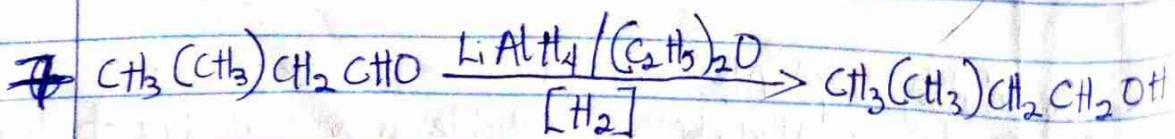
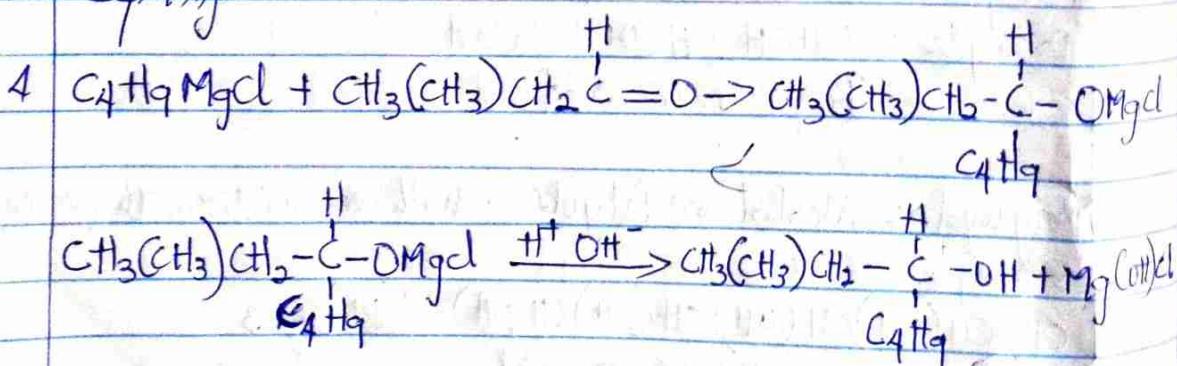
- Step 2



- Step 3



A C_4H_9



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

