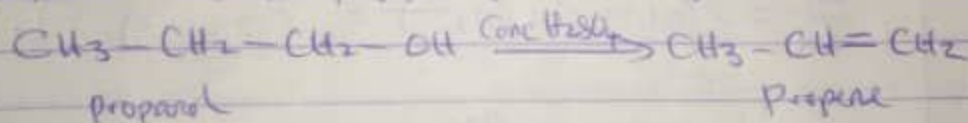


8. Aim: To convert propan-1-ol to propan-2-ol

Materials: Concentrated Sulphuric acid water

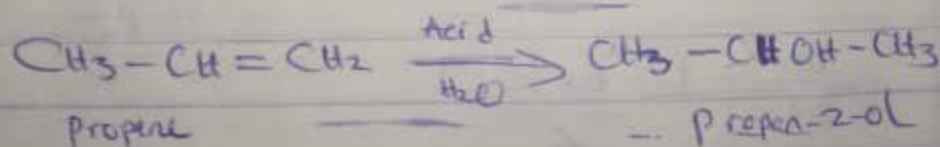
Process: Dehydration of Propanol, Hydration of propene to propan-2-ol

When propan-1-ol is treated with conc H_2SO_4 , the phenomenon called dehydration occurs - due to which a water molecule from propan-1-ol gets eliminated. As a result ~~propanol~~ propan-1-ol gets converted to propene.

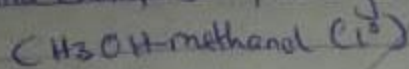


Hydrate Hydration of Propene treated

Propene obtained above is treated with H_2O which gets added to propene in presence of acid (catalyst). This addition takes place according to Markovnikov's rule



Primary alcohols: In a primary alcohol (1°), the carbon atom that carries the OH group is only attached to one alkyl group. Some examples of primary alcohols are shown below



Primary alcohols

- ① Alcohols 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 2 or 3 it is called a PRIMARY ALCOHOL (1°). If it is one it is called a SECONDARY ALCOHOL (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group it is called a tertiary alcohol (3°)

Examples of primary alcohol - CH_3OH - methanol, $\text{CH}_3\text{CH}_2\text{OH}$ - ethanol

" " secondary alcohol - $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ - Propan-2-ol

" " tertiary alcohol - $(\text{CH}_3)_3\text{C-OH}$ - 2-methylpropan-2-ol

Alcohols can also be classified according to the number of hydroxyl groups they possess. Monohydric Alcohols possess one hydroxyl group in its structure. Dihydric Alcohols also called glycols possess two hydroxyl groups in its structure while Trihydric Alcohols possess 3 hydroxyl groups present in its structure. Polyhydric alcohols possess more than three hydroxyl groups

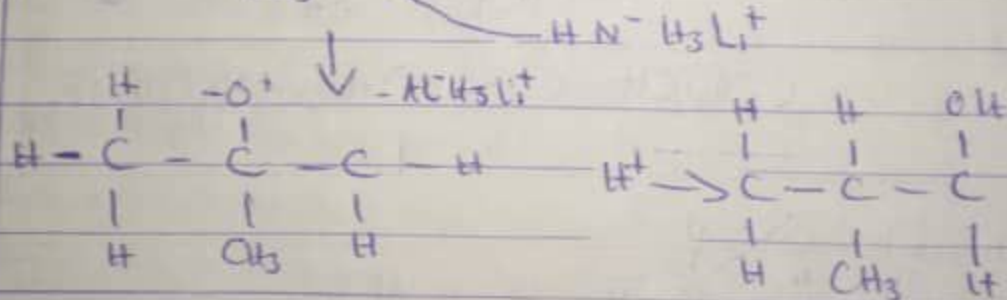
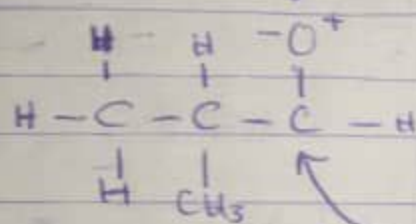
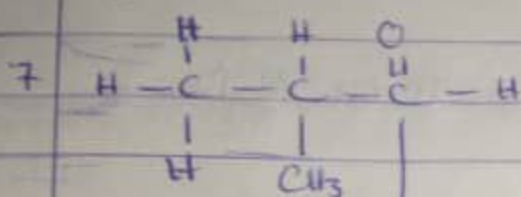
Examples

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ - Propanol (Monohydric Alcohols)

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

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

$\text{CH}_2\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$ - Heptane-2,3,4,5,6-pentaol (Polyhydric alcohol)



Aim

2, methyl propanol

8 To convert propan-1-ol to propan-2-ol

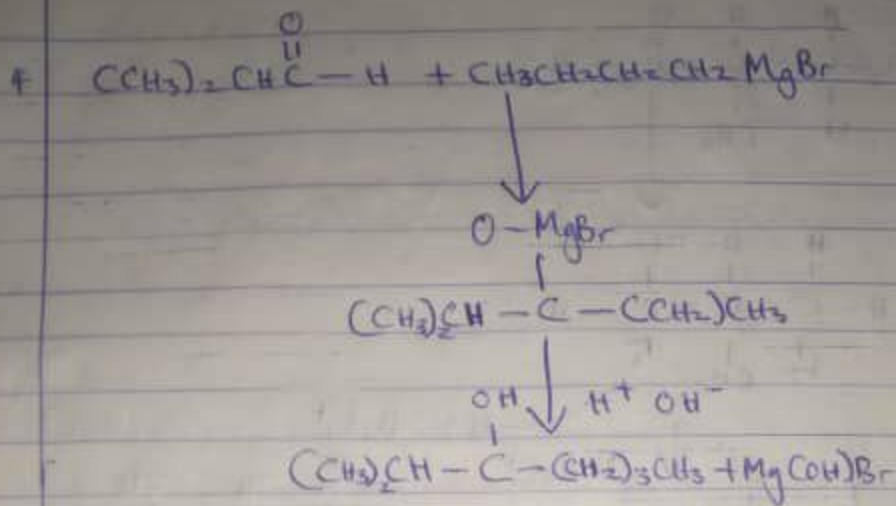
reagents: Concentrated sulphuric acid, water

Process: Dehydration of propan-1-ol to propene, Hydrolysis of propene to propan-2-ol

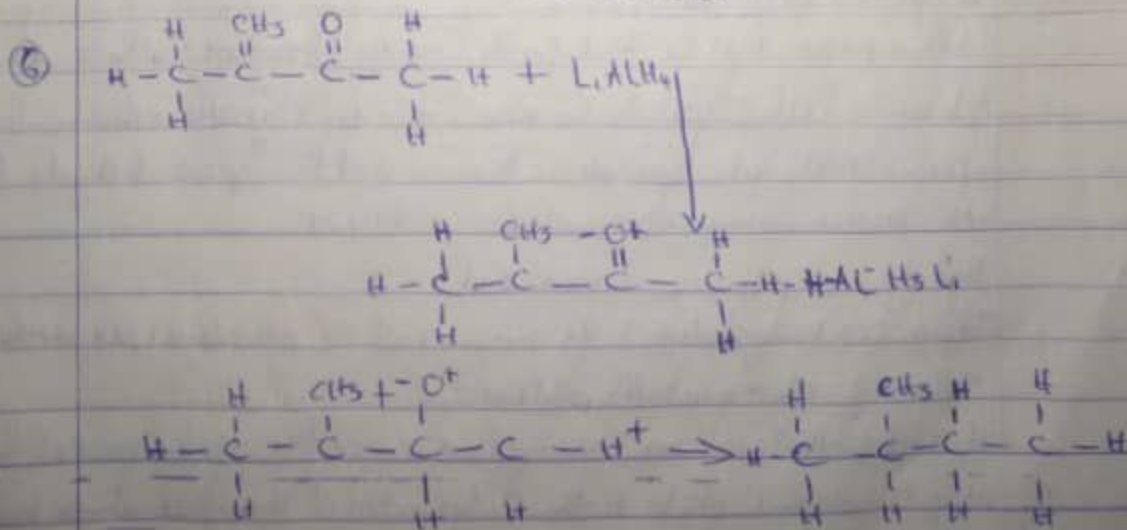
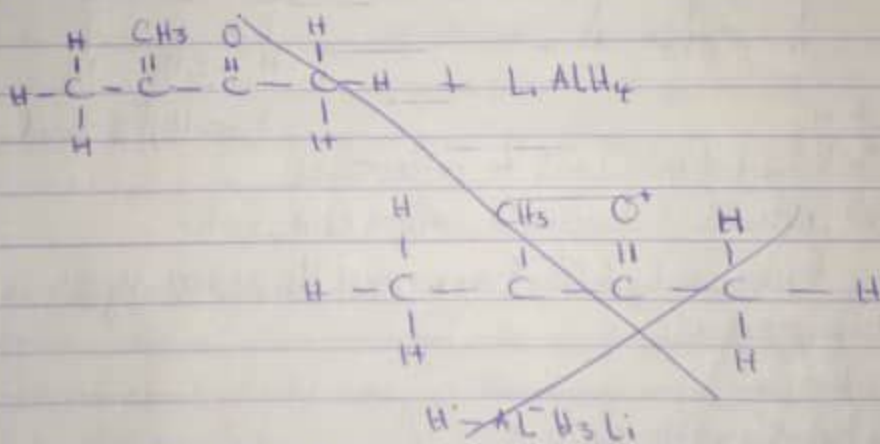
Steps

Dehydration of propan-1-ol

When propan-1-ol is treated with concentrated sulphuric acid the phenomenon called dehydration occurs due to which water molecule forms



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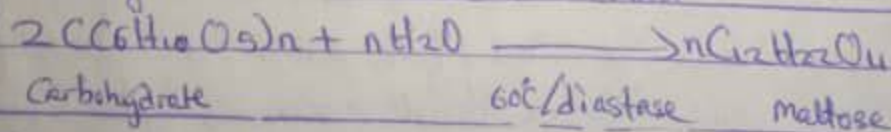


- ② Alcohols contain 2 groups of different polarities. The alkyl group is a chain of one or more carbon atoms & some hydrogen atoms - this is a non-polar group of atoms. The other group is an $-OH$, which is the polar end of the molecule.

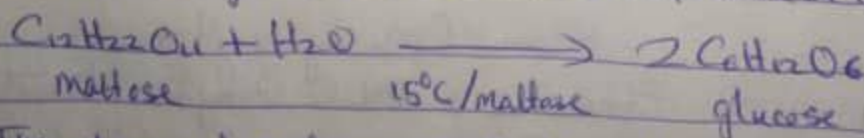
The non-polar alkyl group enables alcohols to interact with non-polar organic molecules. The polar group interacts with polar water molecules & can also hydrogen bond with water.

As the size of the alkyl group gets larger, alcohols become less soluble in water. Alcohols with 2 (ethanol) or 3 (n-propanol & ~~iso~~ iso-propanol) carbon atoms are miscible with water & are great solvents for non-polar organic compounds.

- ③ Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include molasses, potatoes, cereals, rice and ^{or} ~~and~~ ^{or} mashing with malt to $60^{\circ}C$ for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



The maltose is ~~is~~ broken down into glucose on addition of yeast which contains the enzyme maltase & at a temperature of $15^{\circ}C$.



The glucose at ~~constant~~ constant temperature of $15^{\circ}C$ is then converted into alcohol by the enzyme zymase contained also in yeast.

