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CHM 102

ASSIGNMENT II

1. Classification of Alcohols:

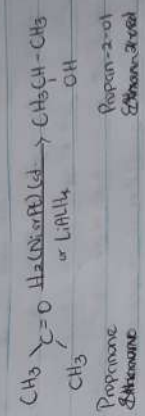
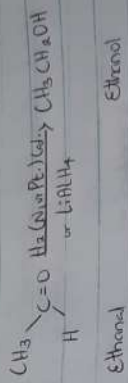
i. Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is a primary alcohol (1°). E.g. CH_3OH (Methanol), $\text{C}_2\text{H}_5\text{OH}$ (Ethanol). If it is one hydrogen atom, it is called secondary alcohol (2°) e.g. $\text{C}_2\text{H}_5\text{CH}(\text{OH})\text{CH}_3$ (Propan-2-ol), $\text{C}_4\text{H}_9\text{CH}_2\text{CH}(\text{OH})\text{C}_2\text{H}_5$ (Hexan-2-ol). And if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°) e.g. $\text{C}_2\text{H}_5)_2\text{C}-\text{OH}$ (2-methylpropan-2-ol), 3-methylpentan-3-ol ($\text{C}_6\text{H}_{13}\text{O}$), $\text{C}_4\text{H}_9\text{C}_2\text{H}_5$.

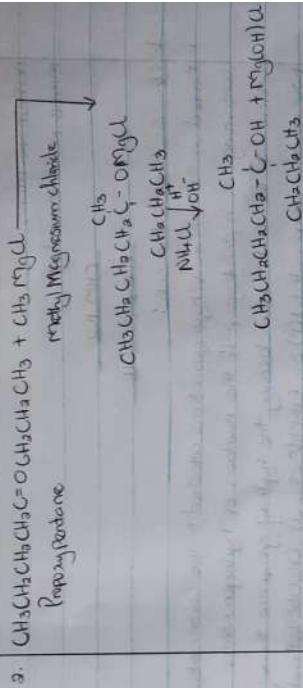
ii. Based on the number of hydroxyl groups they possess.

- Monohydric alcohols: have one hydroxyl group present in the alcohol structure. E.g. Methanol, Ethanol.
- Dihydric alcohols: also known as glycols have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol.
- Polyhydric alcohols or polyols: have more than three hydroxyl groups.

Examples

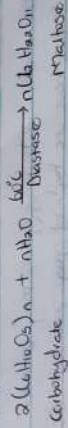
- $\text{HOCH}_2\text{CH}_2\text{OH}$ (Ethane-1,2-diol) } Dihydric Alcohol
- $\text{C}_2\text{H}_4(\text{OH})_2$ (Ethane-1,2-diol) } Dihydric Alcohol
- $\text{C}_3\text{H}_8(\text{OH})_2$ (Propane-1,2,3-triol) } Trihydric Alcohol
- $\text{C}_5\text{H}_{12}(\text{OH})_3$ (Pentane-2,3,4-triol) } Trihydric Alcohol
- $\text{C}_7\text{H}_{14}(\text{OH})_4$ (Heptane-2,3,4,5,6-pentol) } Polyhydric Alcohol
- $\text{C}_6\text{H}_{12}(\text{OH})_4$ (Hexane-1,2,4,5-tetrol) } Polyhydric Alcohol



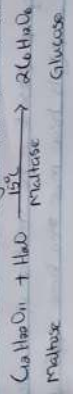


3. Industrial Manufacture of Ethanol

The starch containing materials include molasses, potatoes, cereals, rice and 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.



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



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

