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19/MHS009/008

DENTISTRY

CHEMISTRY ASSIGNMENT

1. Alcohols are classified into two based on two things:
 - a. Based on the number of hydrogen atoms attached to the carbon atom carrying the hydroxyl group.
 - Primary alcohol (1°): this is when there are three or two hydrogen atoms attached to the carbon atom carrying the hydroxyl group. Example: CH_3OH Methanol
 - Secondary alcohol (2°): this is when there is one hydrogen atom attached to the carbon atom carrying the hydroxyl group. Example $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ Propan-2-ol
 - Tertiary alcohol (3°): this is when there is no hydrogen atom attached to the carbon atom carrying the hydroxyl group. Example: $(\text{CH}_3)_3\text{C-OH}$ 2-Methylpropan-2-ol
 - b. Based on the number of hydroxyl groups they possess.
 - Monohydric alcohols: have one hydroxyl group in its alcohol structure. Example: $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ Propanol.
 - Dihydric alcohol also known as glycols has two hydroxyl groups in its alcohol structure. Example: $\text{HOCH}_2\text{CH}_2\text{OH}$ Ethane-1,2-diol
 - Trihydric alcohols or triols: have three hydroxyl groups present in the alcohol structure. Example: $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ Propane-1,2,3-triol
 - Polyhydric alcohols or polyols: have more than three hydroxyl groups in their alcohol structure. Example: $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$ Heptane-2,3,4,5,6-pentanol

2. Solubility of alcohols in water: lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

Solubility of alcohols in organic solvent: all monohydric alcohols are soluble in organic solvent. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

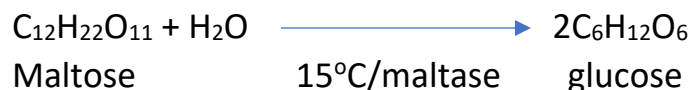
3. Industrial production of alcohols.

Production of ethanol

- 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 to alcohol by the zymase contained also in the yeast.

