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Course code: - Chem 102

1. Alcohols are very important Organic compounds. Discuss briefly their classification and give one example each.

(A) Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group:

(i) Primary alcohol (1°): It is when the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two.

Example: -  $\text{CH}_3\text{OH}$  - Methanol (1°)

(ii) Secondary alcohol: - This is when only one hydrogen atom is attached to the carbon atom bearing the hydroxyl group.

Example: -  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  Propan-2-ol

(iii) Tertiary alcohol: - This is when there is no hydrogen atom attached to the carbon atom bearing the hydroxyl group.

Example: - Methyl-3-pentanol

(B) Based on the number of hydroxyl groups they possess:

(i) Monohydric alcohol: They have one hydroxyl group present in the alcohol structure.

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

(ii) Dihydric alcohols: They have two hydroxyl groups present in the alcohol structure; they are also glycols.

Example: - Hexan-2,4-diol.

(iii) Trihydric alcohols (Triols): They have three hydroxyl groups present in the structure of the alcohol.

Example: - Propan-1,2,3-triol.

(iv) Polyhydric alcohols (Polyols): These have more than three hydroxyl groups.

Example: - Polyhydric acid.

2. Discuss the solubility of alcohols in water, Organic solvent.

Lower alcohols with up to three carbon atoms in their molecules are soluble in water because, alcohols can form hydrogen bond with water molecules.

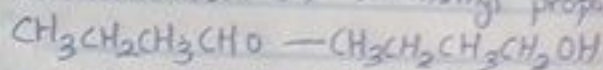
The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohols are soluble in Organic solvents. The solubility of some alcohols and polyhydric alcohols is largely due to their





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7. The reduction of 2-methyl propanal



2-methyl propanal by using  $\text{LiAlH}_4(\text{C}_2\text{H}_5)_2\text{O}_2$  as reducing agent.

8. Propose a scheme for the conversion of propan-1-ol to propan-2-ol

