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COURSE: CHM 102 (GENERAL CHEMISTRY II)

1. The classification of alcohols are:

i. Classification based on 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 three or two, it is called a primary alcohol ( $1^\circ$ ). If it is one hydrogen atom, it is called secondary alcohol ( $2^\circ$ ) and if no hydrogen atom is attached it is called a tertiary alcohol ( $3^\circ$ ). Example is  $\text{CH}_3\text{OH}$  - methanol ( $1^\circ$ ).

ii. Classification based on the number of hydroxyl groups they possess: Monohydric alcohols have only one hydroxyl group present in the alcohol structure. Dihydric alcohols/glycols/diols have two hydroxyl groups present in their alcohol structure while trihydric alcohols/triols have three hydroxyl groups in the structure of the alcohol. Polyhydric alcohols/polyols have more than three hydroxyl groups. Example is  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  - propanol (monohydric alcohol).

2. Solubility of alcohols: This is one of the physical properties of alcohols. 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. All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3. The industrial manufacture of ethanol includes the following processes:  
Carbohydrates such as starch are major groups of natural compounds

