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**ASSIGNMENT**

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

**ANSWER**

Classification of alcohols

1. Classification 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 three or two, it is called a “primary alcohol (10)”[in a primary alcohol ,the hydroxyl group is attached to a primary (or terminal) carbon atom in the molecule ,it is characterized by – CH2OH].if it is one hydrogen atom attached to the carbon atom bearing the hydroxyl group it is called “secondary alcohol(20)” [in a secondary alcohol ,the-OH group is on a secondary carbon atom; it is characterized by > CHOH] and if no hydroxyl group, it is called a “tertiary alcohol (30)” [in a tertiary alcohol,the – OH group is on a tertiary carbon it is characterized by >C-OH]

H H - EXAMPLE : Ethanol (10) -- CH3CH2OH :H -- C--- C—O—H

H H

1. Classification based on the number of hydroxyl group they possess

Monohydric alcohols have only one hydroxyl group per molecule present in the alcohol structure. Dihydric alcohols also called Glycols have two hydroxyl group present in the alcohol structure while trihydric alcohol or triols have three hydroxyl groups present in the structure of the alcohol.polyhdric alcohol or polyols have more than three hydroxyl groups

Example: CH3CH2CH2OH- propanol (monohydric alcohol)

2.Discuss the solubility of alcohol in water,organic solvents

SOLUBILITY OF ALCOHOL IN WATER,ORGANIC SOLVENTS

* Solubility in water : Lower alcohols with up to three carbon atom in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules .”the water solubility of alcohol decreases with increasing relative molecular mass”
* Solubility in organic solvents : All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohol is largely due to their ability to form hydrogen bonds with water molecules .

3.show the three steps in the industrial manufacture of ethanol. Equations of reaction are mandatory .

INDUSTRIAL MANUFACTURE OF ETHANOL

Carbonhydrates such as starch are major groups 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 carbonhydrate molecules into ethanol to give a yield of 95%

STEP1: The starch containing materials include molasses, potatoes, cereal, rice and on warming with malt to 600C for a specific period of time are converted into “maltose” by the enzyme diastase contained in the malt.

2(C6H10O5)n + Nh20 + nC12H22O11

STEP2: The maltose is broken down glucose on addition of yeast which contains the enzyme maltase and at a temperature of 150C

C12H12O11  + H2O 2C6H12O6

Maltose water glucose

4. Show the reaction between 2-methlpropanal and butylmagnesiumchloride .hint : Grignard synthesis