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**PHARMACY**

**19/MHS11/023**

**CHEM 102**

1. Classification of Alcohols

a. 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’s called a primary alcohol. If it’s one hydrogen atom it’s called secondary alcohol and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl it’s called a tertiary alcohol .

Example: CH3OH Methanol

b. Based on the number of hydroxyl group they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols/ Glycols have two hydroxyl groups present in the alcohol structure while trihydric alcohol have three hydroxyl groups present in the structure of the alcohol.

Example: CH3CH2CH2OH Propanol

2. The solubility of alcohols in water decreases with increasing relative molecular mass because 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 solubility of alcohols is largely due to their ability to form hydrogen bonds with water molecules. All monohydric alcohols are soluble in organic solvents.

3 .INDUSTRIAL MANUFACTURE OF ETHANOL

a. carbohydrates such as starch are major group 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 carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include molasses,potatoes,cereals,rice and on warming with malt to 600C for a specific period of time are converted into maltose by the enzymes diastase contained in the malt.

2(C6H10O5)n +nH2O nC12H22O11

Carbohydrate 60oc/diastase maltose

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

C12H22O11 +H2O 2C6H12O6

Maltose 150C/maltase glucose

c.The glucose at constant temperature of 15oC is then converted into alcohol by the enzyme Zymase contained also in yeast

C6H12O6 2CH3CH2OH +2CO2

Glucose 150c/ZYMASE Ethanol

**4**.(CH3)CHO+C4H9MgCl CH3CH(CH3)C4H9C-OMgCl CH3CH(CH3)C4H9CHC-OH +Mg(OH)Cl

**7**. CH3CH(CH2)

C =O CH3CH(CH3)CH2OH

H 2 methyl propanal

2 methyl propanal

**8**. CH3CH2CH2OH + H2S04 CH3CH2CH2OH2OS03H remove H2O

CH3CH2CH2OSO3H remove H2SO4 CH3CH=CH2 add H2O CH3CH(OH)CH3.