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**COLLEGE: MEDICINE AND HEALTH SICENCES**

**DEPARTMENT**: **PHARMACY**

**MATRIC NO: 19/MHS11/024**

**COURSE: CHEM102**

**1.** Discuss the two mayor classification of alkanols. Give examples each for each class

1. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group is two or three it is called PRIMARY ALCOHOL, if it is one hydrogen atom, it is called SECONDARY ALCOHOL and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol.

**EXAMPLES>**

CH**3**OH Methanol [primary alcohol]

CH**3**CH[OH]CH**3** Propan-2-ol [2nd alcohol]

[CH3]3C-OH 2-Methypropan-2-ol [3rd alcohol]

1. This is based on the number of hydrogen they possess. Monohydric alcohols have one hydroxyl group presence in the alcohol structure. Dihydric alcohols are also called glycols having two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl group present in the structure of alcohol, Polyhydric alcohols or polyols have more than three hydroxyl group.

**EXAMPLES >**

CH3CH2CH2OH propanol [Monohydric Alcohol]

CH3CH[OH]CH2CH[OH]CH2CH2 Hexane-2,4-diol [Dihydric Alcohol ]

OHCH2CH[OH]CH2OH Propane-1,2,3-diol [Dihydric Alcohol]

CH3CH[OH]CH[OH]CH[OH]CH[OH]CH[OH]CH3 Heptane-2,3,4,5,6-pentaol [polyhydric Alcohol**.**

2**.** In the Grignard synthesis of alcohols react a named Grignard reagent with CH3CH2CH2C=OCH2CCH3. Show the reaction steps.

R’RC=O+RMgX RR’R’ ‘C-OMgX H+ RR’R’ ‘C-OH=Mg[OH]X

Dil .acid OH-

**3.** Discuss the industrial manufacture of alcohols showing all reactions equation and necessary enzymes and temperature of reaction.

**>** Carbohydrates such as starch are major group of natural compound that can be made to yield ethanol by the biological by process of **fermentation**.

2[C6H10O6]n +nH2O nC12H22O11

Carbohydrate 60c/diastase maltose

C12H22O11+H2O 2C6H12O6

Maltose 15c/maltose

C6H12O6 2CH3CH2OH+2CO2

Glucose 15c/ zymase Ethanol

4. Determine the product obtained in the reduction of alkanone and alkanal. Use a specific example for each and show the equation of reaction.

Alkanone and alkanal are reduced to primary and secondary alcohols respectively by reaction with hydrogen in the presence of platinum or nickel catalyst or with aluminium isopropoxide [ the Meerwein-ponndorf reaction ] or with complex metal hydride, such as lithium tetrahydridoaluminate [III] [LiALH4] or sodium tetrahydridoborate [III] [NaBH4].

SPECIFIC EXAMPLE

O

CH3CH2C LIAIH4 CH3CH2CH2OH

H H20