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**DEPARTMENT: PHARMACY**

**MATRIC NO: 19/MHS11/070**

**LEVEL: 100**

**COURSE CODE: CHM 102**

1. **CLASSIFICATION OF ALCOHOLS**
* Classification based on the number of hydrogen atoms attached to the carbon atom containing the OH group

**PRIMARY ALCOHOL**

If 2 or 3 hydrogen atoms are attached to the carbon atom bearing the OH group, it is called a primary alcohol.

**SECONDARY ALCOHOL**

If 1 hydrogen atom is attached, it is called a secondary alcohol

**TERTIARY ALCOHOL**

If no hydrogen atom is attached, it is called a tertiary alcohol.

**EXAMPLES**

Methanol CH3OH – Primary alcohol

Propan(2)ol CH3CH(OH)CH3 – Secondary alcohol

Tert-butanol (CH3)3 COH – Tertiary alcohol

* Classification based on the number of hydroxyl groups they posses

**MONOHYDRIC ALCOHOL**

They possess 1 hydroxyl group present in the alcohol structure

**DIHYDRIC ALCOHOL**

They possess 2 hydroxyl groups present in the structure and they can also be referred to as Glycols.

**TRIHYDRIC ALCOHOL**

They possess 3 hydroxyl groups present in the structure and they can also be called Triols.

**POLYHYDRIC ALCOHOL**

They possess more than 3 hydroxyl groups and they are also called Polyols.

**EXAMPLES**

Monohydric alcohol – Methyl alcohol/Methanol CH3OH

Dihydric alcohol – 1,2-Ethanediol CH2OHCH2OH/C2H602

Trihydric alcohol – 1,2,3-Propantriol C10H15NO5

1. **GRIGNARD SYNTHESIS OF ALKANOLS**

Grignard reagent – C2H5MgBr

CH3CH2CH2CH2 – C – C – OMgBr 🡪 C4H9C3H7C2H5 – C – OH + Mg(OH)Br

1. **INDUSTRIAL MANUFACTURER OF ETHANOL**

Carbohydrate 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%. On warming starch with malt to 60% for a specific period of time are converted into maltose by the enzyme diastase contained.

2C(C6H10O5)n + H2O 🡪 n(C12H22O11)

Carbohydrate 60C/diastase Maltose

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

C12H22O11 + H2O 🡪 2C6H12O6

Maltose 15/maltase Glucose

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

C6H12O6 🡪 2CH3CH2OH + 2CO2

Glucose 15/zymase Ethanol

1. **ALKANONE**

Reduction of alkenone gives secondary alkanols

CH3C2H5 – C = O 🡪 CH3C2H5CHOH

 LiAlH4 Secondary alcohol

**ALKANALS**

Reduction of alkanals give primary alkanols

CH3CH2CH = O 🡪 CH3CH2CH2OH

 LiAlH4/H2O