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Pharmacy

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CHM 102 Assignment

1. Classification of Alcohols
2. Classification based on the numbers of hydrogen atoms attached to the carbon atom containing the OH group
3. If 2 or 3 hydrogen atoms are attached to the carbon atom bearing the OH group, it is called a primary alcohol (1⁰).
4. If one hydrogen atom is attached, it is called a secondary alcohol (2⁰).
5. If no hydrogen atom is attached to the carbon atom, it is a tertiary alcohol (3⁰).

Examples:

Methanol CH3OH (1⁰)

Propanol CH3CH (OH) CH3 (2⁰)

1. Classification based on the number of hydroxyl groups they possess. Monohydric alcohols have one OH group present in the alcohol structure. Dihydric alcohols are called glycols, they have 2 hydroxyl group present in the structure while trihydric alcohols or triols have 3 OH group present in the structure of the alcohol. Polydric alcohols or polyols have more than 3 OH groups.

Examples

Monohydric alcohol – Propanol CH3CH2CH2OH

Dihydric alcohol – Ethane1, 2diol HOCH2-CH2OH

1. Grignard synthesis of Alkanols

Grignard reagent – C2H5MgBr

CH3CH2CH2CH2-C=O CH2CH2CH3 + C2H5MgBr →

C4H9C3H7C2H5-C-OMgBr ---🡪 C4H9C3H7C2H5-C-OH + Mg(OH)Br

1. Industrial manufacturer of Ethanol

Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrates molecules into ethanol to give a yield of 95%. On warming starch with malt to 60⁰ for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.

2(C6H1OO5) n + nH2O - - - - - - - - - 🡪 n (C12H22O11)

Carbohydrate 60⁰ C/ diastase. Maltose

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

C12H22O11 + H2O - - - - - - - -> 2C6H12O6

Maltose 15⁰C/maltase Glucose

The glucose at constant temperature of 15⁰C is then converted into alcohol by the enzyme zymase contained also in yeast

C6H12O6 --------------🡪 2CH3CH2OH +2CO2

Glucose. 15⁰/Zymase Ethanol

1. Alkanone Reduction of alkanone gives secondary alkanols

CH3C2H5-C=O - - - - - - -> CH3C2H5CHOH (2⁰) alcohol

LiAlH4

Alkanals reduction of alkanals gives primary alkanols

CH3CH2CH=O --------------🡪 CH3CH2CH2OH

LiAlH4/H2O

Alkanals Reduction of alkanals gives primary alkanols

CH3CH2CH=0 - - - - - - - - >