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19/MHS11/123

Pharmacy

1. Classification of alkanols with two examples each.

a) This is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group.

*Primary Alcohol (1°): if the hydrogen atoms attached to the carbon atom bearing the hydroxyl group (OH) are three or two.

*Secondary Alcohol(2°): if it is one hydrogen atom attached to the carbon.

* Tertiary Alcohol(3°): if no hydrogen atom is attached to the carbon.

Examples are: CH₃OH Methanol(1°) CH₃CH(OH)CH₃Propan-2-ol (2°), (CH₃)₃C-OH 2-methylpropan-2-ol (3°)

b) This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called glycols have two hydroxyl groups presenting the structure.

Examples are CH₃CH₂CH₂OH Propanol (Monohydric alcohol)

2. Grignard Synthesis

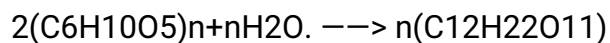
Grignard reagent-C₂H₅MgBr

CH₃CH₂CH₂CH₂-C=OCH₂CH₂CH₃+ C₂H₅MgBr - - ->
C₄H₉C₃H₇C₂H₅-C-OMgBr----> C₄H₉C₃H₇C₂H₅-C-OH +Mg(OH)Br

3. Industrial manufacture of Ethanol

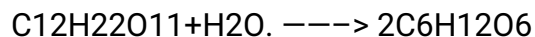
Carbohydrate such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecule into ethanol to

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 in the malt.



Carbohydrate 60°C/diastase. Maltose

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



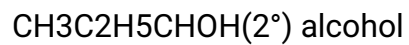
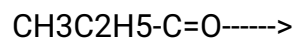
Maltose. 15°C/maltase Glucose

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



Glucose. 15°C/Zymase Ethanol

4. Alkanone. Reduction of alkanone gives secondary alkanols



Alkanals. Reduction of alkanals gives primary alkanols.

