

NAME: ALONYENU TREASURE AGBENU-OWO

DEPARTMENT: CIVIL ENGINEERING

MATRIC NUMBER: 19/ENG03/005

GENERAL CHEMISTRY II (CHM 102)
ASSIGNMENT

1. Discuss the two major classifications of Alkanols. Give two examples each for each class.

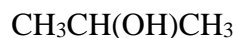
SOLUTION:

A) Classification by number of hydrogen atoms surrounding the carbon atom attached to the OH group; If the number of hydrogen atoms surrounding the carbon atom attached to the OH group is three or two, it is a primary alkanol. If it is one, it is a secondary alkanol. If none, then it is a tertiary alkanol.

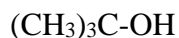
Examples:



Methanol (1^0)



Propan-2-ol (2^0)



2-Methylpropan-2-ol (3^0)

B) Classification by number of OH group they possess; Monohydric alkanols have one OH group present, dihydric alkanols have two OH group present, trihydric alkanols have three OH group present, polyhydric alkanols have more than three OH group present.

Examples:



Propanol



Ethan-1,2-diol



Propan-1,2,3-triol

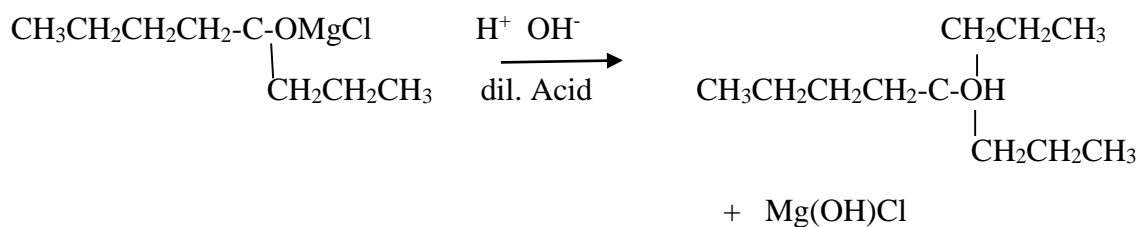


Heptan-2,3,4,5,6-pentaol

2. In the Grignard synthesis of Alkanols, react a named Grignard reagent with $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3$. Show the reaction steps.

SOLUTION:



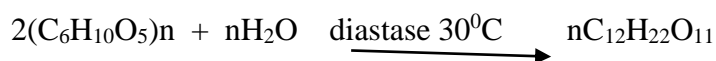


3. Discuss the industrial manufacture of ethanol showing all reaction equations and necessary enzymes and temperature of reaction.

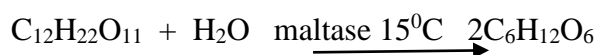
SOLUTION:

Ethanol is produced industrially by the fermentation of starch.

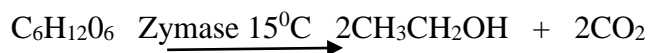
- The starch is turned into maltose by enzyme diastase at 30°C



- The maltose is converted into glucose by the enzyme maltase found in yeast at a temperature of 15°C



- Finally, the glucose is converted into ethanol by the enzyme zymase also found in yeast at a temperature of 15°C



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

SOLUTION:

Aldehydes and ketones are reduced to primary and secondary alcohols respectively by reaction. With hydrogen in the presence of platinum or nickel catalyst or with aluminum isopropoxide (the Meerwein-Ponndorf reaction) or with complex metal hydride, such as lithium tetrahydridoaluminate (III) (LiAlH_4) or sodium tetrahydridoborate (III) (NaBH_4)

EXAMPLES:

