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**COLLEGE: MEDICINE AND HEALTH SCIENCES**

**DEPARTRMENT: HUMAN NUTRITION AND DIETETICS**

**MATRIC NUMBER: 19/MHS04/001**

**COURSE: CHEM 102**

**ASSIGNMENT.**

1. Discuss the two major classification of Alkanols and give two examples for each class.

Answer.

1. Number of hydrogen atoms: This is based on the number of hydrogen atoms attached to the carbon atoms containing the hydroxyl group. If the numbers of hydrogen group are 3 or 2, it is known as a primary alcohol. if it is one hydrogen atom, it is a secondary alcohol and if there is no hydrogen atom attached it is called a tertiary alcohol. Examples are CH3OH methanol(primary alcohol),(CH3)3C-OH 2-methylpropan-2-ol(tertiary alcohol)
2. Number of hydroxyl groups: monohydric alcohols have one hydroxyl group present in the alcohol structure, dihydric alcohols have two hydroxyl groups present in the alcohol structure ,trihydric or triols have three hydroxyl groups present in the alcohol structure while polyhydric or polyols have more than three hydroxyl groups . examples are CH3CH2CH2OH propanol(monohydric ), OHCH2CH(OH)CH2OH propane-1,2,3-triol(trihydric ).
3. In Grignard synthesis of alkanols ,react a named Grign**ard reagent with CH3CH2CH2CH2C=OCH2CH2CH3. Show the reaction steps.**

**Answer.**

**CH3CH2CH2MGCl + CH3CH2CH2CH2C=OCH2CH2CH3**

**Grignard reageant( propyl 4**-octanone

 Magnesium chloride)

CH3CH2CH2-Mgcl + CH3CH2CH2CH2=O

 CH2CH2CH3

 !

CH3CH2CH2- C – O –Mgcl

 !

 CH2CH2CH2CH3

 ! H+ OH-

 CH2CH3CH3

 !

 CH3CH2CH2-C – OH + Mg( OH) Br

 ! magnesium hydroxyl bromile

 CH2CH2CH2CH3

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

Answer.

1. The starch containing materials include molasses, potatoes,cereals,rice and on warming with malt for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.

2(C6H10O60)n+nH2O🡪nC12H22O11

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

C12H22O11+H2O-🡪2C6H12O6

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

C6H12O6🡪2CH3CH2OH+2CO2

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

Answer.

They are reduced to primary and secondary Alkanols respectively by reaction with hydrogen in the presence of a platinum or nickel catalyst or with aluminum proponide or with complex metal hydride, such as Lithium tetrahydridoaluminate 3 (LiAlh4) or sodium tetrahydridoborate 3 (NaBH4)

Answer.

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