NAME: Aibangbee Efeosa Anthonia

DEPARTMENT: Pharmacy

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COURSE: CHEMISTRY( CHM102)

 Assignment

1. a. Classification of alcohols based on the number of alkyl groups attached to the carbon which bears the hydroxyl group. 2 examples are
2. primary alkanols
3. secondary alkanols

 b. classification based on the number of hydroxyl group. Examples are

 i. Monohydric alkanols

 ii. Dihydric alkanols

1. reaction of a named Grignard reagent with CH3CH2CH2CH2C=OCH2CH2CH3 with the reaction steps

Grignard reagent – ethylmagnesiunchloride (CH3CH2MgCl)

 Reaction

The Grignard reagent reacts with octan-4-ol, the product is then hydrolyzed by water to give the alcohol

 CH3CH2 CH3CH2MgCl + CH3CH2CH2CH2C= OCH2CH2CH3 CH3CH2CH2CH2 C OMgCl

 CH2CH2CH3

 H+/OH-

 CH3CH2

 CH3CH2CH2CH2 C OH + Mg(OH)Cl

 CH2CH2CH3

 4ethylOctan-4-ol

1. One industrial preparation of ethanol by fermentation of starch

Example of starch is crushed potatoes. The crushed potato is steamed at 1400$℃$ to 1500$℃$ under pressure to prepare starch solution known as mash.

i. Hydrolysis of starch

Starch is hydrolyzed to maltose by an enzyme called diastase

2(C6H10O5) + nH2O $→$ n (C12H22O11)

Starch 60$℃$ Maltose

ii. Fermentation

Finally, yeast is added to maltose

C12H22O11 + H2O $→$ 2C6H12O6

Maltose 15$℃$ glucose

C6H12O6 $→$ C2H5OH + 2CO2

Glucose 15$℃$ ethanol

1. Product of reduction of alkanone is secondary alcohol by using LiAlH4

 Example is propanone to propan-2-ol

CH3(C=O)CH3 + 2[H] $→$ CH3CH(OH)CH3

 Products of reduction of aldehydes are primary alcohols

 Example is Ethanal to Ethan-1-ol

CH3CHO + 2[H] $→$ CH3CH2OH