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MATRIC NO: 19/ENG05/048

DEPT: MECHATRONICS ENGINEERING.

SUBJECT: CHM102 ASSIGNMENT

SIGN: 

(1) Discuss the two major classification of Alkanols - Give 2 Examples each for each class.

* Organic compounds containing hydrogen, oxygen and carbon.

General formula: $C_nH_{2n+1}OH$

Classification of Alcohol:

(1) BASED ON THE NUMBER OF HYDROGEN ATTACHED TO THE CARBON CARRYING THE (OH) GROUP:

(a) Primary Alcohol \Rightarrow propanol, Butanol.

(b) Secondary Alcohol \Rightarrow Butan-2-ol, propan-2-ol

(c) Tertiary Alcohol \Rightarrow 2-methyl propan-2-ol, 3-Ethyl Hexan-3-ol

(2) NUMBER OF (OH) FUNCTIONAL GROUP PRESENT IN THE COMPOUND

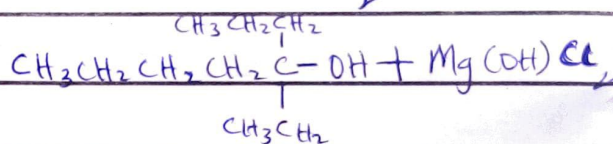
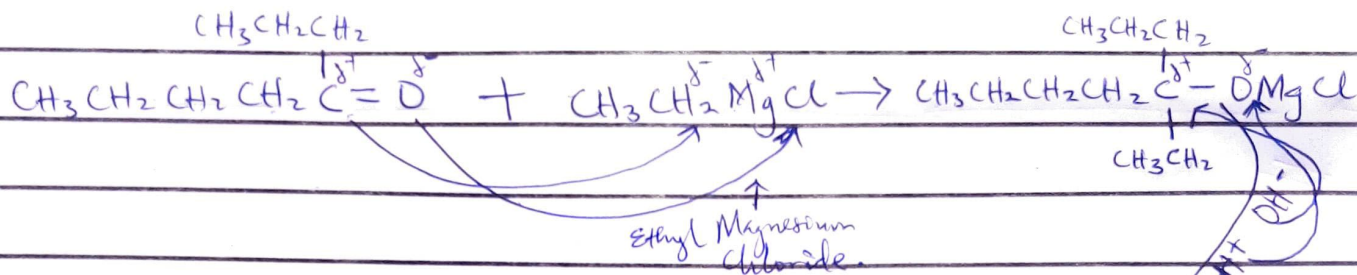
(a) 1(OH) \rightarrow Monohydric Alcohol \rightarrow propanol, Butanol.

(b) 2(OH) \rightarrow Dihydric Alcohol \rightarrow 1,2-Ethandiol, 1,3-propanediol.

(c) 3(OH) \rightarrow Trihydric Alcohol \rightarrow 1,2,3-Propanetriol, 1,2,3-Butanetriol

(2) In the Grignard synthesis of Alkanols, react a named Grignard reagent with.

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3$; Grignard reagent used: Ethyl-Magnesium chloride.



4-Ethyl Octan-4-ol

(3) Discuss the Industrial Manufacture of ethanol showing all reactions equation and necessary enzymes and temperature of reactions.

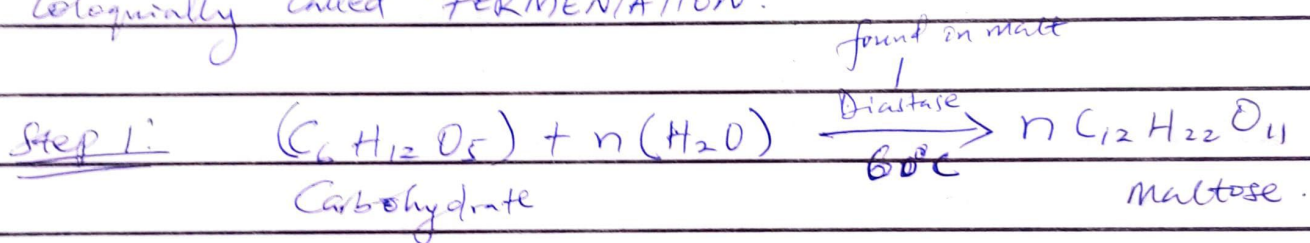
Production of Ethanol

Carbohydrates such as starch are major group of Natural compounds that can be made to yield ethanol by the biological process of fermentation.

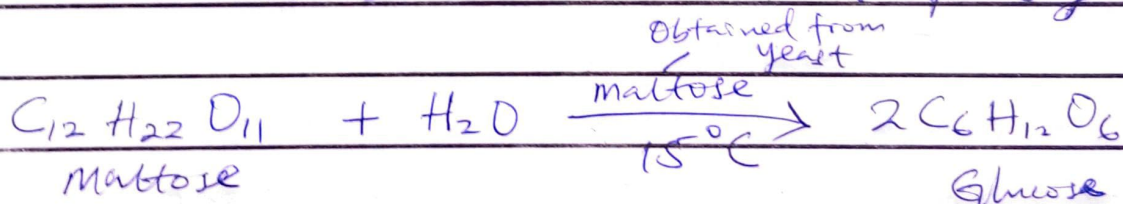
The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The

starch containing materials include molasses, potatoes, cereals, rice and on warming with malt to 60°C for a specific period

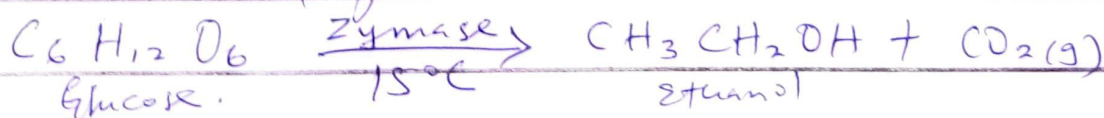
of time are converted into maltose by the enzyme diastase contained in the malt. This continuous reaction is shown below and colloquially called "FERMENTATION".



Step 2: Maltose must be broken down into simple sugar.



Step 3: Conversion of glucose to ethanol



Step 4: Reaction is complete.

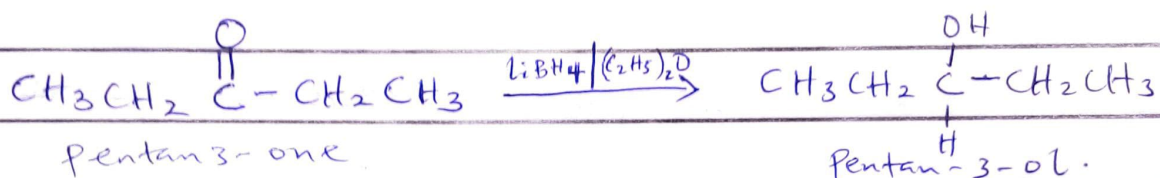
(4) Determine the product obtained on the reduction of Alkone, and Alkanal. Use a specific example for each and show the equation of reaction.

Reduction of Alkanone:

* Reduction of ~~propanone~~ ^{Pentanone} will give ~~propan-2-ol~~ ^{pentan-3-ol}.

~~ie~~ Reduction of Alkanone \Rightarrow Secondary Alcohol.

Reduction of Pentan-3-one will give pentan-3-ol.



Reduction of Alkanal

Reduction of Alkanal will give Primary Alcohol,
e.g. Reduction of Propanal \Rightarrow propanol.

