

NAME : MBIA, MALORY ANNE

COURSE : CHEM 102

DEPARTMENT : INDUSTRIAL CHEMISTRY

COLLEGE : SCIENCES

Matric Num: 19/Sci.09/004

i) There are two major classifications of alkanols which are
General Alkanol formula:

$R-OH$ where R is the alkyl group and $-OH$ is methyl - CH_3

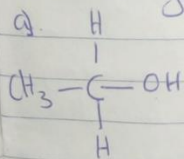
Ethyl - CH_3CH_2

Propyl - $CH_3CH_2CH_2$ etc.

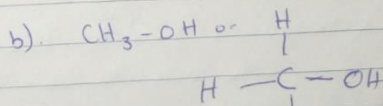
While $-OH$ is the hydroxyl group which is the motion functional group for alkanol.

Therefore based on this classification, alkanol can be classified as follows:

i) Primary alkanol: Primary alkanols, have only one alkyl group or there are two hydrogen atoms attached to the carbon atom that carries hydroxyl group. e.g.

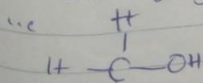


Ethanol [1°]



[Methane (1°)]

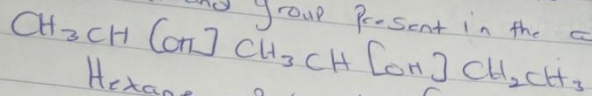
ii) Secondary alkanol: Secondary alkanol has two alkyl groups or one hydrogen atom attached to the carbon.



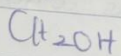
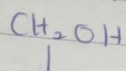
Ethanol [Monohydric Alkanol]

Number 2.

i) Dihydric Alkanol: Dihydric alkanol are also called Glycol. Have two hydroxyl group present in the alkanol group present in the alkanol structure e.g.

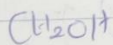
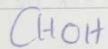
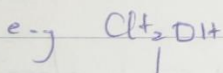


Hexane - 2,4-diol [Dihydric alkanol]



ethane - 1,2-diol [Dihydric alkanol]

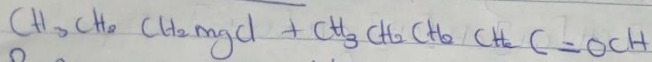
ii) Trihydric alcohol: Trihydric alcohols or triol are alkanols that have three hydroxyl groups present in the alkanol structure.



Propane - 1,2,3-triol [Trihydric alkanol]

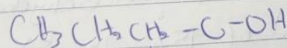
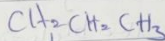
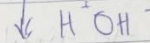
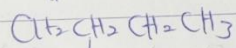
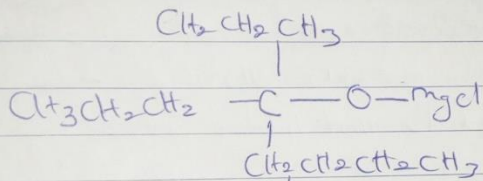
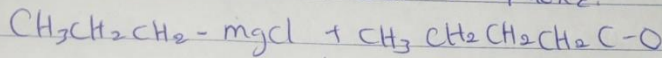
Number 2: In the Grignard Synthesis alkanols reacts
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{CH}_2\text{CH}_2\text{CH}_3$

Solution

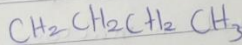


Propyl magnesium chloride + 4-octanone

Octane-4-one



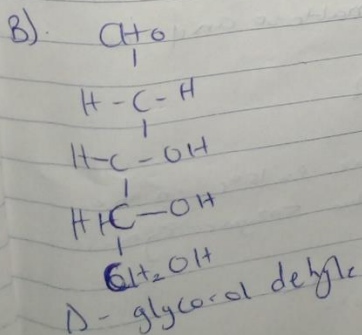
+ $\text{Mg}[\text{O}]\text{H}$



4-Propyl-4-octanol

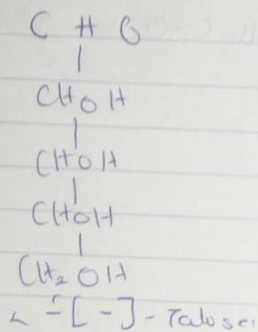
Magnesium hydroxide
Bromide

or
4-Propyl Octan-4-ol



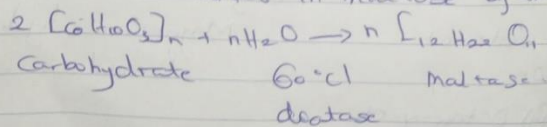
ii) Polyhydric alcohols: Polyhydric alcohols or polyols are those alcohols having more than three hydroxyl groups in the alcohol structure e.g.

a) $\text{CH}_2\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_2$
 Heptane-2,3,4,5,6-pentanol (Polyhydric alcohol)

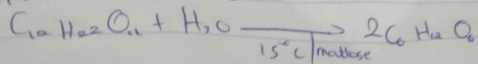


Number 3:

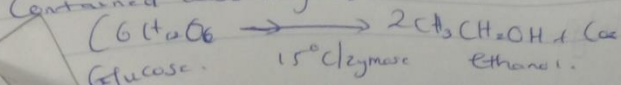
Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalyst enzymes found in yeast breakdown the carbohydrates molecule into ethanol to give a yield of 95%. The starch containing a warming with malt. to 60°C for a specified period of time are converted in maltose by the enzyme.



The maltose is broken into ~~glucose~~ glucose on addition of yeast which contains the enzymes maltase and a temperature of 15°C.



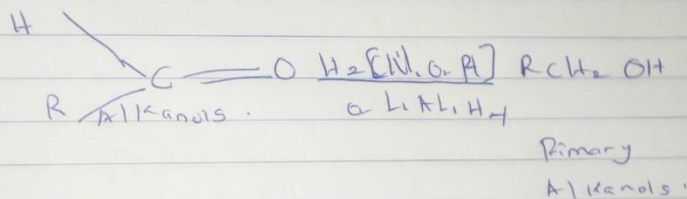
The glucose at a constant temperature of 15°C in the converted into alcohol [ethanol] by the enzyme zymase contained also in yeast



Number 4:

Reduction of Alkanals and alkanones.

Alkanals and alkanones are reduced into Primary and Secondary Alkanols respectively by reaction with hydrogen in the presence of Platinum or nickel catalyst or with aluminium O-peroxide [see merwin-Bonnett reaction] or with complex metal hydride such as Lithium tetrahydridoaluminate [Li] [LiAlH₄] or Sodium tetrahydridoborate [Li] [NaBH₄].



Examples:

