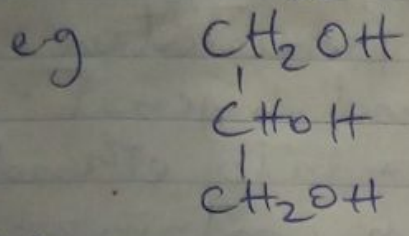
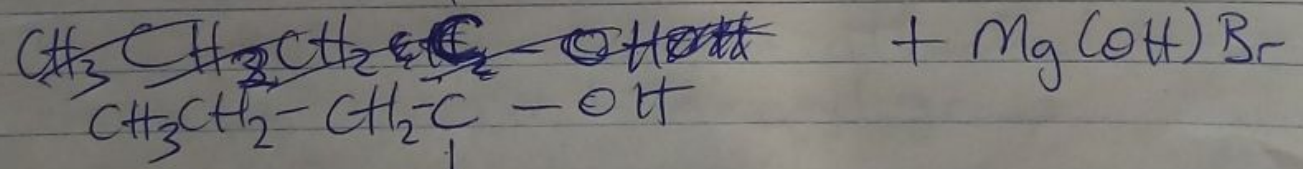
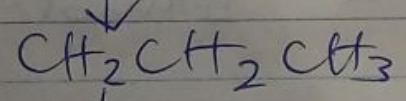
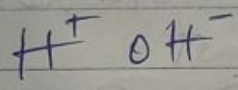
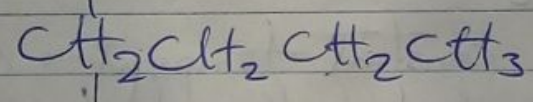
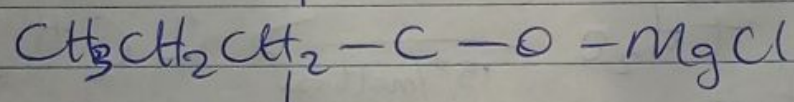
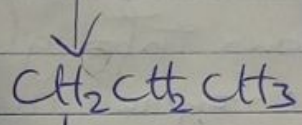
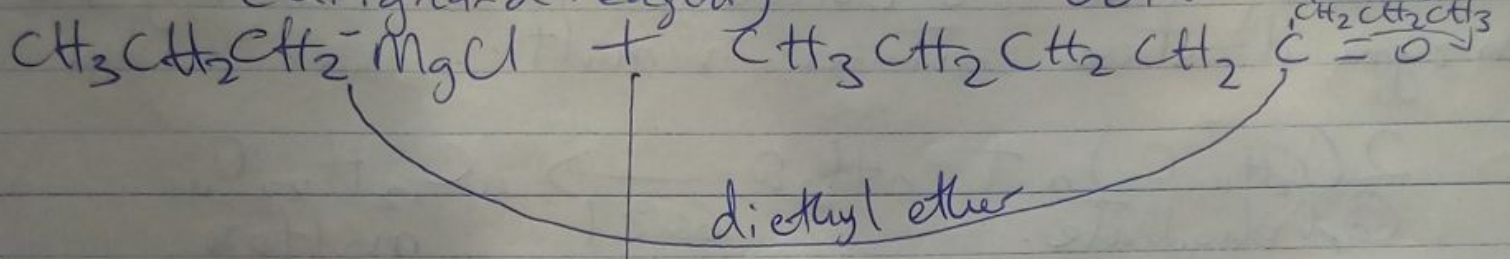
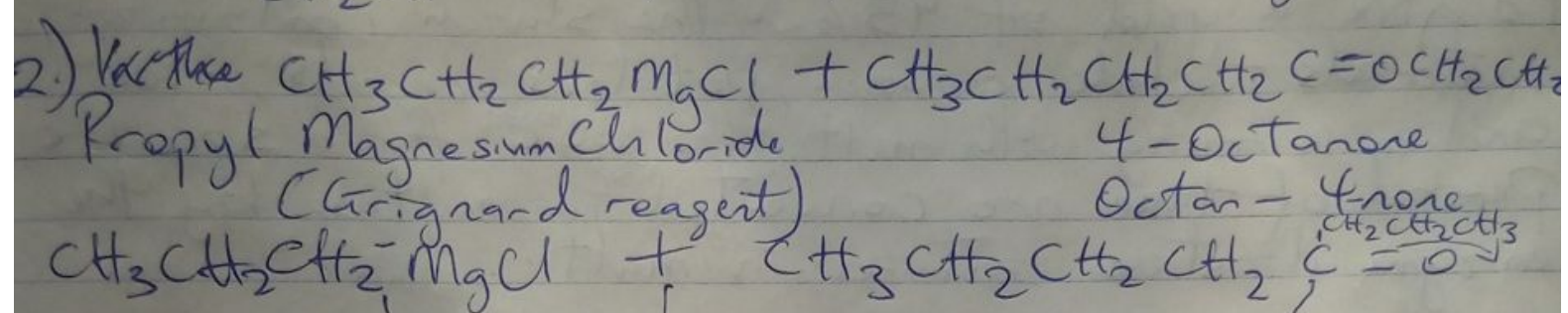


1) Trihydric alcohol: - Trihydric alcohol or triols are alcohols that have three hydroxyl groups present in the alcohol structure



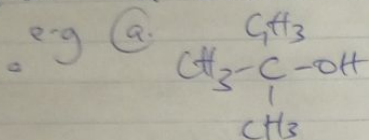
Propane-1,2,3-triol (Trihydric alcohols)



4-propyl-4-octanol
or
4-propyloctan-4-ol

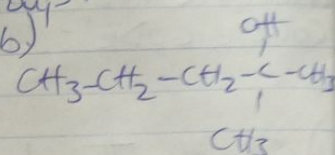
Magnesium hydroxyl
Bromide

iii) Tertiary alkanol: Tertiary alkanols have three alkyl groups and no hydrogen atom attached to the carbon atom that carries the hydroxyl group.



2-Methyl propan-2-ol (3°)

or
2-methyl-2-propanol (3°)



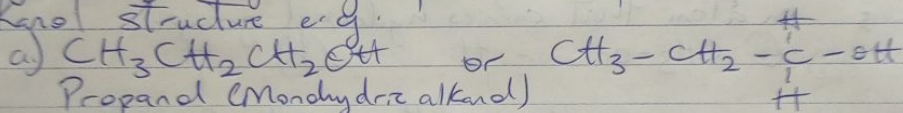
2-methyl Butan-2-ol

or
2-methyl-2-Butanol

B) Classification based on the numbers of hydroxyl groups that possess:

NB - The hydroxyl group has a general formula $-\text{OH}$. Therefore, based on this classification, alkanols can be classified as follows:

i) Monohydric alkanols: Monohydric alkanols have only one hydroxyl group ($-\text{OH}$) present in the alcohol structure e.g.

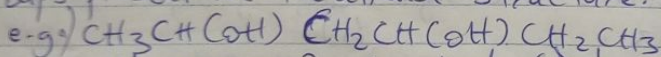


Propanol (Monohydric alcohol)

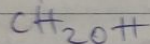
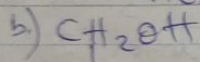
b)
$$\begin{array}{c} \text{H} \\ | \\ \text{H} - \text{C} - \text{OH} \\ | \\ \text{H} \end{array}$$

Ethanol (Monohydric alcohol)

ii) Dihydric alkanols: Dihydric alkanols are also called Glycols. Glycols have two hydroxyl groups present in the alcohol structure.

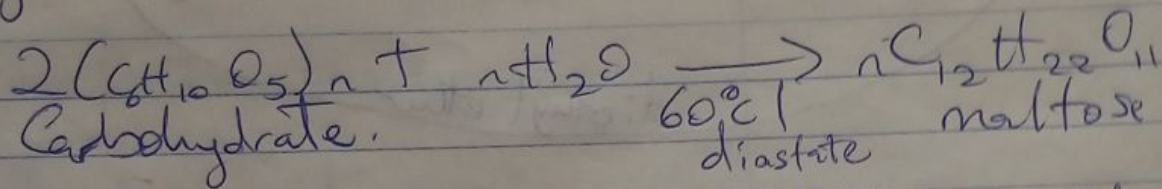


Hexane-2,4-diol (Dihydric alcohol)

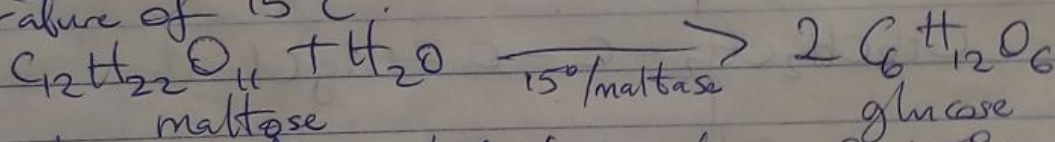


Ethane-1,2-diol (Dihydric alcohol)

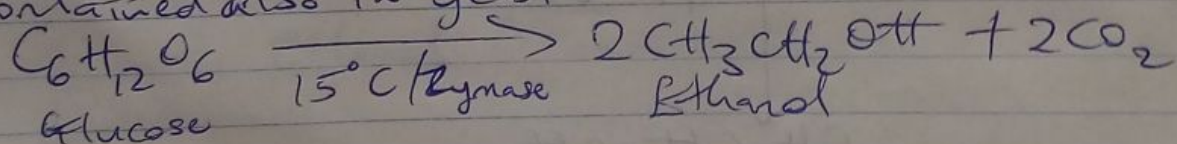
3) Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast breakdown the carbohydrate molecules into ethanol to give a yield of 95% - The starch containing materials include molasses, potatoes, cereals, rice and on warming with malt to 60°C for a specific period of time are converted in maltase by the enzyme diastase contained in malt.



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



The glucose at constant temperature of 15°C is then converted into alcohol (ethanol) by the enzyme (zymase) contained also in yeast.



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 APARTMENT: - Microbiology
 MATRIC NO: - 19/SCI05/004
 COURSE CODE: - CHM 102

Assignment

Classification based on the number of alkyl group.
 Note: - Alkanol has the general formula "R-OH" where 'R' is the alkyl group e.g

Methyl - CH_3

Ethyl - CH_3CH_2

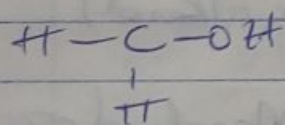
Propyl - $\text{CH}_3\text{CH}_2\text{CH}_2$ etc

While OH is the hydroxyl group which is the main functional group for alkanols.

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

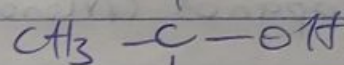
i) Primary alkanol: Primary alkanols have only one alkyl group or three or two hydrogen atom attached to the C_{OH} on atom that carries hydroxyl group.

e.g a) $\text{CH}_3\text{-OH}$ or $\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}-\text{OH} \\ | \\ \text{H} \end{array}$



Methanol (1°)

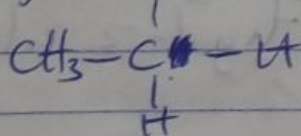
b) $\begin{array}{c} \text{H} \\ | \\ \text{CH}_3-\text{C}-\text{OH} \\ | \\ \text{H} \end{array}$



Ethanol (1°)

ii) Secondary alkanol: Secondary alkanols have two alkyl groups or one hydrogen atom attached to the carbon that contains the hydroxyl group.

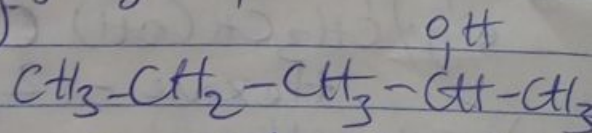
e.g a) CH_3



Propan-2-ol (2°)

or
2-propanol (2°)

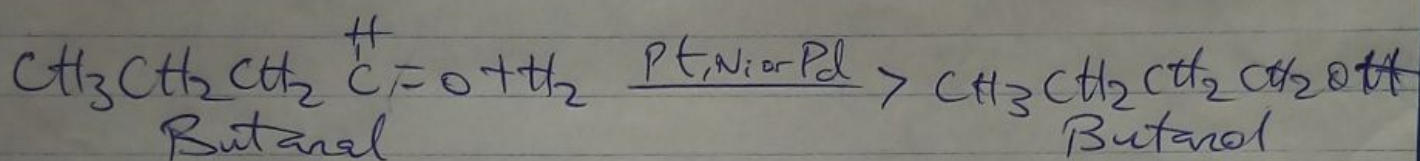
b)



2-Butanol (2°)

or
Butan-2-ol (2°)

f.) Alkane and alkanones are reduced to primary and secondary alcohol by hydrogen in the presence of a platinum or nickel catalyst or with aluminium isopropoxide (the Meerwein-Ponndorf reaction) or with complex metal hydride such as lithium tetrahydridoaluminate (III) $(LiAlH_4)$ or sodium tetrahydroborate (III) $(NaBH_4)$



b.) Reduction of an alkanone yield a secondary alcohol

e.g. ii

