

SOTANIG REBECCA

CIVIL ENGINEERING

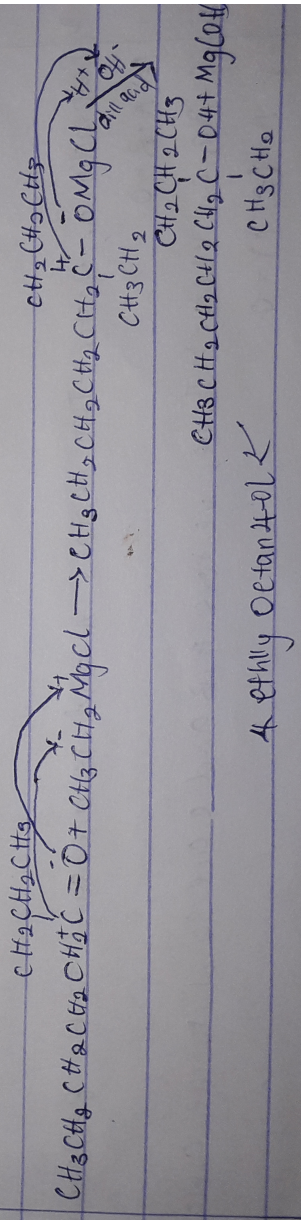
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CHM 102

Answers.

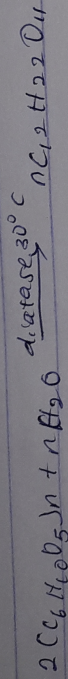
1. Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called primary alcohol (1°). If it is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°). Examples  $\text{CH}_3\text{OH}$  (Methanol 1°),  $\text{CH}_3\text{CH(OH)CH}_3$  (Propan-2-ol 2°)  $(\text{CH}_3)_3\text{C-OH}$  (tert-butyl alcohol 3°)

2. Based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called glycols have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Polyhydric alcohols or polyols have more than three hydroxyl groups. Examples are  $\text{C}_2\text{H}_4\text{O}_2$ ,  $\text{C}_3\text{H}_8\text{O}_2$  propanediol (monohydric alcohol),  $\text{HO(CH}_2\text{)}_2\text{CH}_2\text{OH}$  Ethane-1,2-diol (dihydric alcohol),  $\text{C}_4\text{H}_8\text{O}_3$  (dihydric alcohol),  $\text{C}_3\text{H}_8\text{O}_3$  (trihydric alcohol),  $\text{C}_6\text{H}_{12}\text{O}_6$  (hexahydric alcohol) etc.  $\text{CH}_3$  Heptane-2,3,4,5,6-pentaol (Polyhydric alcohol).

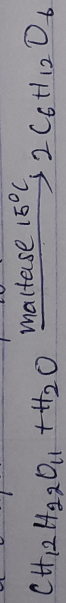


4 Ethyl Octanol

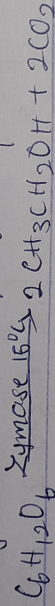
3. Ethanol is produced industrially by the fermentation of starch.
- The starch is turned into maltose by enzyme diastase at  $80^{\circ}\text{C}$



- The maltose is converted into glucose by the enzyme maltase found in yeast at a temperature of  $15^{\circ}\text{C}$



- Finally the glucose is converted into ethanol by the enzyme Zymase also found in yeast at a temperature of  $15^{\circ}\text{C}$



Aldehydes and ketones are reduced to primary and secondary alcohol respectively by reaction with hydrogen in the presence of platinum or nickel catalyst or with aluminium isopropoxide (the Meerwein-Ponndorf reaction) or with complex metal hydride, such as lithium tetrahydridoaluminate ( $\text{LiAlH}_4$ ) or sodium tetrahydroborate ( $\text{NaBH}_4$ ). Examples:

