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CHM102 Assignment

1.) a) Classification by number of hydrogen atoms surrounding the carbon atom attached to the OH group: if the number of hydrogen atoms surrounding the carbon atom attached to the OH group is three or two, it is a primary alcohol. If it is one, it is a secondary alcohol. If none, then it is a tertiary alcohol.

e.g: CH_3OH : methanol

$\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$: Propan-2-ol

$(\text{CH}_3)_3\text{C-OH}$: 2-Methylpropan-2-ol

b) Classification by number of OH group they possess: Monohydric alcohols have one OH group present, dihydric alcohols have two OH group present, trihydric alcohols have three OH group present, Polyhydric alcohols have more than three OH group present.

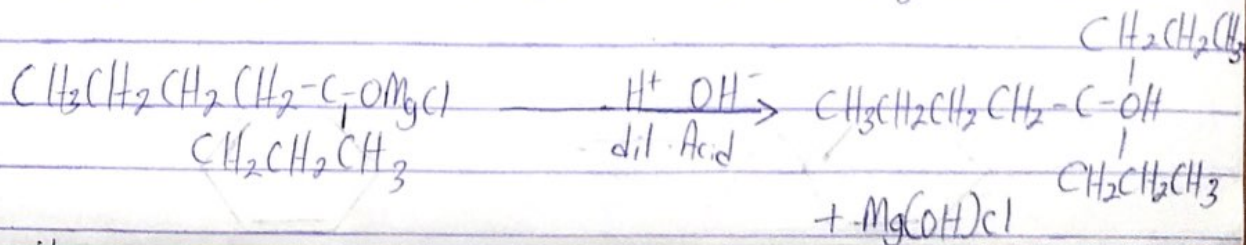
e.g: $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (Monohydric) - propanol

$\text{HOCH}_2\text{CH}_2\text{OH}$ (Dihydric) - Ethane-1,2-diol

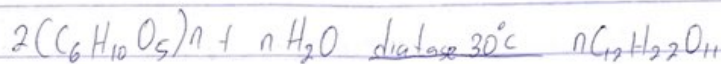
$\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ (Trihydric) - Propan-1,2,3-triol

$\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$ (Polyhydric) - Heptan-2,3,4,5,6-pentol

2.) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3 + \text{CH}_3\text{CH}_2\text{CH}_2\text{MgCl} \rightarrow$



- 3) Ethanol is produced industrially by the fermentation of starch
- The starch is turned into maltose by enzyme diastase at 30°C



- The maltose is converted into glucose by the enzyme maltase found in yeast at a temperature of 15°C



- finally the glucose is converted into ethanol by the enzyme Zymase also found in yeast at a temperature of 15°C



- A) Aldehydes and ketones are reduced to primary and secondary alcohols 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 (III) (LiAlH_4) or sodium tetrahydroborate (III) (NaBH_4)

