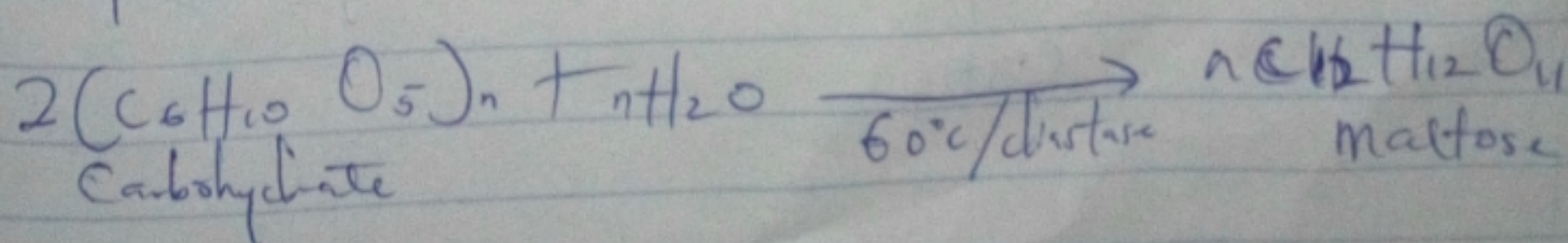


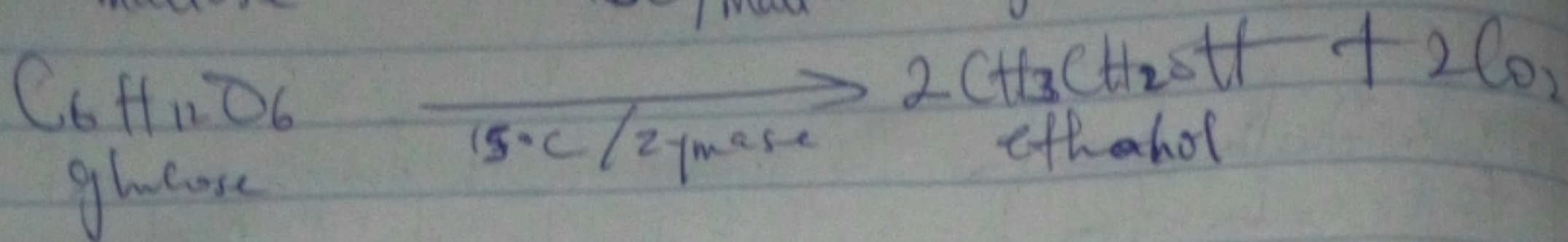
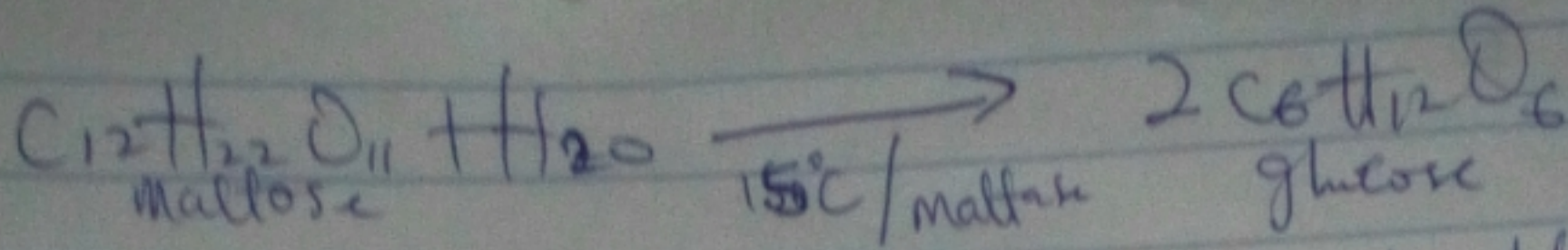
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Courses CHTM102  
Assignment

1a) Classification based on the number of hydrogen atom attached to the carbon atom bearing the hydroxyl group. If ~~three~~ hydrogen is attached to the carbon atom, it is called primary alcohols, if two is attached it is called secondary alcohols and if ~~none~~ is attached it is called tertiary alcohols.  
example ethanol -  $\text{CH}_3\text{CH}_2\text{OH}$   
methanol -  $\text{CH}_3\text{OH}$

b) Classification based on the number of hydroxyl group. In this classification there are monohydric, dihydric, trihydric and polyhydric alcohols. Monohydric has one hydroxyl group, Dihydric has two and trihydric has three. Polyhydric contain more than three hydroxyl group  
Examples - Ethane-1,2 diol (Dihydric alcohol)  
 $\text{OHCH}_2\text{CH}_2\text{OH}$   
Butanol  $\rightarrow$   $\text{C}_4\text{H}_9\text{OH}$  (Monohydric alcohol)

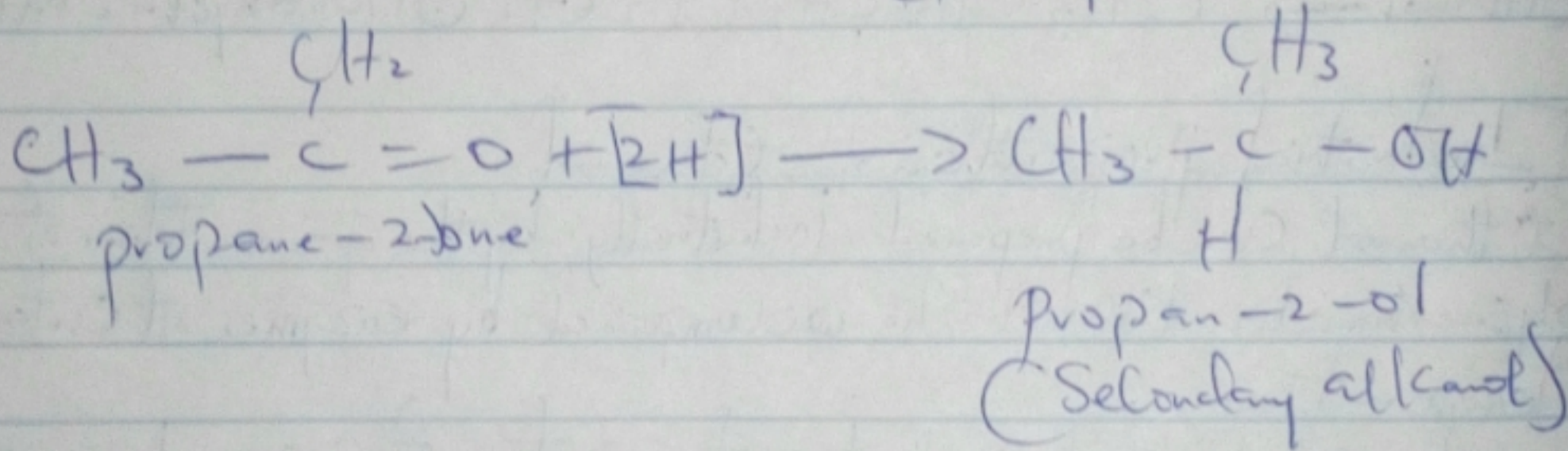
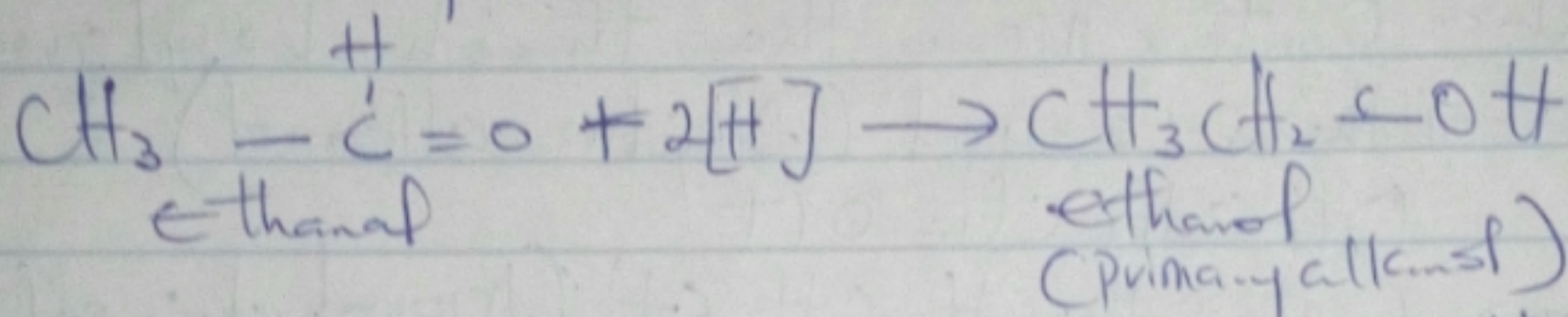
3) Industrial preparation of ethanol  
Ethanol can be prepared industrially, by the fermentation of polysaccharides like starch accompanied by enzymes at certain temperatures.  
If starch is boiled to a temperature of  $60^\circ\text{C}$  and malt containing an enzyme ~~maltase~~ <sup>diastase</sup> is added. The product will be maltose. The maltose is broken down into glucose on addition of yeast which contains an enzyme maltase at a temperature of  $15^\circ\text{C}$ .  
Glucose at temperature of  $15^\circ\text{C}$  is converted to ethanol and carbon dioxide by an enzyme Zymase contained in yeast.





#### 4. Reduction of Alkanal and Alkanone:

Alkanal when reduced by the reducing agent such as lithium tetrahydridoaluminate (III) in ethoxyethane ( $\text{LiAlH}_4 / (\text{C}_2\text{H}_5)_2\text{O}$ ) or sodium tetrahydridoborate (III) in water ( $\text{NaBH}_4 / \text{H}_2\text{O}$ ), the product obtained is a primary alcohol. Similarly when Alkanone is reduced by any of these reducing agents, the product obtained is secondary alcohol.



#### 2. Grignard Synthesis of Alcohol using Ketone + Grignard reagent

