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Course: ~~Medicine~~ / ~~Surge~~ Surgery CHM 102  
Dept: Medicine and Surgery  
Matric No: 19/MHS01/343

### Assignment

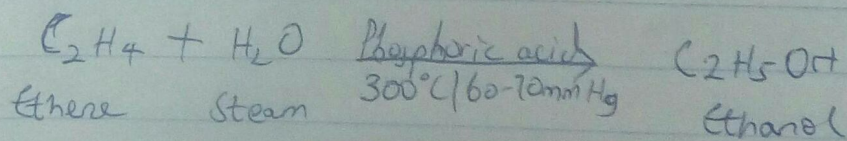
- 1) Discuss the two major classification of Alkanols. Give two examples each for each class.
- 2) In the Grignard synthesis of Alkanols, react a named Grignard reagent with  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}=\text{OCH}_2\text{CH}_2\text{CH}_3$ . Show the reaction steps.
- 3) Discuss the industrial manufacture of ethanol showing all reaction equations and necessary enzymes and temperature of reaction.
- 4) Determine the product obtained in the reduction of Alkanal and Alkanone, use a specific example for each and show the equation of reaction.

### Answers

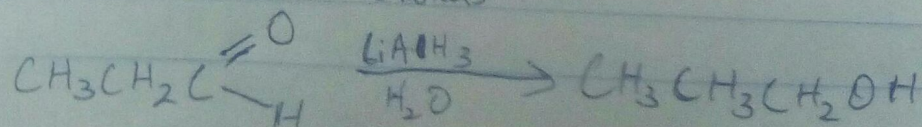
- ① It is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. Examples
- Methanol  $\text{CH}_3\text{OH}$  (Primary alcohol)
  - Propan-2-ol ~~( $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ )~~  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  (Secondary alcohol)
- ② It is based on the number of hydroxyl group that the alcohol has. Examples
- Propanol  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  (Monohydric alcohol)
  - Ethane-1,2-diol  $\text{HOCH}_2\text{CH}_2\text{OH}$  (Dihydric alcohol)

### ③ Industrial Preparation of Ethanol

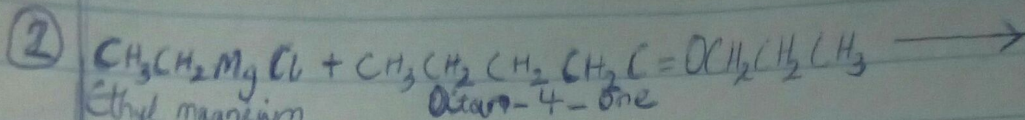
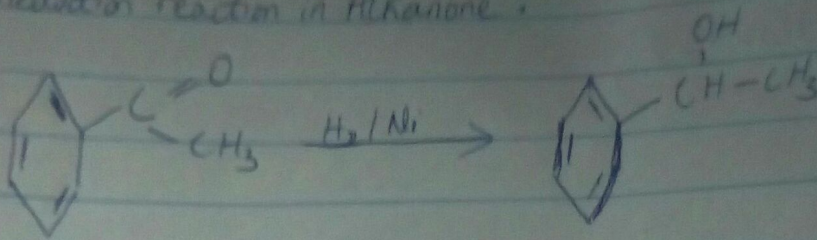
Ethanol can be manufactured by the hydration of ethene. In this reaction ethene (which comes from cracking crude oil fractions) is heated with steam in the presence of a catalyst phosphoric acid to speed up the reaction.



### ④ Reduction Reaction in Alkanals:

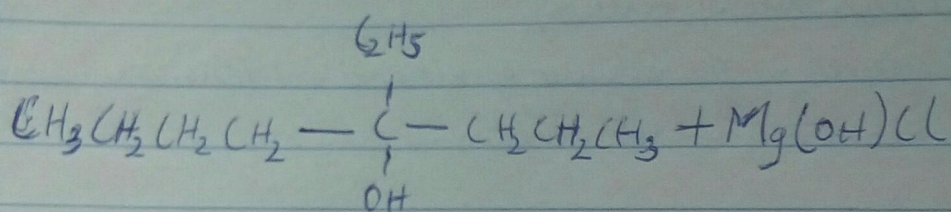
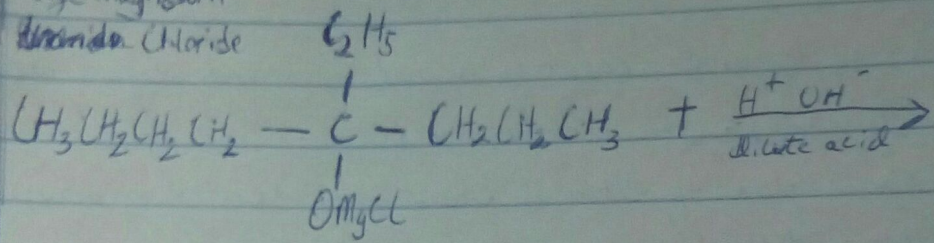


① Reduction reaction in Alkanone:



Ethyl magnesium  
chloride

Octan-4-one



4-ethyl Octan-4-ol