

# SYNTHETIC REAGENTS

1.

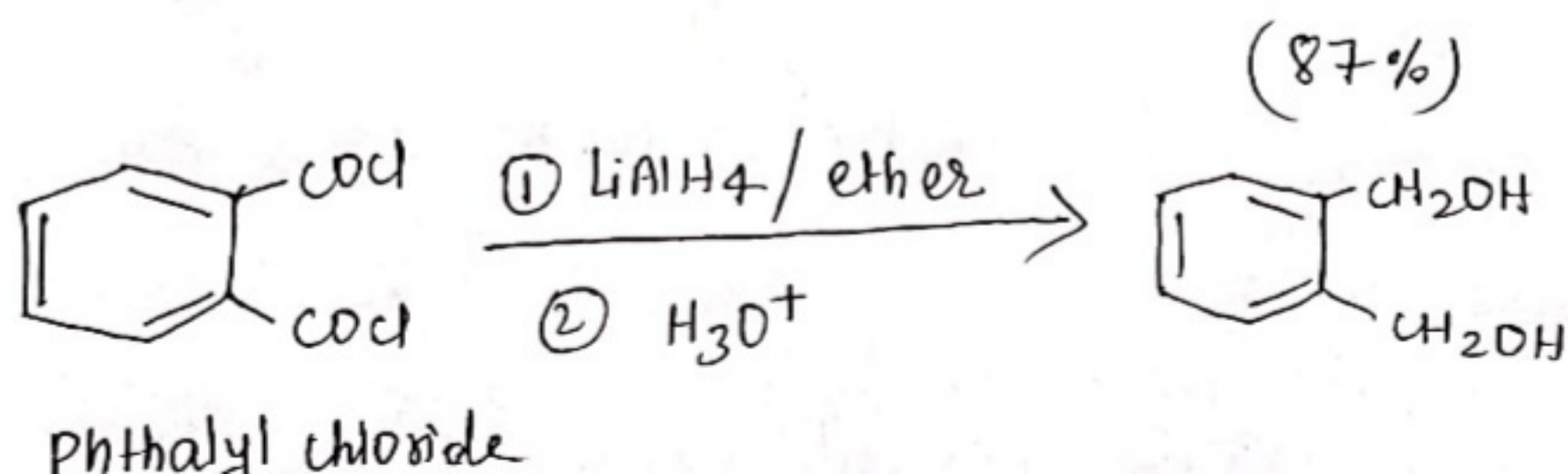
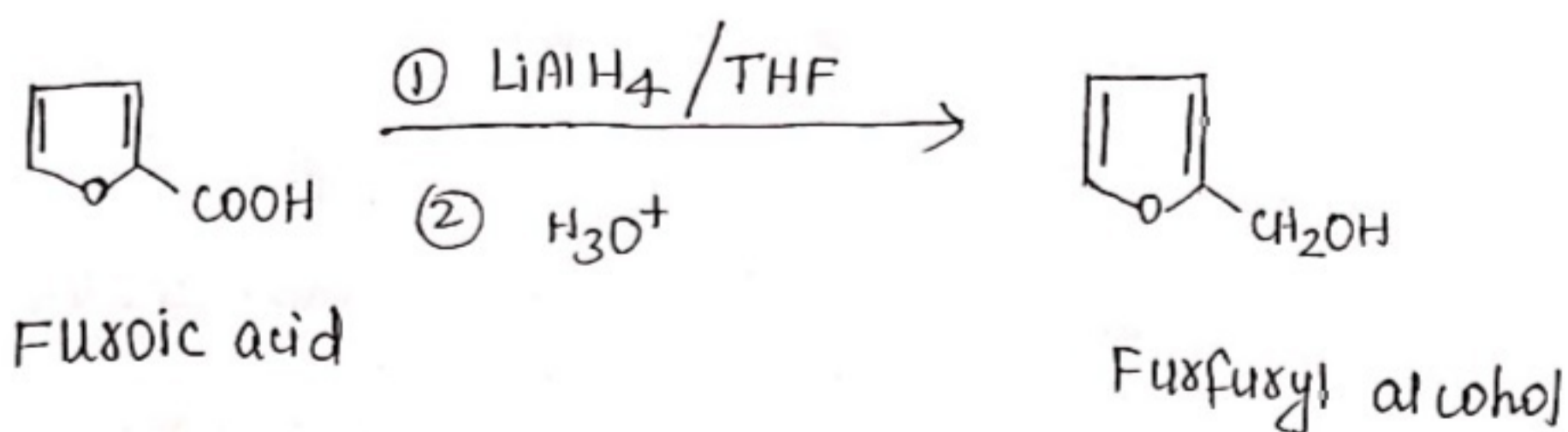
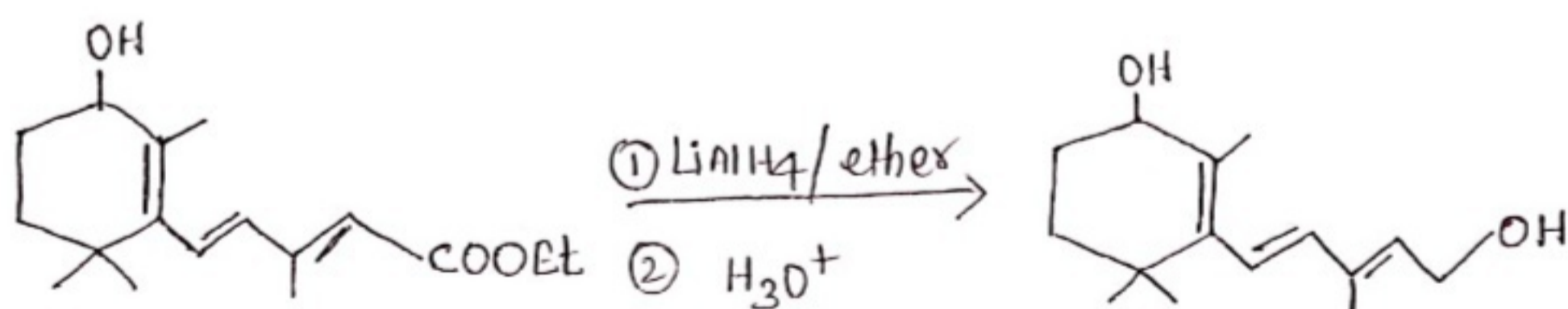
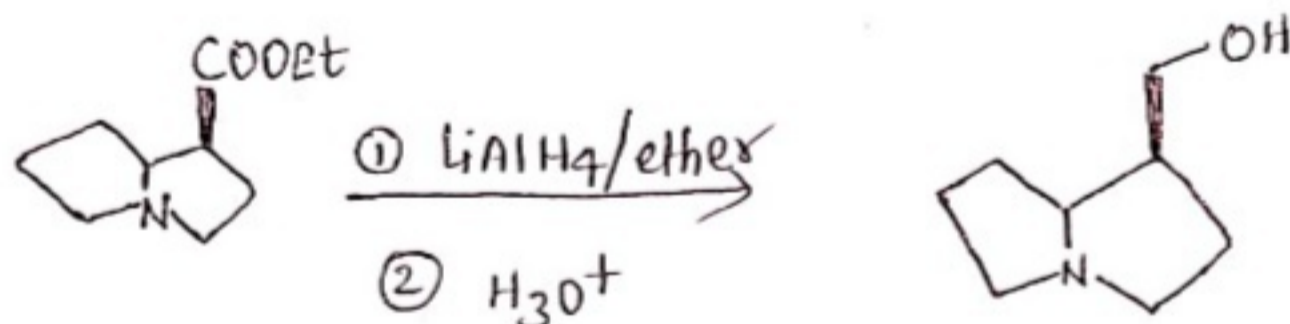
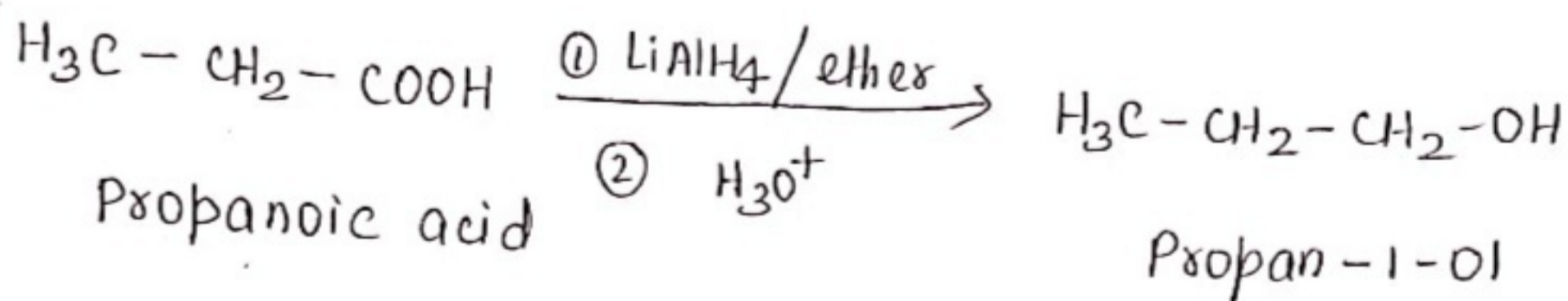
By-Dr.Rinky  
29-07-2020

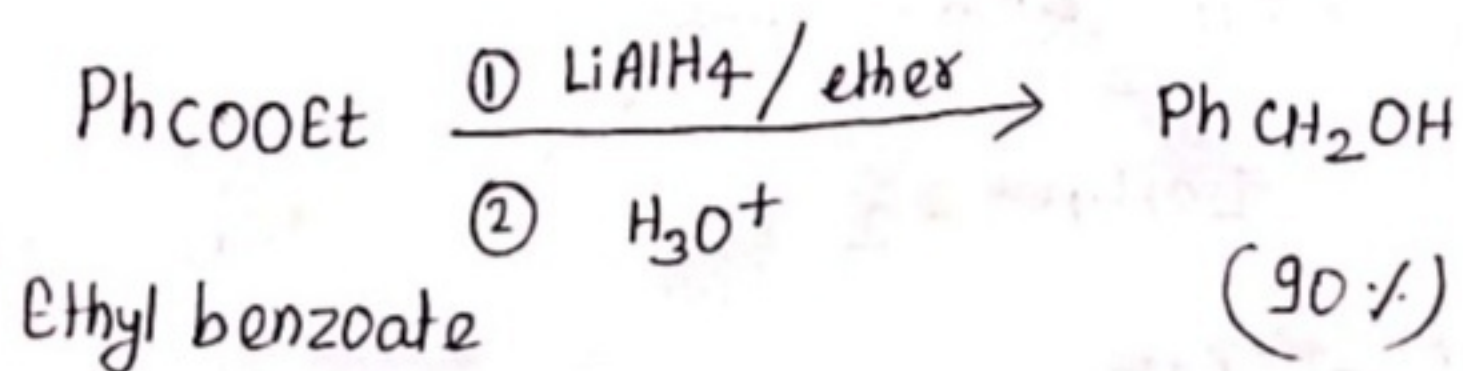
## LECTURE -2

Organic Chemistry  
Paper-VII,Chapter-2

### DEGREE-II (CHEMISTRY HONS.)

#### Lithium Aluminium Hydride Continue..

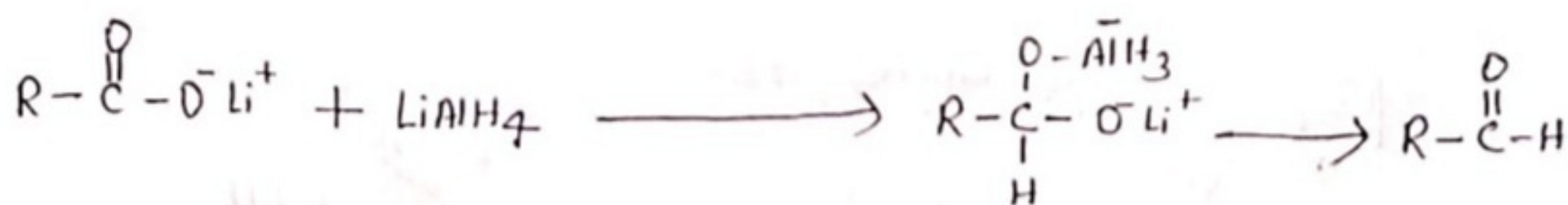




## Mechanism

LAH is one of the few reagents that can reduce carboxylic acid to an alcohol. The mechanism of the reaction of carboxylic acid with LAH is not clear. However, it is suggested that carboxylic acid reacts with LAH to first give carboxylate anion and  $\text{H}_2$ . This is followed by addition of hydride ion to the carbonyl group to give tetrahedral intermediate.

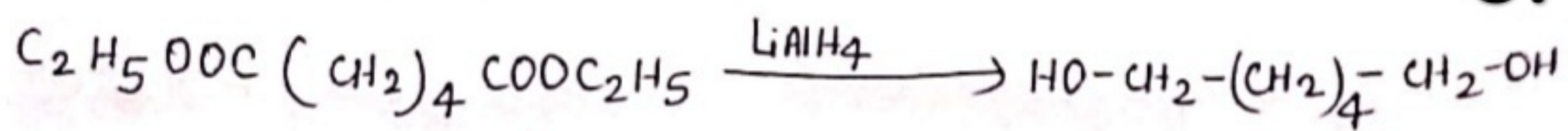
Finally intermediate collapses to give an aldehyde, which is further reduced to  $1^\circ$  alcohol.



\* Reduction of diesters to diols with  $\text{LiAlH}_4$  is a very useful reaction.

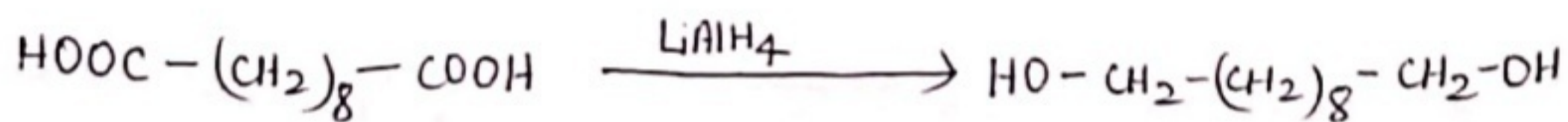
\* Similarly, dicarboxylic acid, sebacic acid is reduced to decan-1,10-diol.

3.



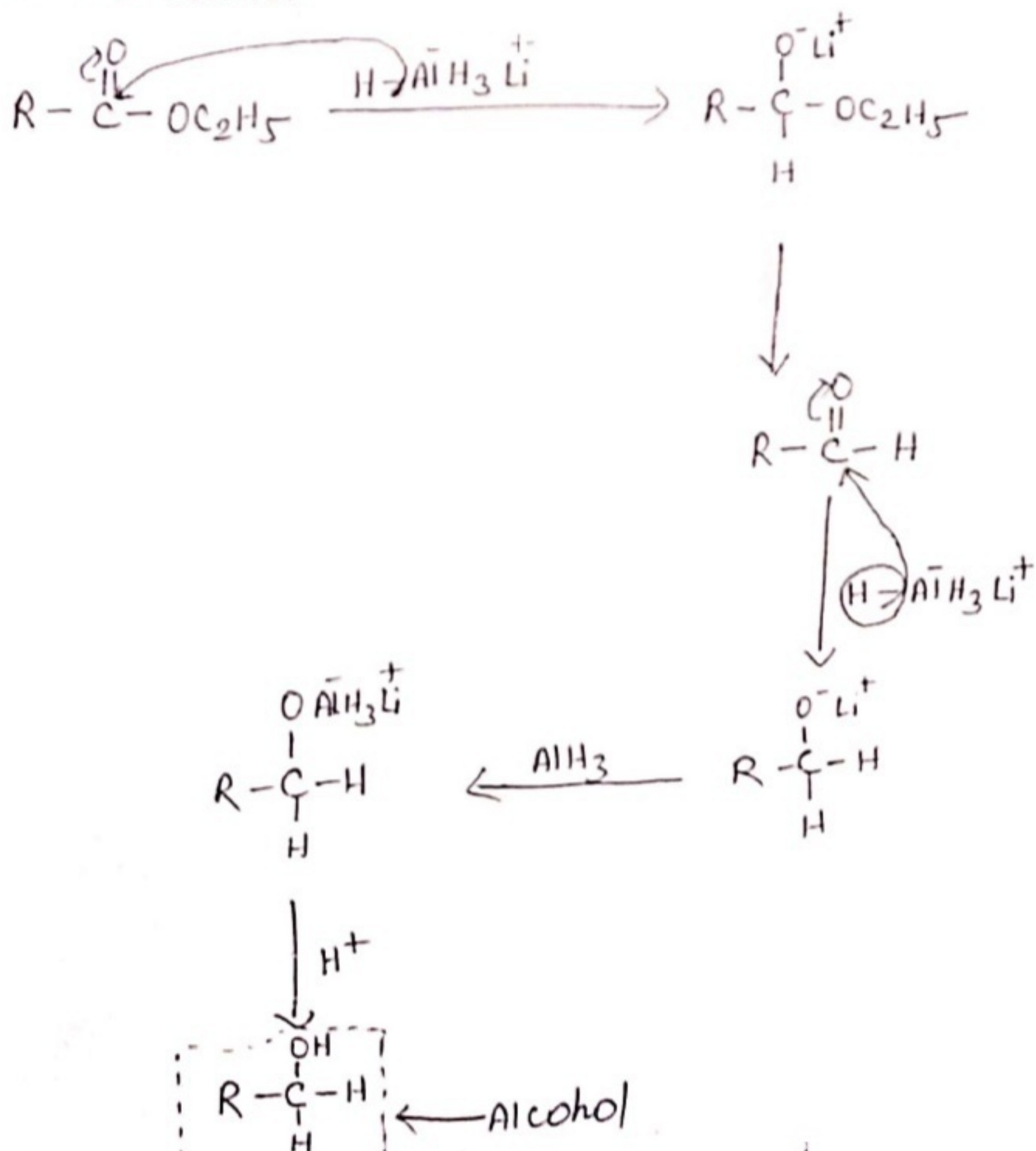
Diethyl adipate

Hexan-1,6-diol



Sebacic acid

Many LAH reduction of esters, acids and acid-chlorides are difficult to stop at the intermediate aldehyde or ketone state and the usual results in further reduction to the alcohol.

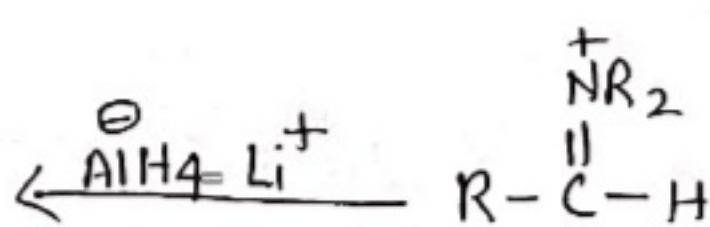
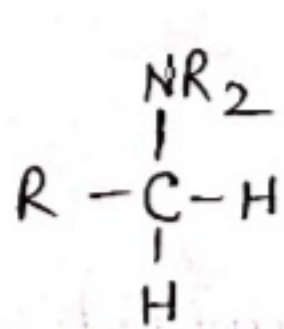
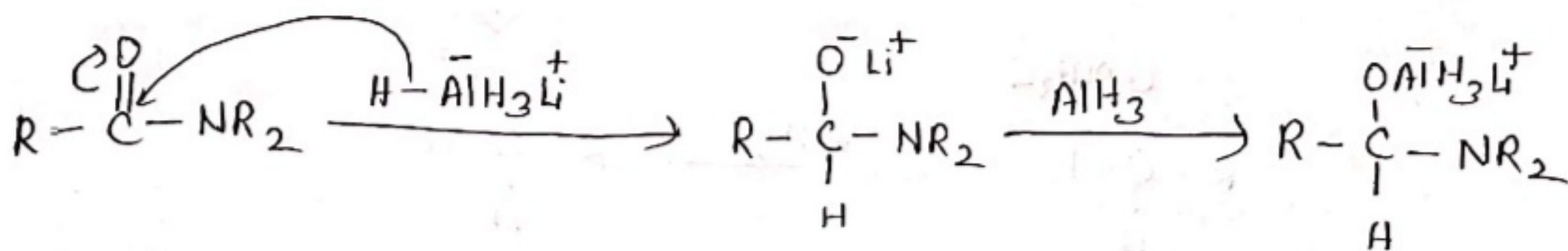
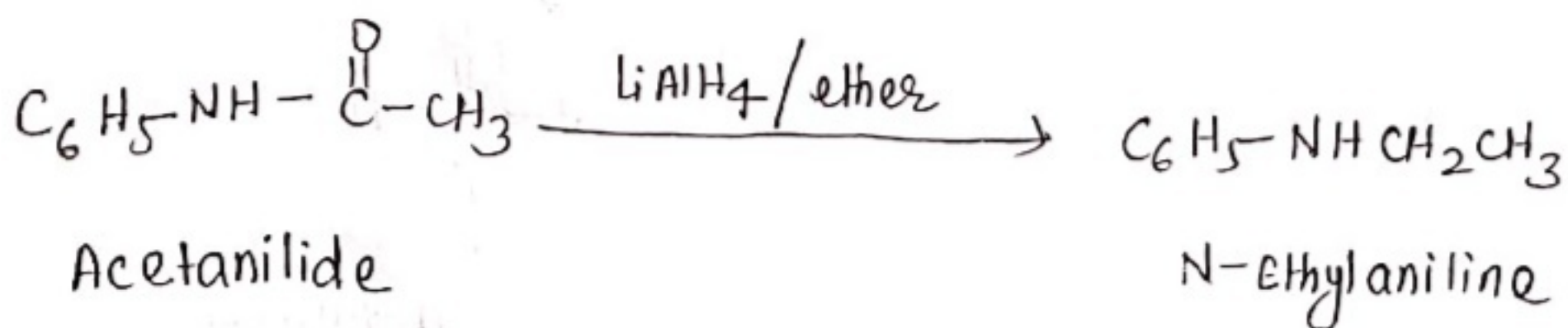
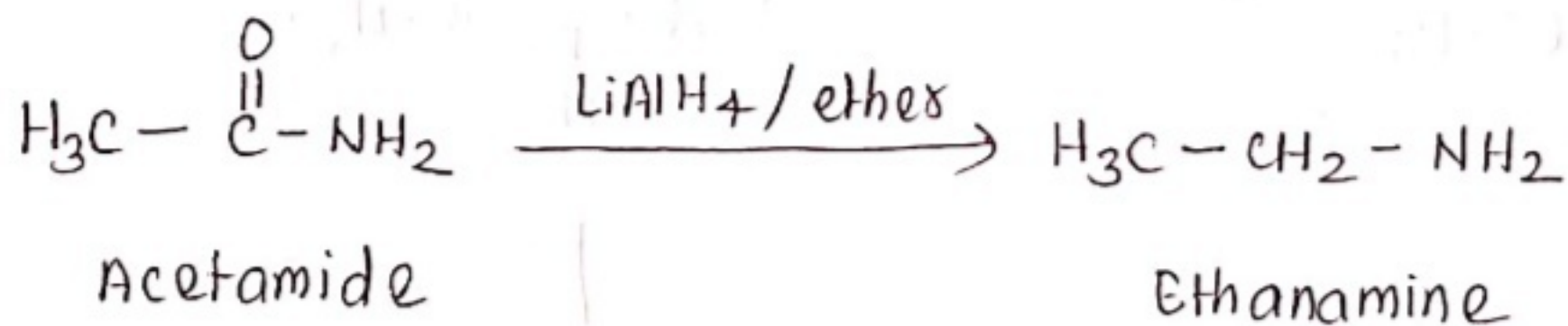


- \* Unsubstituted amides form primary amines, whereas N-substituted amides gives secondary amines, and N,N-disubstituted amides form tertiary amines.

\* Reduction of amide with LAH gives anion as intermediate

\* When the reaction is carried out at low temp. ( $-70^{\circ}\text{C}$ ), amides can be reduced to aldehydes.

For example; N,N-dimethylbenzamide gives 80% benzaldehyde at  $-70^{\circ}\text{C}$  with LAH in THF.



To be continued in next lecture...