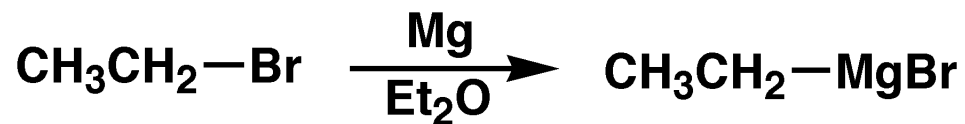


# Addition Involving Carbon Nucleophiles

## Grignard reagents



Reacts like a  
carbanion Nu:<sup>-</sup>



## Synthesis of **primary** alcohols

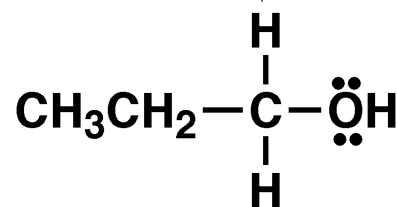
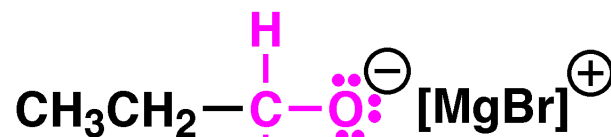
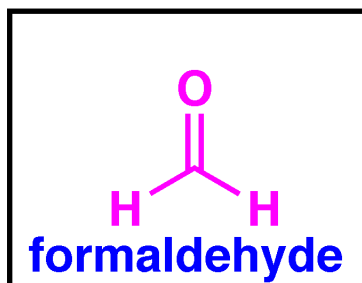
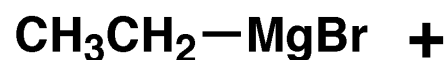


Image Gallery

C=O nucleophilic  
addition

C=O nucleophilic  
substitution

C=O addition - loss of  
carbonyl oxygen

Borohydride reduction

Cyanide addition

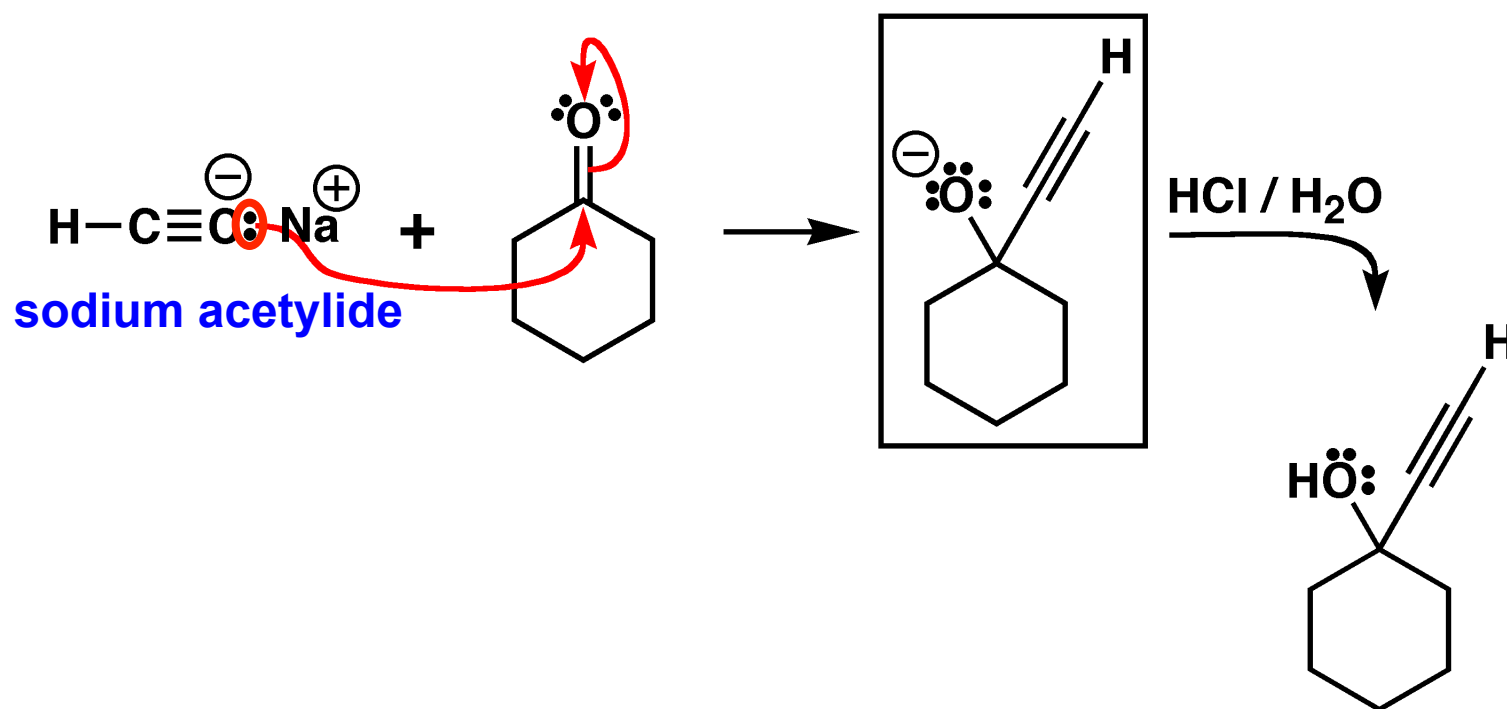
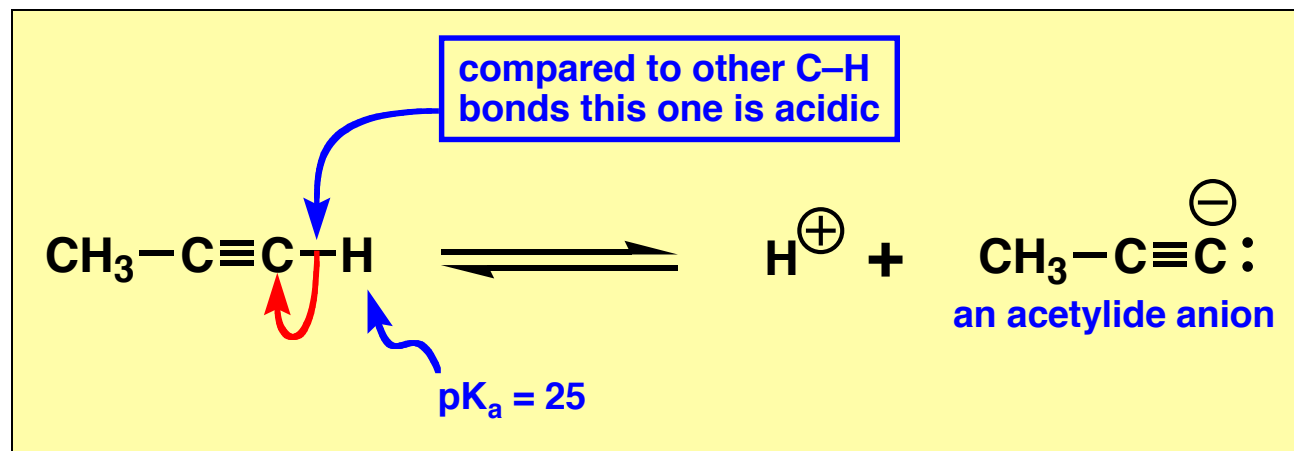
Hemiacetal formation

Grignard and organolithium addition

<http://www.chemtube3d.com/>



# Acetylide Anions As Carbon Nucleophiles



# Hydride Reduction of Ketones and Aldehydes

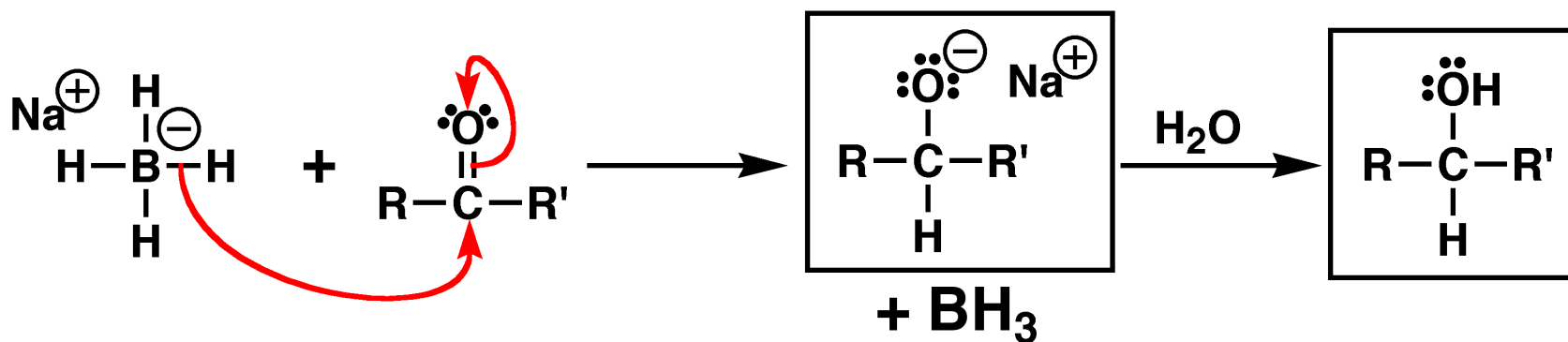
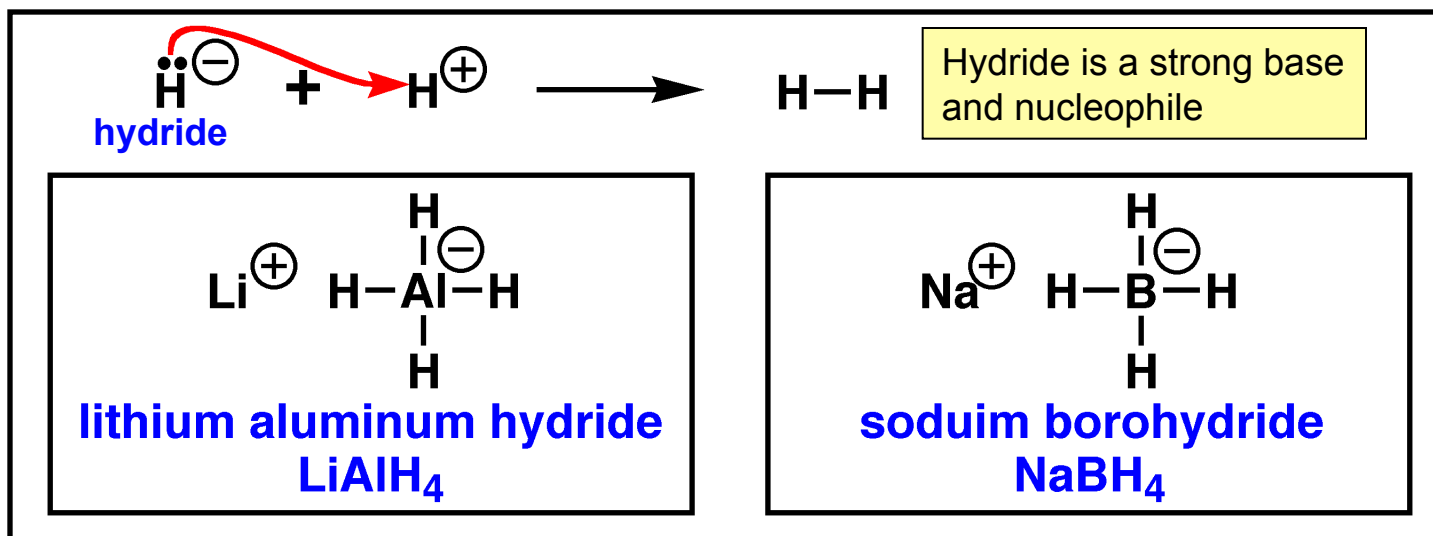


Image Gallery

C=O nucleophilic addition

C=O nucleophilic substitution

C=O addition - loss of carbonyl oxygen

Borohydride reduction

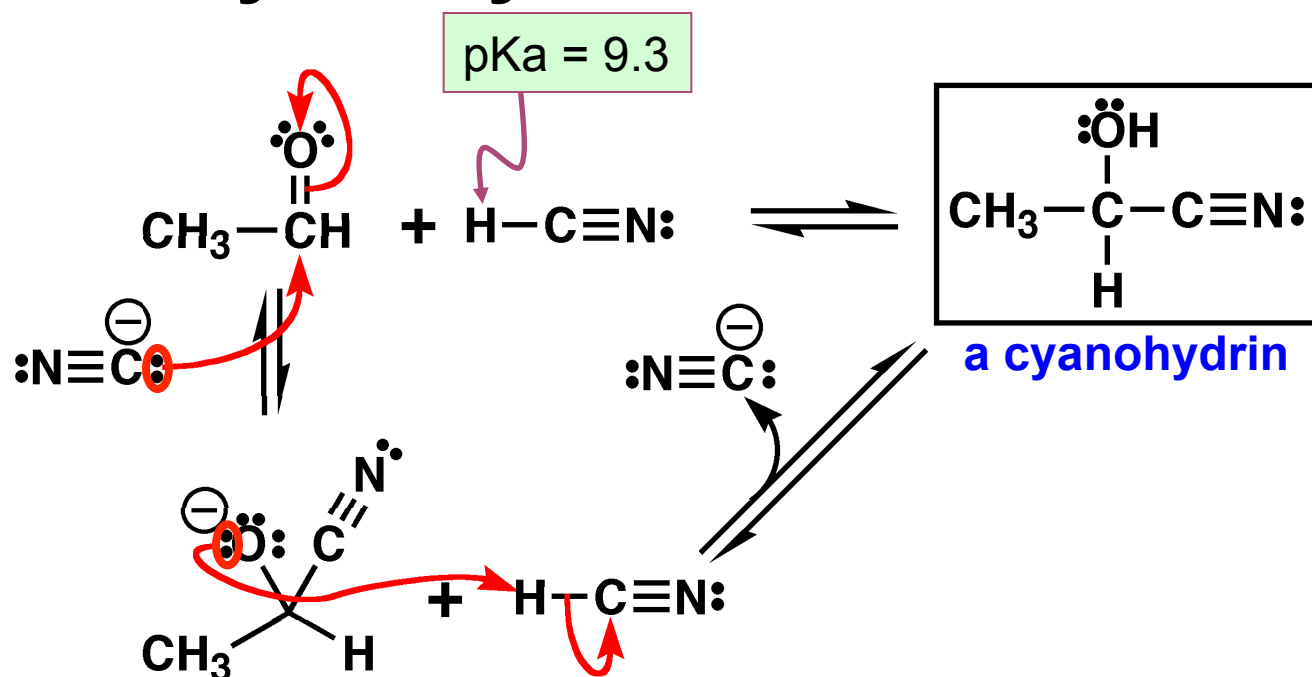
Cyanide addition

Hemiacetal formation

Grignard and organolithium addition

<http://www.chemtube3d.com/>

# Addition of H-CN to a Ketone or Aldehyde: Cyanohydrin Formation



For aldehydes and most ketones, the position of the equilibrium favors cyanohydrin formation. For aryl ketones and sterically hindered aliphatic ketones, starting materials are favored.

## Image Gallery

C=O nucleophilic addition

Borohydride reduction

Cyanide addition

C=O nucleophilic substitution

Hemiacetal formation

C=O addition - loss of carbonyl oxygen

Grignard and organolithium addition

<http://www.chemtube3d.com/>