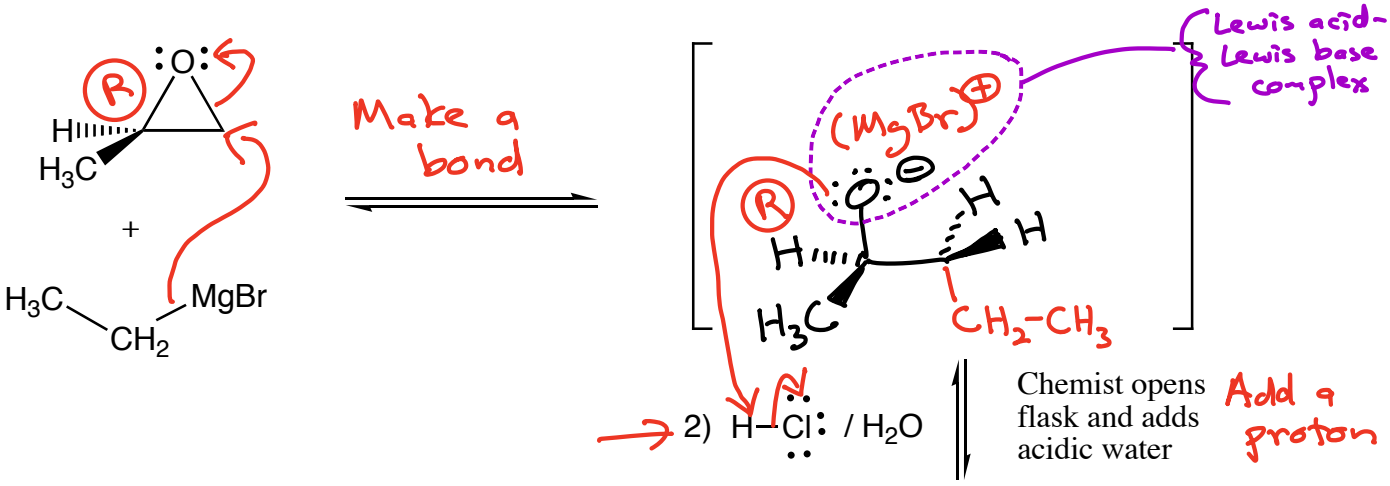
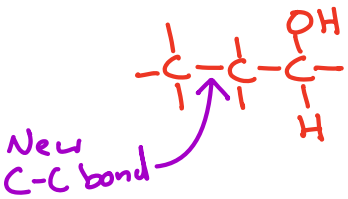
Organolithium and Gilman reagents react the same way as Grignard reagents in this reaction.

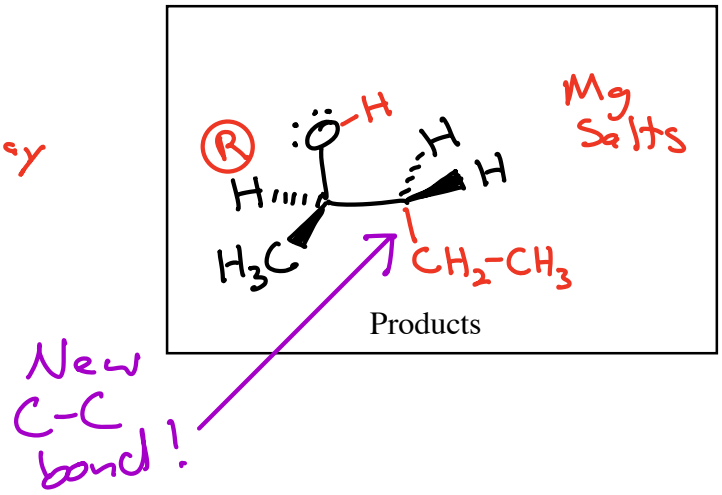
Grignard Reagent Reacting with an Epoxide

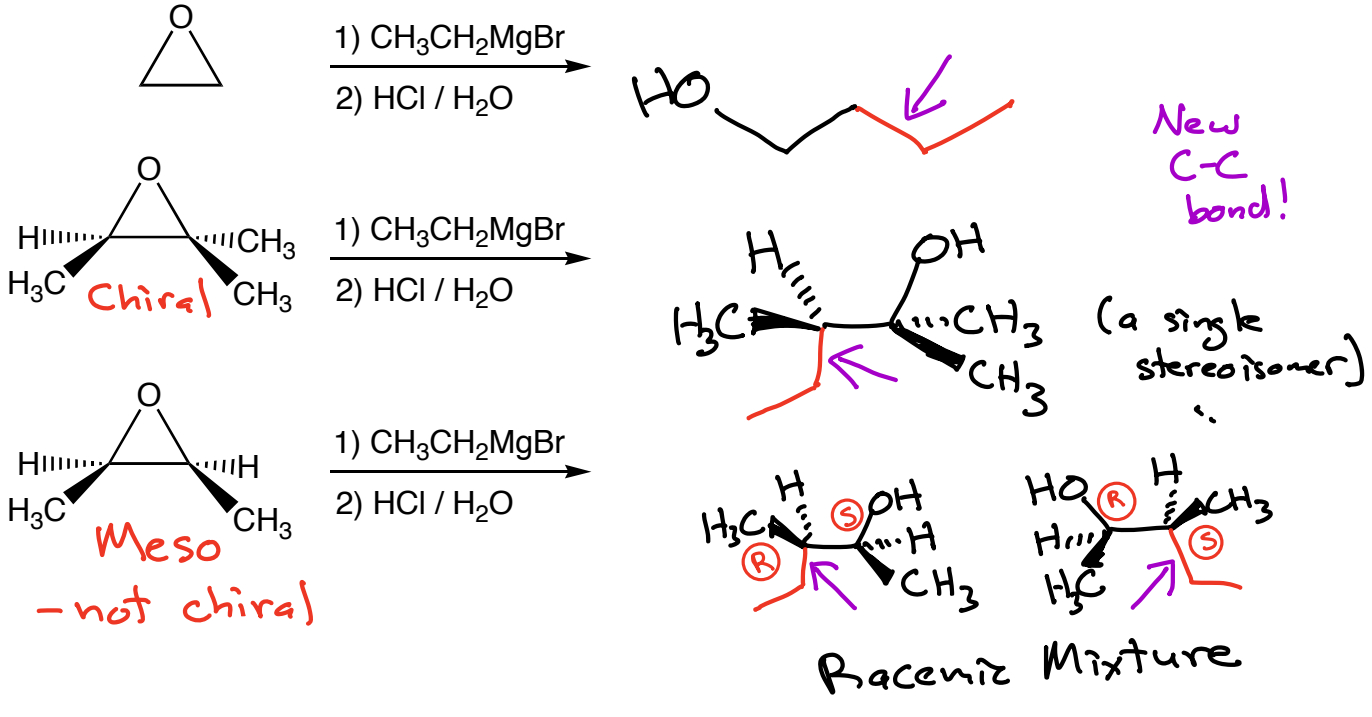


Key Recognition Element (KRE):

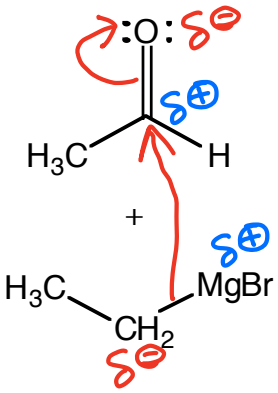
There is a new C-C bond that is two carbon atoms away from an OH group



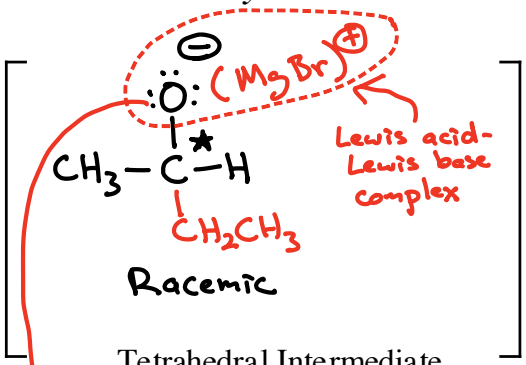




Grignard Reagent Reacting with an Aldehyde or Ketone



Make a bond



Chemist opens the flask

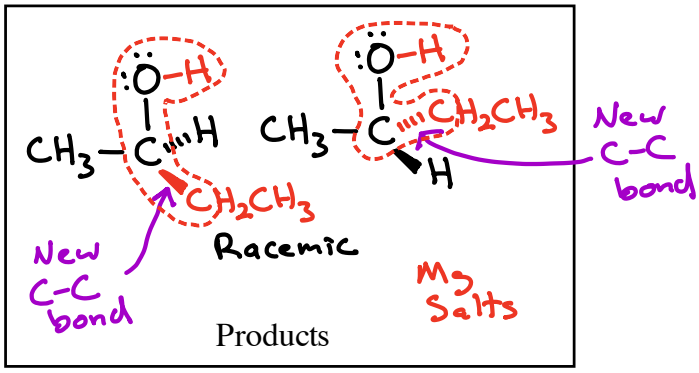
2) $H-Cl: / H_2O$

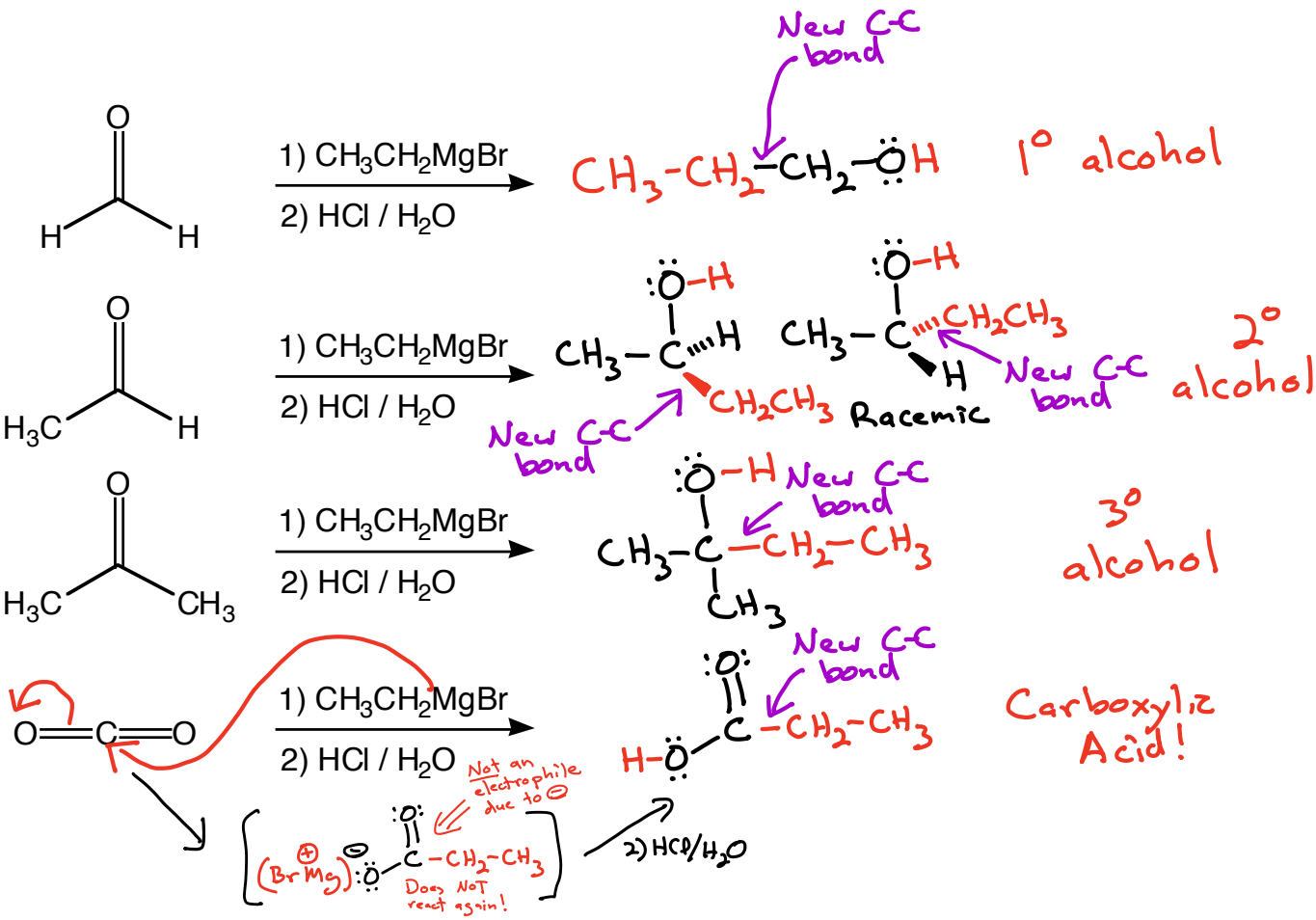
Add a proton

Mechanism A

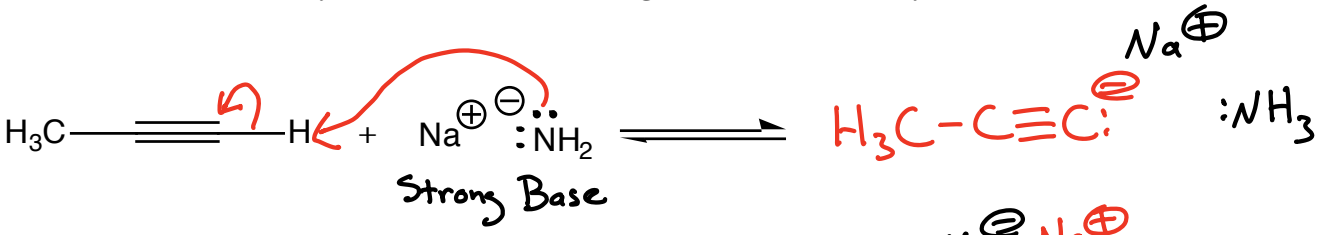
Key Recognition Element (KRE):

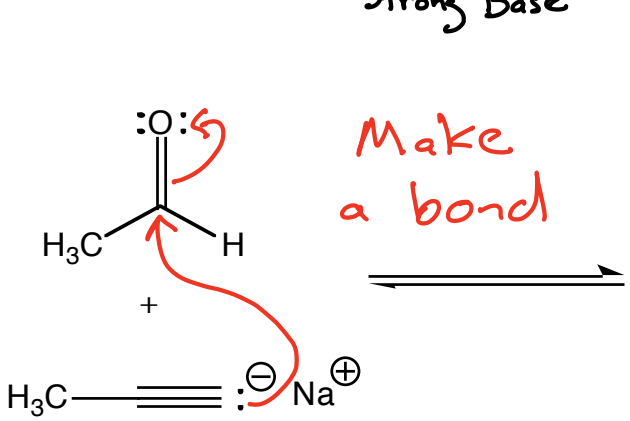
-OH group attached the same C atom as a new C-C bond

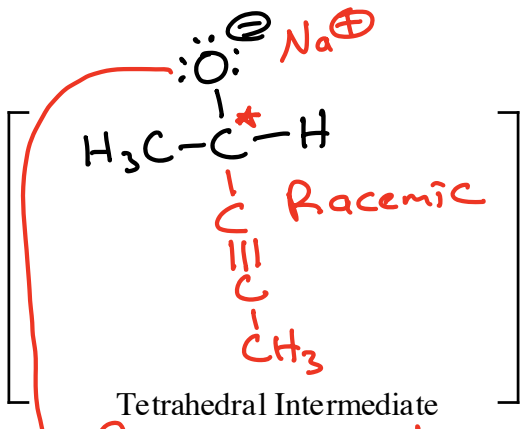


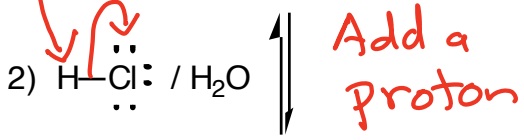


Alkyne Anion Reacting with an Aldehyde or Ketone





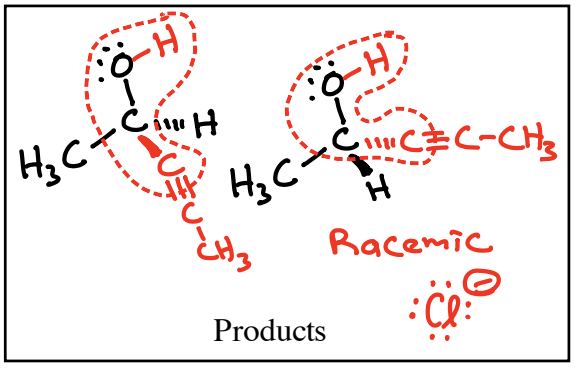




Mechanism A

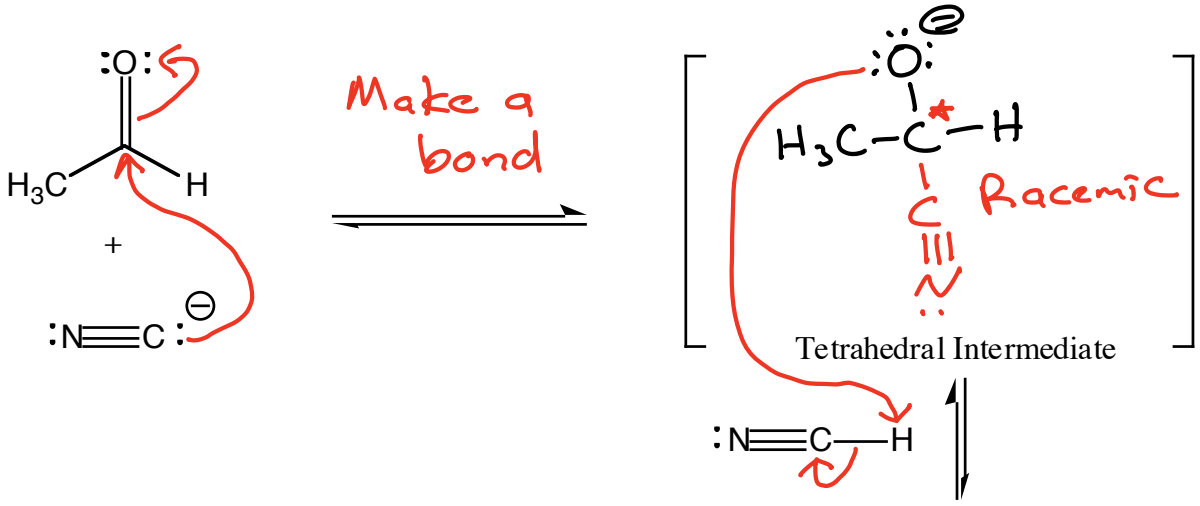
Key Recognition Element (KRE):

OH group on the carbon that makes a new C-C bond to an sp C atom (alkyne)



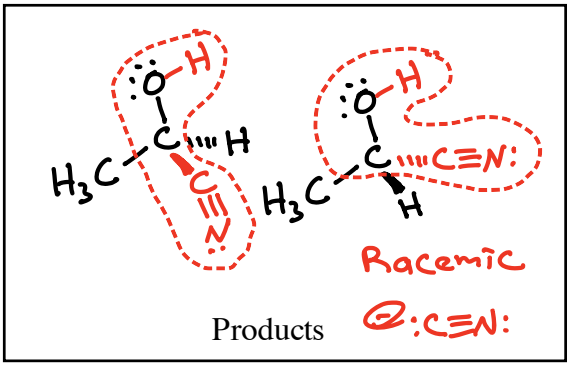
HCN Reacting with an Aldehyde or Ketone

Reacts on the C atom because that makes stronger bonds



Key Recognition Element (KRE):

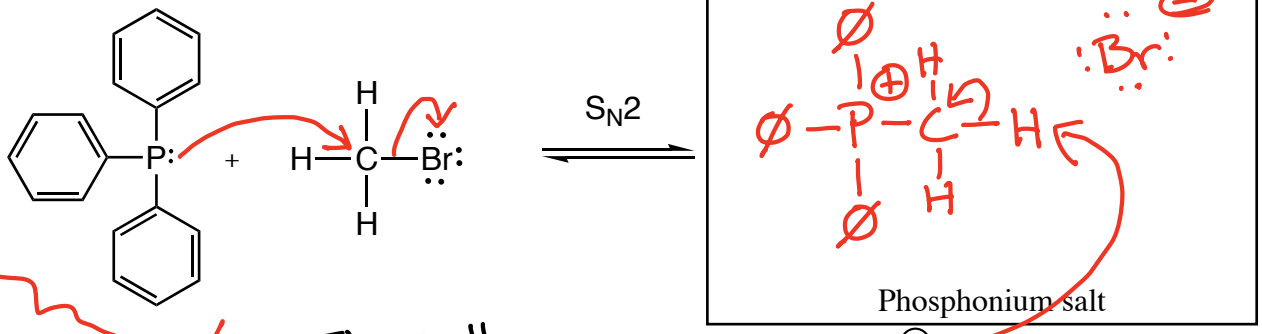
Cyanohydrin → OH on a C atom that made a new C-C bond to −C≡N:



Time capsule → cyanohydrins can be hydrolyzed in H_2SO_4/H_2O to give α-hydroxyacids

"alpha"

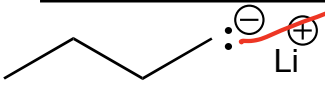
Wittig Reaction



ϕ–P: or $(Ph)_3P$:

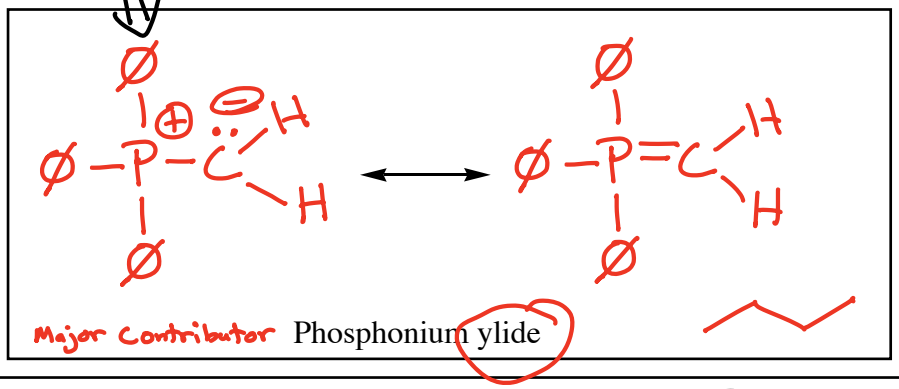
shorthand ways to indicate the same molecule

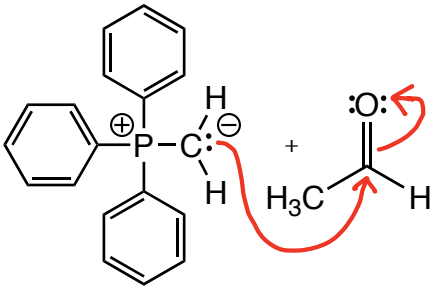
This is the way the think about a Wittig reagent



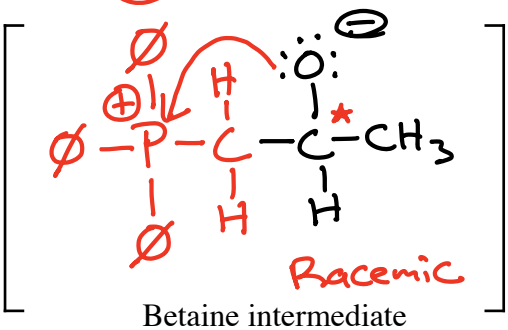
n-Butyl lithium (n-BuLi)

Take a proton away

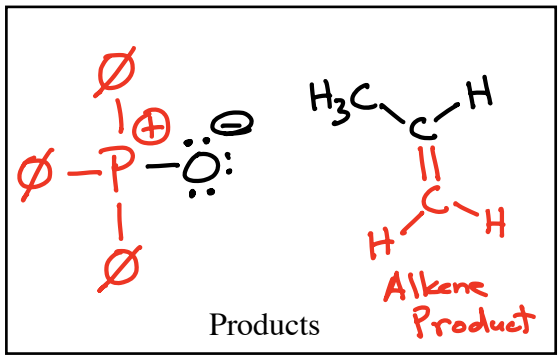




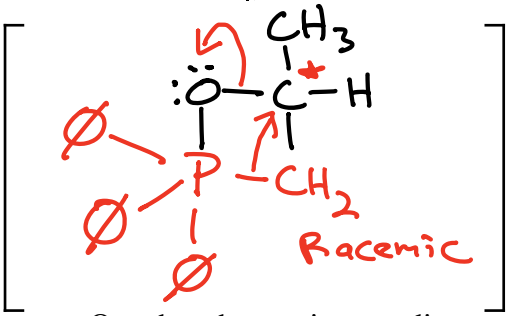
Make a bond



Make a bond



Remember this step!



"Four-membered ring intermediate"

Key Recognition Element (KRE):

Alkene → New C=C where the C=O was!