

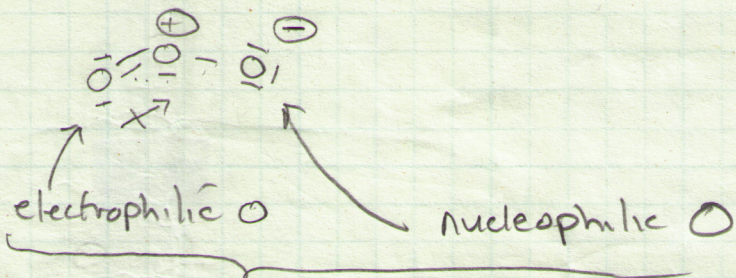
# Ozonolysis of alkenes

↓  
Ozone      Cut

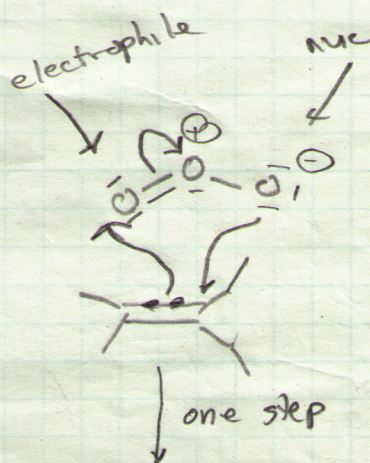
cleaving an alkene with Ozone ( $O_3$ )

Lewis structure that you should know how to draw.

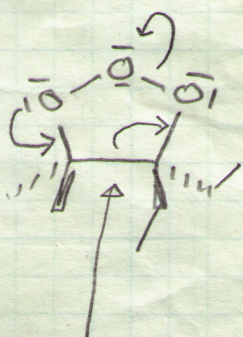
$O_3$  has 18 val  $e^-$



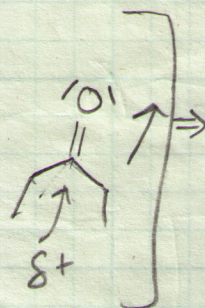
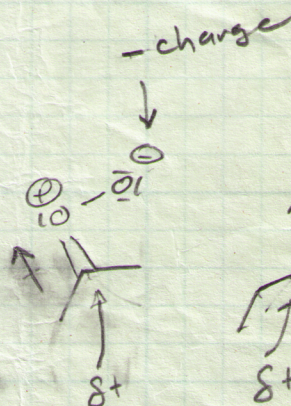
knowing this, how will it react with an alkene?



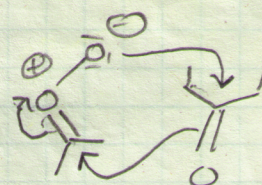
mulozonide



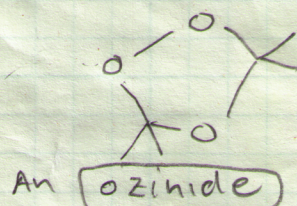
6  $e^-$  movement  
recall O-O bonds are relatively weaker.



Redrawn

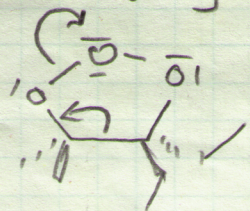


follow arrows

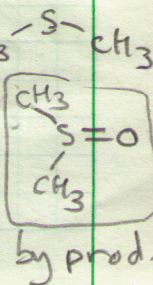
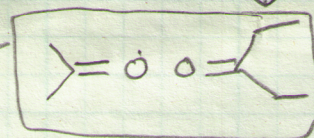


$O_3$  already broke the  $\pi$  bond, Now, this  $\sigma$  bond must break if Ozonolysis is proceeding.

NOTE: equally OK.



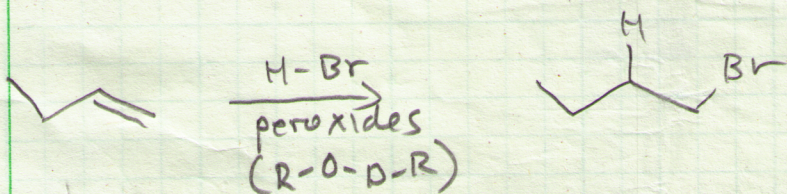
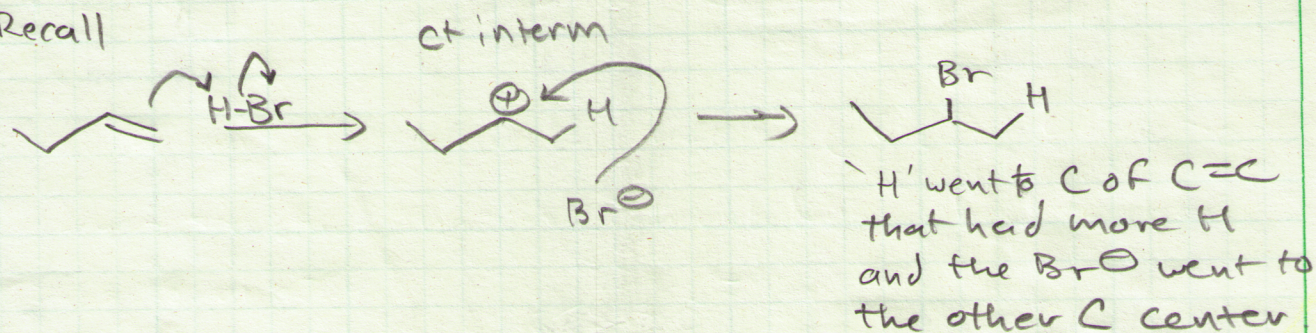
ozonolysis products



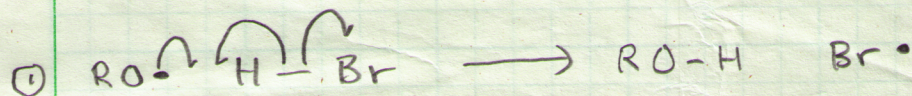
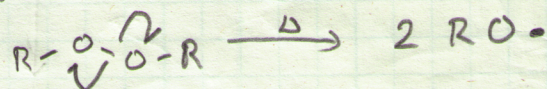


# Anti-Markovnikov Add<sup>n</sup> of H-Br in presence of peroxides

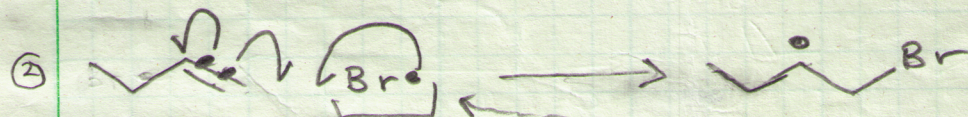
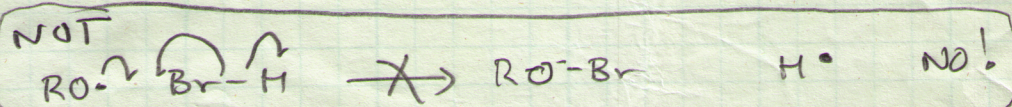
Recall



Mech:



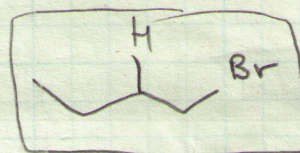
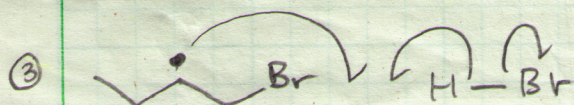
$\Delta H$  is exothermic (-)  
this drives this step.



electron deficient  
 $\therefore$  Lewis Acid!

It adds to C of  $\text{C}=\text{C}$  to give the more stable radical ( $^\bullet$ ) stabilized by hyperconjugation.

This is nothing new!



Anti-Markovnikov Product

$\text{Br}^\bullet$  used again

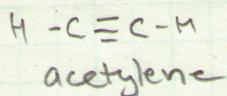


# Naming Alkynes.

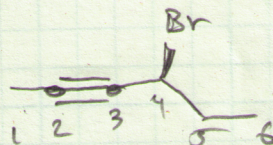
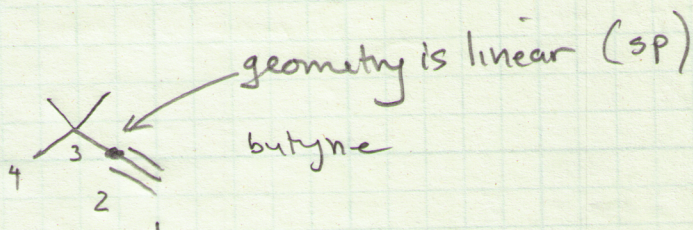
Rules similar to those for naming alkenes

Common name

IUPAC name

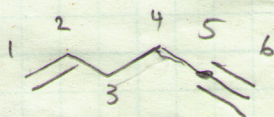


ethyne 'yne' for alkyne

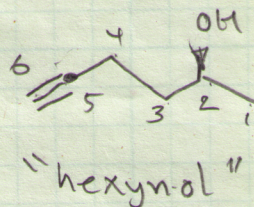
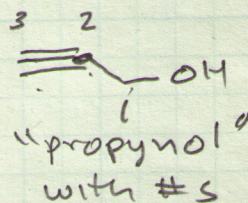


3,3-dimethyl-1-butyne  
"terminal alkyne"

(4S)-4-bromo-2-butyne  
"internal alkyne"



1-hexen-5-yne

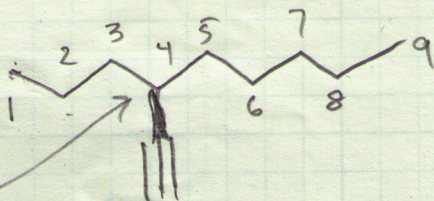


$C=C$  priority over  $C \equiv C$

2-propyn-1-ol

(2S)-5-hexyn-2-ol

OH priority over  $C \equiv C$



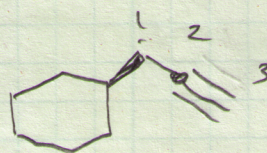
(4S)

No other chain link is  $\geq 9$

nonane

4-ethynyl

substituent suffix



2-propynylcyclohexane

put it together

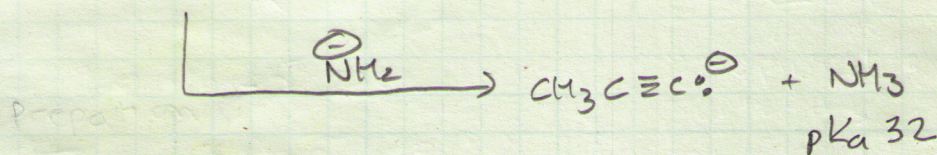
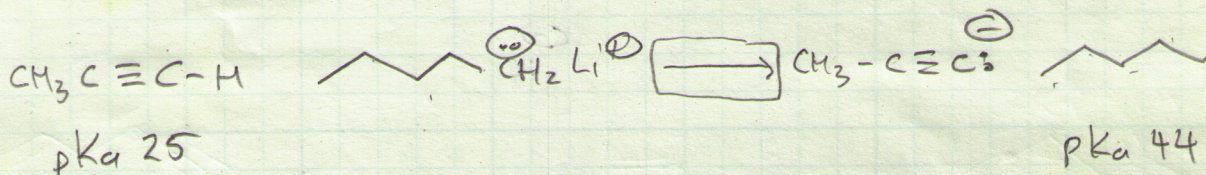


Which is more stable?

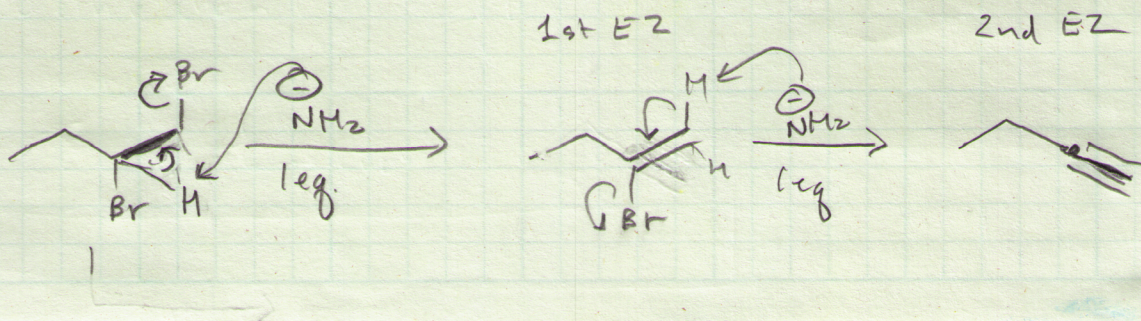
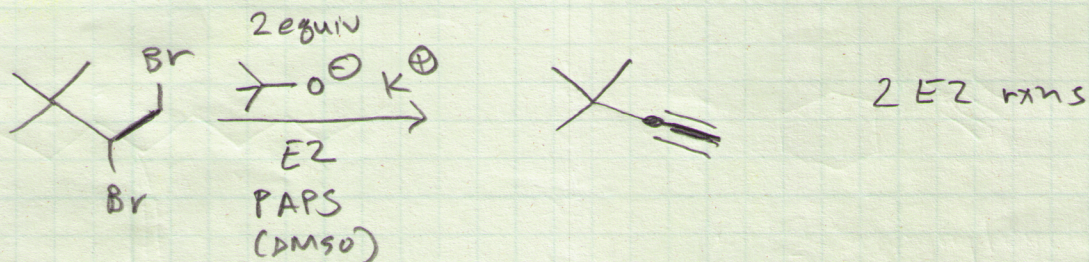


Ans. (B)

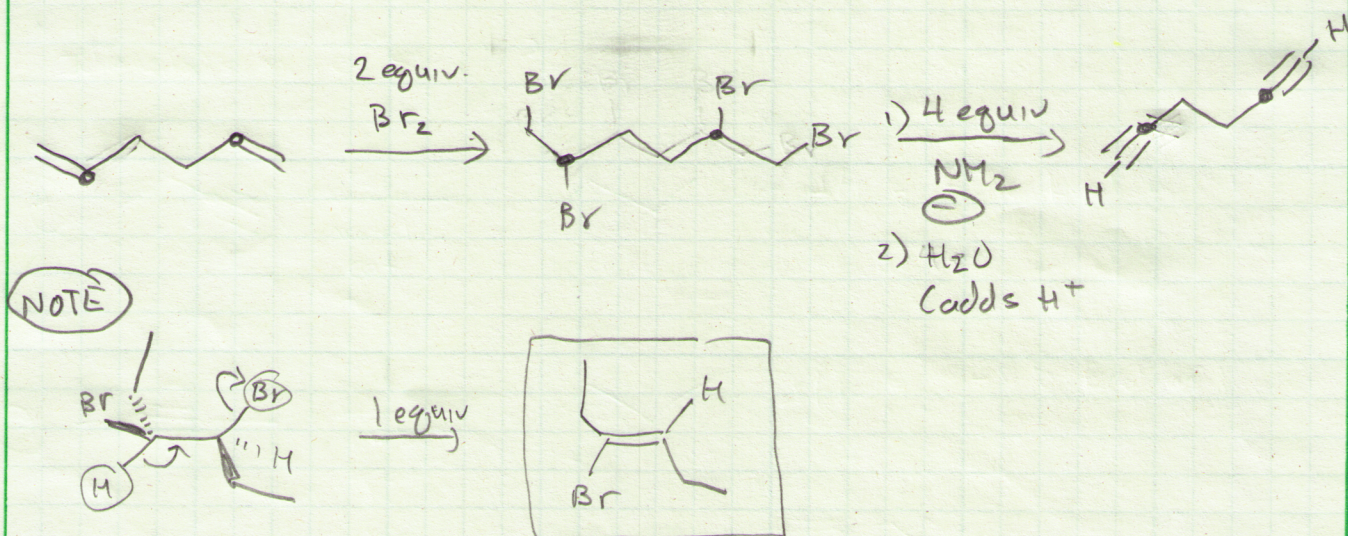
Acidity of terminal Alkyne



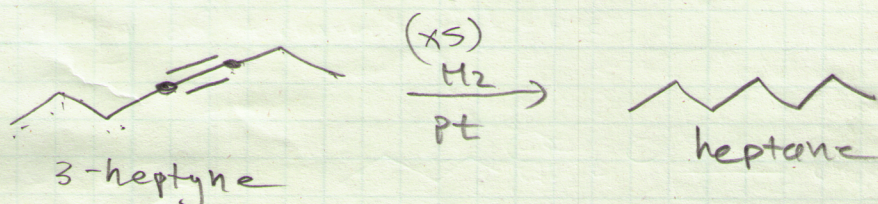
Prep of Alkynes via E2 of dibromo alkanes







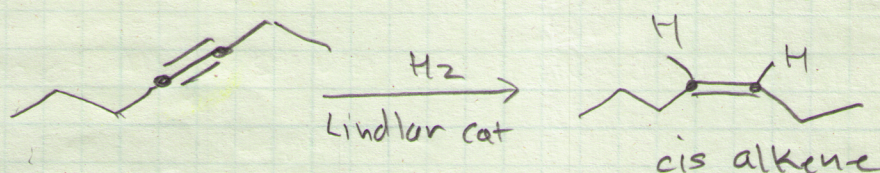
### Reduction of Alkynes ( $\text{H}_2$ Pt)



"Metered" reduction with  $\text{H}_2$  and Lindlar catalyst

syn-addition of 2-hydrogens

$\text{Pb}(\text{OAc})_2$   
 $\text{CaCO}_3$   
 quinoline



Anti add<sup>n</sup> of 2 H across  $\text{R}-\text{C}\equiv\text{C}-\text{R}$   $\left[ \begin{array}{l} 1) \text{ Na}^+ \text{ liquid NH}_3 \\ 2) \text{ H}_2\text{O} \end{array} \right]$

