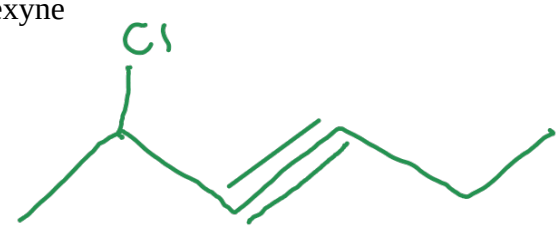
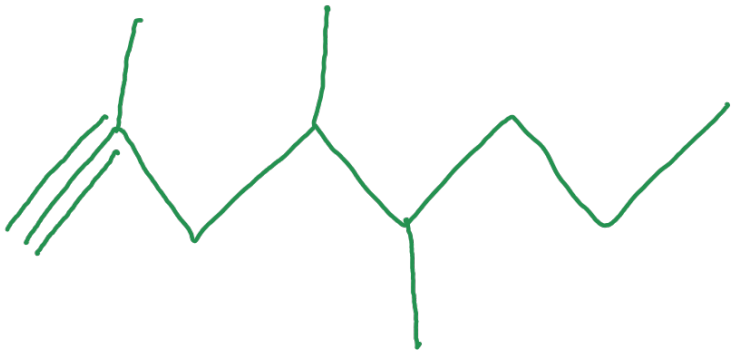
1. Draw the skeletal structures for each of the following:
   a) 2-chloro-3-hexyne



   b) 2,4,5-triethyl-1-octyne



   c) Cyclobutyne

2. Name the following:

PC: Butanol Sub: 3-yne

d. $HOCH_2CH_2C{\equiv}CH$ (1 2 3 4)

3-Butyn-1-ol

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e. $CH_3CH{=}CHCH{=}CHCH{=}CHCH{=}CH_2$ (7 6 5 4 3 2 1)

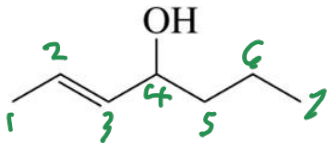
1,3,5-Heptatriene

f. $CH_3CH{=}C(CH_3)CH_2CH(CH_3)CH_2OH$ (6 5 4 3 2 1)

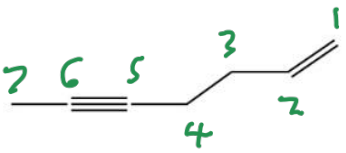
2,4-dimethyl-4-Hexen-1-ol

3. Name the following:

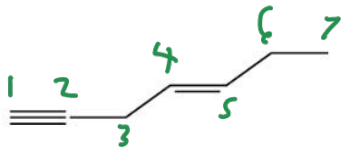
p.7

a. 

(E)-2-Hepten-4-ol

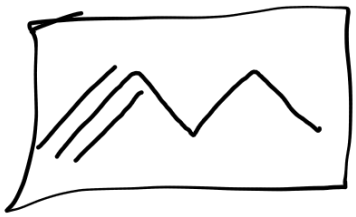
b. 

1-Hepten-5-yne

c. 

(E)-4-Hepten-1-yne

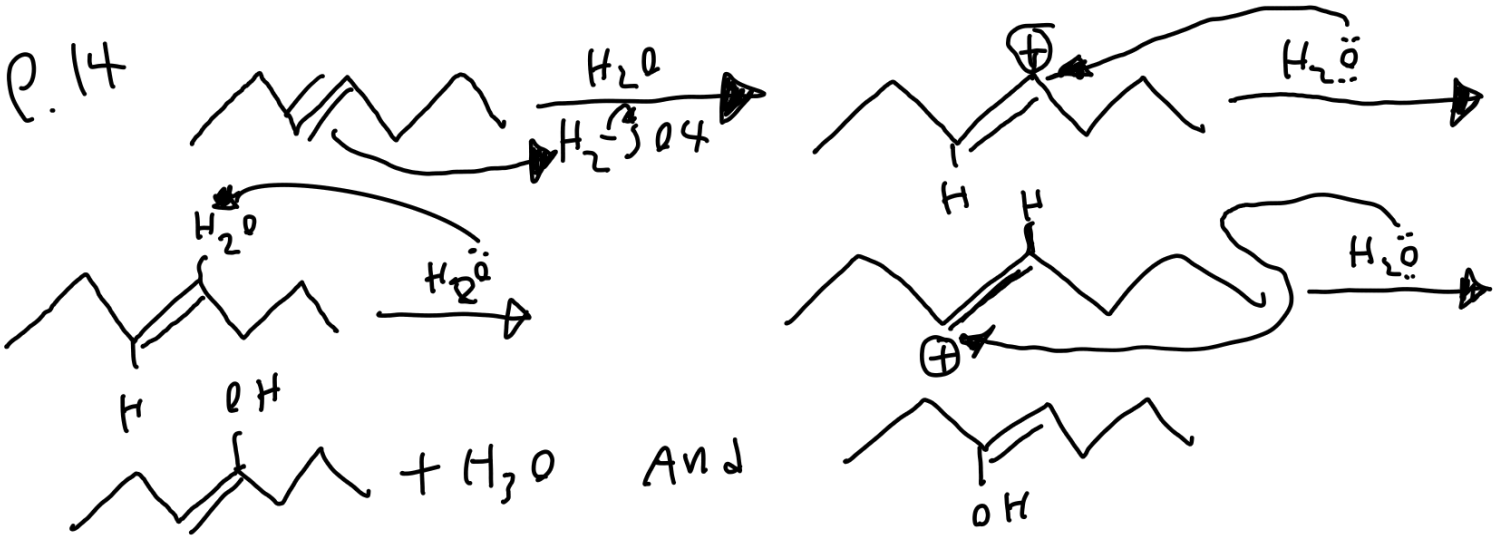
4. Why does 1-pentyne have a higher boiling point than 1-pentene?



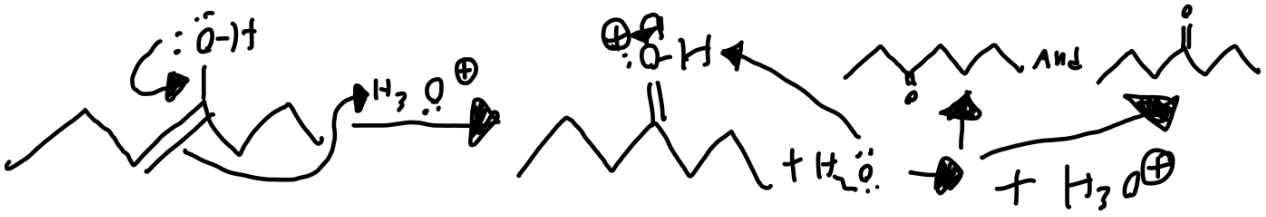
≡ has a bigger dipole moment than

5. What ketones are formed from the acid-catalyzed hydration of 3-heptyne?

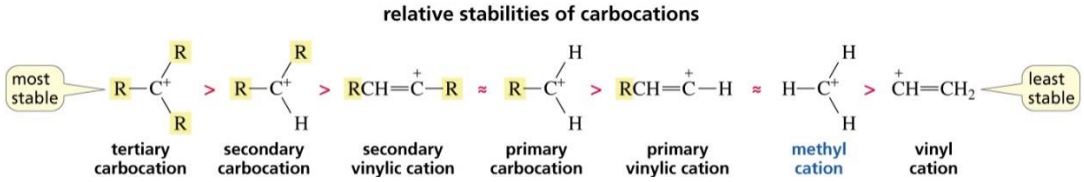
p.14



And



6. Knowing this:



p. 12 What is the major product of the following reactions?

a. $HC{\equiv}CCH_3 \xrightarrow{HBr}$

b. $HC{\equiv}CCH_3 \xrightarrow{\text{excess } HBr}$

c. $CH_3C{\equiv}CCH_3 \xrightarrow[CH_2Cl_2]{Br_2}$

d. $HC{\equiv}CCH_3 \xrightarrow[CH_2Cl_2]{\text{excess } Br_2}$

e. $CH_3C{\equiv}CCH_3 \xrightarrow{\text{excess } HBr}$

f. $CH_3C{\equiv}CCH_2CH_3 \xrightarrow{\text{excess } HBr}$

(A) $HC{\equiv}CCH_3 \xrightarrow{H\text{-}Br} H_2C{=}\overset{\oplus}{C}CH_3 + :\ddot{Br}:^- \longrightarrow H_2C{=}C(Br)CH_3$

(B) $HC{\equiv}CCH_3 \xrightarrow{ex.\ H\text{-}Br} H_2C{=}\overset{\oplus}{C}CH_3 \xrightarrow[ex.\ HBr]{:\ddot{Br}:^-} HC(Br){=}CH_3 \xrightarrow{ex.\ H\text{-}Br}$

$H_3C{-}\overset{\oplus}{C}(Br)CH_3 \xrightarrow{:\ddot{Br}:^-} H_3C{-}C(Br)(Br)CH_3$

configuration would be E

(C) $CH_3C{\equiv}CH_3 \xrightarrow[CH_2Cl_2]{Br\text{-}Br}$

$CH_3C{=}CCH_3 \xrightarrow{:\ddot{Br}:^-}$ (bromonium ion) $\longrightarrow CH_3C(Br){=}CCH_3$ (Br)

(D) $HC{\equiv}CCH_3 \xrightarrow[CH_2Cl_2]{ex.\ Br_2} H\text{-}C(Br)(Br)\text{-}C(Br)(Br)\text{-}CH_3$

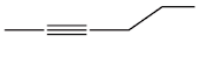
(E) $CH_3C{\equiv}CCH_3 \xrightarrow{ex.\ HBr} CH_3\text{-}C(Br)=C(H)\text{-}CH_3$

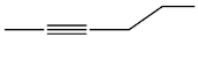
(F) $CH_3C{\equiv}CCH_2CH_3 \xrightarrow{ex.\ H\text{-}Br}$

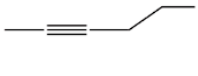
$CH_3\text{-}C(Br)(H)\text{-}C(H)(Br)\text{-}CH_2CH_3$ And $CH_3\text{-}C(H)(Br)\text{-}C(Br)(H)\text{-}CH_2CH_3$

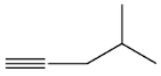
7. What are the products of the following reactions?

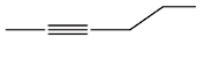
p.20

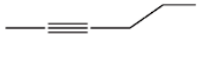
a.  + H_2 $\xrightarrow{Pd/C}$

b.  + H_2 $\xrightarrow[\text{catalyst}]{\text{Lindlar}}$

c.  $\xrightarrow[NH_3(liq)\ -78\ ^\circ C]{Na}$

d.  $\xrightarrow[2.\ HO^-, H_2O_2, H_2O]{1.\ R_2BH/THF}$

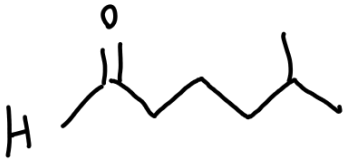
e.  $\xrightarrow[2.\ HO^-, H_2O_2, H_2O]{1.\ R_2BH/THF}$

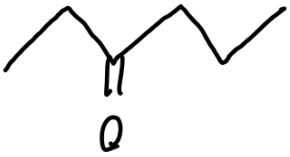
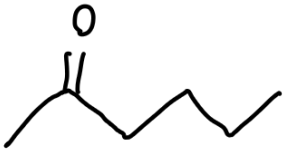
f.  + H_2O $\xrightarrow{H_2SO_4}$

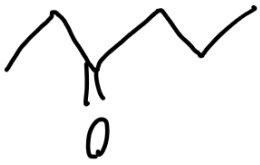
(A)  H Added to the same side

(B)  H Added to the same side

(C)  H Added Anti Addition

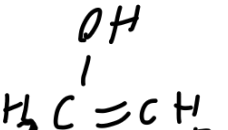
(D) 

(E)  And 

(F)  And 

$\underline{H_2SO_4}$ / $HgSO_4$ for terminal Alkyne

Acids.....

enol = 

Ketone