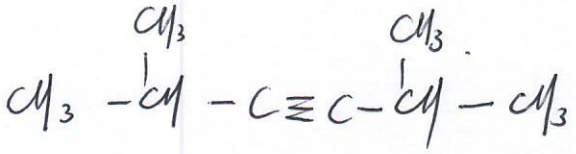
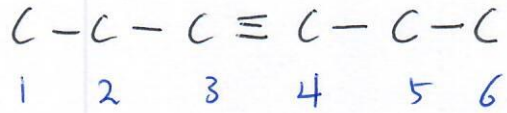
Problem 9.-1.-1.

(a)



① Find the parent.



3 - hexyne.

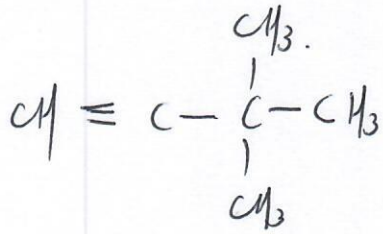
② Find the substituents.

2- methyl , 5 - methyl.

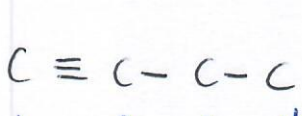
③ write the full name

2. 5 - Dimethyl -3- hexyne.

(b)



① Find the parent.



butyne.

② Find the substituents

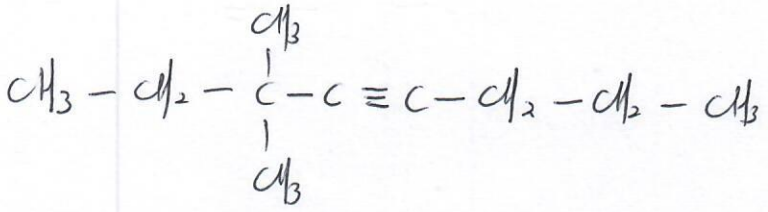
3 - methyl , 3 - methyl.

problem 9-1-2

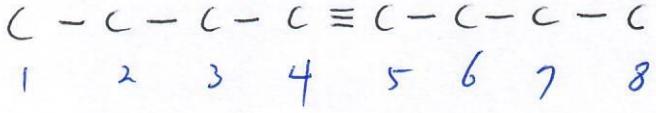
③ write the full name.

3, 3- Dimethyl butyne.

(c)



① Find the parent.



4 - octyne.

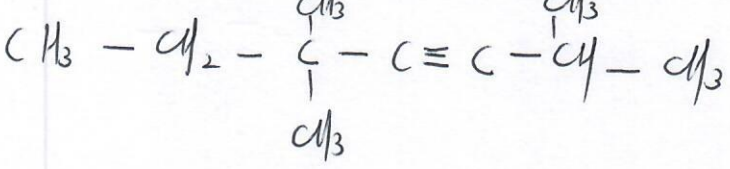
② Find the substituents.

3 - methyl , 3- methyl

③ write the full name.

3, 3 - Dimethyl -4- octyne.

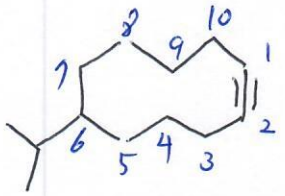
(d)



2, 5, 5 - Trimethyl - 3 - heptyne.

Problem 9-1-3

(e)



① Find the parent

cyclodecyne.

② Find the substituents.

6 - Isopropyl

③ Write the full name

6 - Isopropyl cyclodecyne.

(f) $CH_3-CH=CH-CH=CH-C\equiv C-CH_3$

① Find the parent.

C-C=C-C=C-C≡C-C

Double bonds receive lower number than triple bonds.

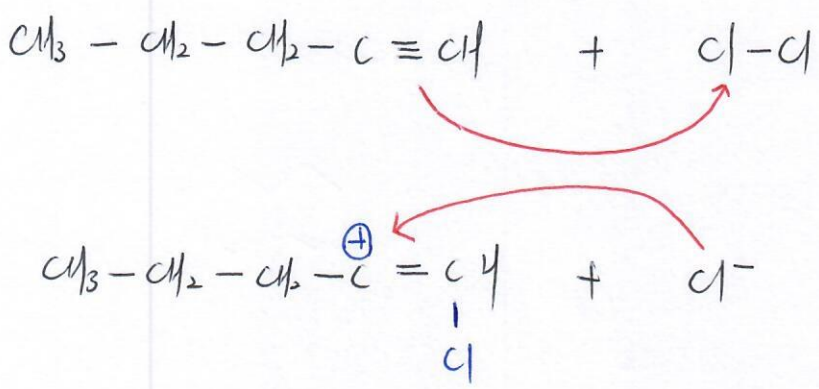
C-C=C-C=C-C≡C-C
1 2 3 4 5 6 7 8

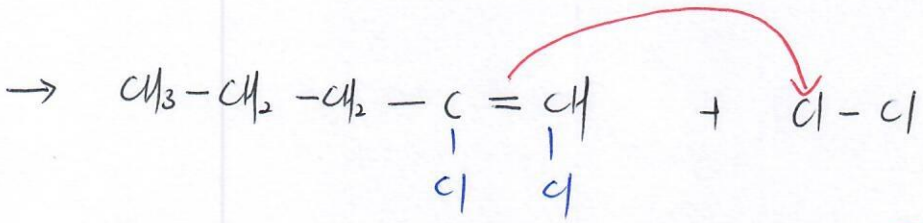
2,4-octadien-6-yne.

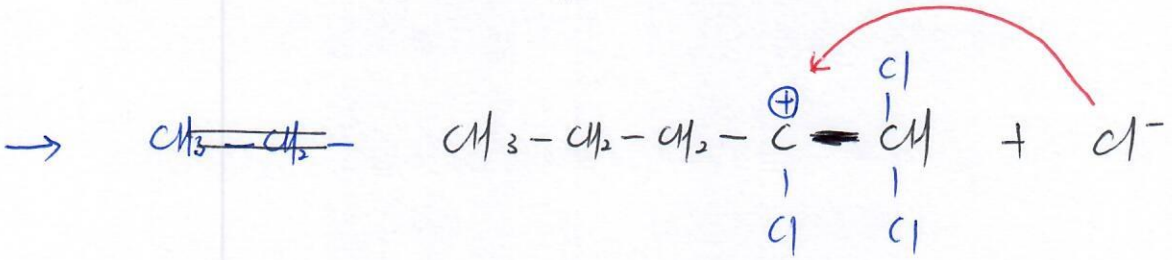
problem 9-3-1

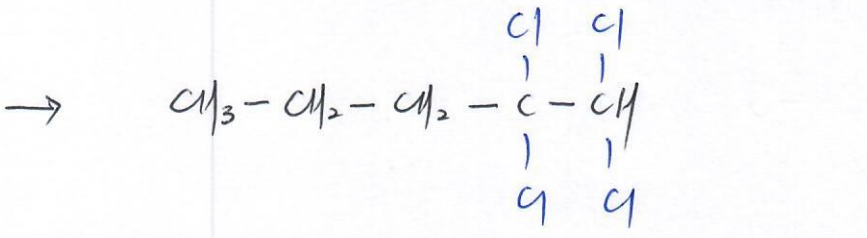
(a) $CH_3-CH_2-CH_2-C\equiv CH$ + $\underline{2\,Cl_2}$.

pentyne. $Cl_2 + Cl_2$





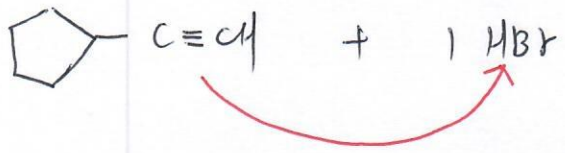




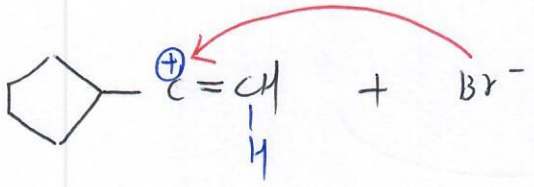
1, 1, 2, 2 - tetra chloro pentane.

Problem 9-3-2.

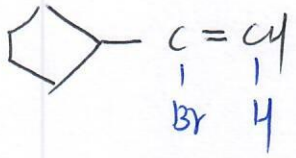
(b)



→



→



(C) $CH_3-CH_2-CH_2-CH_2-C\equiv C-CH_3 + HBr$.

→ $CH_3-CH_2-CH_2-CH_2-\overset{\oplus}{C}=C(H)-CH_3$ or $CH_3-CH_2-CH_2-CH_2-C(H)=\overset{\oplus}{C}-CH_3$

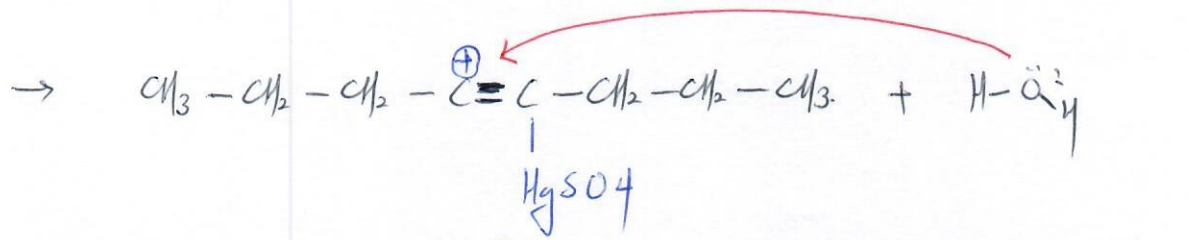
2° carbocation 2° carbocation.

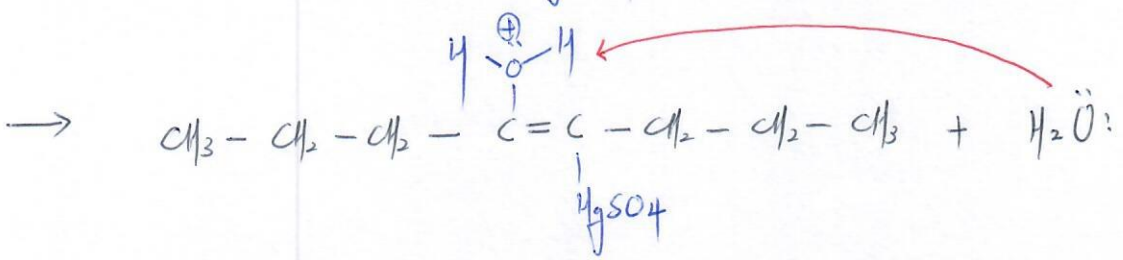
$\Downarrow + Br^-$

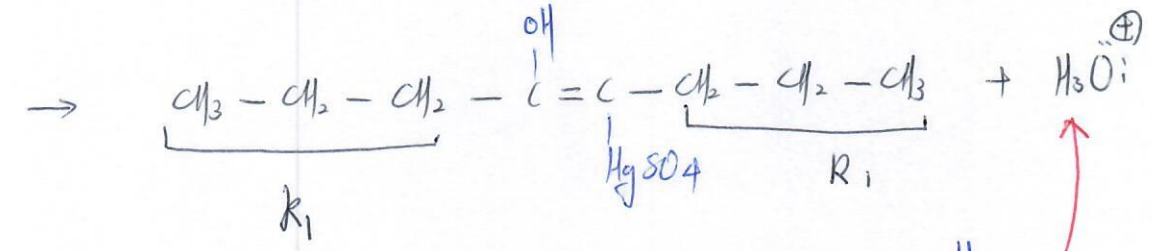
$CH_3-CH_2-CH_2-CH_2-C(Br)=C(H)-CH_3$ $CH_3-CH_2-CH_2-CH_2-C(H)=C(Br)-CH_3$.

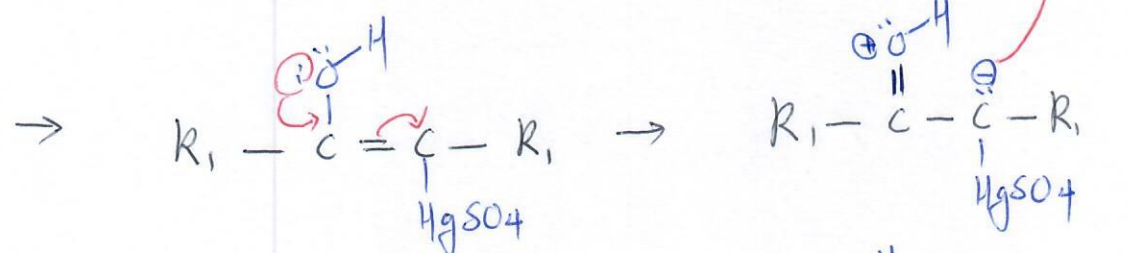
Problem 9-4-1

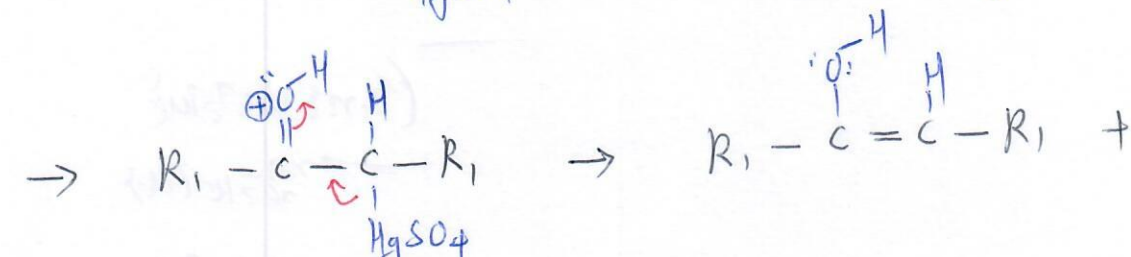
(a) $CH_3-CH_2-CH_2-C\equiv C-CH_2-CH_2-CH_3 + Hg^{2+}SO_4^{2-}$







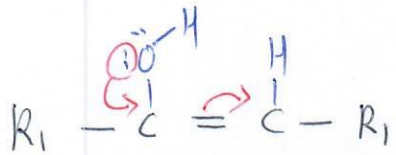




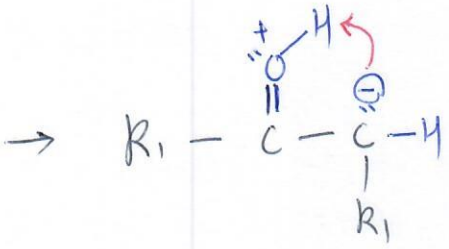
⇒ next.

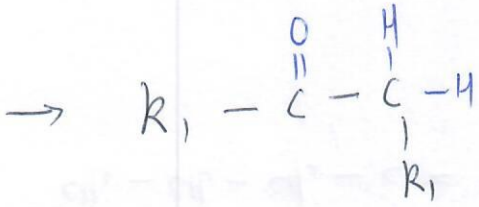
Problem 9-4-2.

(4)



(Enol tautomer)

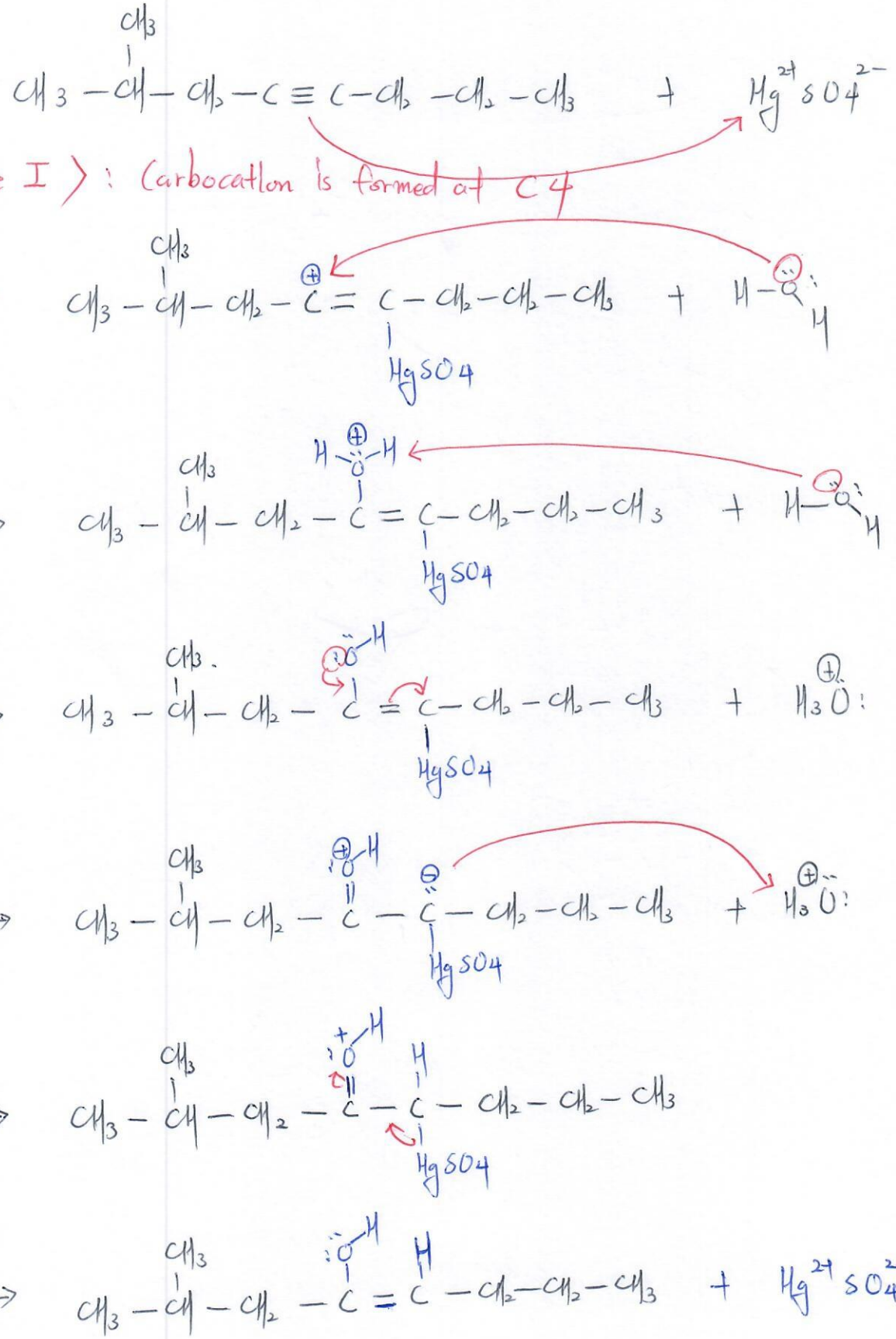




(keto tautomer.)

Problem 9-4-3.

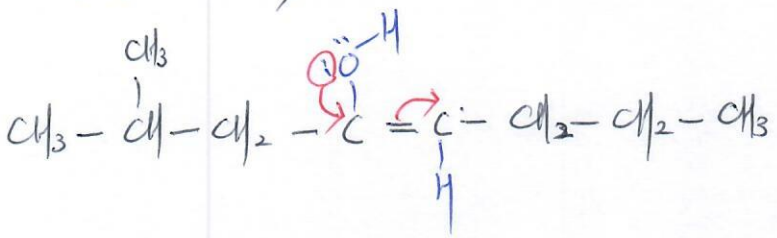
(b)



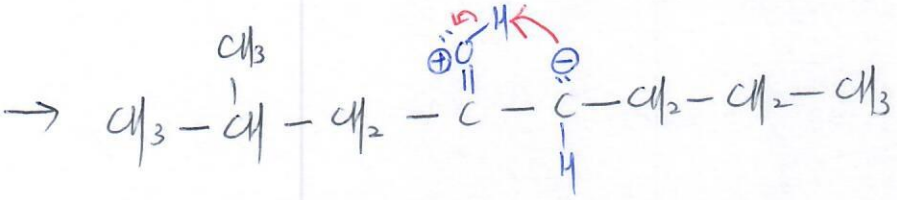
⇒ next.

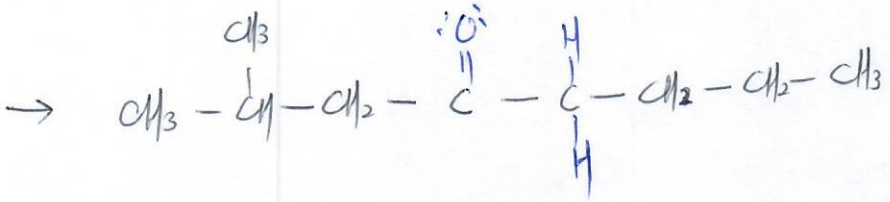
Problem 9-4-4.

(b) . < Case I >



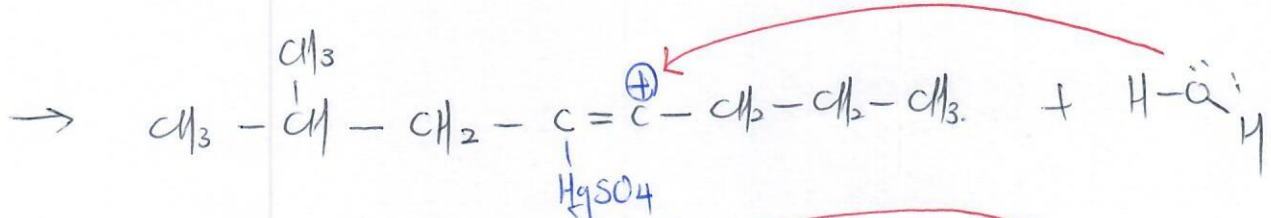
< Enol Tautomer >

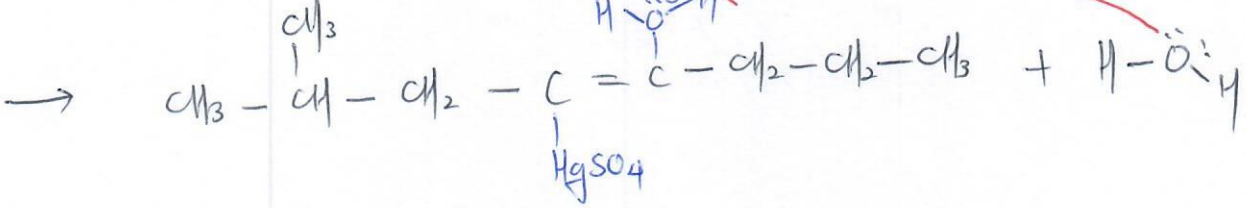


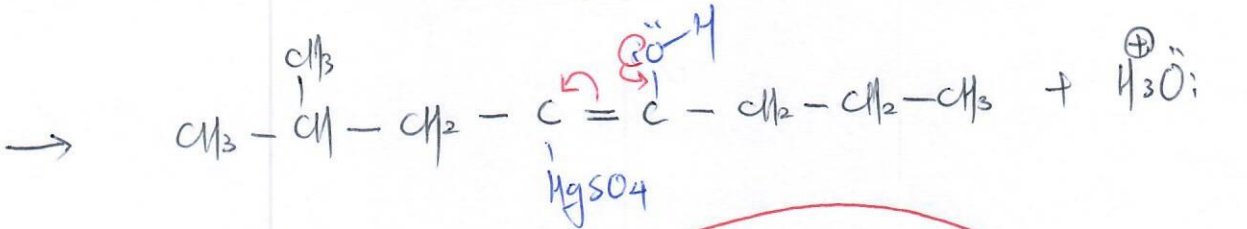


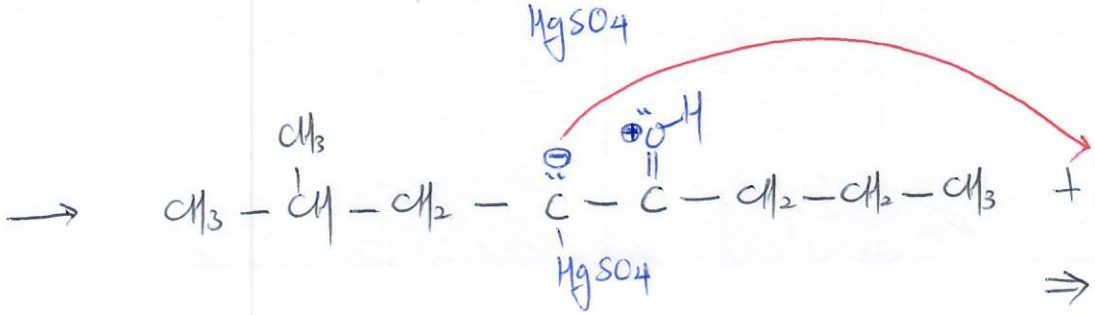
< Keto Tautomer >

< case I > : Carbocation is formed at C5.





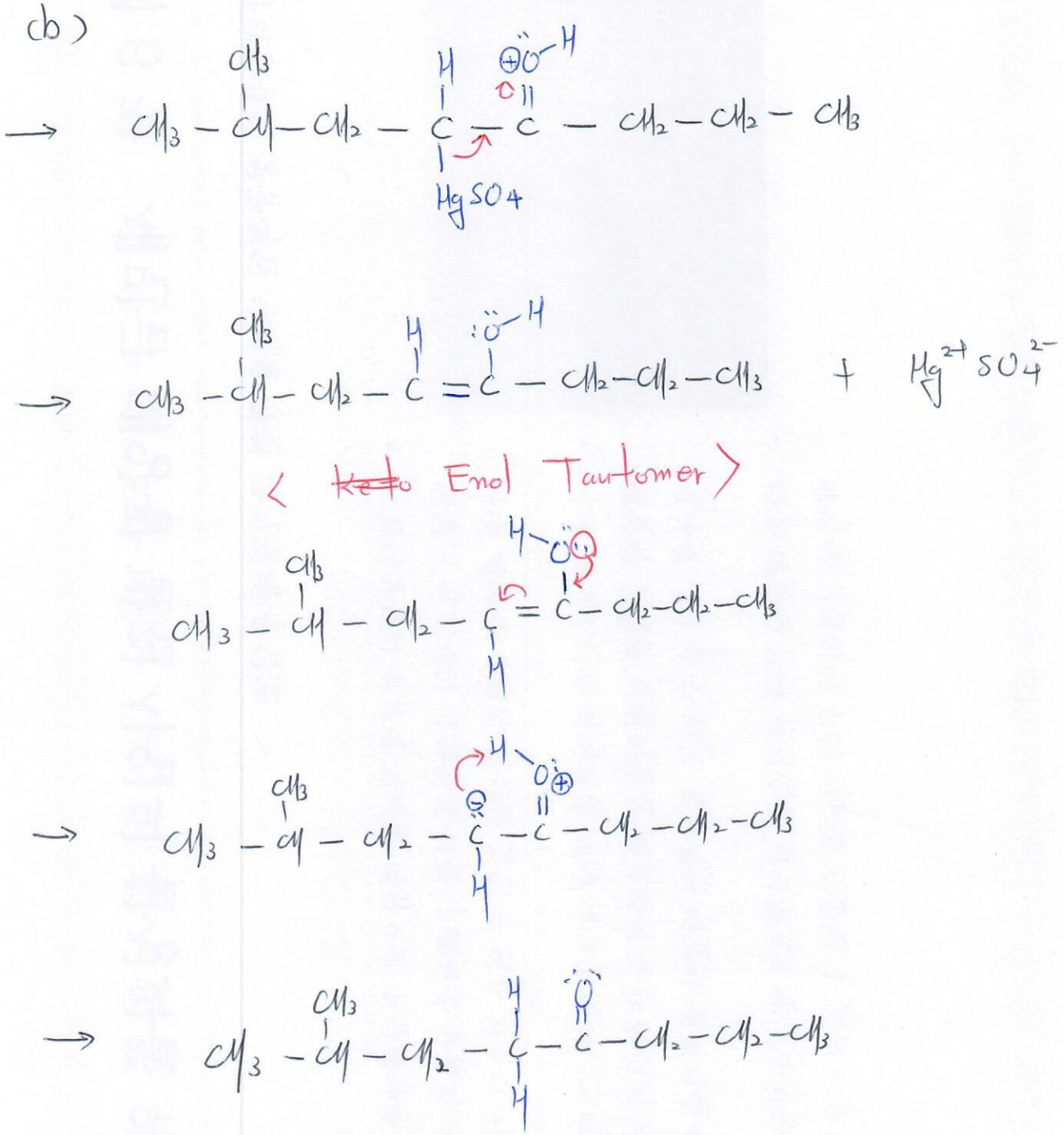




⇒ next.

Problem 9-4-5.

(b)



< ~~Keto~~ Enol Tautomer >

< Keto Tautomer >

Problem 9-5-1.

(a)

$CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-CH_3$ (?)

$CH_3-CH_2-CH_2-C\equiv CH \xrightarrow[HgSO_4]{H_2O,\ H_2SO_4} CH_3-CH_2-CH_2-\overset{HO}{\overset{|}{C}}=CH$

$\xrightarrow{H_2O} CH_3-CH_2-CH_2-\overset{OH}{\overset{|}{C}}=CH_2$

Keto-enol tautomerism $\rightarrow$ $CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{CH}}$

Problem 9-5-2

(a) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-CH_2-CH_3$ (?)

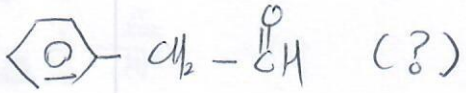
~~$CH_3-CH_2-C\equiv C-CH_2-CH_3$~~

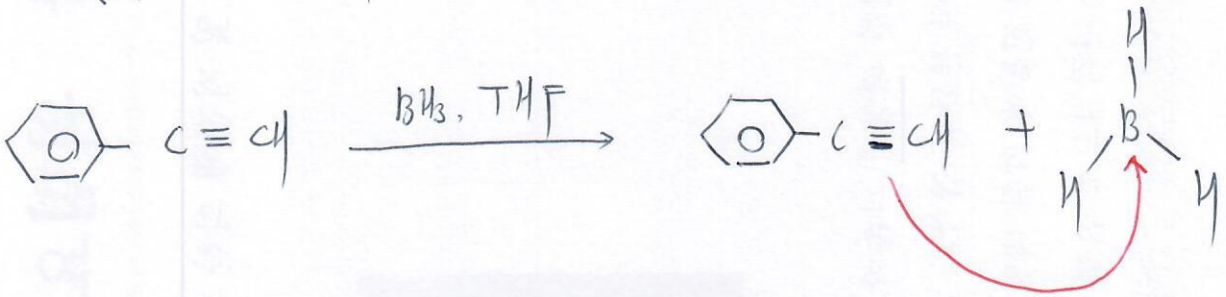
$CH_3-CH_2-C\equiv C-CH_3 \xrightarrow[HgSO_4]{H_2O,\ H_2SO_4} CH_3-CH_2-\overset{OH}{\overset{|}{C}}=C(-HgSO_4)-CH_3$

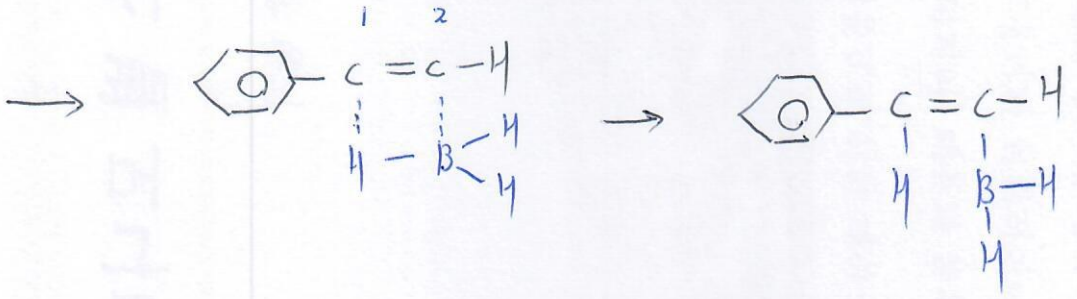
$\xrightarrow{H_2O} CH_3-CH_2-\overset{OH}{\overset{|}{C}}=\underset{H}{\underset{|}{C}}-CH_3$

$\xrightarrow{\text{keto-enol tautomerism}} CH_3-CH_2-\overset{O}{\overset{\|}{C}}-\underset{H}{\underset{|}{\overset{H}{\overset{|}{C}}}}-CH_3$

problem 9-6.-1

(a) 

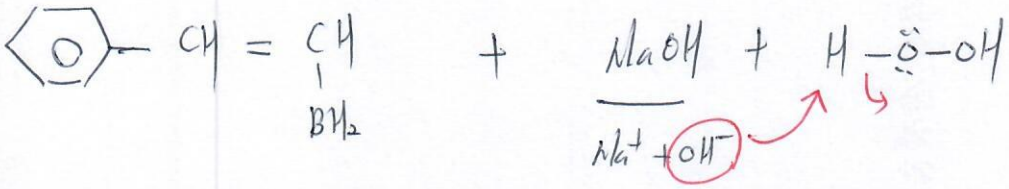


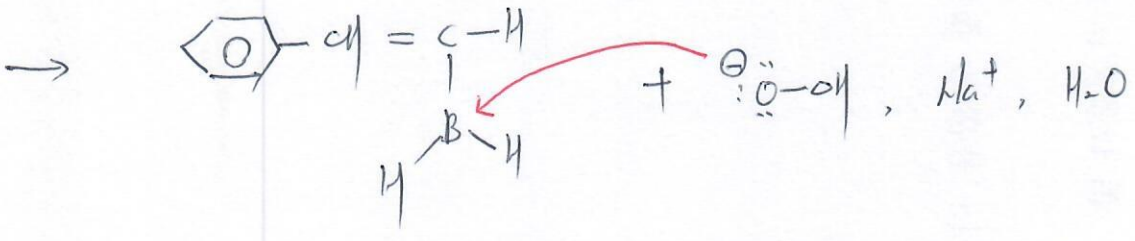


C1 is secondary carbon and has 2 substituents.

C2 is primary carbon and has 1 substituent.

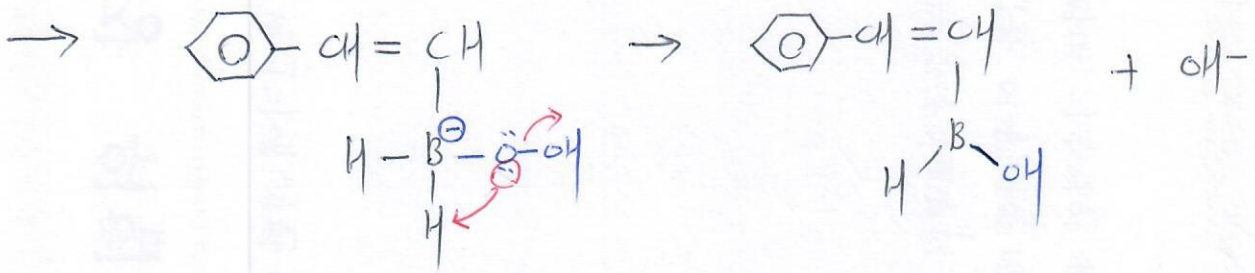
C1 is more steric crowding than C2.

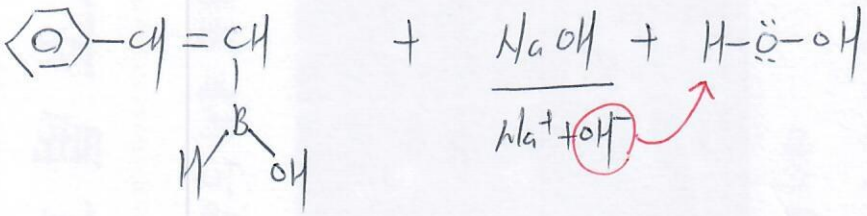


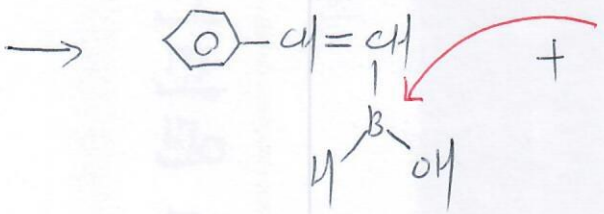


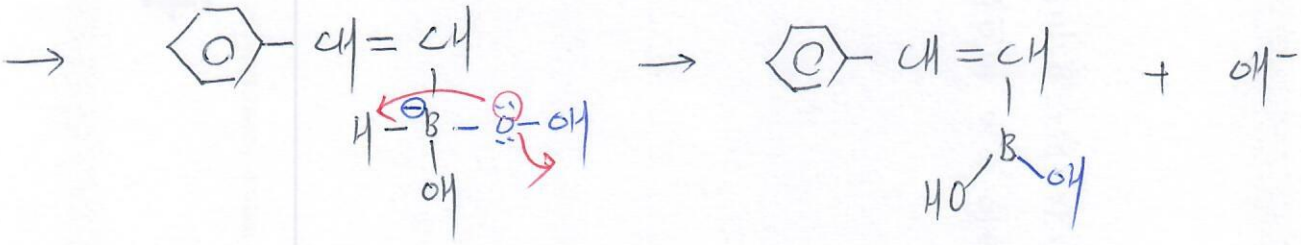
⇒ next

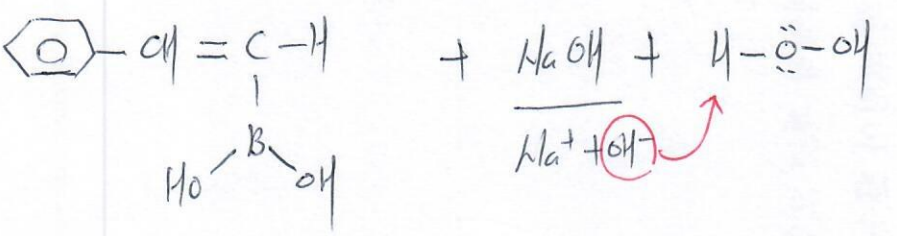
problem 9-6-2.

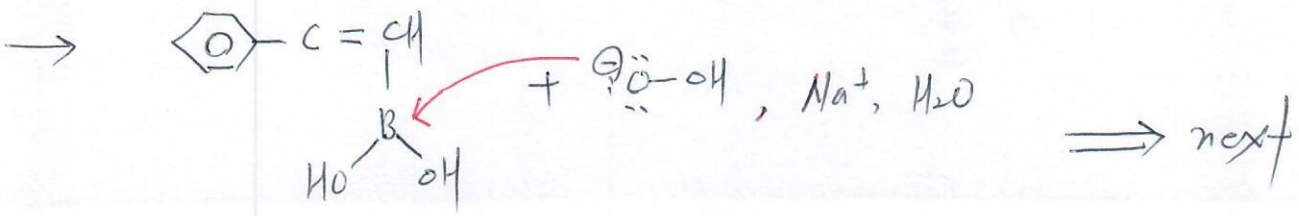




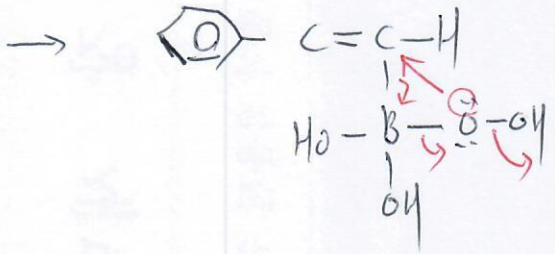


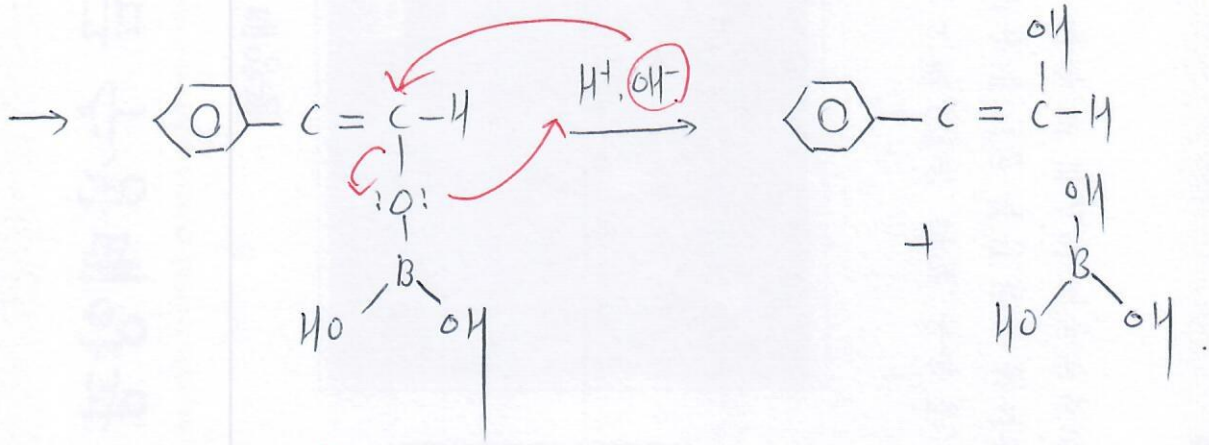


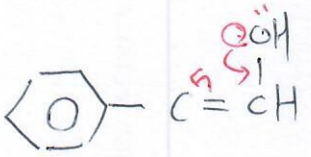




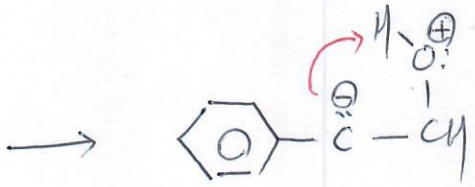
Problem 9-6-3

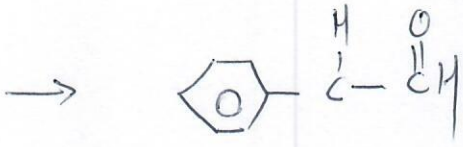






< ~~keto~~ Enol tautomer >

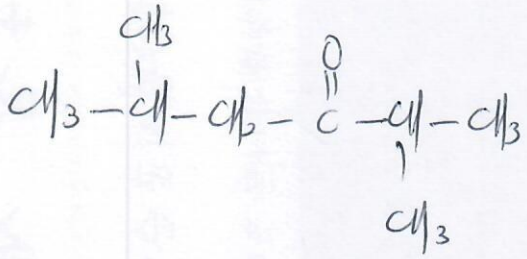




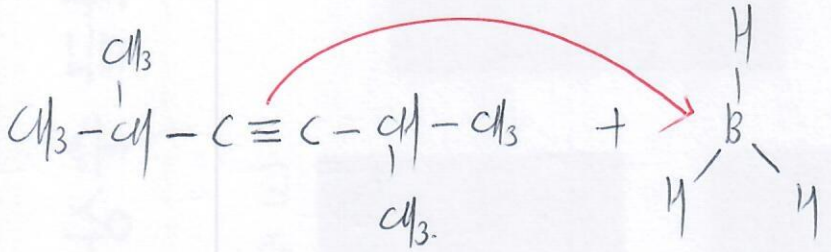
< keto tautomer >

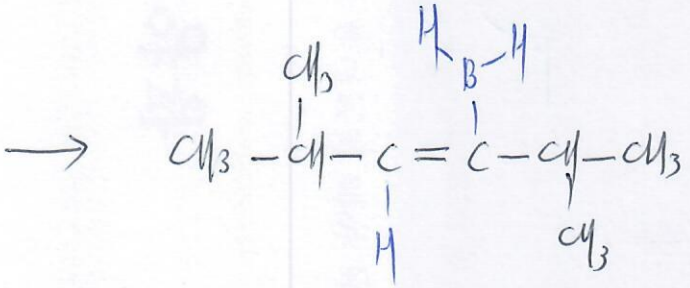
Problem 9-6-4

(b)

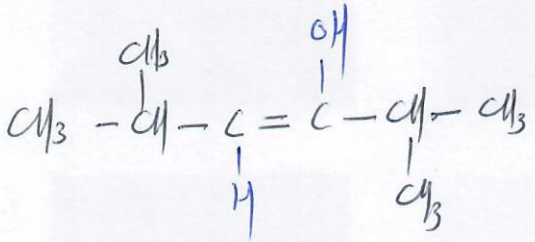


(?)



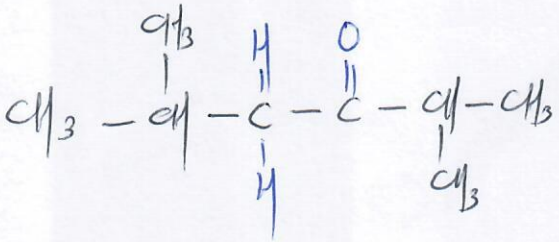


$NaOH, H_2O_2$ →



< Enol tautomer >

keto-enol tautomerism →

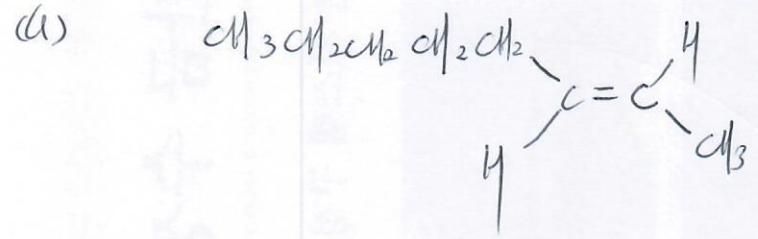


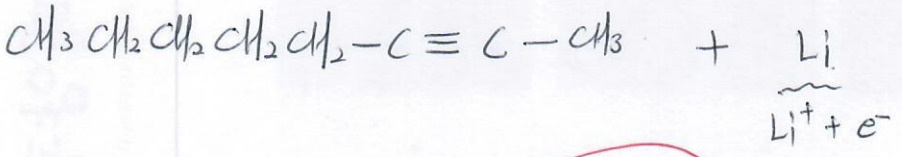
< keto tautomer >

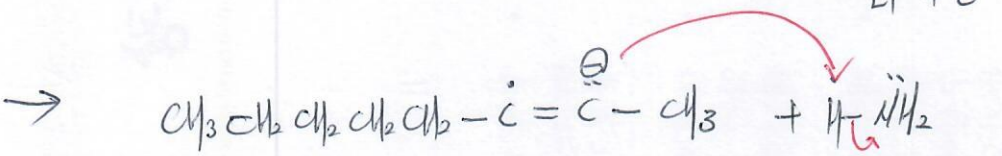
Problem 9-8-1

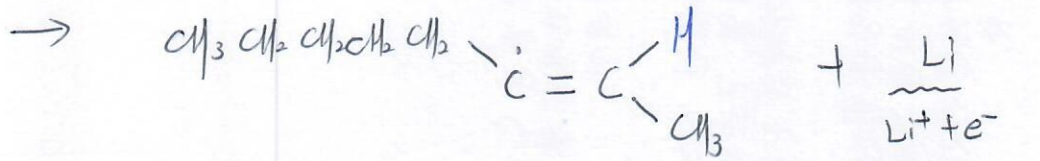
Lindlar catalyst → cis

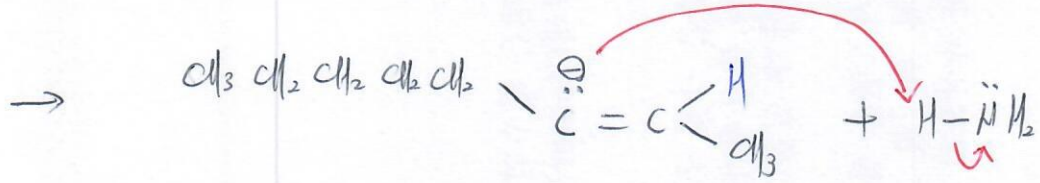
Li, NH_3 → trans.

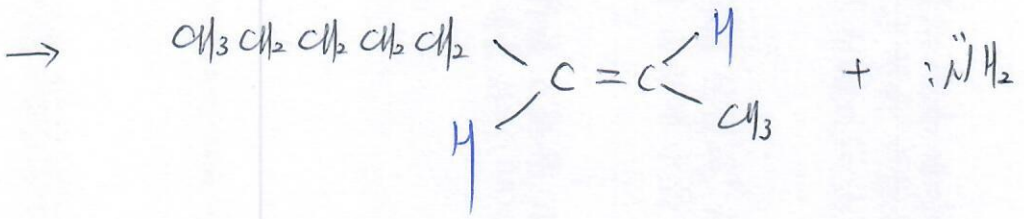
(a)  trans-2-octene ?







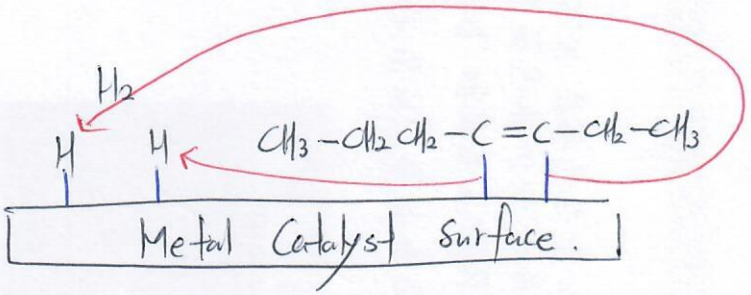


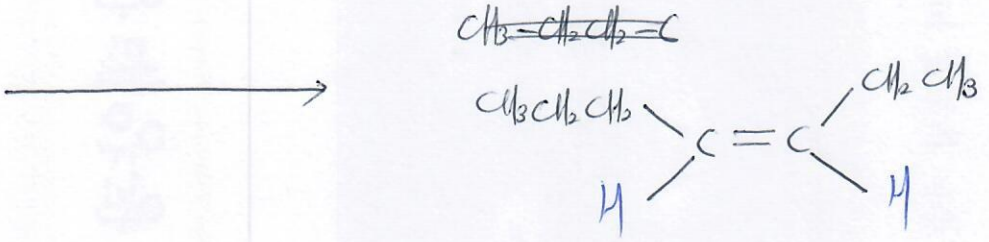


Problem 9-8-2.

(b) $CH_3CH_2CH_2-C\equiv C-CH_2-CH_3$

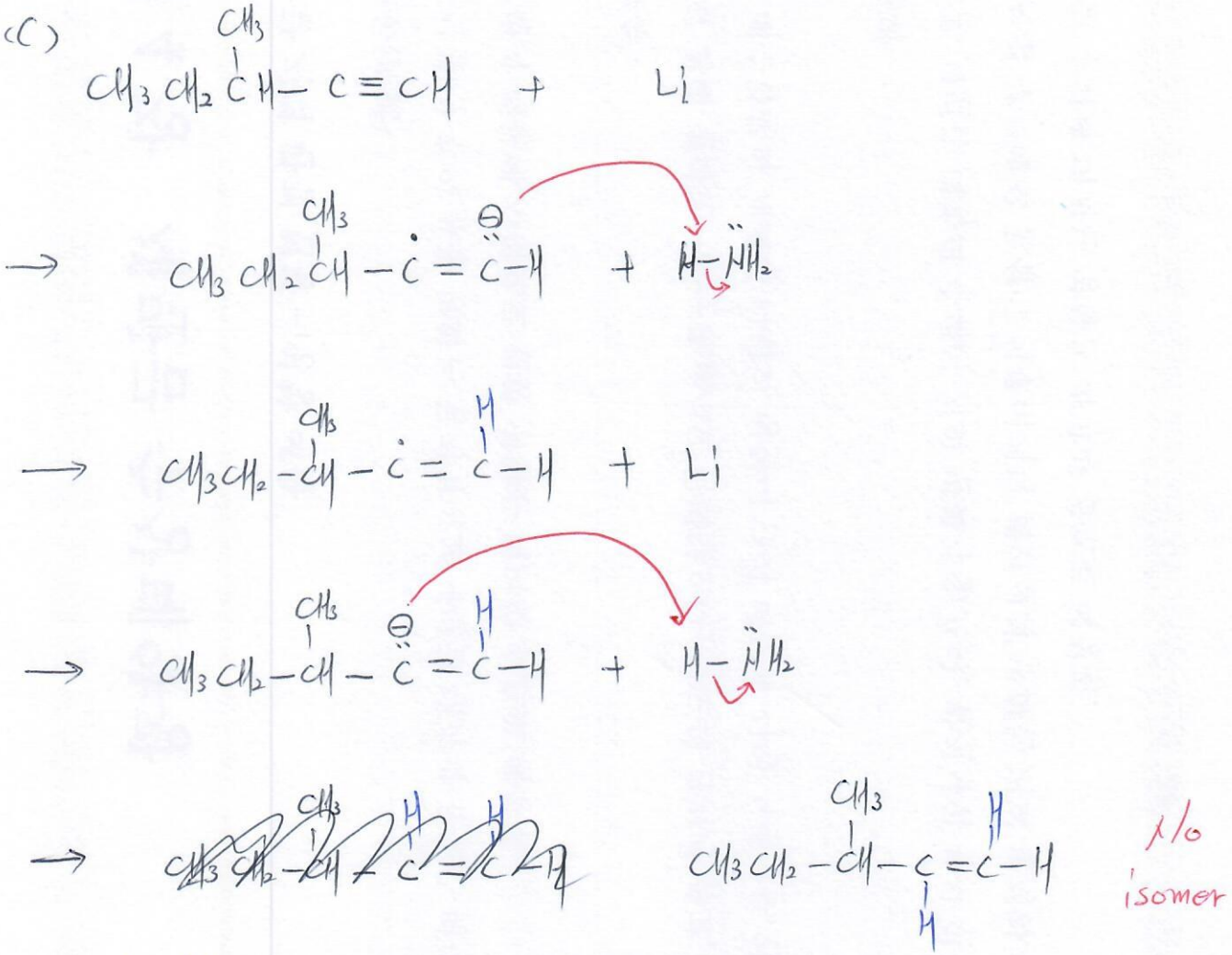
Lindlar Cat. H





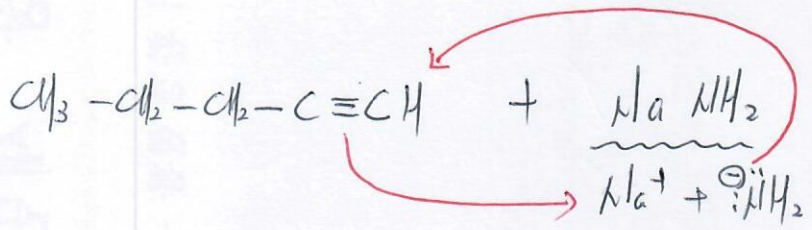
Problem 9-8-3.

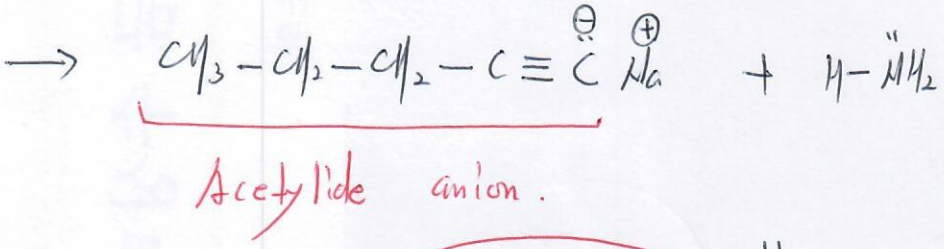
(C)



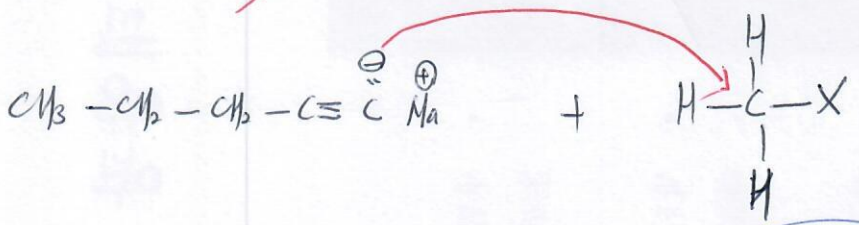
Problem 9-10-1

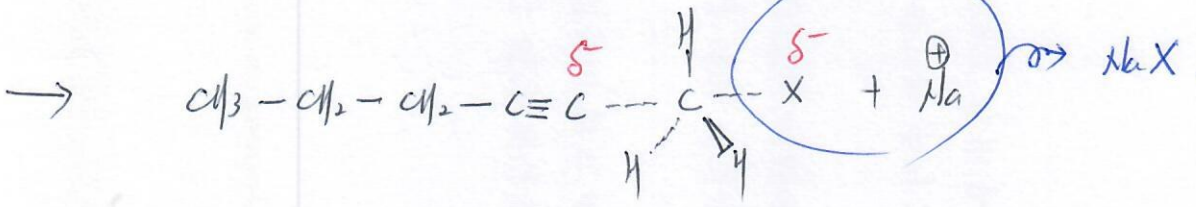
(a) $CH_3-CH_2-CH_2-C\equiv C-CH_3$ (?).

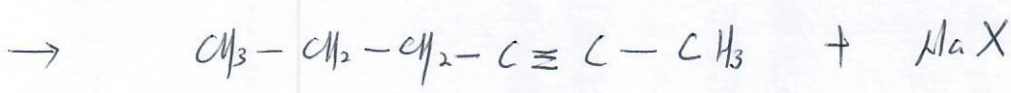




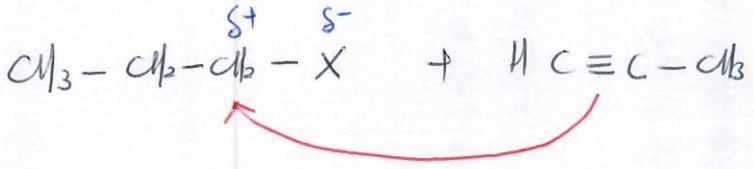
Acetylide anion.

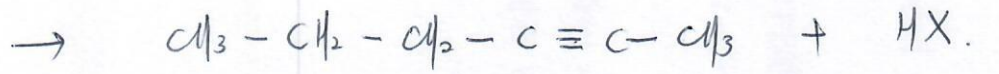






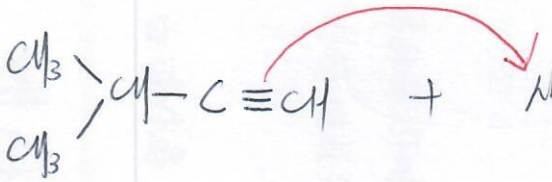
or.

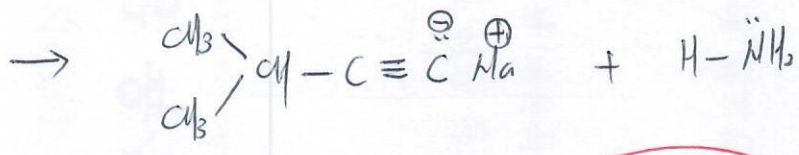


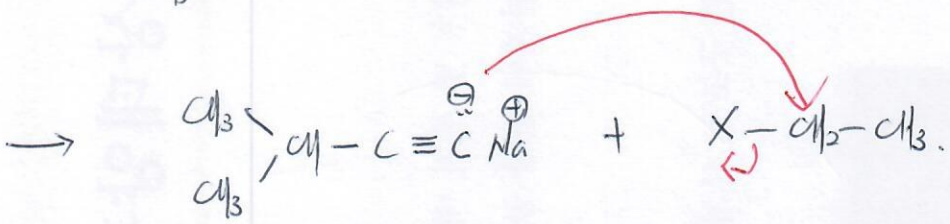


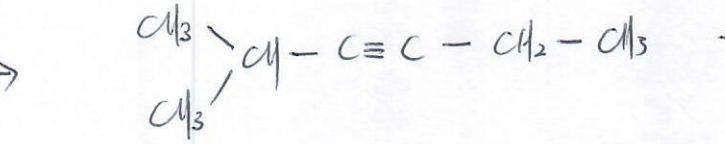
Problem 9-10-2.

(b) Starting materials $(CH_3)_2CH-C\equiv CH$, $X-CH_2-CH_3$.

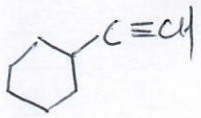


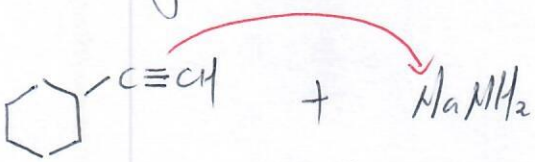


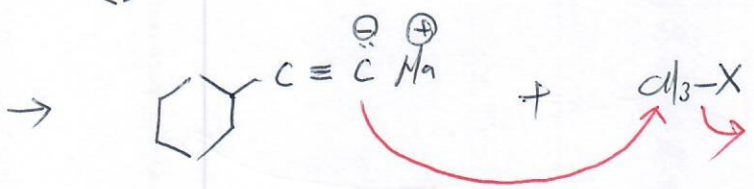


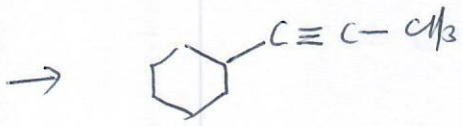


(c) starting materials.







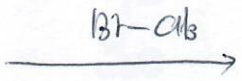


Problem 9-11-1.

Starting materials. $CH_3-C\equiv CH$. $Br-CH_3$.

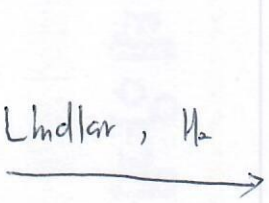
$CH_3-C\equiv CH \quad + \quad NaNH_2$

$\longrightarrow \quad CH_3-C\equiv C^{\ominus}\,Na^{\oplus} \quad + \quad H-NH_2.$

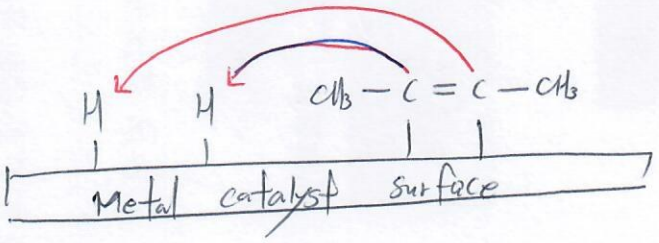


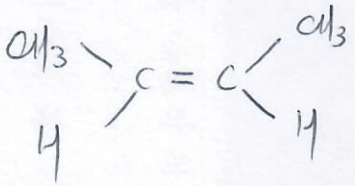
$Br-CH_3$

$\longrightarrow \quad CH_3-C\equiv C-CH_3 \quad + \quad NaBr.$



Lindlar, H_2





cis Isomer.

cis – 2 – butene.