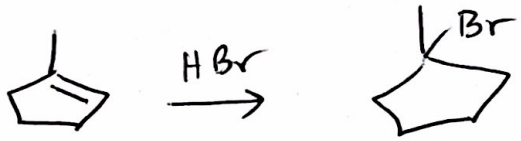
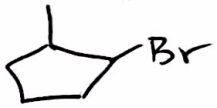
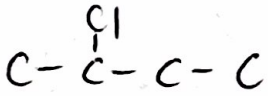
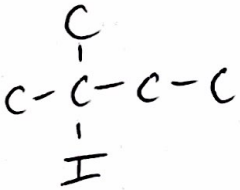
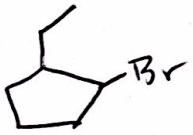
Chapter 11

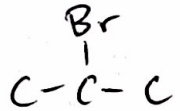
14) a) 

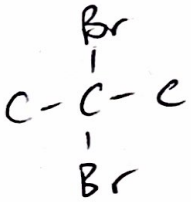
b) 

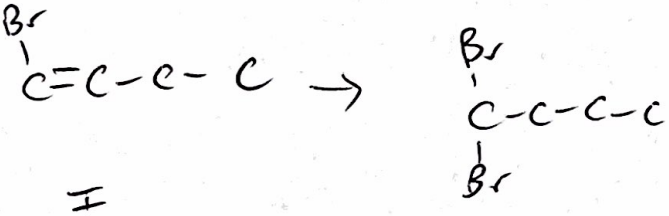
c) 

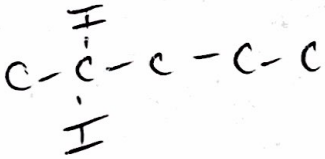
d) 

e) 

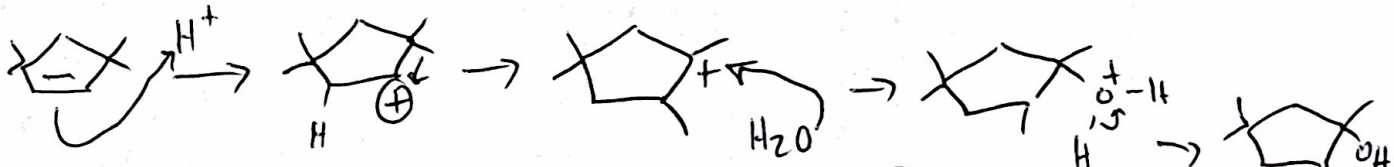
f) 

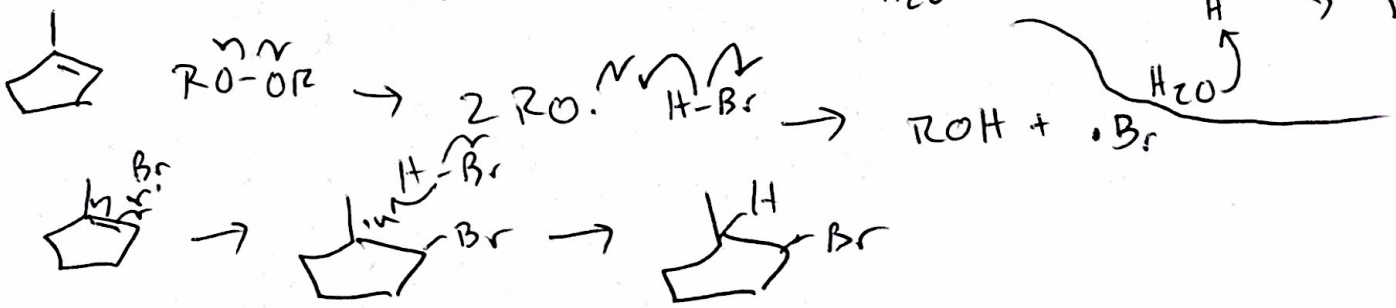
g) 

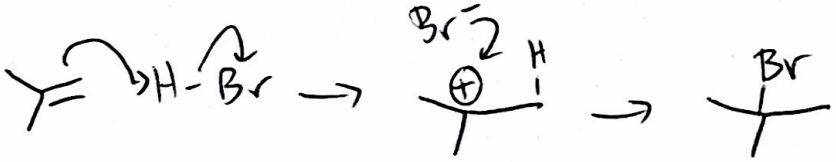
h) 

i) 

15) a) HBr b) HBr, ROOR c) HBr, ROOR d) HBr

16) a) 

b) 

c) 

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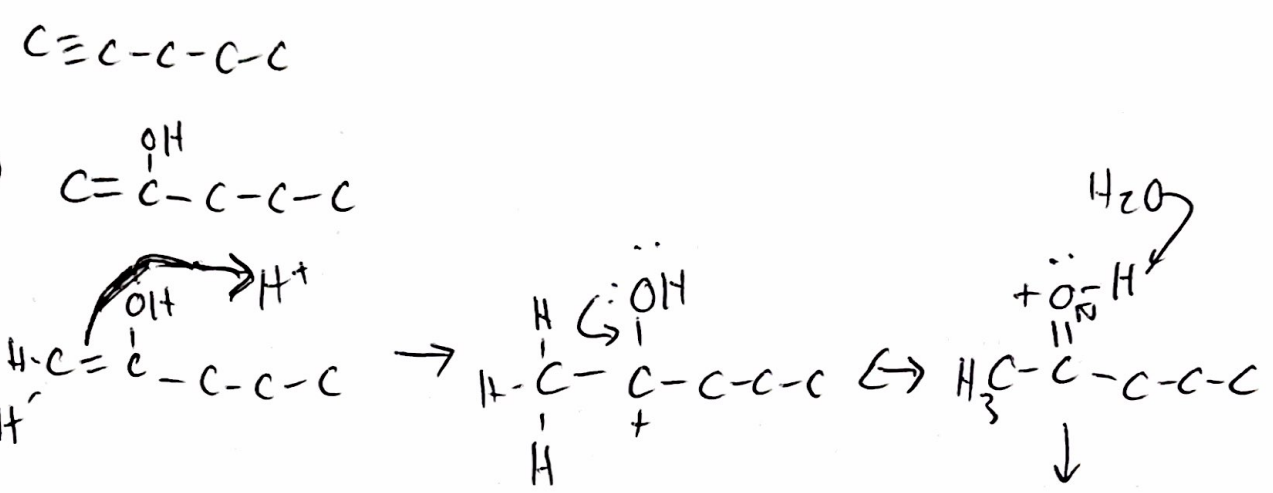
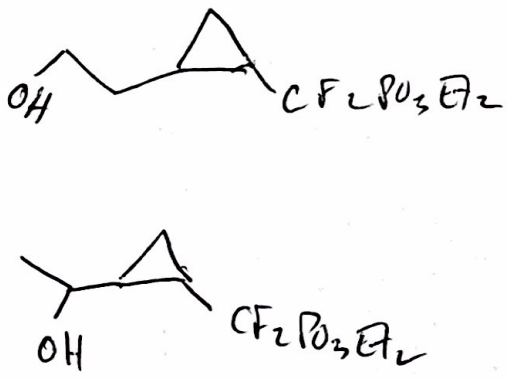
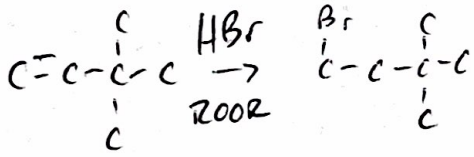


18)



19) a)

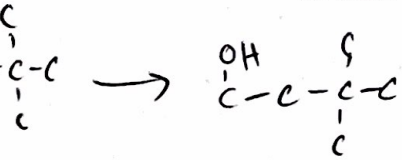


b) 1) $BH_3 \cdot THF$ 2) H_2O_2, OH^-

c) HBr

d) H_3O^+ or 1) $Hg(OAc)_2$ in H_2O 2) $NaBH_4$

e)



1) $BH_3 \cdot THF$ 2) H_2O_2, OH^-

f) 1) $BH_3 \cdot THF$ 2) H_2O_2, OH^-

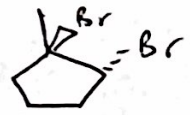
g) 1) $Hg(OAc)_2/H_2O$ 2) $NaBH_4$

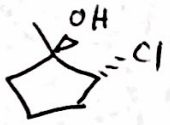
h) yes, it forms carbocation it could rearrange w/ a methyl shift

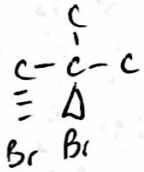
i) 1) $Hg(OAc)_2$/MeOH 2) $NaBH_4, OH^-$

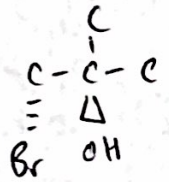
j) 1) Sia$_2$BH 2) H_2O_2, OH^-

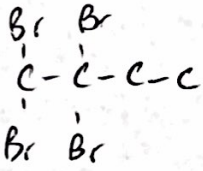
k) $HgSO_4$ in H_2SO_4

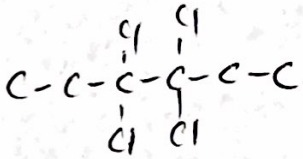
20) a) 

b) 

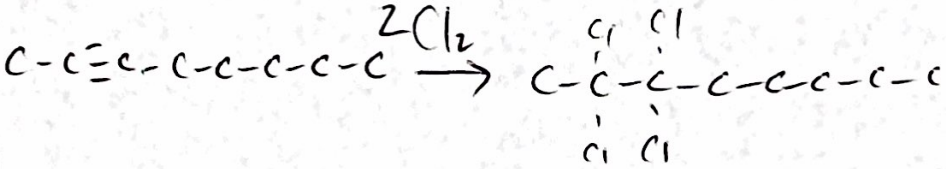
c) 

d) 

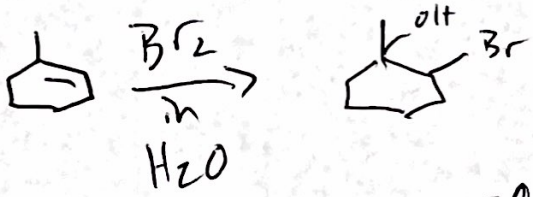
e) 

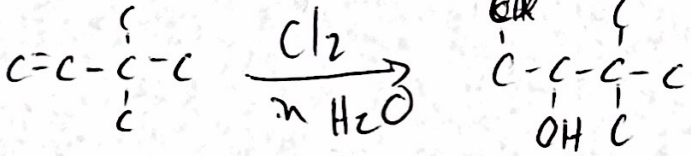
f) 

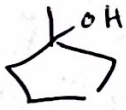
21) a) 

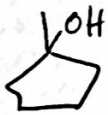
b) 

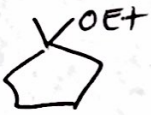
c) $2Br_2$

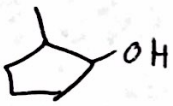
d) 

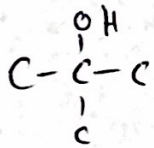
e) 

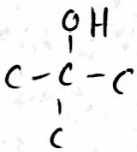
22) a) 

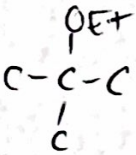
b) 

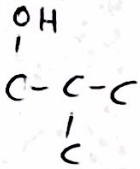
c) 

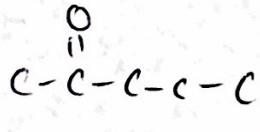
d) 

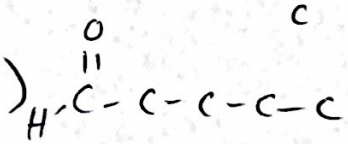
e) 

f) 

g) 

h) 

i) 

j) 

23) a) 

b) 

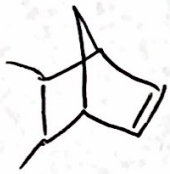
c) 

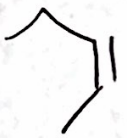
d) 

24)

a)  $\xrightarrow[NaOH]{CHCl_3}$

b)  $\xrightarrow{CH_2N_2}$

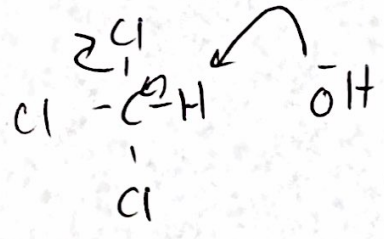
c)  $\xrightarrow{CH_2N_2}$

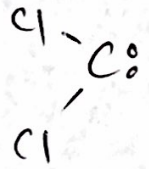
d)  $\xrightarrow[OH^-]{CHBr_3}$

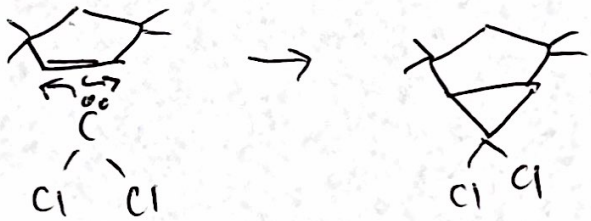
25) a) Simmons Smith Reagent or CH_2N_2

b) carbene

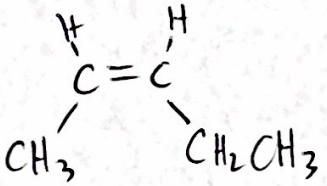
26)

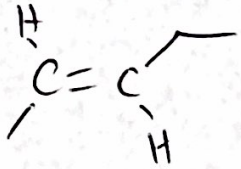




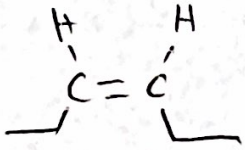


27) a)  b) $CH_3CH_2CH_2CH_2CH_3$ c) $CH_3CH_2CH_2CH_2CH_3$

d) 

e) 

f) $CH_3CH_2CH_2CH_2CH_3$

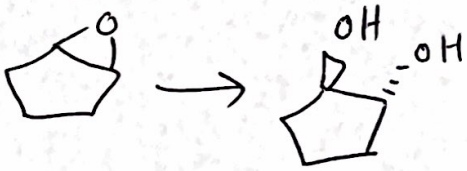
g) 

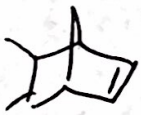
28) The top side of the alkene is too crowded for the H_2/Pt to ATTACK so IT can only ATTACK from underneath.

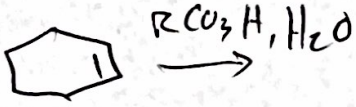
29) a) 

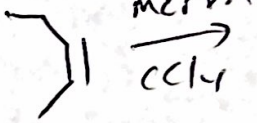
b) 

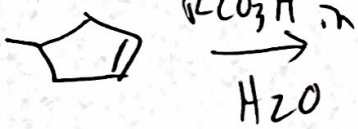
c) 

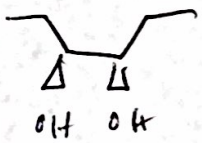
d) 

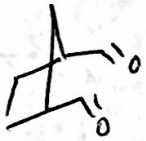
30) a) MCPBA in CCl_4 or $CHCl_3$ 

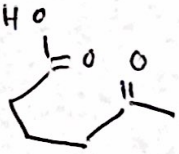
b) 

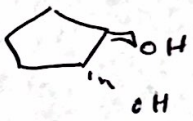
c) 

d) 

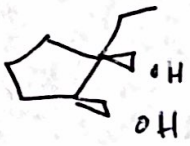
31) a) 

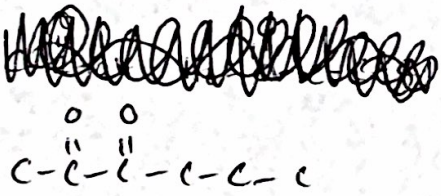
b) 

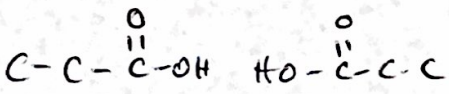
c) 

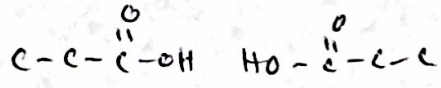
d) 

e) 

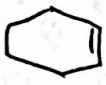
f) 

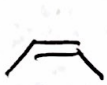
g) 

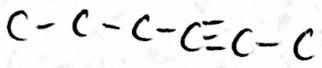
h) 

i) 

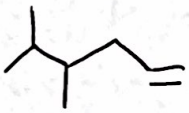
32)

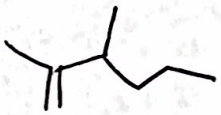
a)  $KMnO_4$, OH^-, warm, conc.

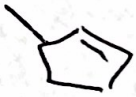
b)  mCPBA

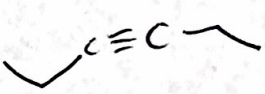
c)  1) O_3 2) Me_2S

d)  1) O_3 2) Me_2S

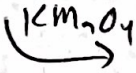
e)  1) O_3 2) Me_2S

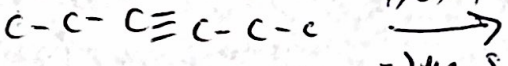
f)  1) O_3 2) Me_2S

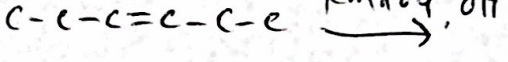
g)  ● RCO_3H, H^+, H_2O

h)  $KMnO_4$, cold, dil.

i)  1) OsO_4 2) H_2O_2

 $KMnO_4$, cold, dil., neutral

j)  1) OsO_4 2) Me_2S

 $KMnO_4$, OH^-, warm, conc.

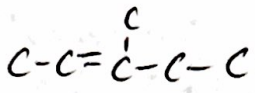
k)  1) O_3 2) Me_2S

l)  $KMnO_4$, OH^-, warm, conc.

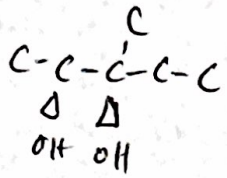
m)  1) OsO_4 1) H_2O_2

~~30)~~

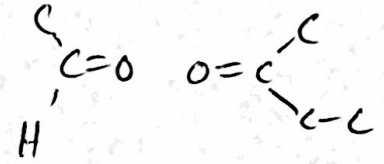
33)



a)

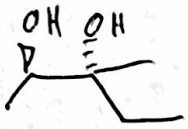


b)

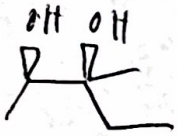


c)

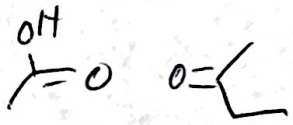
d)



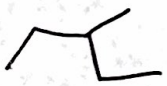
e)



f)

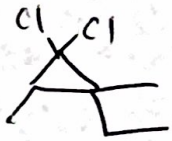


g)



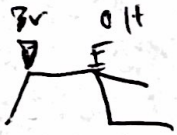
h)

i)



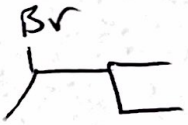
j)

k)

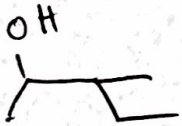


l)

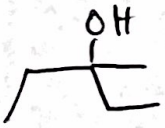
m)



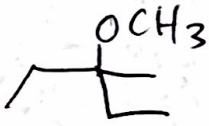
n)



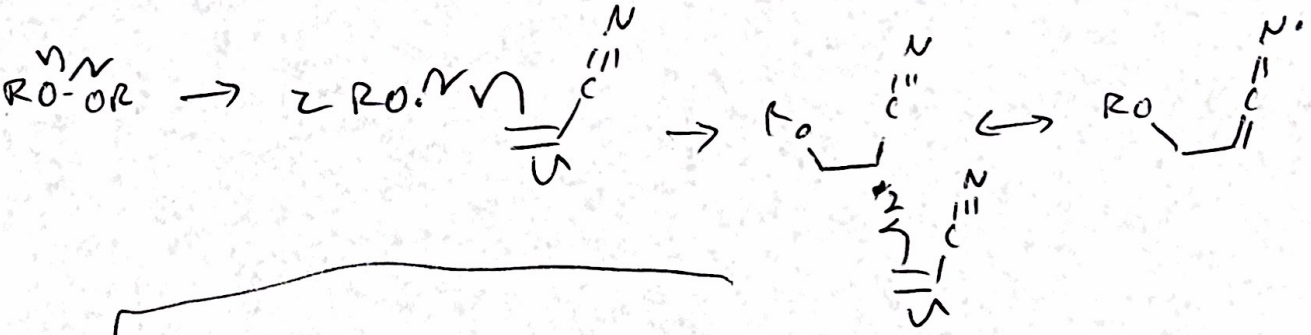
o)

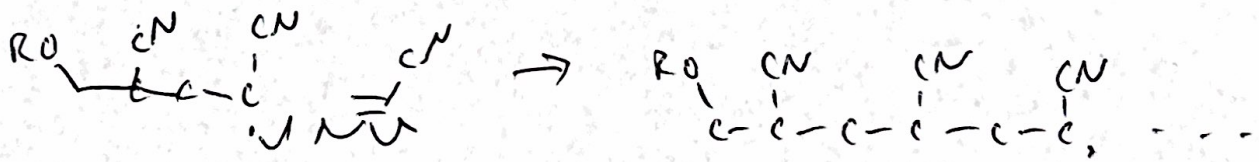


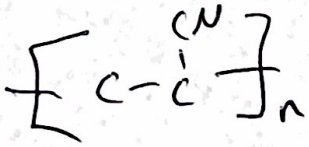
p)

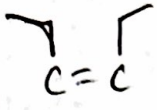


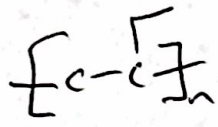
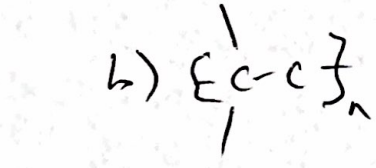
34)

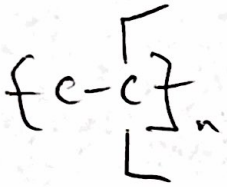


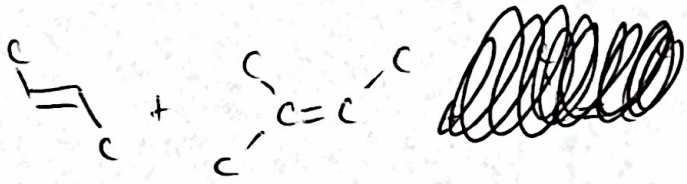




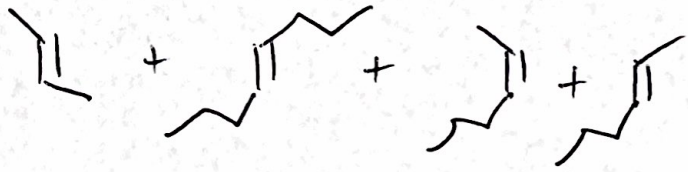
35) a)  b)  c)  d) 

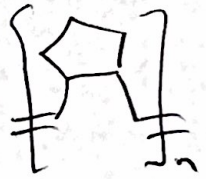
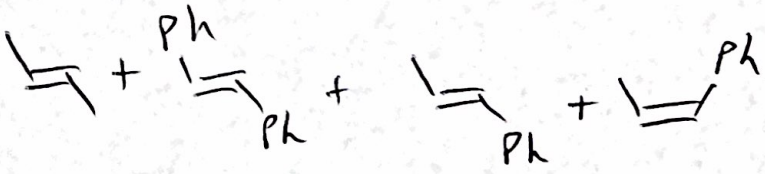
36) a)  b)  c)  d) 

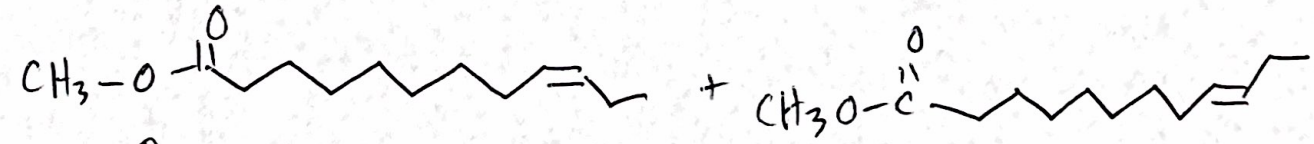
e) 

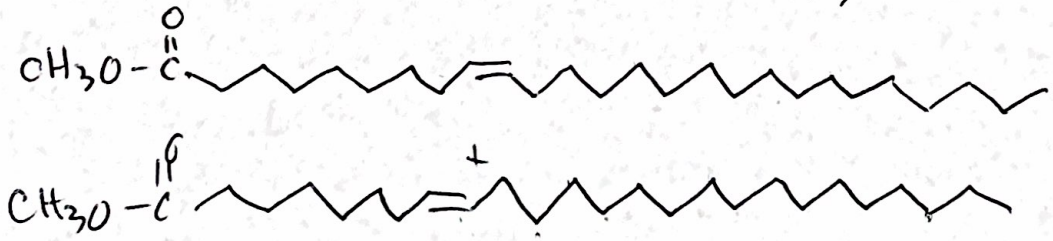
37) a) 

b) $CH_2=CH_2$ + 

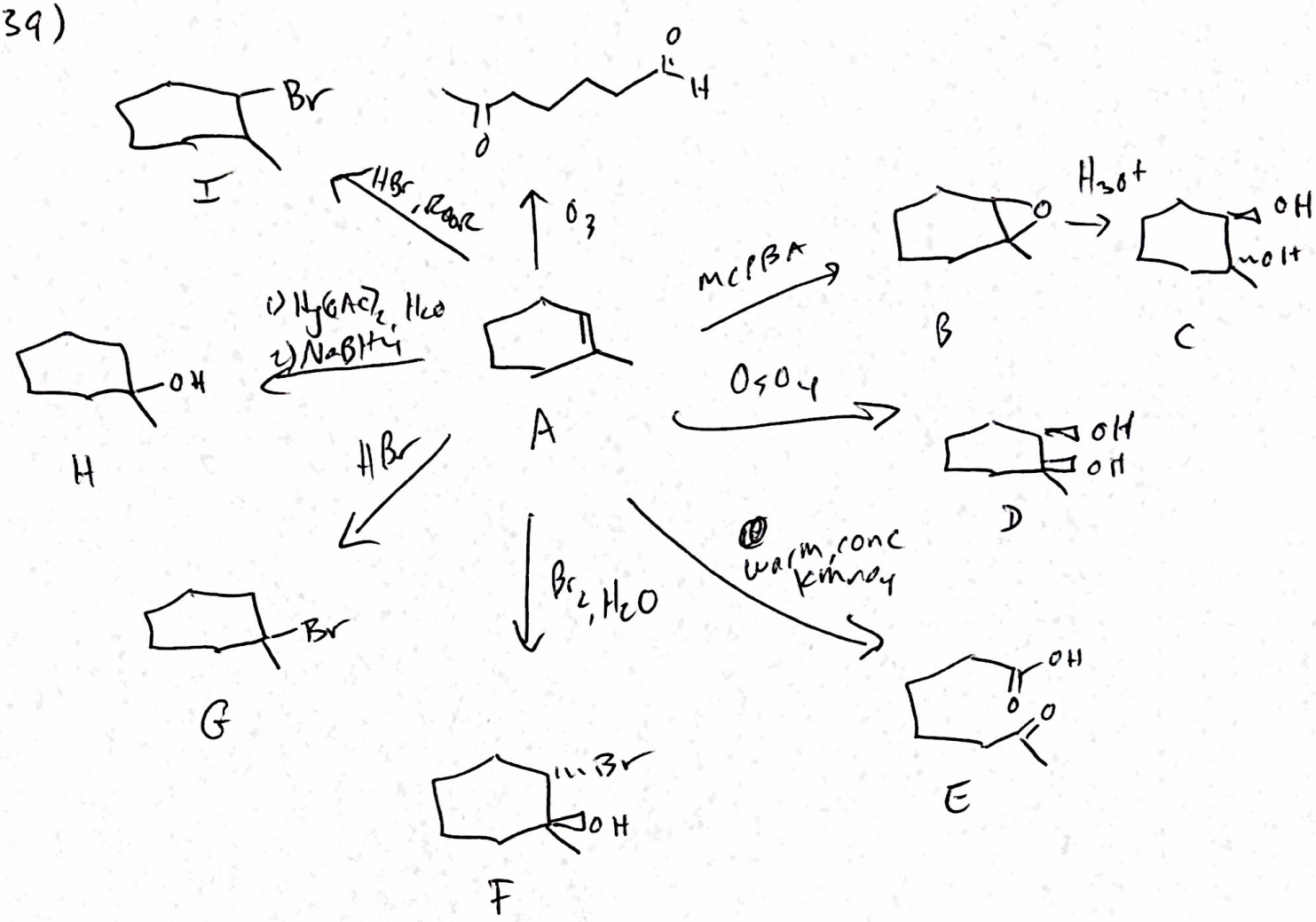
c)  d) 

e)  f) 

38) a) 

b) 

39)



40) a) 1. KO^tBu 2. Br_2, H_2O

b) 1. Br_2, hv 2. KO^tBu 3. O_3 2) Me_2S

c) 1. H_2SO_4 2. i) $Hg(OAc)_2, H_2O$ ii) $NaBH_4$

d) 1. KO^tBu 2. OsO_4, H_2O_2

e) 1. H_2SO_4 2. MCPBA

f) 1. KO^tBu 2. CH_2N_2

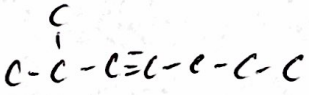
41)

a) $H-C\equiv C-H$ 1) $NaNH_2$ 2)

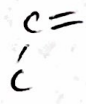
b) $H-C\equiv C-H$
1) $NaNH_2$
2) CH_3Br
3) $NaNH_2$
4) CH_3Br →

c)
1) $NaNH_2$
2)
3) $NaNH_2$
4)

d)
1) $NaNH_2$
2)
3) $NaNH_2$
4) 



42)

a)  

b) Na, NH_3

c) 1) $(Sia)_2BH$ 2) H_2O_2, OH^-

d) $HgSO_4, H_2SO_4$

e) H_2, Pt

f) $2\,HCl$

g) 1) $NaNH_2$ 2) 

h) H_2, Lindlar Cat

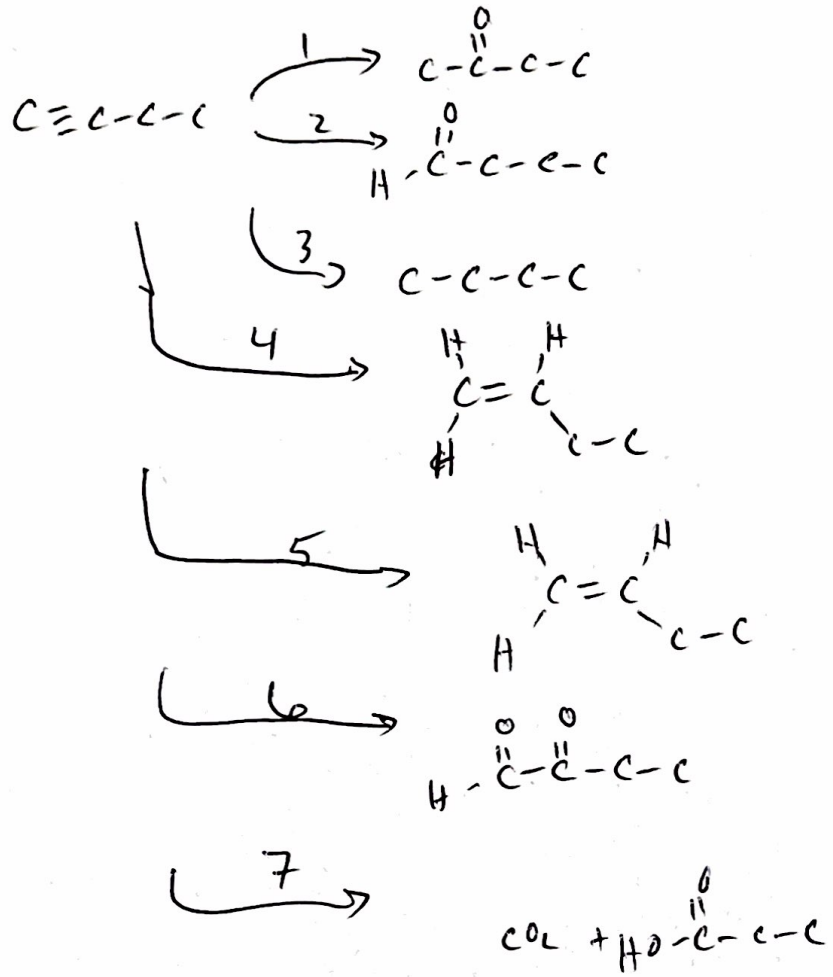
i) Cold, Dil $KMnO_4$ Neutral

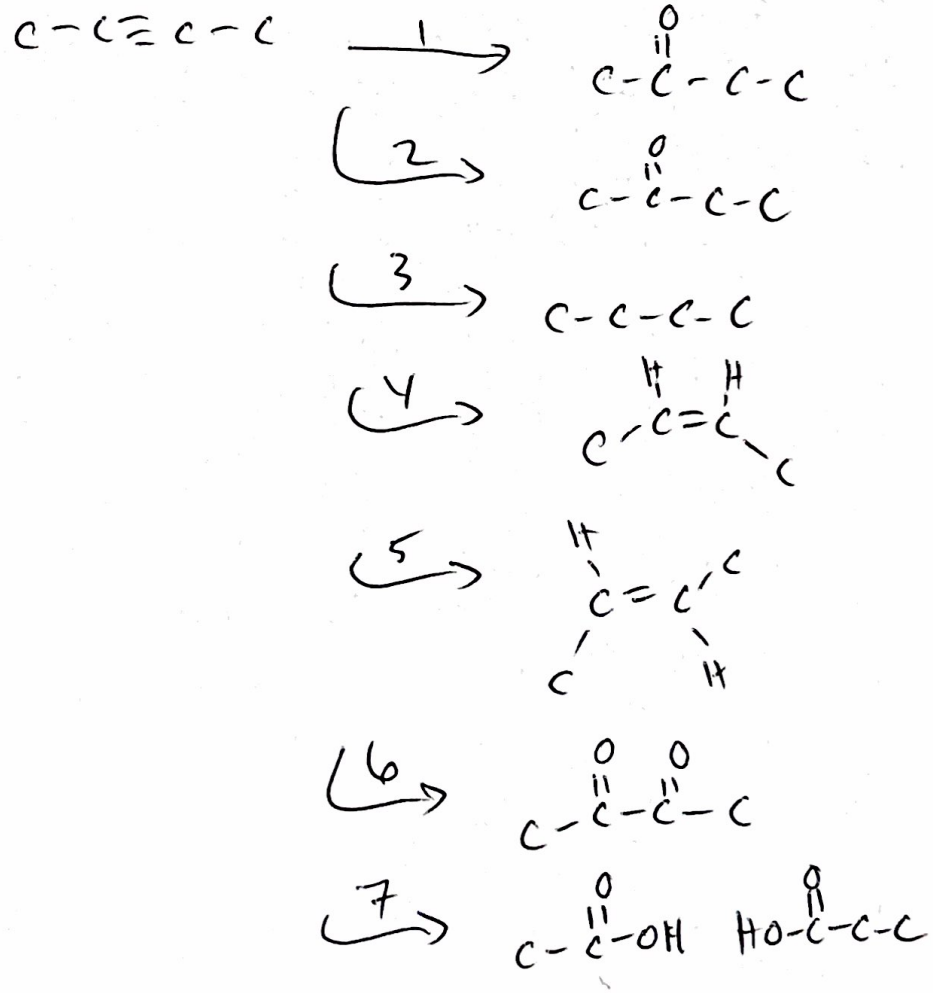
j) $HBr, ROOR$

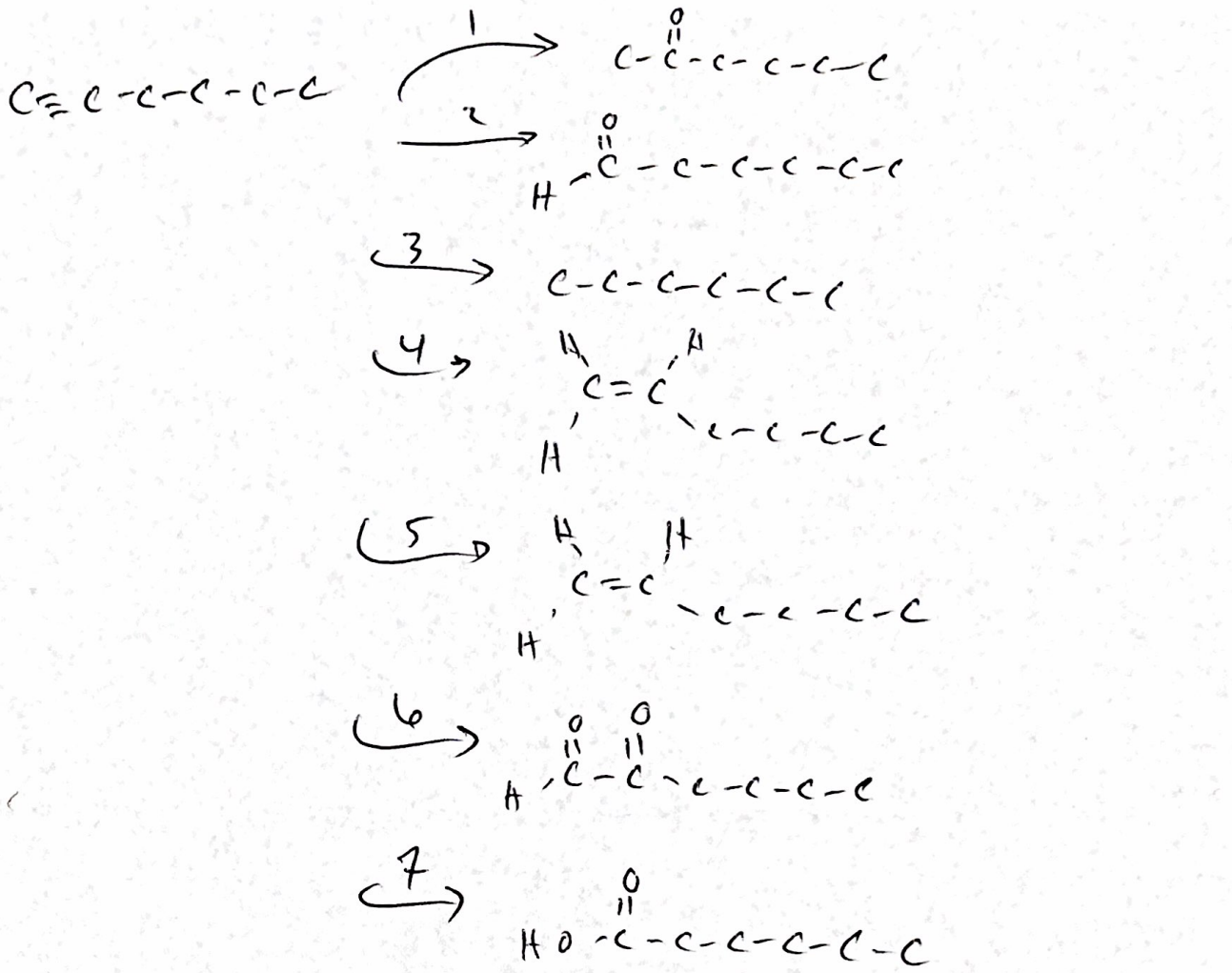
k) 1. Warm, conc, BASIC $KMnO_4$ or 2. O_3 2) Me_2S

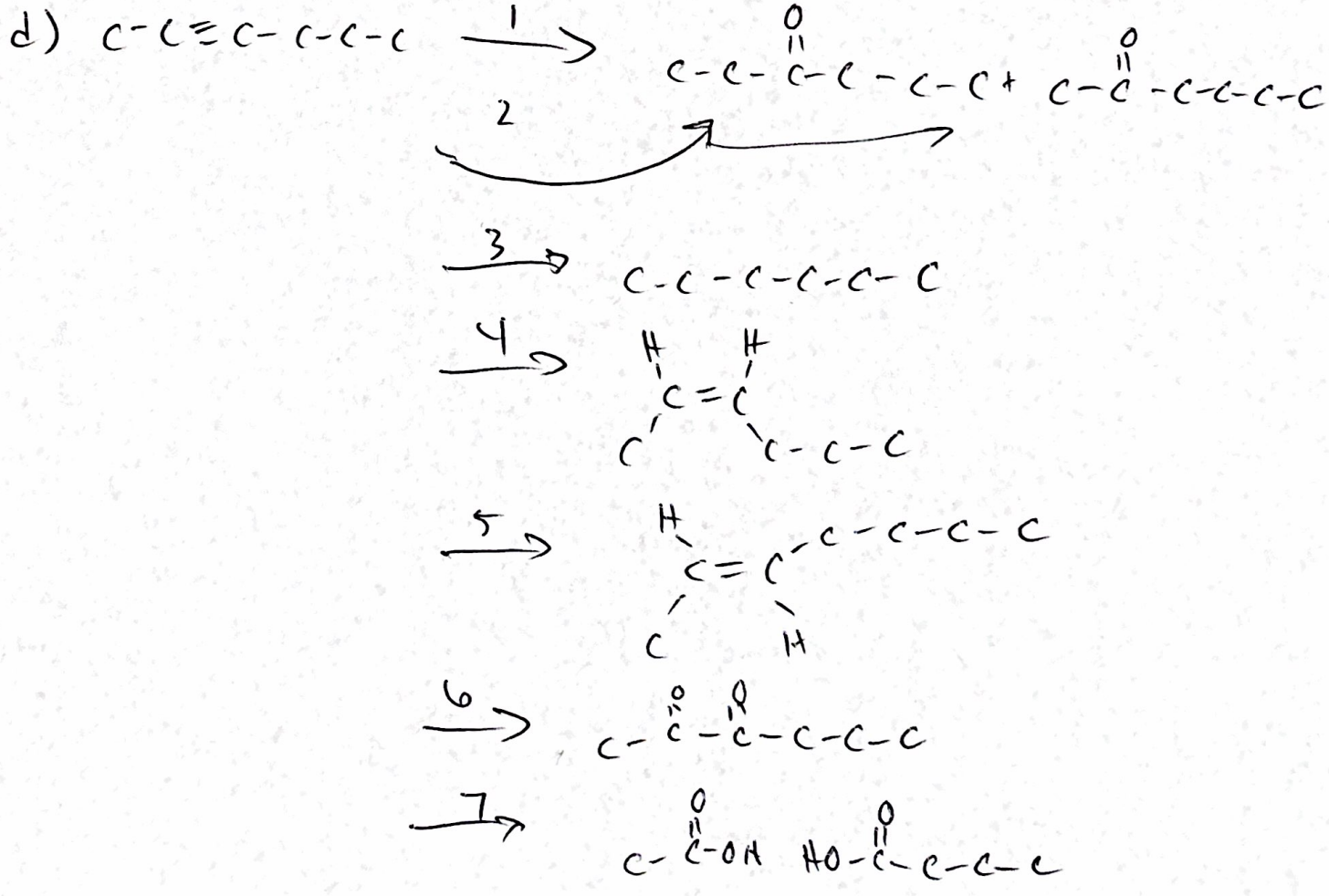
l) Br_2 m) Na, NH_3 n) H_2, Pt

4/3.

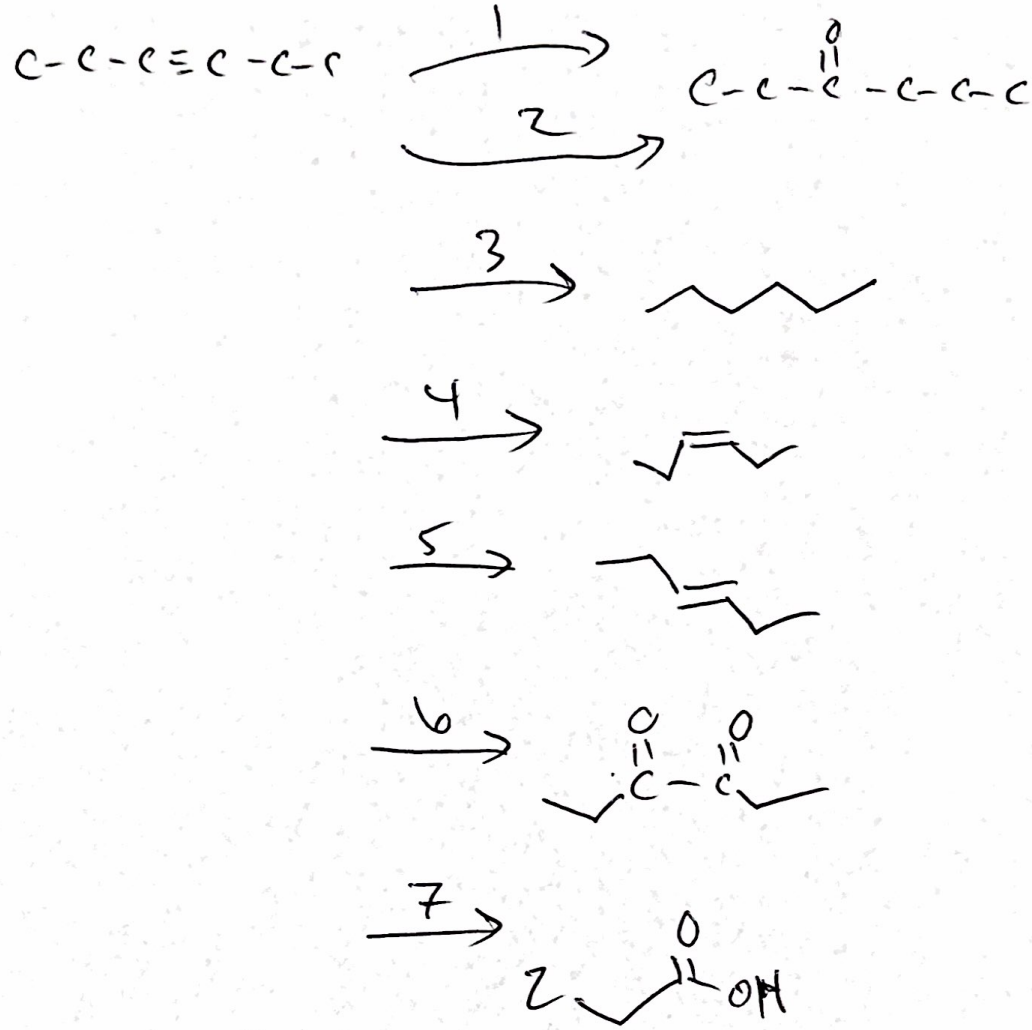
a) 

b) 

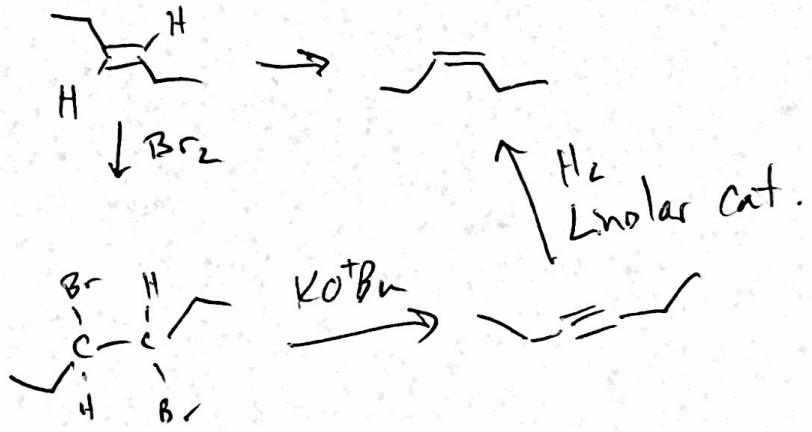
43) c. 

d) 

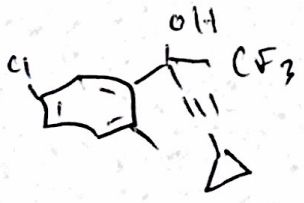
43. e)

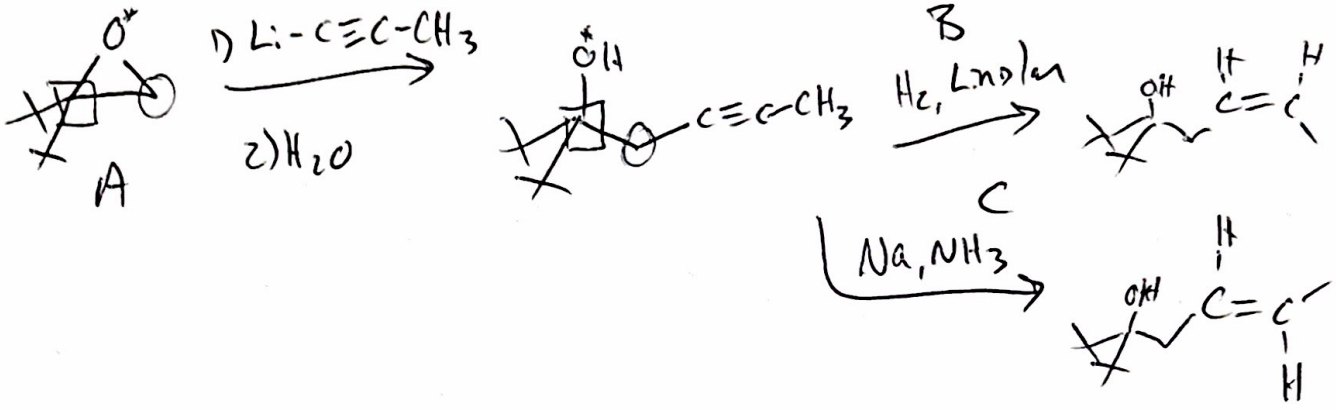


44.

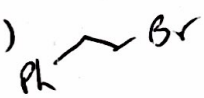


45.

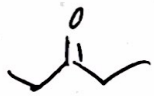


46. 

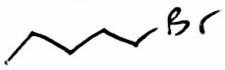
47. a) $H-C\equiv C-H$ 1) $NaNH_2$ 2) C-C-C-Br

b) 1) $NaNH_2$ 2)  3) $NaNH_2$ 4) 

c) 1) $NaNH_2$ 2) 3) BuLi: 4)   5) H_3O^+

d) 1) $NaNH_2$ 2) CH_3Br 3) BuLi 4)  5) H_3O^+

e) 1) $NaNH_2$ 2)  3) BuLi: 4)  5) H_3O^+

f) 1) $NaNH_2$ 2)  3) O_3 4) SMe_2

g) 1) $NaNH_2$ 2) 3) $2\,Br_2$

h) 1) $NaNH_2$ 2) 3) $NaNH_2$ 4) 5) H_2, Lindlar cat.

i) 1) $NaNH_2$ 2) CH_3Br 3) $NaNH_2$ 4) 5) Na, NH_3

47. j) 1) $NaNH_2$ 2) MeBr 3) $NaNH_2$ 4) MeBr

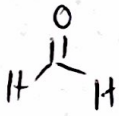
5) H_2, Lindlar cat. 6) OsO_4, H_2O_2

k) 1) $NaNH_2$ 2) MeBr 3) $NaNH_2$ 4) MeBr 5) H_2, Lindlar cat.

6) CH_2N_2

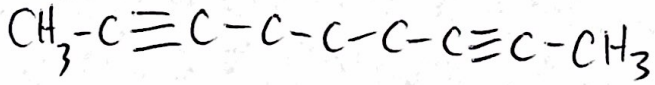
l) 1) $NaNH_2$ 2) 3) $NaNH_2$ 4)  5) $KMnO_4$, cold, dil., neut.

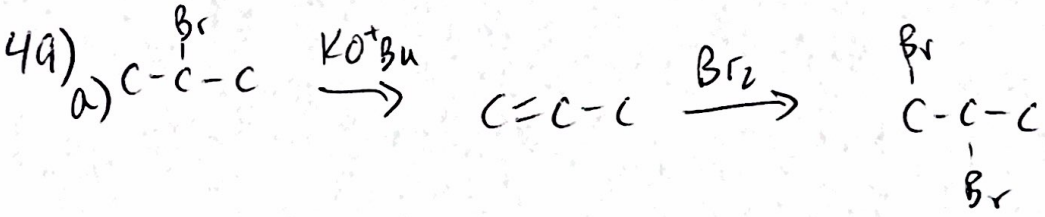
m) 1) $NaNH_2$ 2)  3) $HgSO_4$, H_2SO_4

n) 1) $NaNH_2$ 2)  3) BuLi. 4)  5) H_3O^+

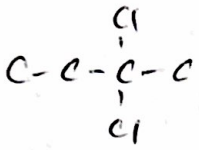
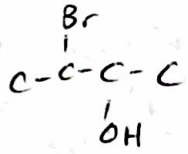
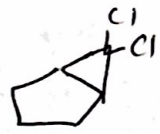
o) 1) $NaNH_2$ 2)  3) 2 HBr

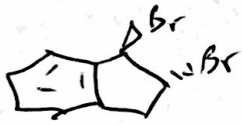
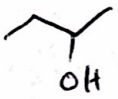
48) a) 

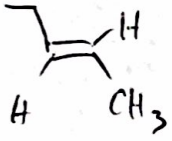
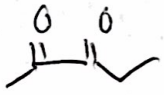
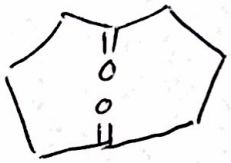
b) 

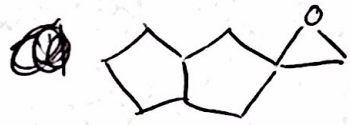
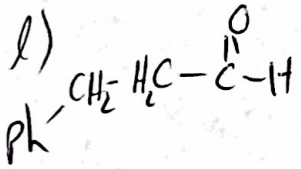
49) a) 

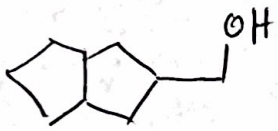
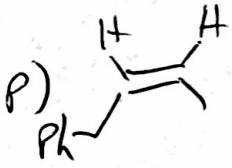
b) 

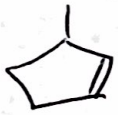
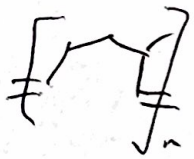
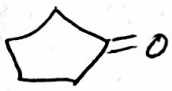
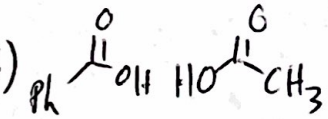
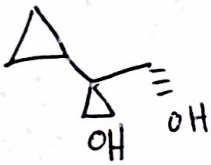
50. a)  b)  c) 

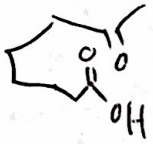
d)  e)  f)  g) 

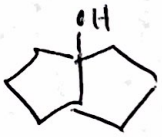
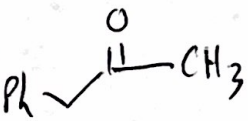
h)  i)  j) 

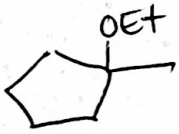
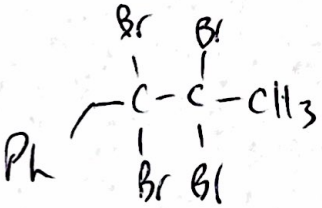
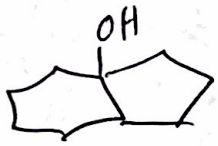
k)  l)  m) 

n)  o)  p) 

q)  or  r)  s)  t) 

u)  v)  w)  x) 

y)  z)  aa)  bb) 

cc)  dd)  ee) 

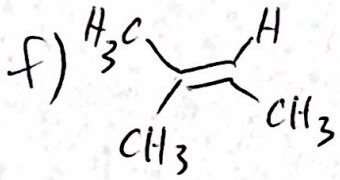
51) a) 1) O_3
2) Me_2S

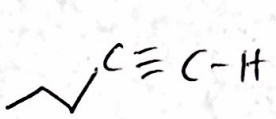
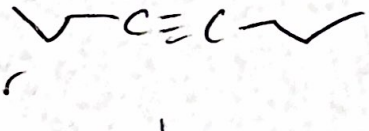
b) 1) Sia_2BH
c) H_2O_2, OH^-

c) BF_3, H_2O

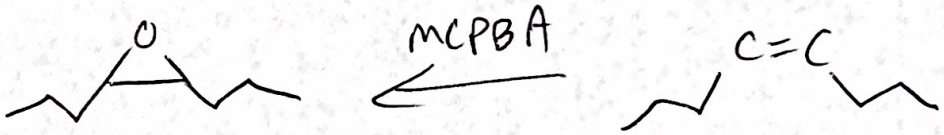
d) $HBr, ROOR$

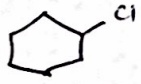
e) 1) $Hg(OAc)_2, EtOH$
2) $NaBH_4$

f) 

52) $H-C\equiv C-H \xrightarrow[2)\ \sim Br]{1)\ NaNH_2}$  $\xrightarrow[2)\ \sim Br]{1)\ NaNH_2}$ 

$\downarrow H_2$, Lindlar Cat



53) a) 1 degree of unsat. $\frac{2C+2-H}{2} = \frac{(2(6)+2-12)}{2}$ 11 H, 1 Cl 

A

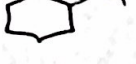
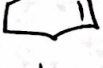
b) NO C=C. The degree of unsat. must be a ring.

c) $\frac{(2(6)+2-10)}{2}$ = 2 degrees of unsat.

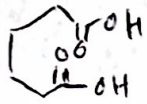
d) Now we have a C=C. 
B

e) 1 type

f) 1 degree of unsat. (The ring) C= 

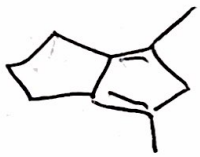
g) A=  B=  C= 

$\downarrow KMnO_4$
warm, conc

D= 

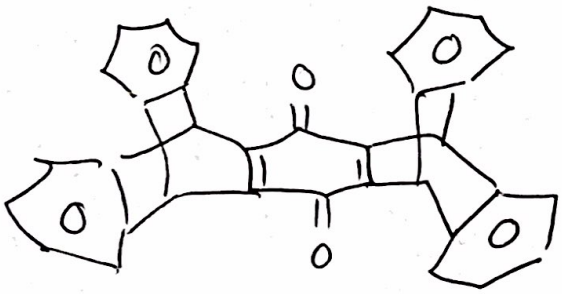
54. a) E contains a π Bond

b)



55.

a)



b) H-C≡C-TMS + BuLi

56.