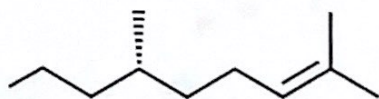


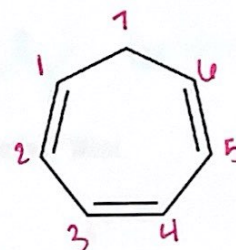
Key

Test Prep 3

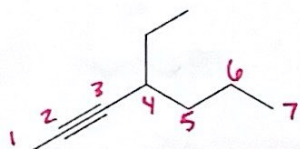
1) Name these compounds.



2,6-dimethyl-2-nonene



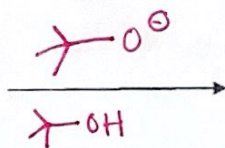
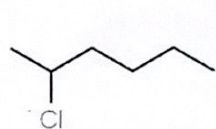
1,3,5-cyclohepta-triene



4-ethyl-2-heptyne

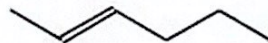
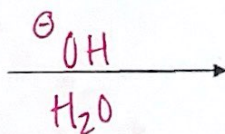
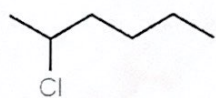
2) Consider the following elimination reaction. What type of bases would be necessary to achieve the given products?

Hoffman's Rule

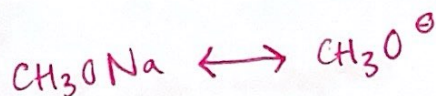


bulky bases usually give a less substituted alkene

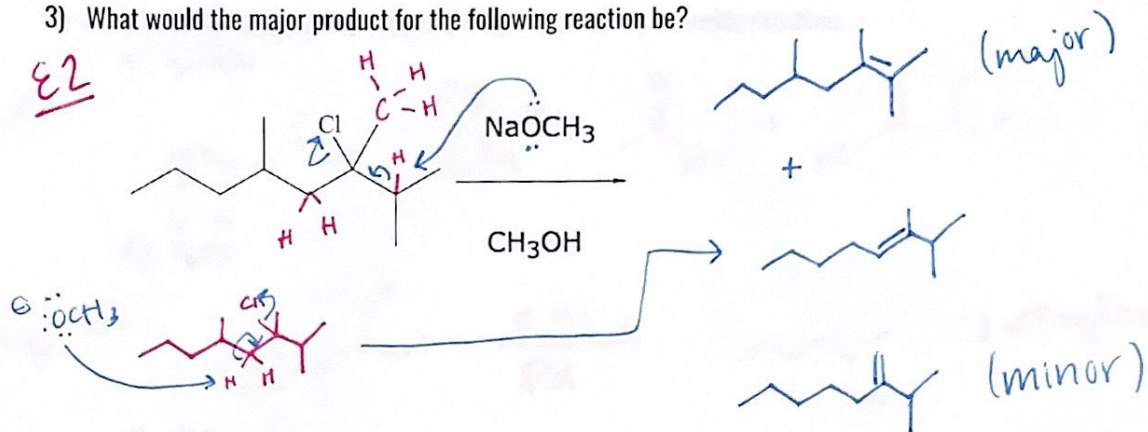
Zaitsev's Rule



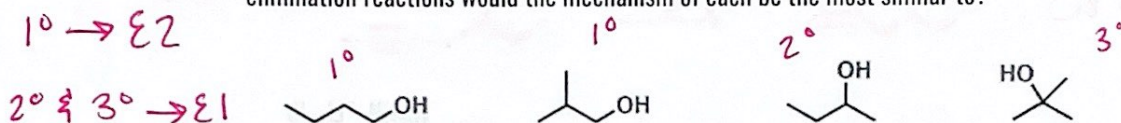
↑ more stable



3) What would the major product for the following reaction be?

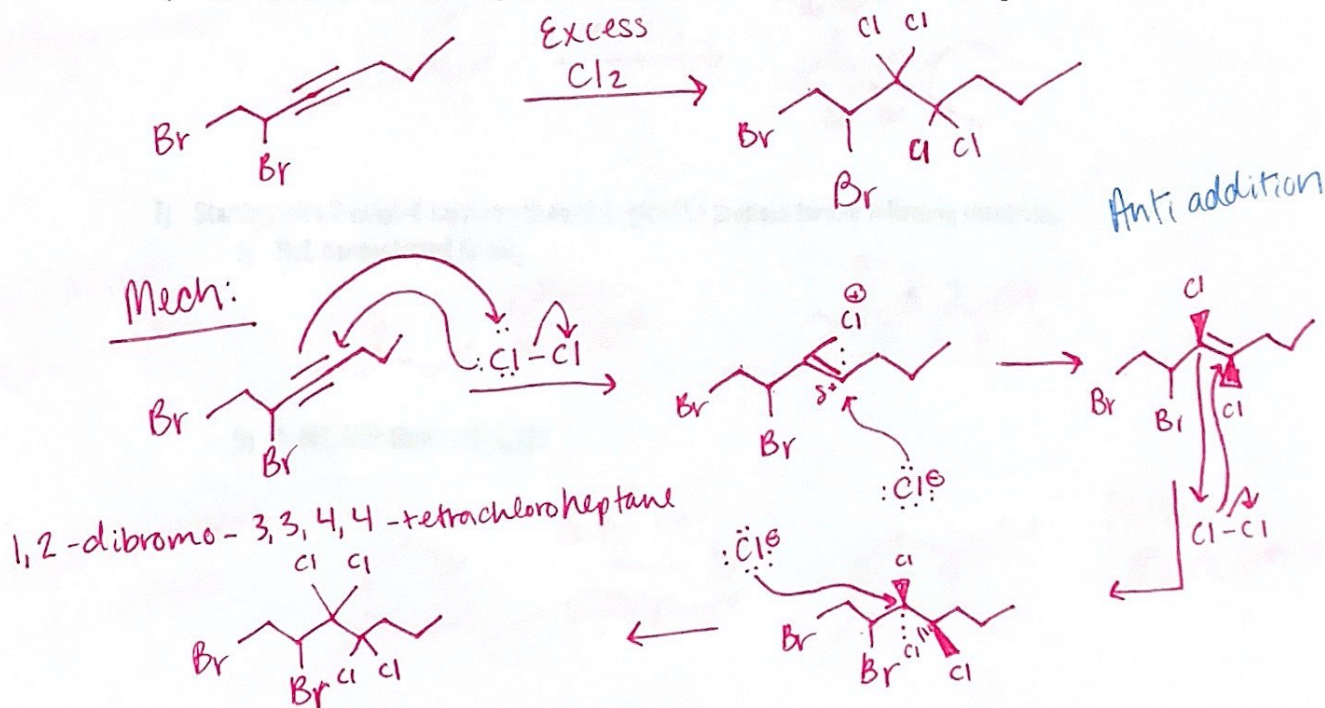


4) Which of the following alcohols would most quickly undergo a dehydration reaction? What elimination reactions would the mechanism of each be the most similar to?



The tertiary alcohol will form the most stable carbocation & would undergo a dehydration reaction the quickest.

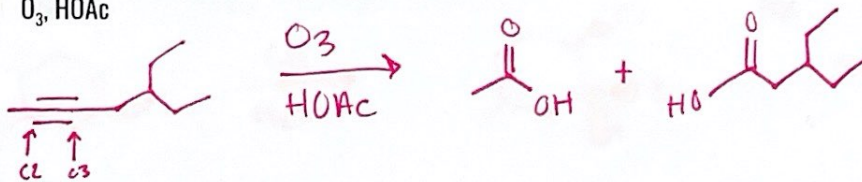
5) Show the mechanism of a halogenation reaction of 1,2-dibromo-3-heptyne with Cl_2 .



6) Starting with 5-ethyl-2-heptyne, give the product for the following reactions.

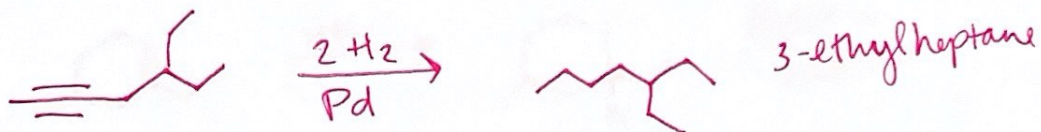
a) $O_3, HOAc$

Ozonolysis



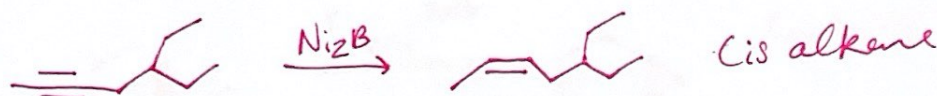
b) H_2, Pd

Hydrogenation



c) Ni_2B

P2 catalyst

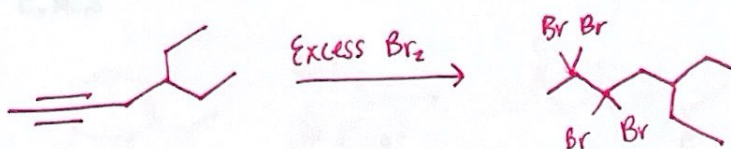


d) $Li^{\ominus}, NH_3(l)$



e) Excess Br_2

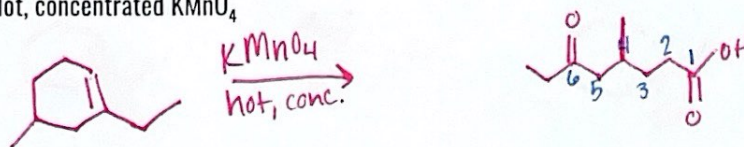
Halogenation



7) Starting with 2-ethyl-4-methylcyclohexene, give the product for the following reactions,

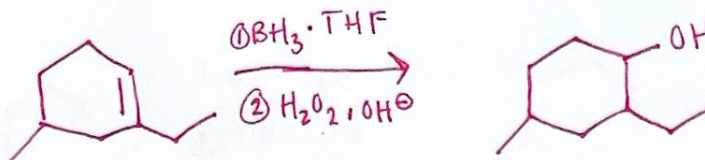
a) Hot, concentrated $KMnO_4$

Oxidative cleavage



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

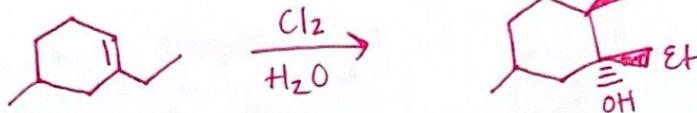
Hydroboration-oxidation



Anti-Markovnikov

Halohydrin

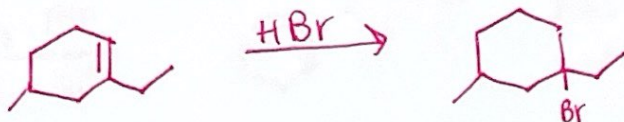
c) $\text{Cl}_2, \text{H}_2\text{O}$



Anti \neq Markov. addition

Hydrohalogenation

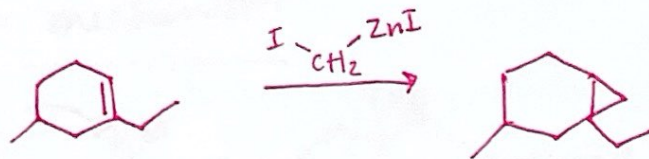
d) HBr



Markov. addition

$\text{CH}_2\text{I}_2 + \text{Zn}(\text{Cu})$
 \downarrow
 $\text{I}-\text{CH}_2-\text{ZnI}$
 (Carbenoid)

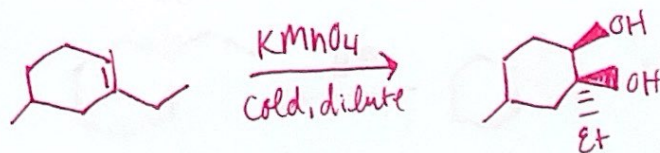
e) Simmons Smith Reagent



Cyclopropanation

Dihydroxylation

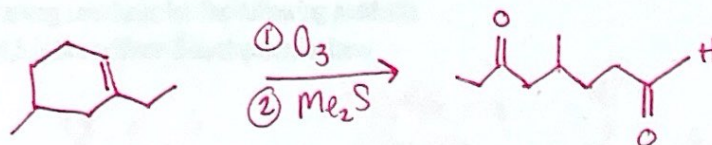
f) Cold, dilute KMnO_4



Cis di-ol

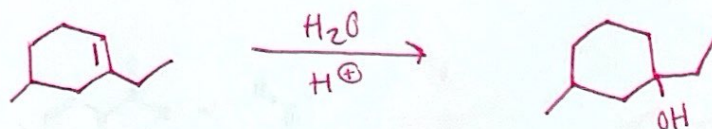
Ozonolysis

g) $\text{O}_3, \text{Me}_2\text{S}$



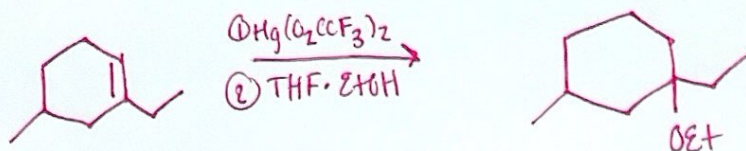
Hydration

h) $\text{H}_2\text{O}, \text{H}^+$



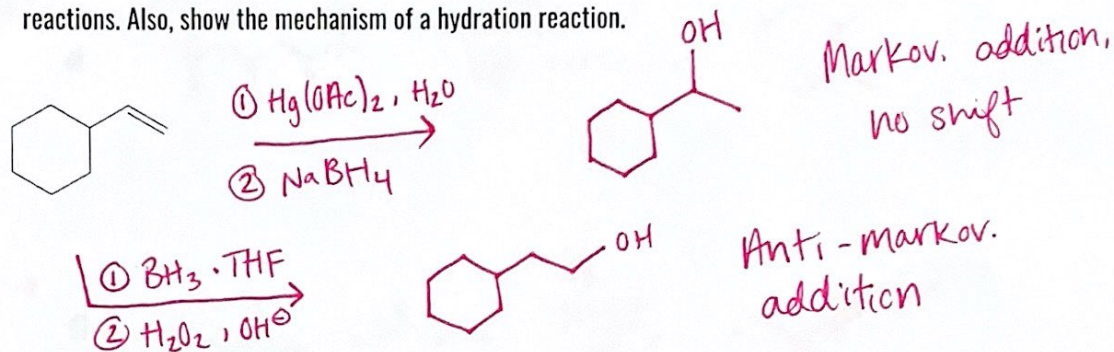
Solvomercuration-Demercuration

i) 1. $\text{Hg}(\text{O}_2\text{CCF}_3)_2$; then 2. $\text{THF} \cdot \text{CH}_3\text{CH}_2\text{OH}$
 ethanol "THF \cdot ROH"

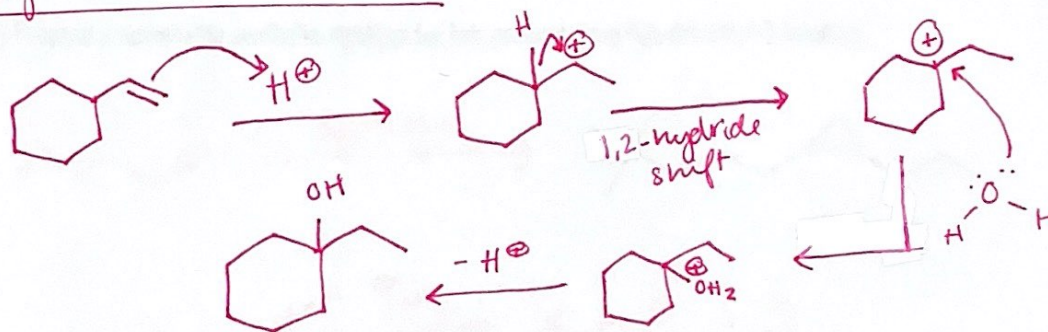


Markov. addition of ether

- 8) For the following compound, show the oxymercuration-demercuration and hydroboration-oxidation reactions. Also, show the mechanism of a hydration reaction.



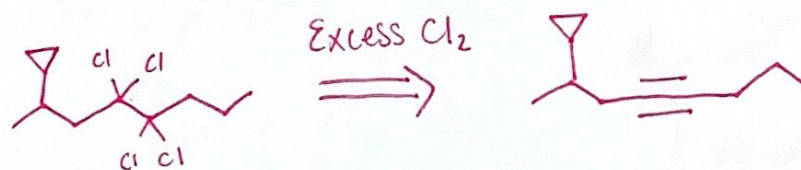
Hydration mechanism:



- 9) Give the starting reactants for the following products.

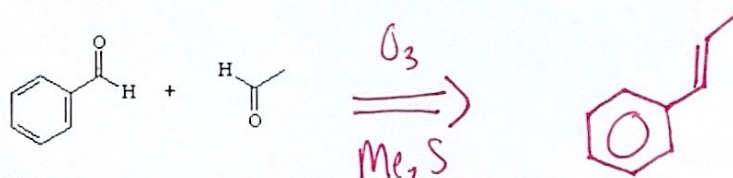
a) 4,4,5,5-tetrachloro-2-cyclopropyloctane

Halogenation
of
Alkynes

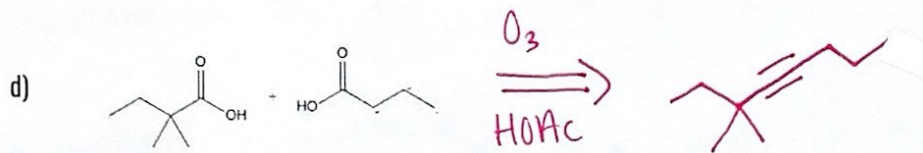
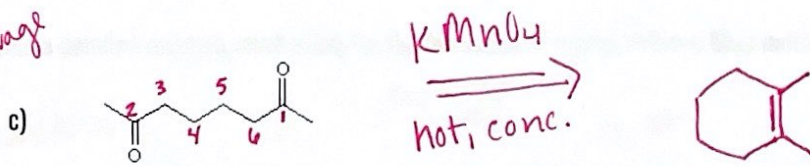


Ozonolysis
of
Alkenes

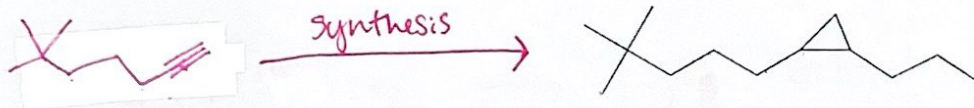
b)



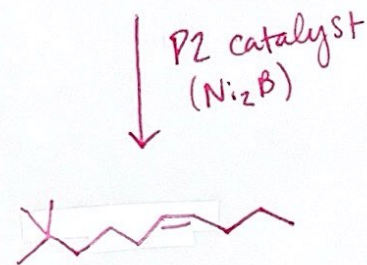
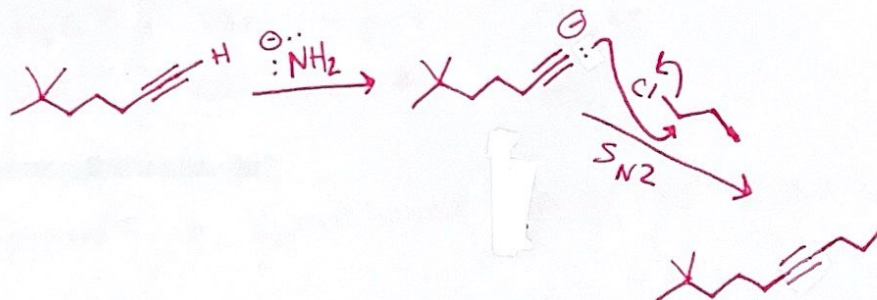
could be ozonolysis or oxidative cleavage



10) Propose a reasonable synthetic strategy for this product from 6,6-dimethyl-1-heptyne.



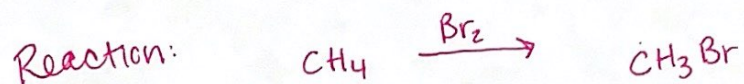
terminal alkyne
 ↓
 deprotonate to carbanion
 ↓ S_N2
 longer alkyne
 ↓
 cis alkene
 ↓
 cyclopropanation



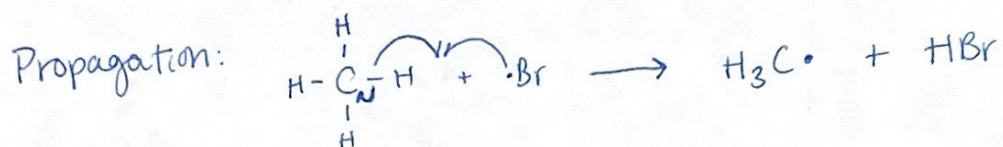
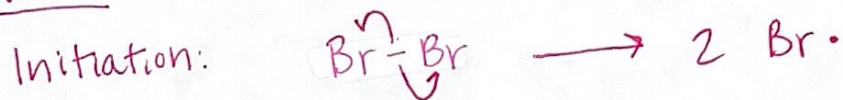
↓ Simmons-Smith reagent



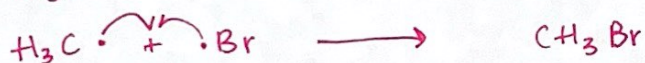
11) Provide a detailed reaction mechanism for the formation of bromomethane from methane.



Mech:



Termination:



12) What do we use radical reactions for?

To provide a functional group to react upon.