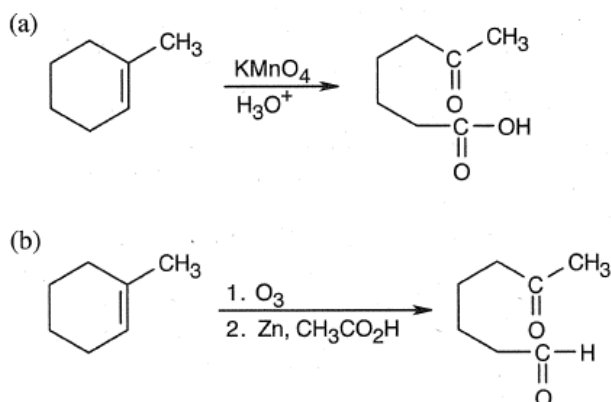
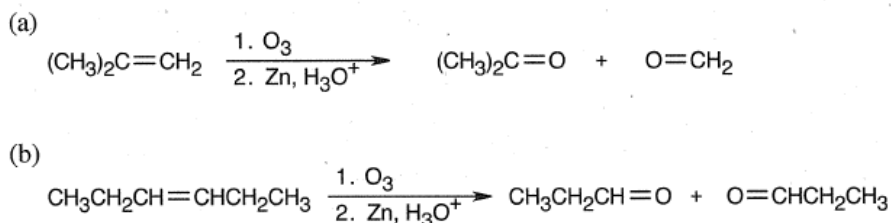


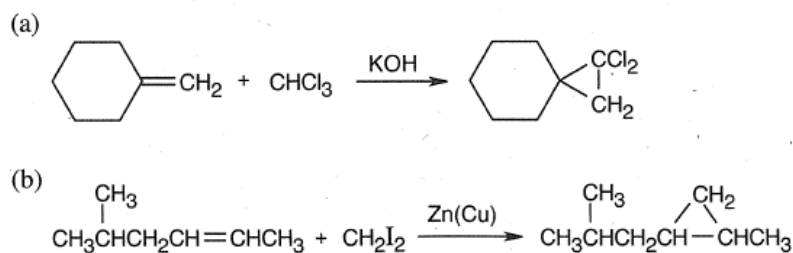
- 8.15 Both sets of reactants cleave double bonds. Aqueous KMnO_4 produces a carboxylic acid from a double bond carbon that is monosubstituted and a ketone from a double bond carbon that is disubstituted. Ozone produces an aldehyde from a double bond carbon that is monosubstituted and a ketone from a double bond carbon that is disubstituted. If the double bond is part of a ring, both carbonyl groups occur in the same product molecule.



- 8.16 Orient the fragments so that the oxygens point toward each other. Remove the oxygens, and draw a double bond between the remaining carbons.

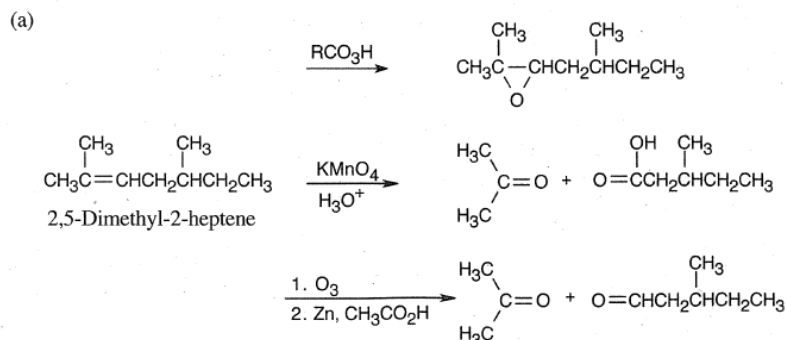


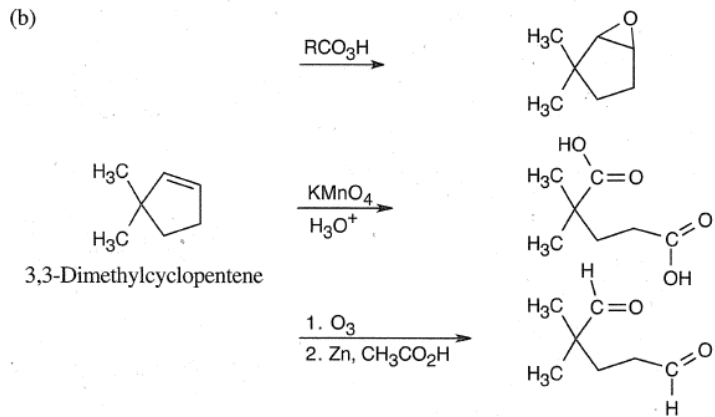
- 8.17 Reaction of a double bond with chloroform under basic conditions gives a product with a cyclopropane ring in which one of the carbons has two chlorine atoms bonded to it. Reaction of a double bond with CH_2I_2 yields a product with a cyclopropane ring that has a $-\text{CH}_2-$ group.



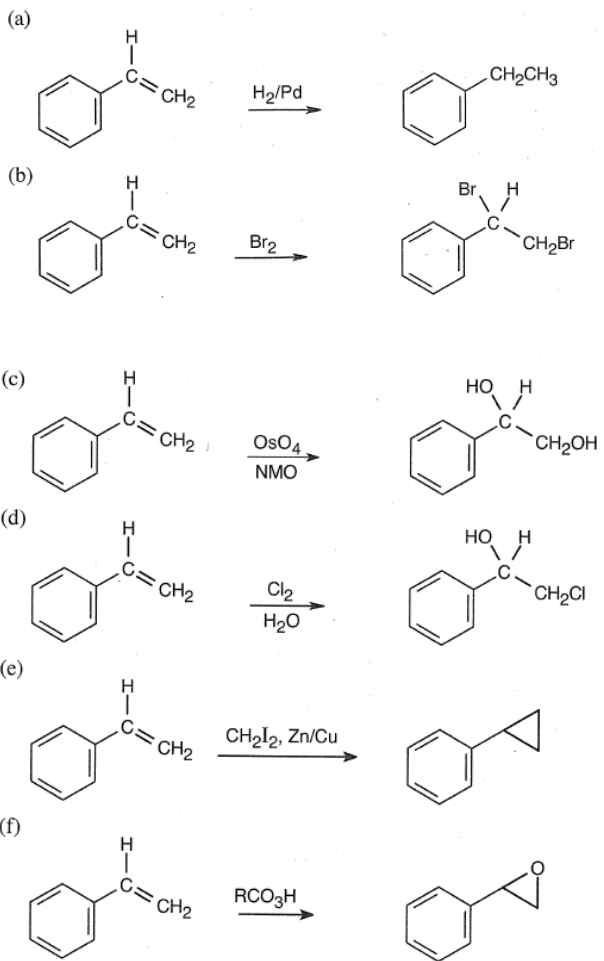
Depending on the stereochemistry of the double bond of the alkene in (b), two different isomers can be formed.

8.22



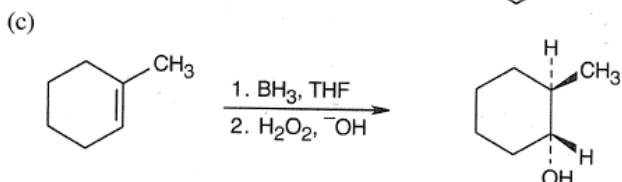
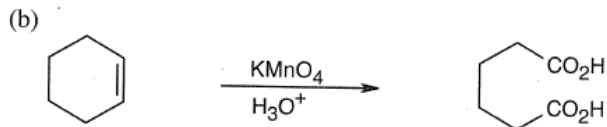
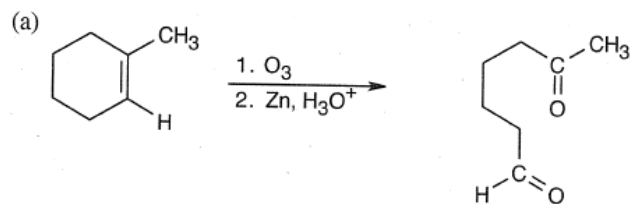


8.26

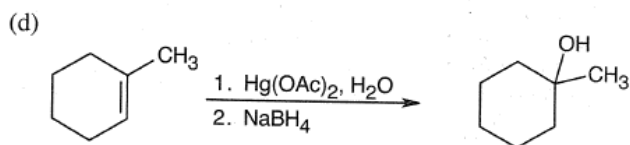


$\text{RCO}_3\text{H} = \textit{meta}$ -Chloroperoxybenzoic acid

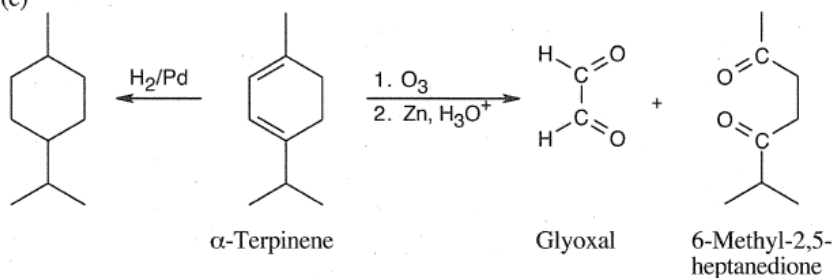
8.28



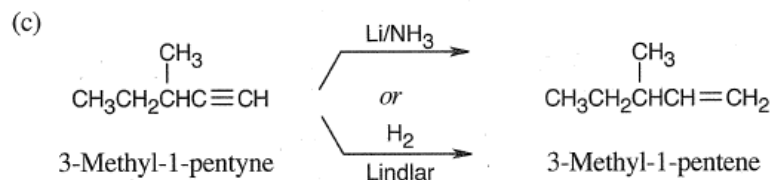
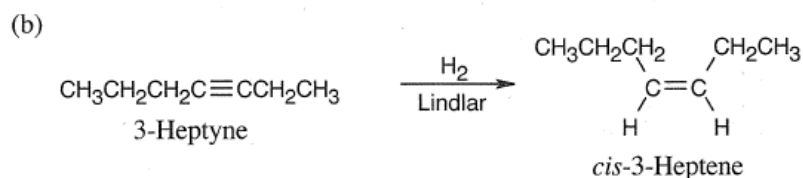
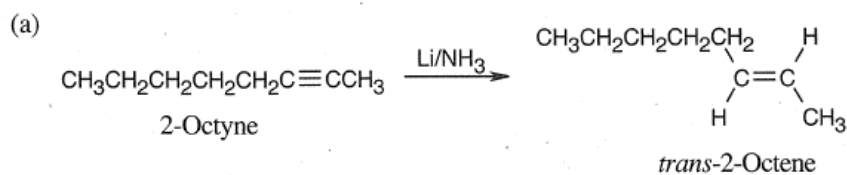
Remember that $-H$ and $-OH$ add syn across the double bond.



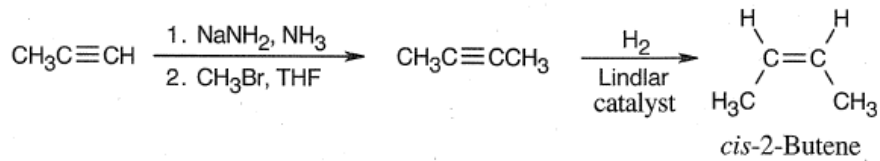
- 8.56 (a) α -Terpinene, $C_{10}H_{16}$, has three degrees of unsaturation.
 (b) Hydrogenation removes only two degrees of saturation, producing a hydrocarbon $C_{10}H_{20}$, that has one ring. α -Terpinene thus has two double bonds and one ring.
 (c)



- 9.8 The correct reducing reagent gives a double bond with the desired geometry.

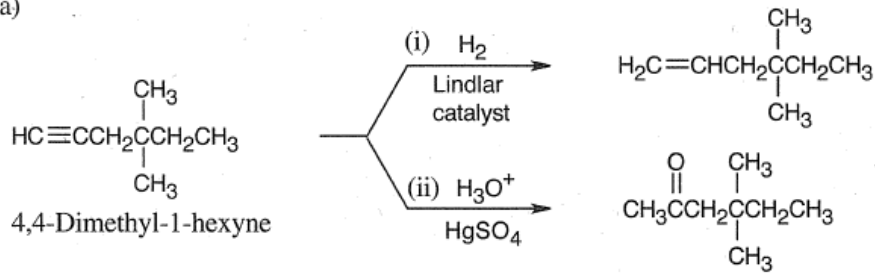


9.11 The cis double bond can be formed by hydrogenation of an alkyne, which can be synthesized by an alkylation reaction of a terminal alkyne.

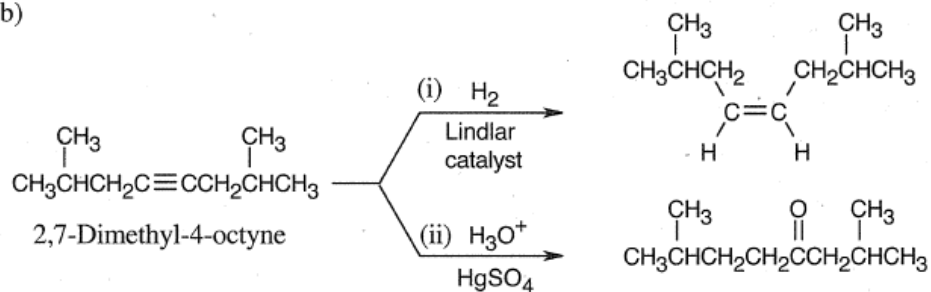


9.14

(a)



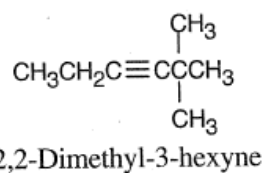
(b)



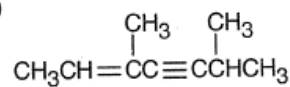
Naming Alkynes

9.18

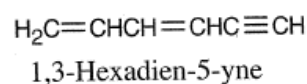
(a)



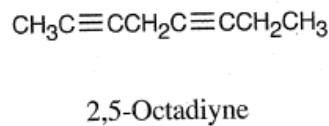
(c)



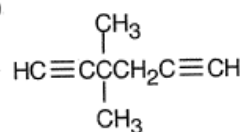
(e)



(b)



(d)



(f)

