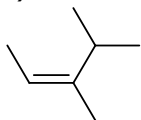


PRACTICE PROBLEMS UNIT 10

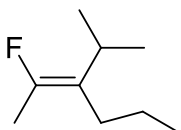
10A. Provide IUPAC names for chain and cyclic alkenes and alkynes including E/Z stereochemistry.

10A.1 Circle the higher priority substituent on each side of the alkene and indicate if the stereochemistry is E or Z.

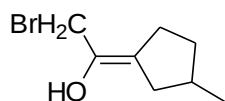
a)



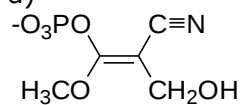
b)



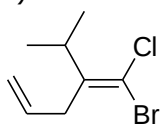
c)



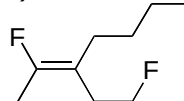
d)



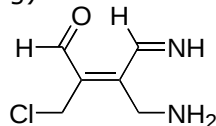
e)



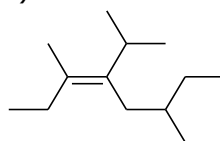
f)



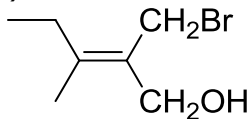
g)



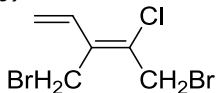
h)



i)

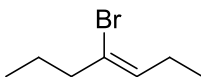


j)

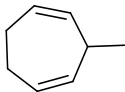


10A.2 Name the following compounds. Include stereochemical assignments where necessary.

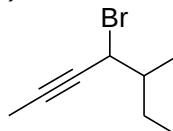
a)



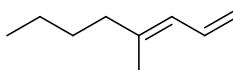
b)



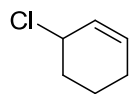
c)



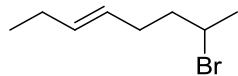
d)



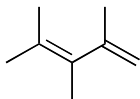
e)



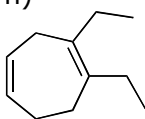
f)



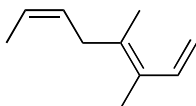
g)



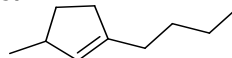
h)



i)



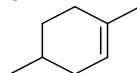
j)



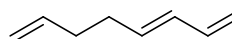
k)



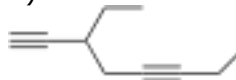
l)



m)



n)



10A.3 Draw the structure of the following compounds.

a) (2Z) 3-isopropyl-2-heptene.

b) (3Z, 6E) 6-bromo-3-ethyl-7-methyl-1,3,6-decatriene.

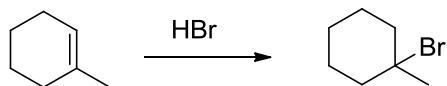
c) 5,5-dimethyl-3-octyne

d) *cis*-2-iodo-4-nonene

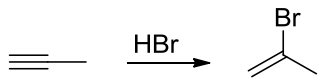
10B. Draw the mechanism of hydrohalogenation, hydration and halogenation reactions.

10B.1 Draw the mechanism for each of the following reactions. Draw any intermediates and use curved arrows to show electron flow.

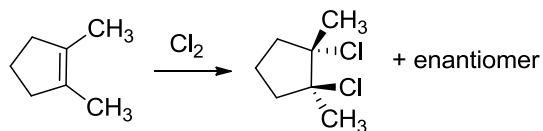
a)



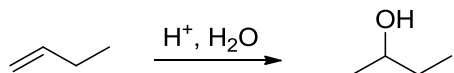
b)



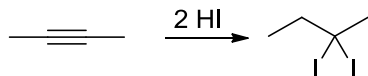
c)



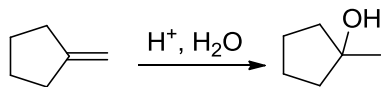
d)



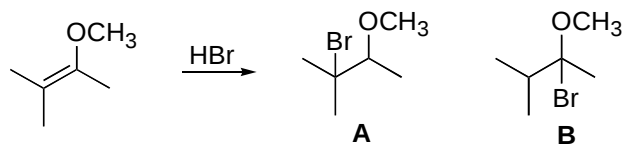
e)



f)

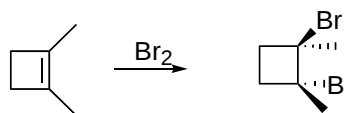
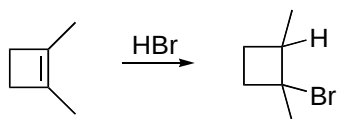


10B.2 a) Draw the mechanism for the formation of both products.



b) Only product B is formed in the reaction. Explain based on structures in the mechanism

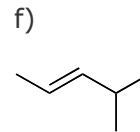
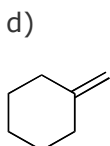
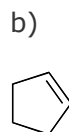
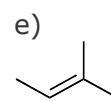
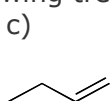
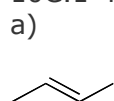
10B.4 a) Draw the mechanism of each reaction.



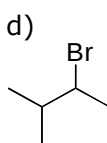
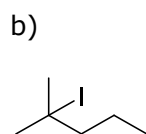
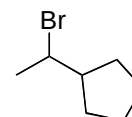
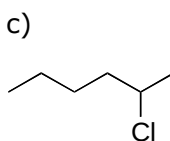
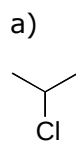
b) Based on the mechanism, why does one reaction give mixed stereochemistry and the other give purely anti?

10C. Predict the products of the following addition reactions to alkenes: hydrohalogenation*, hydration, halogenation*, hydroboration-oxidation, hydrogenation*, sodium reduction*, epoxidation. Know regiochemistry and stereochemistry of each reaction. *Know for alkynes

10C.1 Predict the product of the following treated with HCl.

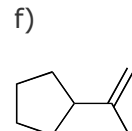
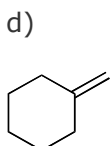
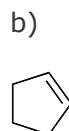
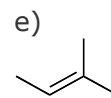
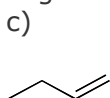
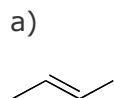


10C.2 What alkene(s) can be used to make the following halides as the only product?



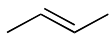
e)

10C.3 Predict the product of the following treated with H_2SO_4 , H_2O .

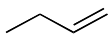


10C.4 Predict the product of the following treated with 1. BH_3 2. H_2O_2 , $-\text{OH}$.

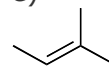
a)



c)



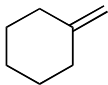
e)



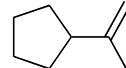
b)



d)

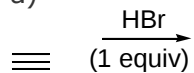


f)

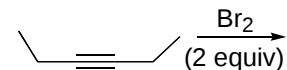
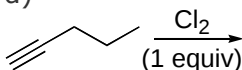


10C.5 Predict the product of the following addition reactions to alkynes

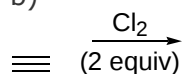
a)



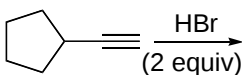
d)



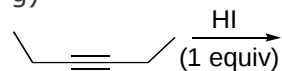
b)



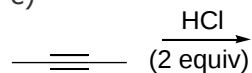
e)



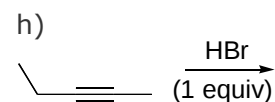
g)



c)

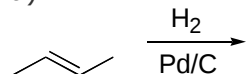


f)

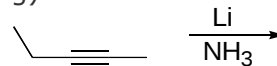


10C.6 Predict the product of the following reduction reactions.

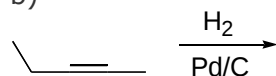
a)



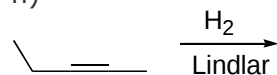
g)



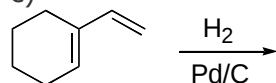
b)



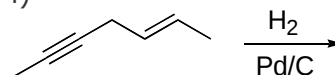
h)



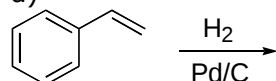
c)



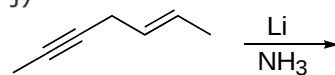
i)



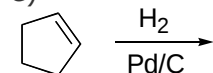
d)



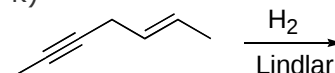
j)



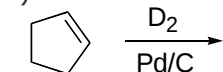
e)



k)

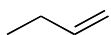


f)



10C.7 Predict the product of the following reacted with mCPBA.

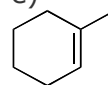
a)



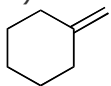
c)



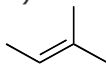
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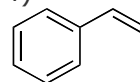
b)



d)

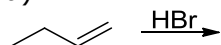


f)

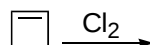


10C.8 Predict the major product(s) of the following reactions.

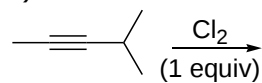
a)



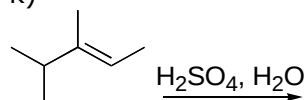
j)



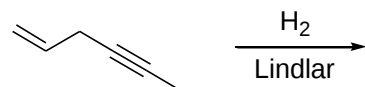
b)



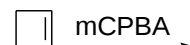
k)



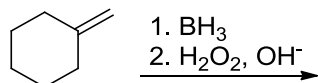
c)



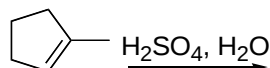
l)



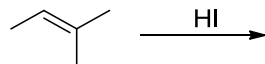
d)



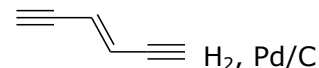
m)



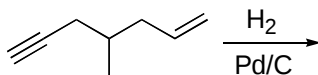
e)



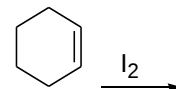
n)



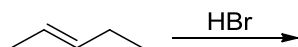
f)



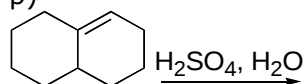
o)



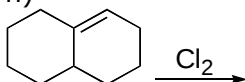
g)



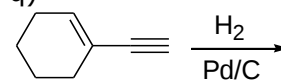
p)



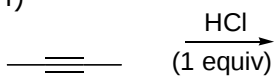
h)



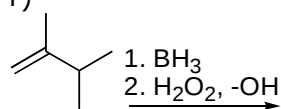
q)



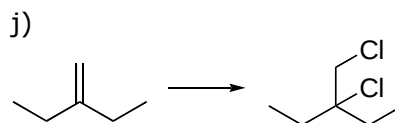
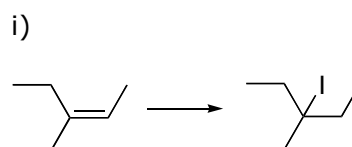
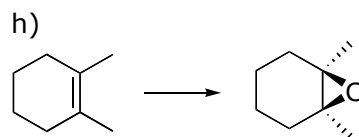
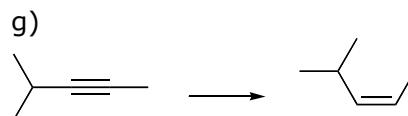
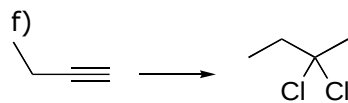
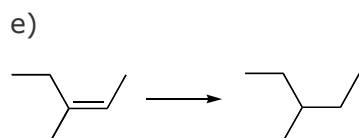
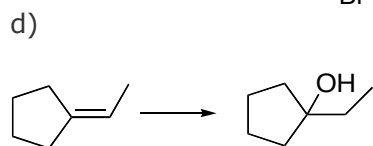
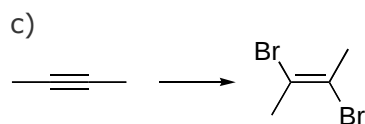
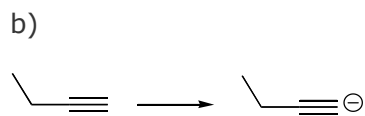
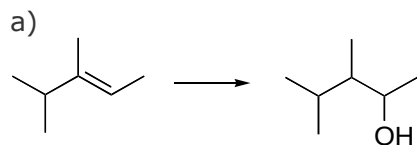
i)



r)

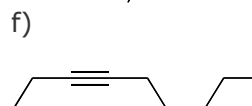
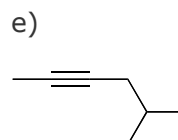
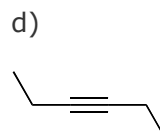
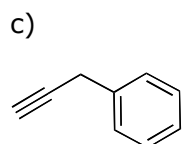
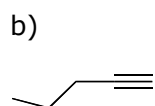
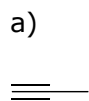


10C.9 Fill in the missing reagent for the following transformations.



10D. Synthesize substituted alkynes through acetylide ions.

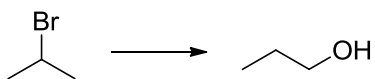
10D.1 Propose a synthesis for the following alkenes starting with acetylene



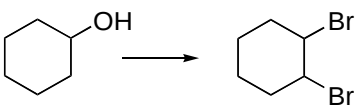
10E. Propose multistep-syntheses of molecules.

10E.1 Propose a multistep synthesis for the following reactions.

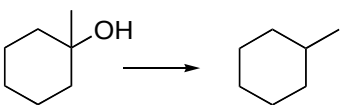
a)



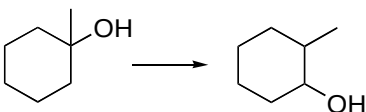
b)



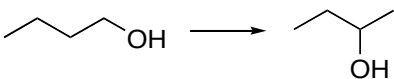
c)



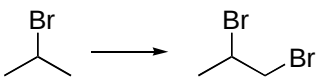
d)



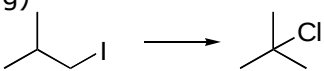
e)



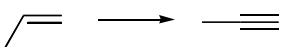
f)



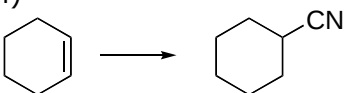
g)



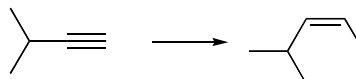
h)



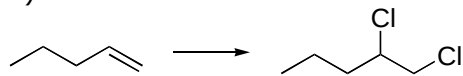
i)



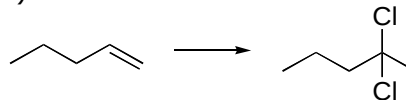
j)



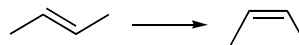
k)



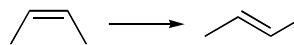
l)



m)



n)



o)

