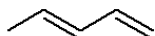


## 16.12: ADDITIONAL EXERCISES

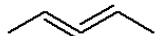
### General Review

16-1 Identify which of the following dienes are isolated, conjugated, or cumulated.

a)



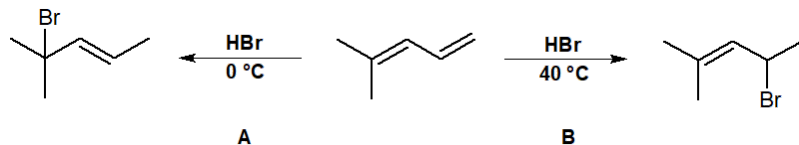
b)



c)



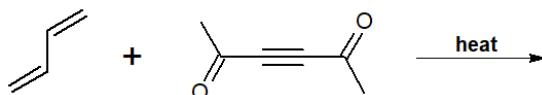
16-2 Identify which pathway gives the thermodynamic or the kinetic product and provide a reason for your answer.



16-3 Draw the resonance structures of the following molecule.

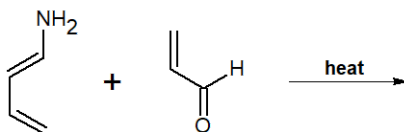


16-4 Provide the final product of the following reaction.



16-5 Predict the final product for the following reactions.

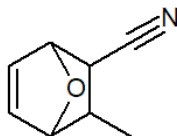
a)



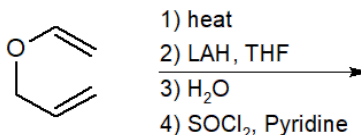
b)



16-6 For the following compound, predict which bonds could be broken to give the most probable Diels-Alder dienes that reacted to make the compound. Provide the resulting dienes from the prediction.



16-7 Give the final product of the following reaction chain..



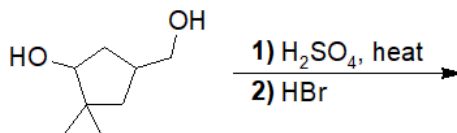
### 1,2- and 1,4-Addition to Conjugated Dienes

16-8 Predict all possible products of the following reaction.



**16-9** Identify the kinetic and thermodynamic products of the previous problem, **16-8**.

**16-10** Predict the kinetic product(s) of the following reaction and provide proper IUPAC nomenclature.

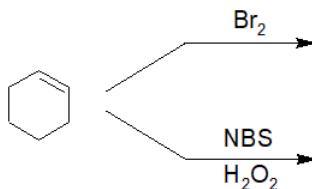


### Allylic Radicals

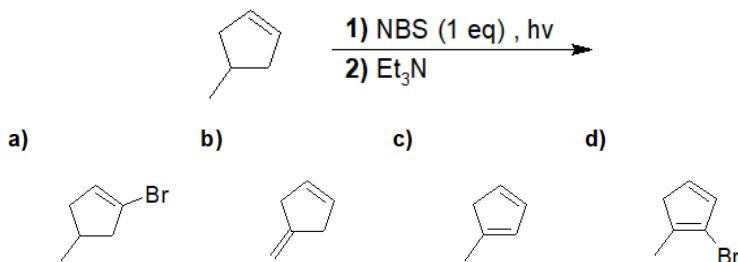
**16-11** Draw arrows to show the movement of electrons in the following allylic radical.



**16-12** Show the products of the following reactions.

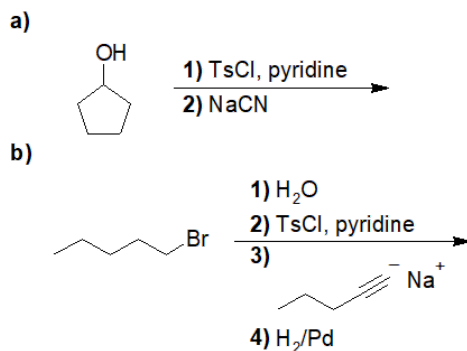


**16-13** Choose the correct answer of the following reaction.

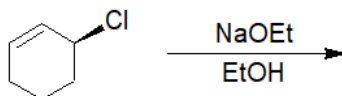


### $\text{S}_{\text{N}}2$ Displacement Reactions of Allylic Halides and Tosylates

**16-14** Predict the products of the following reactions.

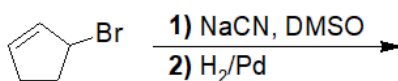


**16-15** Choose the correct IUPAC nomenclature of the product of the following reaction and provide its structure.



- a) (3R)-3-ethoxycyclohex-1-ene
- b) (3S)-3-ethoxycyclohex-1-ene
- c) ethoxycyclohexane
- d) cyclohexa-1,3-diene

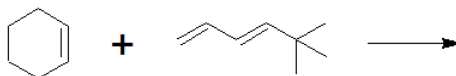
**16-16** Predict the product of the following reaction.



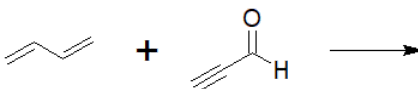
### Diels-Alder Reactions

16-17 Predict the products of the following Diels-Alder reactions.

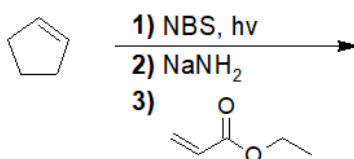
a)



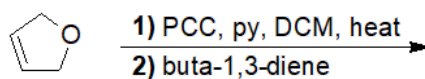
b)



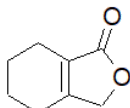
16-18 Predict the product of the following reaction.



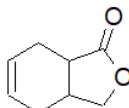
16-19 Choose the correct answer.



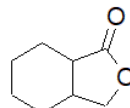
a)



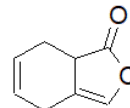
b)



c)



d)



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