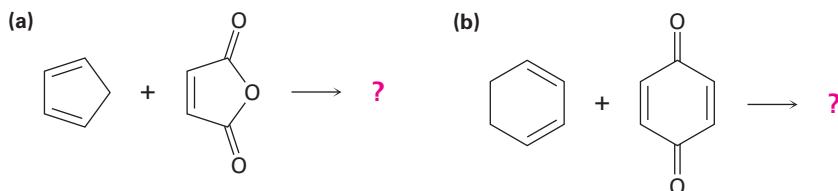
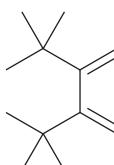


Diels–Alder Reactions

14-31 Predict the products of the following Diels–Alder reactions:

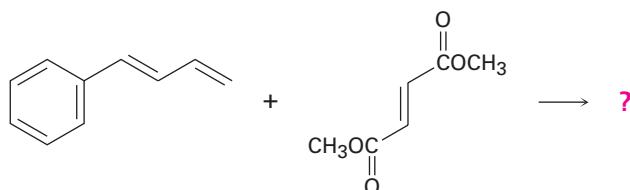


14-32 2,3-Di-*tert*-butyl-1,3-butadiene does not undergo Diels–Alder reactions. Explain.



2,3-Di-*tert*-butyl-1,3-butadiene

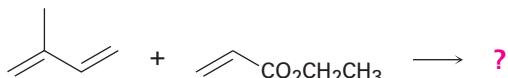
14-33 Show the structure, including stereochemistry, of the product from the following Diels–Alder reaction:



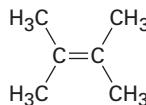
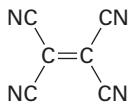
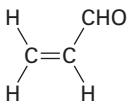
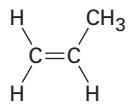
14-34 How can you account for the fact that *cis*-1,3-pentadiene is much less reactive than *trans*-1,3-pentadiene in the Diels–Alder reaction?

14-35 Would you expect a conjugated diyne such as 1,3-butadiyne to undergo Diels–Alder reaction with a dienophile? Explain.

14-36 Reaction of isoprene (2-methyl-1,3-butadiene) with ethyl propenoate gives a mixture of two Diels–Alder adducts. Show the structure of each, and explain why a mixture is formed.

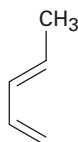


14-37 Rank the following dienophiles in order of their expected reactivity in the Diels–Alder reaction.

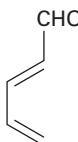


14-38 1,3-Cyclopentadiene is very reactive in Diels–Alder cycloaddition reactions, but 1,3-cyclohexadiene is less reactive and 1,3-cycloheptadiene is nearly inert. Explain. (Molecular models are helpful.)

14-39 1,3-Pentadiene is much more reactive in Diels–Alder reactions than 2,4-pentadienal. Why might this be?



1,3-Pentadiene



2,4-Pentadienal

14-40 How could you use Diels–Alder reactions to prepare the following products? Show the starting diene and dienophile in each case.

