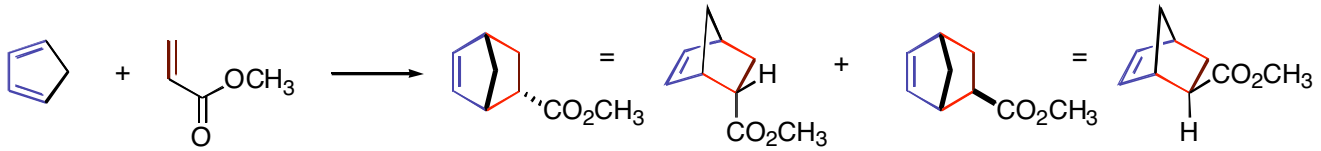
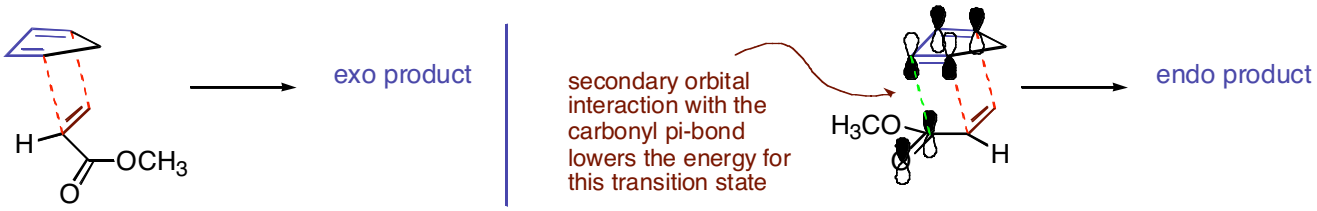
These notes can be obtained at: http://www.ndsu.nodak.edu/instruct/grcook/chem342/notes.shtml

Chapter 14: Conjugated Dienes and UV Spectroscopy

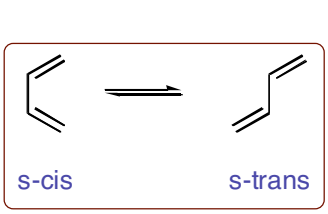
Diels-Alder Cycloaddition Reaction

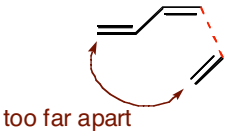
The Diels-Alder cycloaddition prefers to place the electron withdrawing group underneath the diene because the carbonyl pi-bond can interact with the diene pi-system. This gives rise to the endo product as the major product in the reaction.



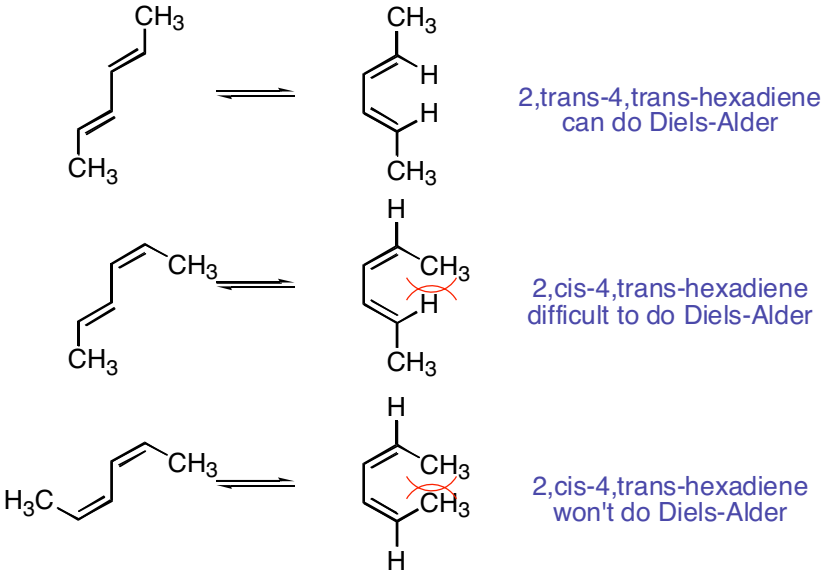


The conformation of the diene is very important for the Diels-Alder reaction. It must be in the s-cis conformation to react. Dienes in rings where the conformation is forced to be s-cis are the best. Sterics can influence the conformation of the dienes.

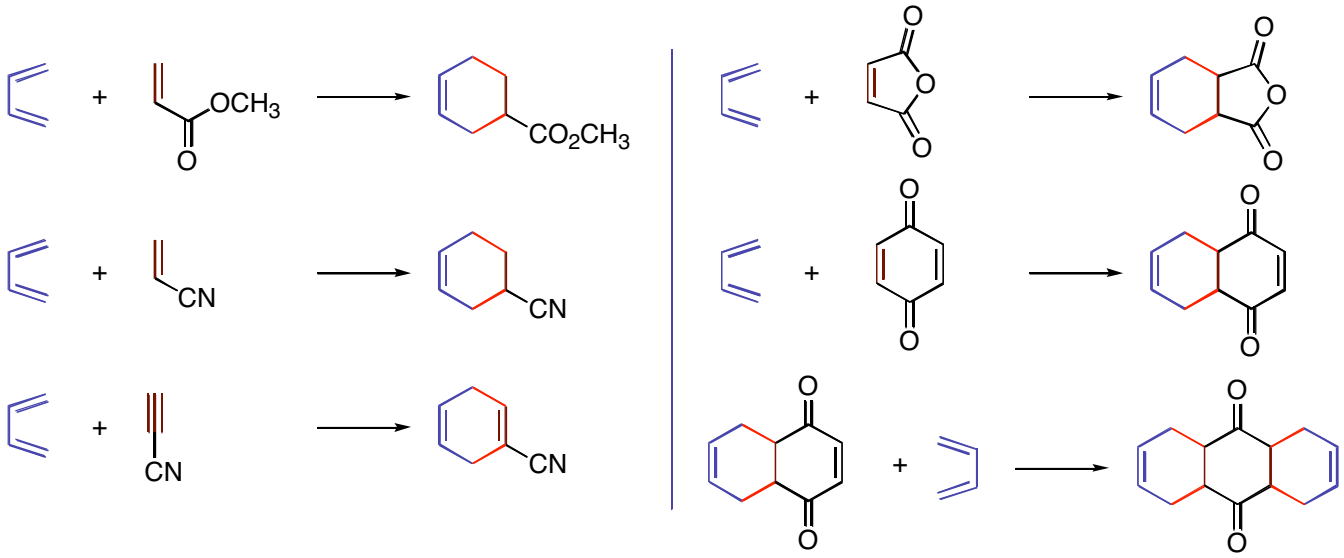




one of the best dienes for Diels-Alder



Many dienophiles participate in Diels-Alder reactions. If an alkyne is used, then another double bond appears in the product.



If the diene and dienophile are attached together, and the attachment is long enough for the two reactants to come together, then the Diels-Alder reaction can occur in an intramolecular fashion.