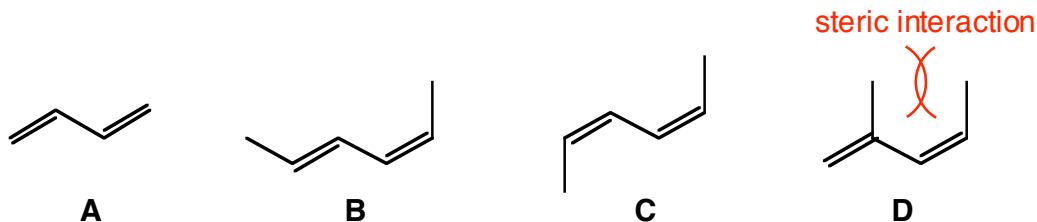
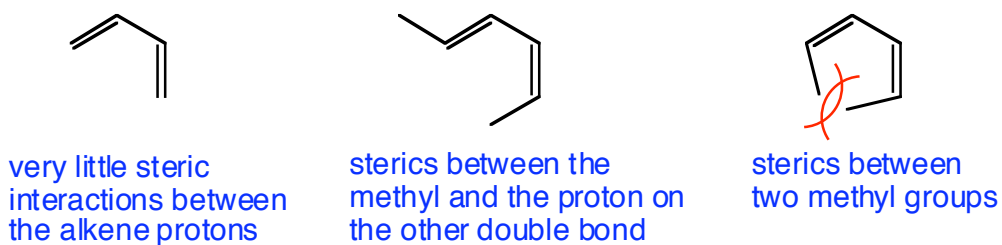


1. Rank the following dienes according to their reactivity (fastest to slowest) in a Diels-Alder reaction. Explain your ranking using pictures *and* words.



Since the Diels-Alder reaction can only occur with *s-cis* dienes, the relative rate of the reaction will depend on the ability or likelihood of the diene attaining that conformation. We can use **A** as the reference case since we know that it is capable of attaining the *s-cis* conformation. We can analyze the others from one of two standpoints; the stability of the diene in its current conformation or the stability of the diene in its *s-cis* conformation. The former is best suited for **D**, since the two methyl groups can interact unfavorably due to sterics (see above). Therefore, **D** is probably the most likely to assume an *s-cis* conformation. If we compare the *s-cis* conformers of **A**, **B**, and **C**, we can see that steric repulsion of the inwardly pointing groups determines how likely the diene is to stay in the *s-cis* conformation.



faster	D > A > B > C	slower
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