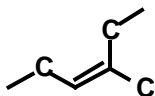


CHE 173

Winter, 2005

Specific Objectives for Quiz 3

1. Understand what is meant by the term "conjugation," what constitutes a "conjugated system" of electrons, and the effects of conjugation on the relative energy of a compound.
2. Understand the basic structure of an allyl group, and be able to identify the allylic position(s) in a given molecule (there are three allylic carbons in the example shown below):



3. Understand that an allylic carbocation is stabilized by resonance delocalization and know what effect this has on reactions that proceed through formation of carbocation intermediates (S_N1 reactions, for example).
4. Understand that one consequence of resonance delocalization of allyl carbocations is that mixtures of products (regioisomers) can and will form; be able to predict the major and minor product(s) of a reaction for which this is possible.
5. Understand that an allylic free radical intermediate is stabilized by resonance delocalization and know what effect this has on reactions that proceed through formation of free radical intermediates (halogenation reactions, for example).
6. Understand that one consequence of resonance delocalization of allyl free radicals is that mixtures of products (regioisomers) can and will form; be able to predict the major and minor product(s) of a reaction for which this is possible.
7. Be able to identify different types of dienes (conjugated, isolated, and cumulated) and understand the relative stabilities of each.
8. Understand why conjugated dienes are most stable and that the s-cis conformation is slightly higher in energy than the s-trans (by about 12 kJ/mol).

9. Understand that conjugated dienes can be prepared selectively by elimination of allyl halides (allyl halides in turn may be prepared from the corresponding hydrocarbon by allylic halogenation).
10. Understand the difference between kinetic control and thermodynamic control of a reaction and be able to predict the products that will result from a given reaction that is either under thermodynamic or kinetic control.
11. Be able to show a mechanism for and predict the product(s) of the following reactions of conjugated dienes:
 - (a) Hydrohalogenation
 - (b) Halogenation
 - (c) Diels Alder