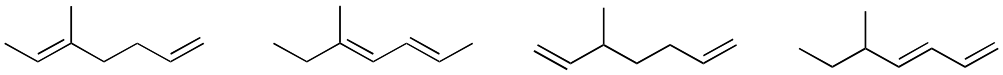
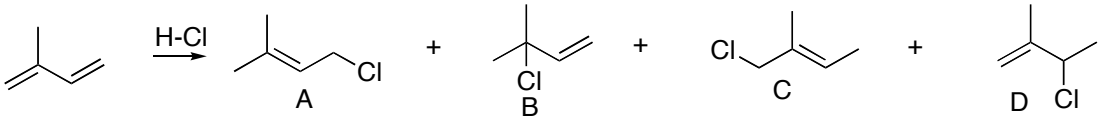
Organic Chemistry I Jasperse
Extra Practice Problems: Conjugated Systems, Dienes, Allylic Systems and the Diels-Alder Reaction

1. Rank the heats of hydrogenation for the following, 1 being most heat released and 4 being least heat. (Think: will the more stable isomer release more heat or less heat when it is hydrogenated)?



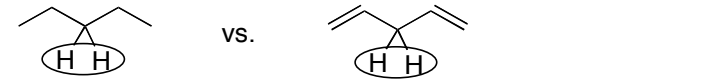
2. Rank the rate of reaction of the following toward S_N1 substitution ($AgNO_3/CH_3CH_2OH$), 1 being most reactive and 4 being least reactive. (Think: what determines the rates for S_N1 reactions?)

3. Products **A** and **B** combine to make up over 90% of the product mixture.
   a. For each of the structures **A-D**, attach an H atom to the carbon that in fact added an H.
   b. Classify each of the four structures as either a 1,2 or 1,4 addition product.
   c. Draw the resonance structures for the cation that leads to both products **A + B**, and also draw the resonance structures for the cation that leads to both products **C**+**D.**



4. Draw the mechanism for formation of products A and B above.

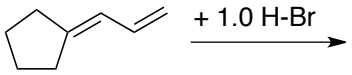
5. 1,4-pentanediene is much more acidic than pentane. Explain why. (Think: what determines acidtiy?)



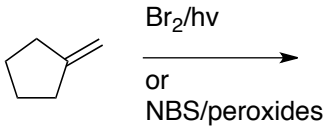
low acidity a million billion times more acidic

6. Draw the two major products for the following reaction.

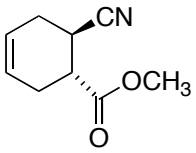
- Identify each as either a 1,2 or 1,4 addition product.
- Write either "thermodynamic" or "kinetic" underneath each one.
- Draw the two resonance structures for the intermediate from which both form.



7. Draw the major product or products for the following reaction. Draw the resonance structures for the intermediate from which both form.



8. Give the reactants (including stereochemistry) that would give the following Diels-Alder product.



9. Draw the major Diels-Alder product.