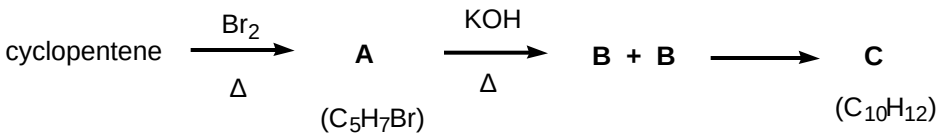
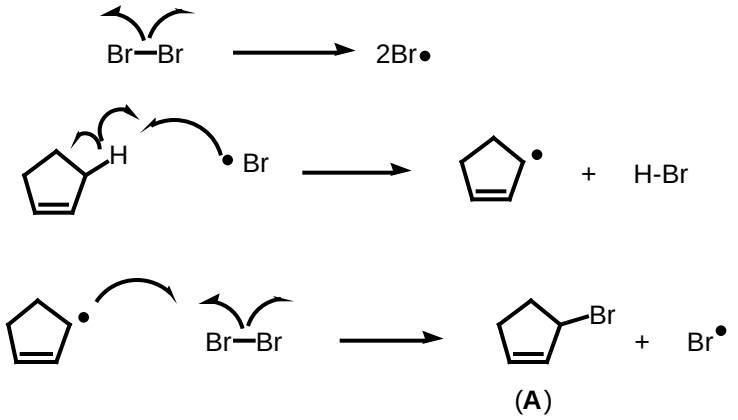
CHE 173
Winter, 2005
Quiz 3 Answer Key

Name_____
Section: 201 202 203 204 205 206
M T W Th F Th nt.
(circle one)

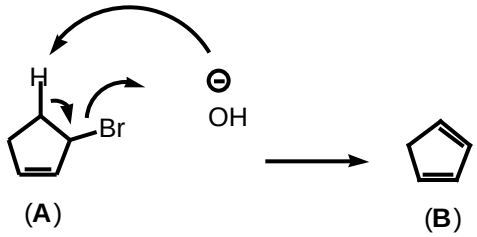
When cyclopentene is heated in the presence of bromine, a substitution reaction occurs to give compound **A** (C_5H_7Br). When compound **A** is heated with a strong base (KOH) it reacts to form a new compound (**B**) which is UV-active. Compound **B** reacts with itself (dimerizes) in a Diels Alder reaction to give the final product **C** ($C_{10}H_{12}$). Compound **C** has an IHD of 5, but is not UV-active.



1. What is the identity of compound **A**? Show a mechanism for the conversion of cyclopentene to compound **A**. (10 points)

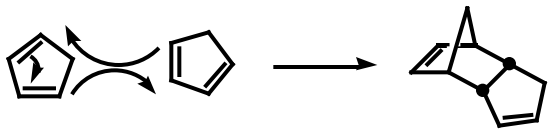


2. What is the identity of compound B? Show a mechanism for the conversion of A to B. (5 points)



(**A**) (**B**)

3. What is the identity of compound C? Show a mechanism for the conversion of B to C. (10 points)

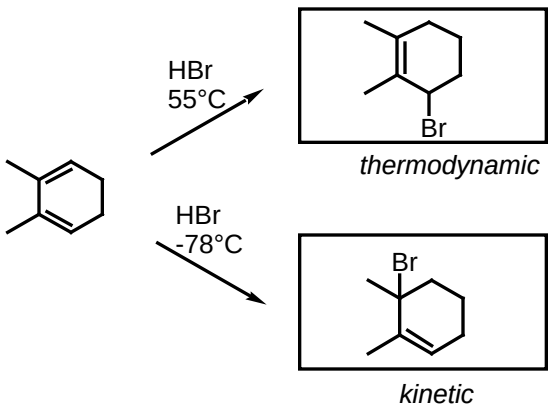


(**C**)

4. Why is compound **B** UV-active while compound **C** is not? (2 points)

***B** is UV-active because it is a conjugated diene; **C** is an isolated diene and is not UV-active.*

5. Show the major product that would form from the reaction below under the given conditions. Which is the thermodynamic product and which is the kinetic? (8 points)

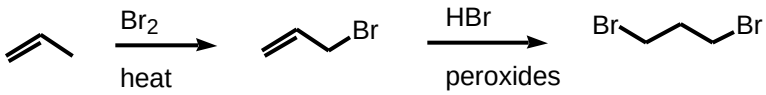


thermodynamic

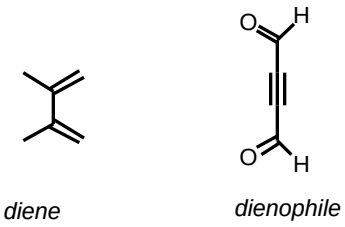
kinetic

6. Show, by writing a suitable sequence of chemical equations, how to prepare 1,3-dibromopropane from propene. (10 points)

Free radical halogenation at the allylic position, followed by an anti-Markovnikov addition of H-Br in the presence of peroxides.



7. What combination of diene and dienophile could you use to prepare the Diels-Alder adduct shown below? (5 points)



diene *dienophile*

Bonus (+5 pts): Show a mechanism for each of the reactions in problem 5.