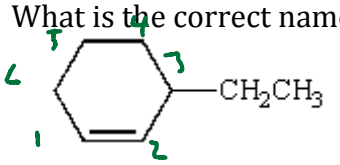
Chem 226. Exam 2-Practice Questions

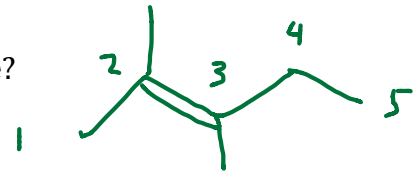
Chapter 3

1. What is the correct name for the following molecule?



3-ethylcyclohexene

2. What is the correct structure for 2,3-dimethyl-2-pentene?

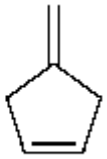


3. Which of the multiple bonds in the following compounds are conjugated:

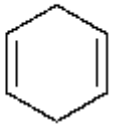
1. $CH_2=C=CH_2$ Cumulated

2. $CH_2=C(CH_3)-C(CH_3)=CH_2$ Conjugated

3. $CH_2=CH-CH=O$ Conjugated

4.  NOT

5. $CH_3-C\equiv C-CH=CH_2$ Conjugated

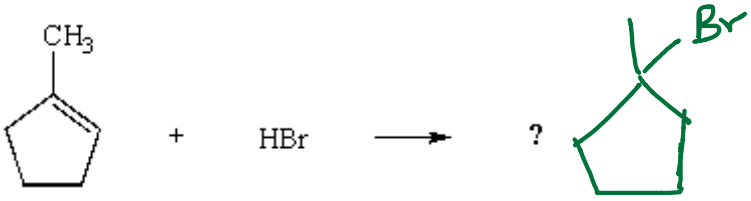
6.  NOT

4. What is the percent s character in an sp^2 hybrid orbital?

$sp^2 \Rightarrow \frac{1}{3} \times 100 = 33\%$ s-character

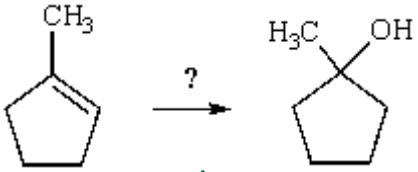
64% p-character

5. What would be the major product of the following reaction?



Addition is Markovnikov's

6. What are the necessary reagents to convert 1-methylcyclopentene to 1-methylcyclopentanol?

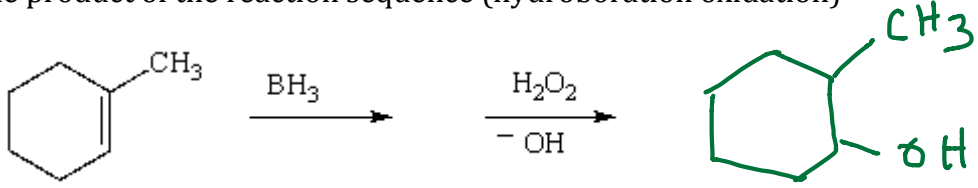


H_2O/H^+

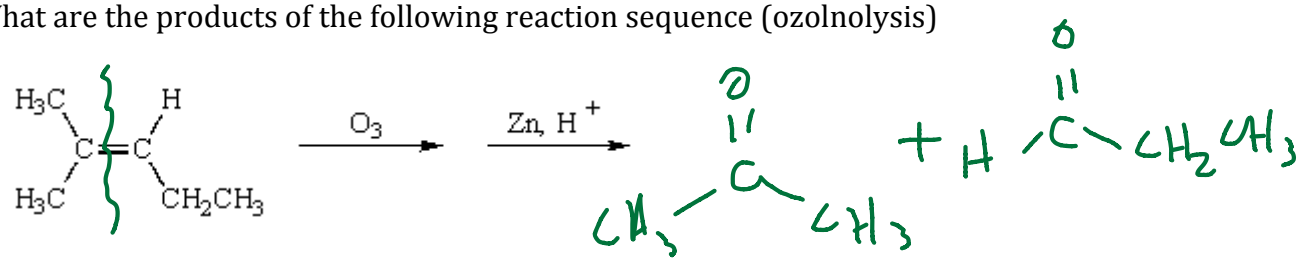
acid catalyzed hydration of alkene to alcohol

NB H-OH adds in a Markovnikov's fashion

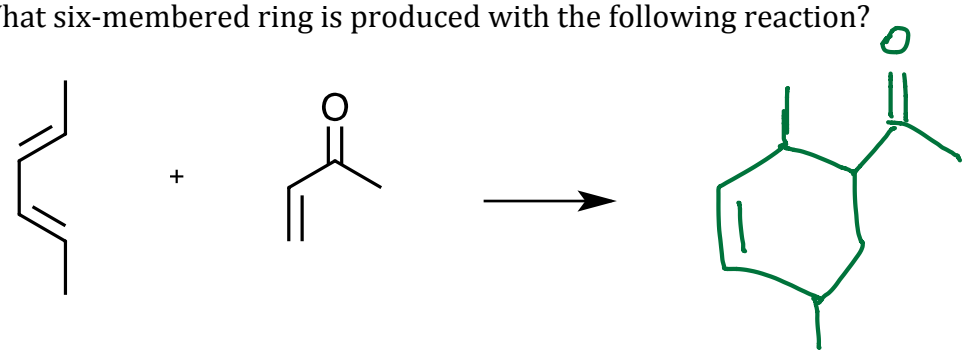
7. The product of the reaction sequence (hydroboration oxidation)



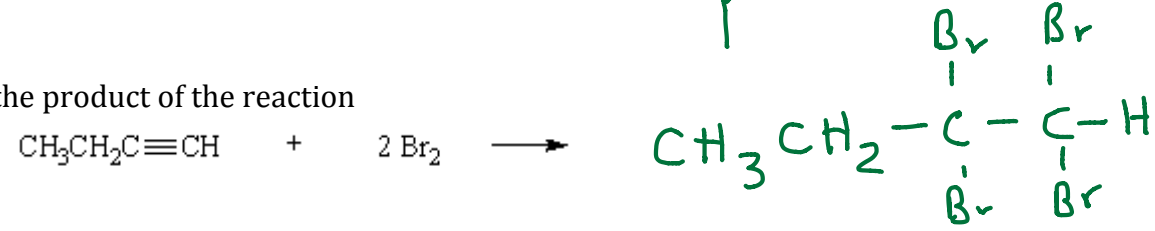
8. What are the products of the following reaction sequence (ozolnolysis)



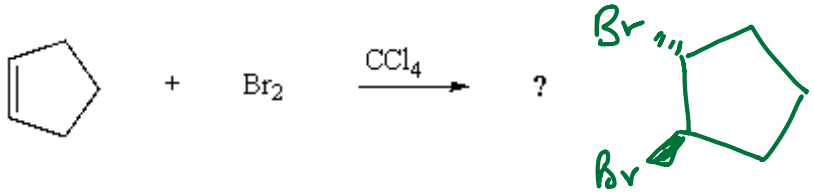
9. The Diels-Alder reaction is very important in the synthesis of six-membered rings. What six-membered ring is produced with the following reaction?



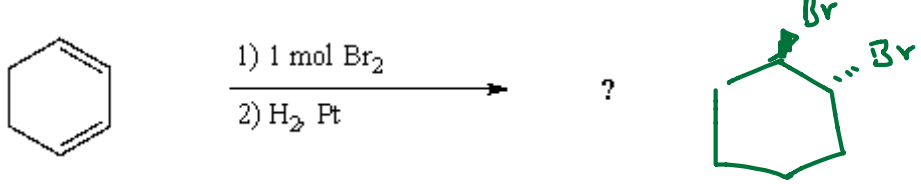
10. What is the product of the reaction



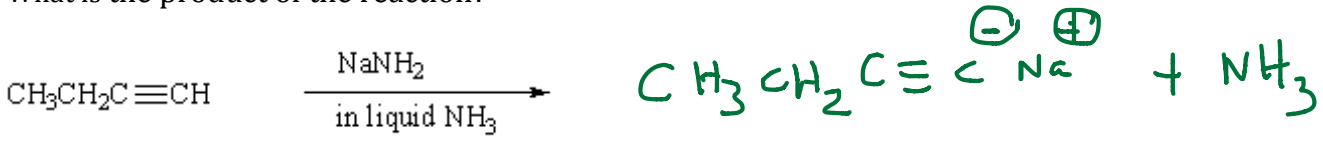
11. What is the structure and name of the product formed from the following reaction?



12. What is/are the final product(s) in the following multistep synthesis?



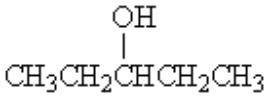
13. What is the product of the reaction?



Chapter 12

In addition to the quiz 2 questions, attempt the following

14. How many peaks would you expect to see in the ^{1}H NMR spectrum for the following compound:



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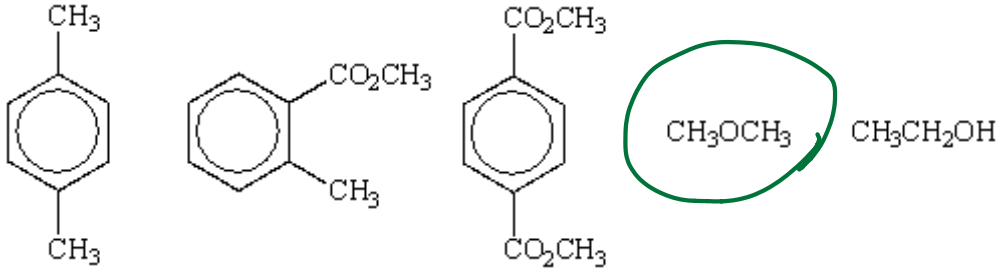
15. Which of the following molecules shows only one singlet in its ^{1}H NMR spectrum?



I II III IV V

16. A monochloroalkane shows two parent ion peaks *m/z* at 92 and 94. What is the molecular formula?

^{37}Cl ^{35}Cl | $C_nH_{2n+1}Cl = 94$ | $n = 4$

$12n + 2n + 1 + 37 = 94$ | $\therefore C_4H_9Cl$

17. The 1H NMR of the following compound will have a how many signals?