

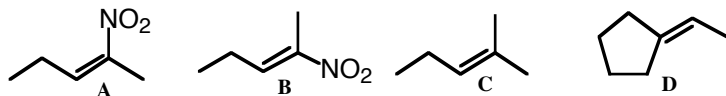
JASPERSE CHEM 350 TEST 3
 Ch. 7 Structure and Synthesis of Alkenes
 Ch. 8 Reactions of Alkenes

VERSION 1

1. How many elements of unsaturation are in the formula $C_6H_9NO_2$? (3 points)

- a. 0 b. 1 c. 2 d. 3 e. 4 f. 5 g. 6

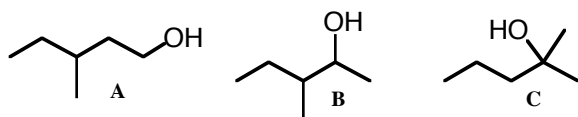
2. For the three structures shown, which of the statements is true? (3 points)



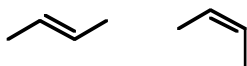
- a. A, C, and D are Z; B is E
 b. A and B are the only Z compounds
 c. A is the only Z compound; B is the only E compound
 d. B, C, and D are Z; A is E
 e. B is the only Z compound; A is the only E compound

3. Rank the reactivity of the following toward H_2SO_4/H^+ catalyzed dehydration. (3 points)

- a. A is fastest; C is slowest
 b. B is fastest; C is slowest
 c. A is fastest; B is slowest
 d. C is fastest; B is slowest
 e. B is fastest; A is slowest
 f. C is fastest; A is slowest

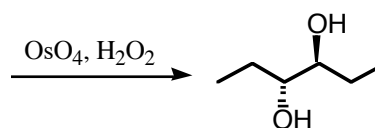


4. Which of the following reactants would give exactly the same products from both (E)- and (Z)-2-butene? (3 points)

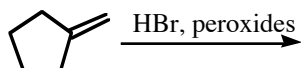
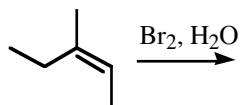
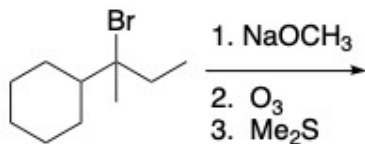
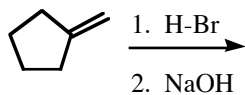
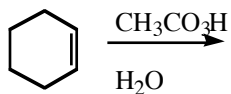
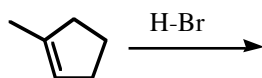
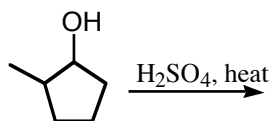
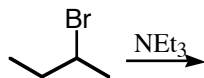
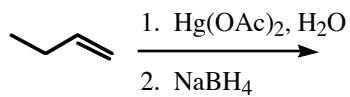


- a. Br_2
 b. $PhCO_3H$
 c. 1) BH_3 -THF 2) $NaOH, H_2O_2$
 d. OsO_4, H_2O_2
 e. D_2, Pt

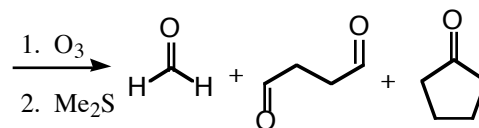
5. Draw the alkene that gives the product shown, and specify its stereochemistry. (2 points)



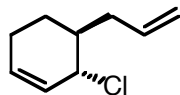
6. Draw the **major** product for each of the following reactions or reaction sequences. You needn't bother to show side products or minor products. For chiral molecules that are racemic, you needn't draw both enantiomers. BE CAREFUL TO SHOW THE CORRECT ORIENTATION, AND THE CORRECT STEREOCHEMISTRY IN CASES WHERE STEREOCHEM IS FACTOR. (3 points each)



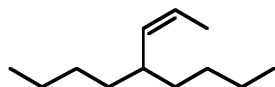
7. A single unknown reacts with O_3/Me_2S to give the following three products. What is the structure for the unknown? (3 points)



8. Provide the name or structure for the following. (3 points each)



(racemic, don't do R/S stuff)



9. Provide a possible structure for a compound with formula C_5H_8 , given that it reacts with excess H_2/Pt to give C_5H_{10} . (3 points)

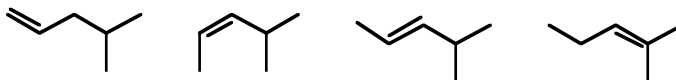
10. Fill in the blanks for the following reaction sequence: (6 points)



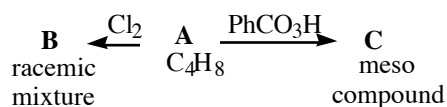
11. Consider how the Se-O bond would be polarized and predict the product which would result when CH_3SeOH adds to propene: (Selenium is located two rows directly below oxygen on the periodic table). (3 points)



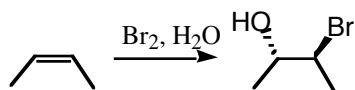
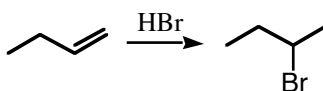
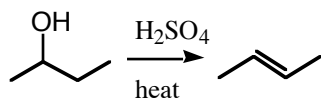
12. When the following isomeric alkenes are fully burned, rank the amount of heat produced in the combustions, from most heat produced (1) to least heat produced (4). (3 points)



13. Provide structures for starting material **A** and reactions products **B** and **C**, given the formula of starting material **A** and the stereochemical status of products **B** and **C**. (5 points)



14. Draw mechanisms for the following reactions, using formal arrow-pushing. Each intermediate along the mechanism pathway must be shown. (6 points, 3 points, 6 points)



(be sure your mech. is consistent with the observed stereochemistry)

15. Provide reagents for the following transformations. (5 points each)

