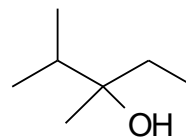


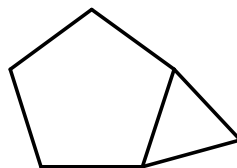
CHM 2210 - Ch 8 Homework

1. Two alkenes can be used to create 2,3-dimethyl-3-pentanol (below) as the major product of oxymercuration. Review the [handout for example 8.2](#), and consider Markovnikov's rule, in order to determine their structures. Draw each alkene and its entire reaction scheme. Name the alkenes and the types of intermediates involved. (2 pts)



2. Show the reaction scheme with all reagents, solvents, and catalysts needed to convert cyclopentene into 1,2-cyclopentanediol. Show the intermediate and indicate the product's stereochemistry. Name the type of intermediate as well. Review hydroxylation in the chapter 8 notes, and to section 8.7 in the text. (1 pt)

3. Show the reaction scheme with all reagents, solvents, and catalysts needed to convert cyclopentene into bicyclo[3.1.0]hexane (below). Review carbenoids in the chapter 8 notes, and to section 8.9 in the text. (1 pt)



4. Show the reaction scheme with all reagents, solvents, and catalysts needed to convert cyclopentenone into cyclopentanone. Review hydrogenation in the chapter 8 notes and text. (1 pt)

5. Show the reaction scheme which converts cyclopentene into 1,2-dibromocyclopentane. Include the mechanism with curved arrows, along with the stereochemistry and names of the intermediate and product. Review halogen addition in chapter notes and section 8.2 in text. (1 pt)
6. Review ozonation in the chapter notes, as well as section 8.8 and example 8.3 in the text. Show the reaction scheme for the cleavage of 2,5-dimethyl-2-heptene using O_3 followed by Zn with H_3O^+ . Also, show the cleavage products for the ozonation of ethene (C_2H_4). (1 pt)
7. Review cleavage with potassium permanganate in the chapter notes. Show the reaction schemes for the cleavage of a) 2,5-dimethyl-2-heptene and b) ethene using $KMnO_4$ with H_3O^+ . (1 pt)

8. Review hydroboration in the chapter notes, [the handout for example 8.2](#), and figure 8.4 in text. Draw the first reaction step, along with the transition state (\ddagger), between 2-methyl-2-pentene and BH_3 in THF. Then, draw the next step, where the second and third alkene molecules are added to the boron atom. Then, show the final reaction step where the BR_3 organoborane intermediate reacts with H_2O_2 and OH^- to form the alcohol molecules. Explain why hydroboration is non-Markovnikov and forms a 2° alcohol. (2 pts)