

Name: _____

Whittier College

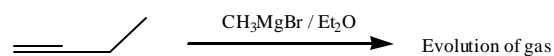
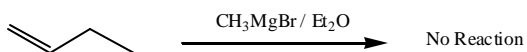
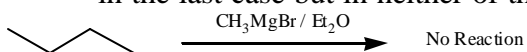
Organic Chemistry: CHEM 231B

Test # 2

115 Points Total

February 24, 2004

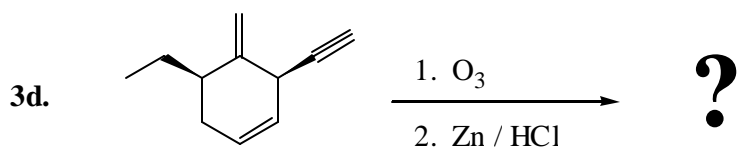
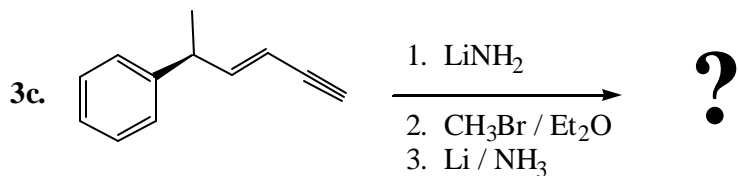
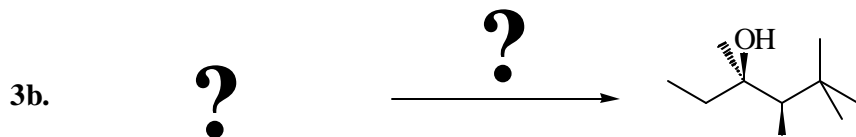
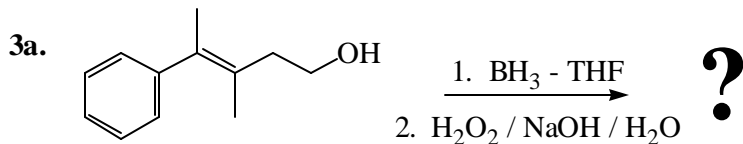
1. Multiple Choice Questions: Circle the letter corresponding to the single, most appropriate answer. (20 points = 4 pts each)
- 1a. Reaction of trans-3-hexene and cis-3-hexene produces different products under which of the following conditions?
- Hydrogenation
 - Ozonolysis
 - Bromination in carbon tetrachloride
 - Hydroboration -Oxidation
 - Combustion
- 1b. The reagent needed to convert 2-butyne to cis-2-butene is:
- H₂ / Pt
 - H₂ / C / BaSO₄
 - Li / NH₃
 - LiNH₂
 - H⁺ / Zinc dust
- 1c. Which of the following conditions is the best for converting an alkene to a markovnikov addition alcohol without observing skeletal rearrangement?
- dilute aqueous acid
 - concentrated aqueous acid
 - Mercury acetate in water followed by sodium borohydride reaction at pH 10
 - Borane-tetrahydrofuran complex followed with aqueous peroxide oxidation
 - none of the above
- 1d. During the reduction of an alkyne using sodium in liquid ammonia, which of the following is NOT believed to be an intermediate in the mechanism?
- vinyl anion
 - vinyl radical
 - radical anion
 - vinyl cation
 - alkene
- 1e. What is the major product for the reaction of 1-methylcyclopentene in aqueous hydrochloric acid?
- 1-chloro-1-methylcyclopentane
 - 1-methylcyclopentanol
 - 1-chloro-2-methylcyclopentanol
 - 1-chloro-1-methylcyclopentanol
 - 2-chloro-1-methylcyclopentanol
2. Provide answers to the following questions: (16 pts total = 8 pts each)
- 2a. Explain the following experimental results. What reaction is occurring and why does it reaction happen in the last case but in neither of the first to reactions? Explain your answer.



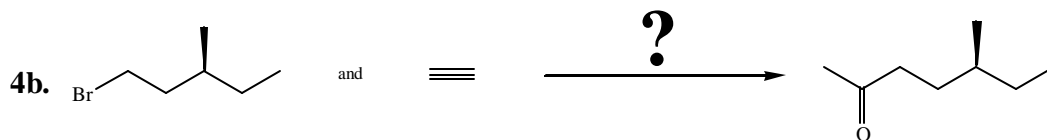
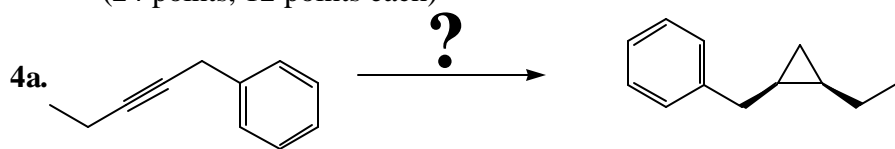
2b. What is facial selectivity? Explain the important factors to consider and provide an example that exhibits facial selectivity.

3. Consider the following reactions. Predict the best answer to complete the question mark and briefly explain your answer. Mechanisms are NOT required, but may be used. Pay close attention to stereochemical issues: (36 points – 9 points for each)

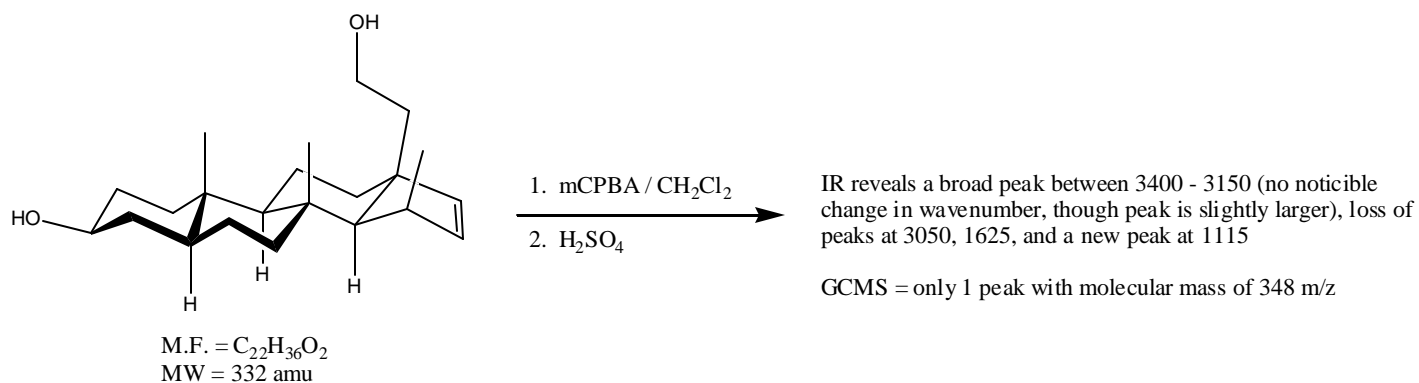
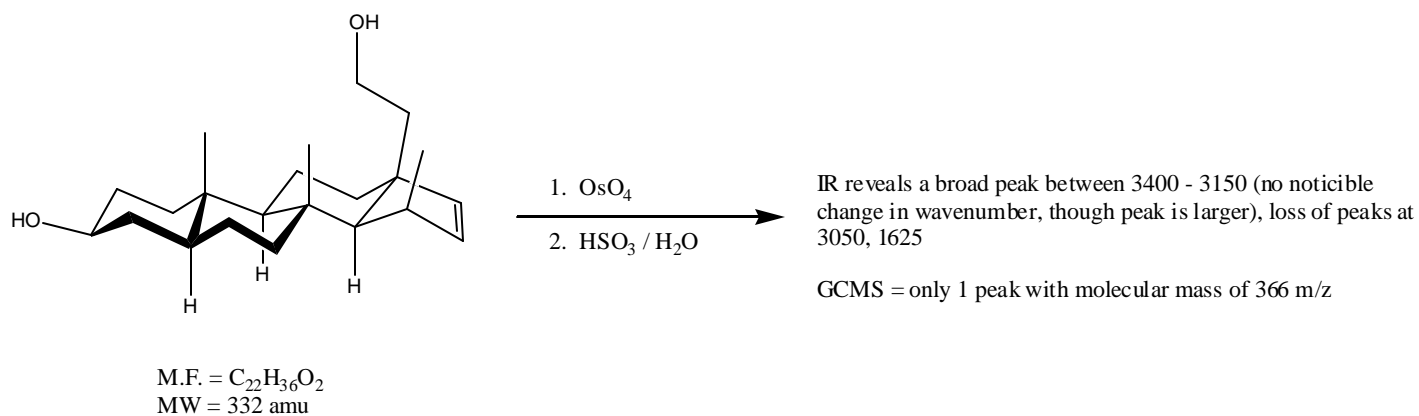
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4. Consider the following reactions. Provide the necessary reagents to affect the desired synthetic transformations. More than one step may be required for each transformation. It may be beneficial, though not required, to think about the problems in a retrosynthetic manner. No mechanisms are required or desired. Briefly explain whether your method is a good method of making these compounds (24 points, 12 points each)



5. Consider the following reactions of the steroid derivative shown below: (19 points)



- 5a. What is the product of the first reaction? (2 points)
- 5b. Provide a mechanism that accounts for the formation of the first product. Feel free to abbreviate the ring structures to make writing your mechanism easier. (5 points)
- 5c. What is the product of the second reaction? (2 points)
- 5d. Provide a mechanism that accounts for the formation of the second product. Feel free to abbreviate the ring structures to make writing your mechanism easier. (5 points)
- 5e. Why are the products different? (3 pts)
- 5f. Why is only one product observed in each reaction? (2 pts)