

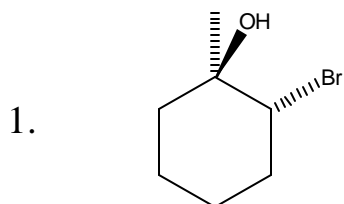
Organic Chemistry: CHEM 331

Fall 2000 - Whittier College

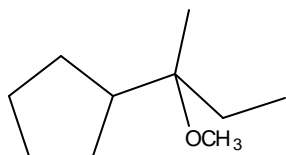
Test #3

September 6, 2001

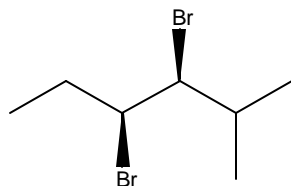
1. How would you make the following molecules? Provide the starting material and the proper reagents. Also, briefly comment on whether your reaction will provide only the desired product or any other products. Providing a mechanism is **NOT** required. (20 points)



2.

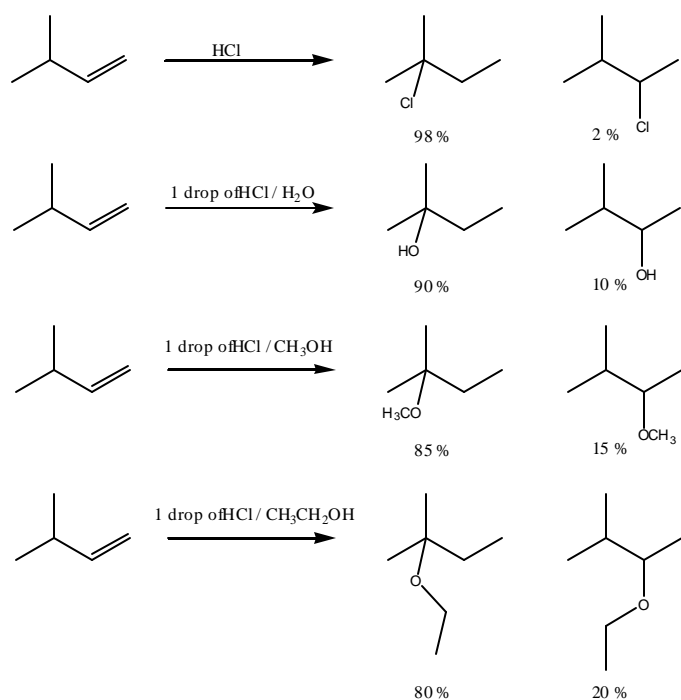


3.



2. When enantiomerically pure (3R) 3-methyl-1-pentene is reacted with HBr two (2) regiochemical products are formed: 2-bromo-3-methylpentane and 3-bromo-3-methylpentane. (20 points)
- 2a. How many stereochemical products are formed? What are they?
- 2b. What are the isomeric relationships between the observed products?
- 2c. Which product(s) is(are) enantiomerically pure? Explain.
- 2d. How many products (not protons) can you observe by NMR? Explain briefly.

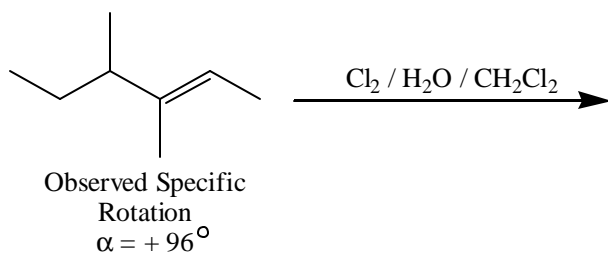
3. Consider the following four reactions: (30 Points)



3a. Chose two of the reactions and provide mechanisms that accounts for the formation of the observed regiochemical products.

3b. Explain why the different reaction conditions yield different amounts of the observed regiochemical products.

4. Consider the following reaction: (30 points)



4a. Given that the optical rotation for pure E-(3S)-3,4-dimethyl-1-hexene is -112° , what is the optical purity of the starting material?

4b. What does optical purity mean? What is(are) the configuration(s) of our starting material?

4c. What is(are) the major product(s) for this reaction?

4d. Which product(s) exist(s) in 86 % enantiomeric excess? Explain briefly.

Extra Credit: Predict the product(s) for the following reaction and provide a mechanism for that accounts for its formation. (10 Points extra credit)

