

Chemistry 3311-100  
Organic Chemistry/Dr. Barney Ellison  
Thursday: April 17<sup>th</sup> @ 7:00pm → 9:00 / 2<sup>nd</sup> Exam/Math 100)

Name: \_\_\_\_\_ (please print)

1. (20 pts) What are the products formed and by what mechanisms in each of the following? (hint — be careful to write out the chemical structures).

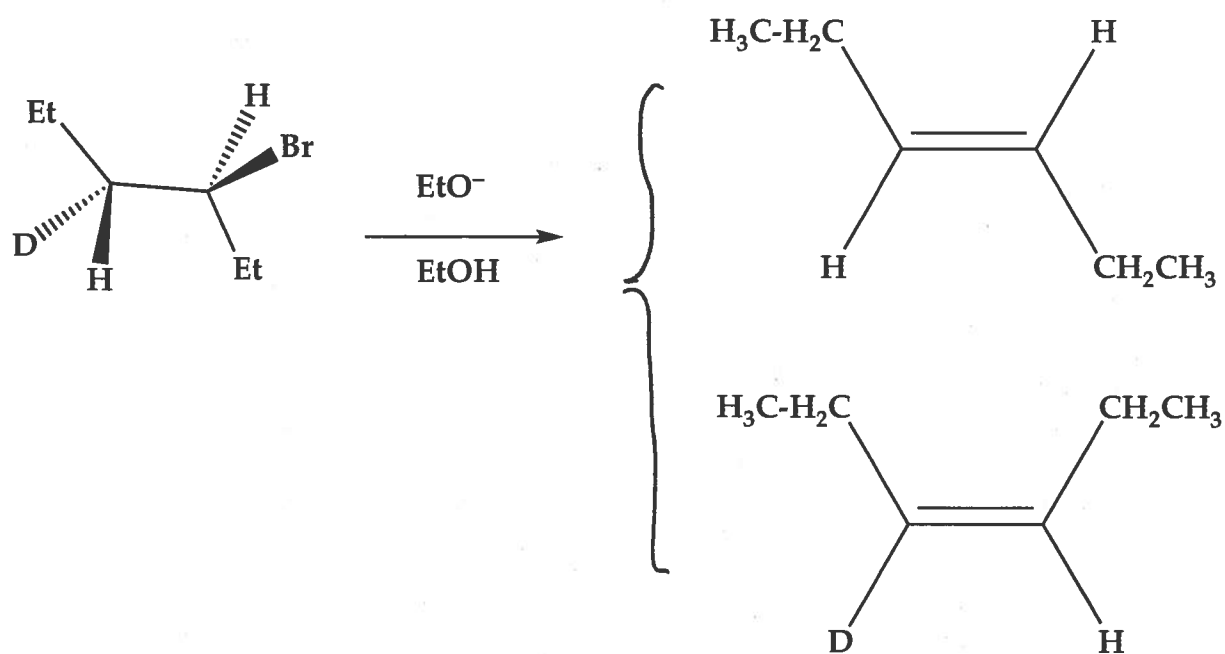
a) 2-bromo-3-methylbutane in hot ethanol

b) 2-bromo-3-methylbutane in ethanol + sodium ethoxide

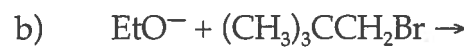
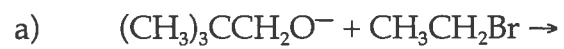
c) 2-bromo-2-methylbutane in ethanol containing an excess of sodium iodide

d) neopentyl bromide in ethanol containing an excess of sodium iodide

2. (10 pts) Why does the 2-bromobutane react with  $\text{CH}_3\text{CH}_2\text{O}^-$  to give a mixture of 2-butene stereoisomers in which the Z isomer contains deuterium?

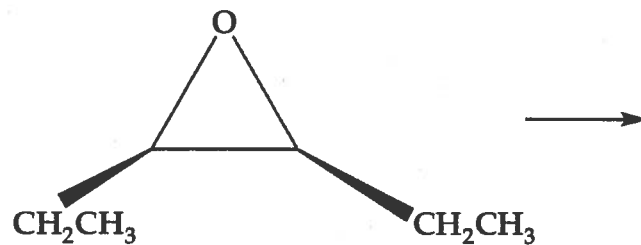


3. (10 pts) What is the product of the Williamson ether synthesis in a) ? Why does reaction b) fail?

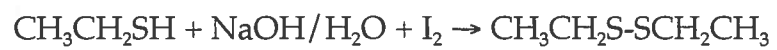


4. (10 pts) What is stereochemistry of the 3, 4-hexanediol formed when *meso* 2, 3 diethyloxirane reacts with aqueous sodium hydroxide?

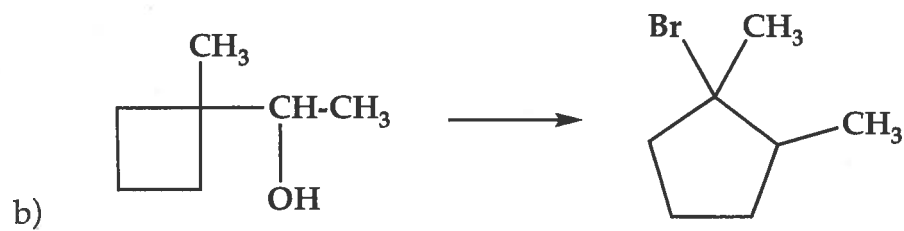
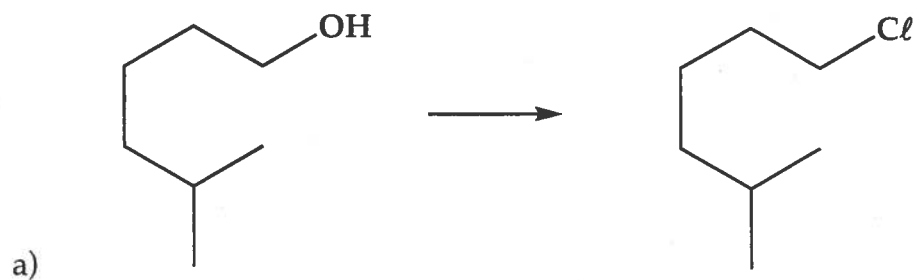
NaOH/H<sub>2</sub>O +



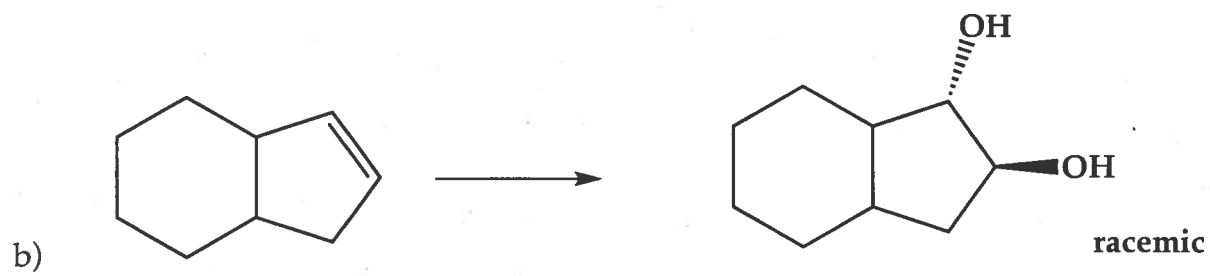
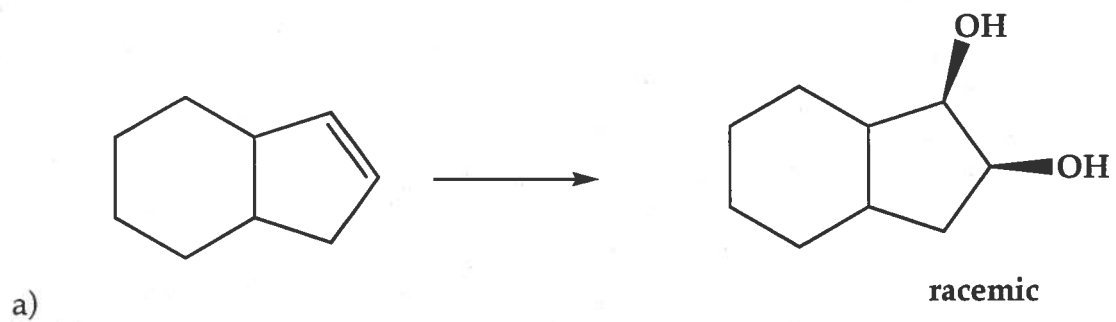
5. (10 pts) When ethane thiol is treated with base and  $I_2$ , a disulfide is formed. What is the mechanism?



6. (10 pts) Suggest conditions for carrying out each of the following reactions.

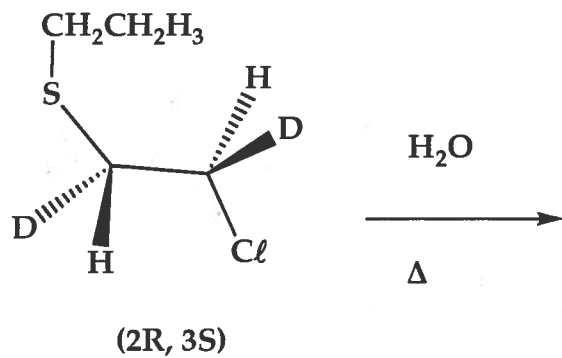


7. (10 pts) Carry out the following transformations:





8. (10 pts) What is the product of the hydrolysis of the following chlorosulfide? Be explicit about the stereochemistry.



9. (10 pts) What is the product of the following oxidations?

