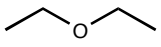
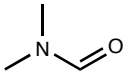
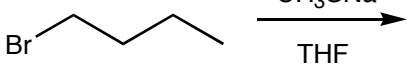
Name _____ Test 1 (2/15)
CHEM 0203 (Organic II) Spring 2008

Common solvents used in organic chemistry.

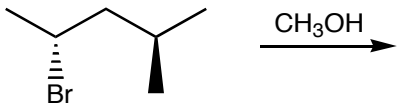
THF =  Et_2O =  DMSO =  DMF =  acetone = 

1. (6 pts ea.) Predict the organic product(s) for the following S_N1 and S_N2 reactions. Remember to indicate the stereochemistry of the product(s) where appropriate.

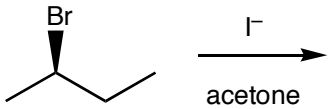
a.

S_N2 

b.

S_N1 

c.

S_N2 

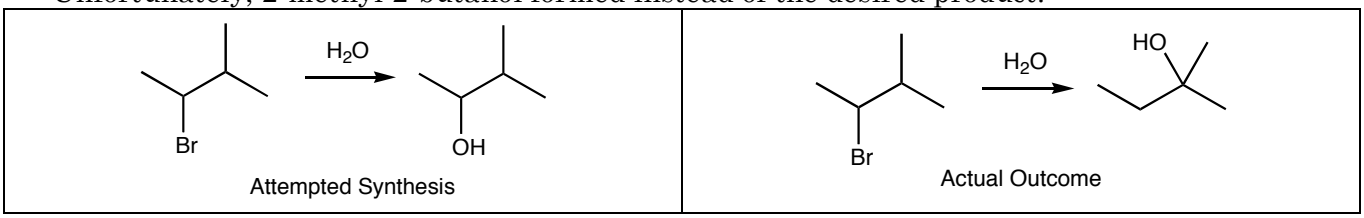
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

2. (8 pts.) Explain why the formation of a nearly 50:50 mixture of *R* and *S* 2-butanol by the reaction of *R*-2-iodobutane with water can be used as evidence to support the formation of a carbocation intermediate.

3. For each pair of nucleophiles drawn below (a. 8 pts.) circle the nucleophilic element on each molecule and (b. 8 pts.) determine which would be the better nucleophile if dissolved in DMSO.

i. $CH_3CH_2S^-$ or CH_3CH_2SH	ii. CH_3OH or CH_3SH
iii. $(CH_3)_3N$ or $(CH_3)_3P$	iv. NH_3 or H_2O

4. A chemist was trying to make 3-methyl-2-butanol by adding water to 2-bromo-3-methylbutane. Unfortunately, 2-methyl-2-butanol formed instead of the desired product.

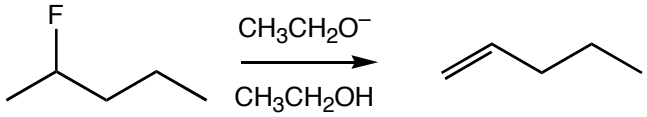


a. (8 pts.) Draw a mechanism that accounts for the formation of 2-methyl-2-butanol during the reaction of 2-bromo-3-methylbutane and water.

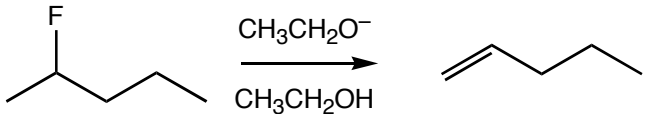
b. (4 pts.) Explain the mechanism that you've drawn in part a.

c. (6 pts.) How would you change the reaction conditions to help encourage the formation of 3-methyl-2-butanol.

5. (8 pts) Explain why when fluoride is the leaving group the major product of the following E2 reaction is 1-pentene.



6. (10 pts.) Draw a mechanism for the following E2 reaction.

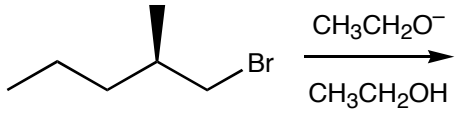


7. (a. 6 pts.) When performing an E2 reaction, where do the electrons come from that are being used to form the double bond? (b. 4 pts.) What about an E1 reaction?

8. (4 pts. ea.) Predict the organic product(s) for the following E1 and E2 reactions, and remember to identify the major product(s).

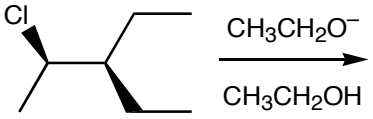
a.

E2



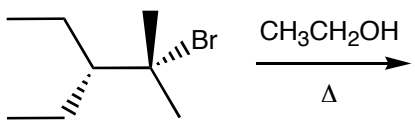
b.

E2



c.

E1



d.

E2