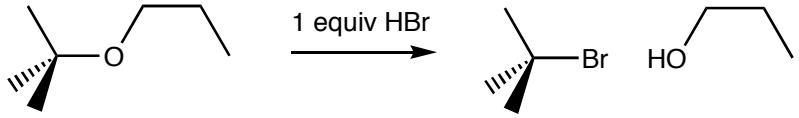
Name _____ Test 3
PHYS 0203 (Organic II) Spring 2006

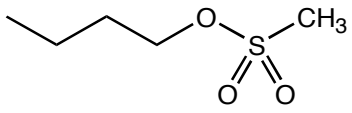
1. Hydrobromic acid reacts with 2-methyl-2-propoxypropane according to the equation shown below.



a. (8 pts.) Draw a mechanism that accounts for the products drawn above.

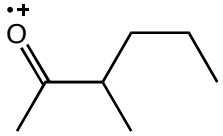
b. (8 pts.) Explain why 2-bromo-2-methylpropane and 1-propanol form instead of 2-methyl-2-propanol and 1-bromopropane.

2. *n*-Butylmethylsulfonate is drawn below. (a. 8 pts.) Draw the methyl sulfonate leaving group and (b. 8 pts.) explain why methyl sulfonate is a good leaving group.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

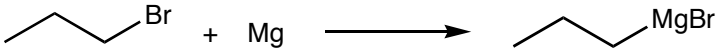
3. The radical cation of 3-methyl-2-hexanone, produced in a mass spectrometer, is drawn below.



a. (8 pts.) Determine the structures of the fragments that form via homolytic cleavage of this cation.

b. (8 pts.) Indicate which of the four fragments are likely to appear in the mass spectrum.

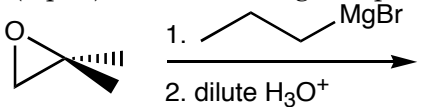
4. Magnesium reacts with 1-bromopropane to form *n*-propylmagnesium bromide.



a. (8 pts.) The carbon directly attached to the bromine in 1-bromopropane, is it electrophilic or nucleophilic, explain?

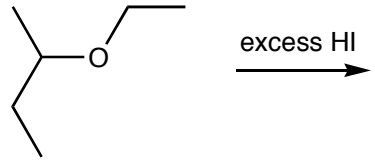
b. (8 pts.) The carbon directly attached to the Mg in *n*-propylmagnesium bromide, is it electrophilic or nucleophilic, explain?

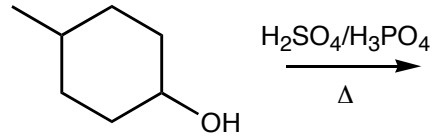
5. (5 pts.) Predict the organic product of the following reaction sequence.

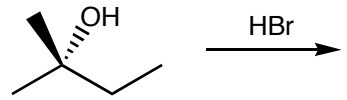


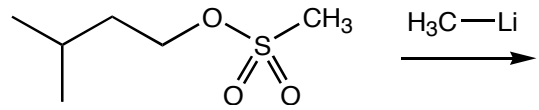
6. (12 pts.) The mass spectrum of 2-bromo-2-methyl-pentane contains two equally sized peaks at *m*/*z* ratios of 164 and 166. At an *m*/*z* ratio of 165, there is only a small peak approximately 6.7% the size of the peak at 164. Explain what these three peaks represent.

(5 pts. each) Predict the products of the following reactions. Ignore stereochemistry.

7. 

8. 

9. 

10. 

11.