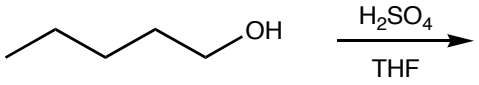
Test 4 Name_____
PHYS 0203 (Organic)

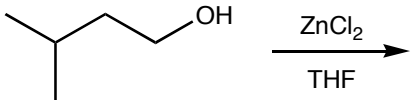
Remember,

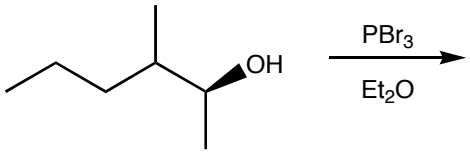
$Et_2O = CH_3CH_2OCH_2CH_3$ or, in general, Et = CH_3CH_2 THF = 

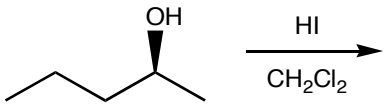
$N(CH_2CH_3)_4^+$ is an organic cation similar to Na^+. xs = excess, and 1 equiv means 1 equivalent

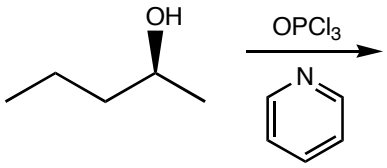
1. (4 pts. each) Draw the products of the following reactions (indicate the stereochemistry of the products).

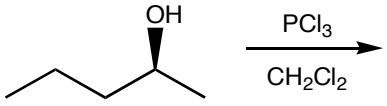
a. 

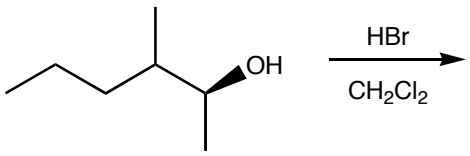
b. 

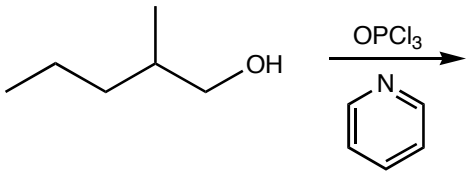
c. 

d. 

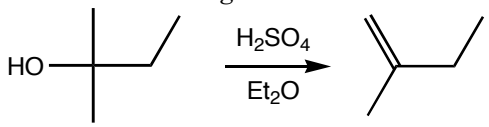
e. 

f. 

g. 

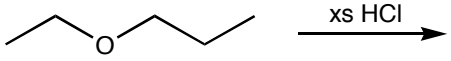
h. 

2. (10 pts.) Provide a mechanism for the following reaction.

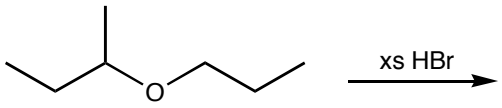


3. (4 pts. each) Draw the products of the following reactions.

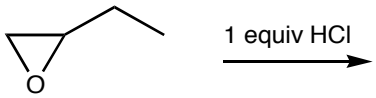
a.



b.

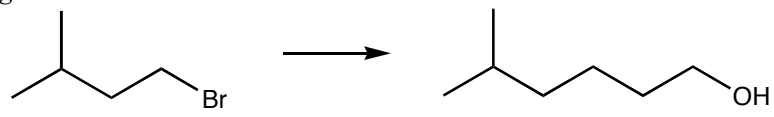


c.

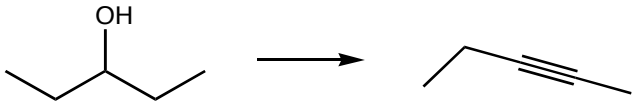


4. (8 pts. each) Make the products below from the following starting material and any other reagents that are needed.

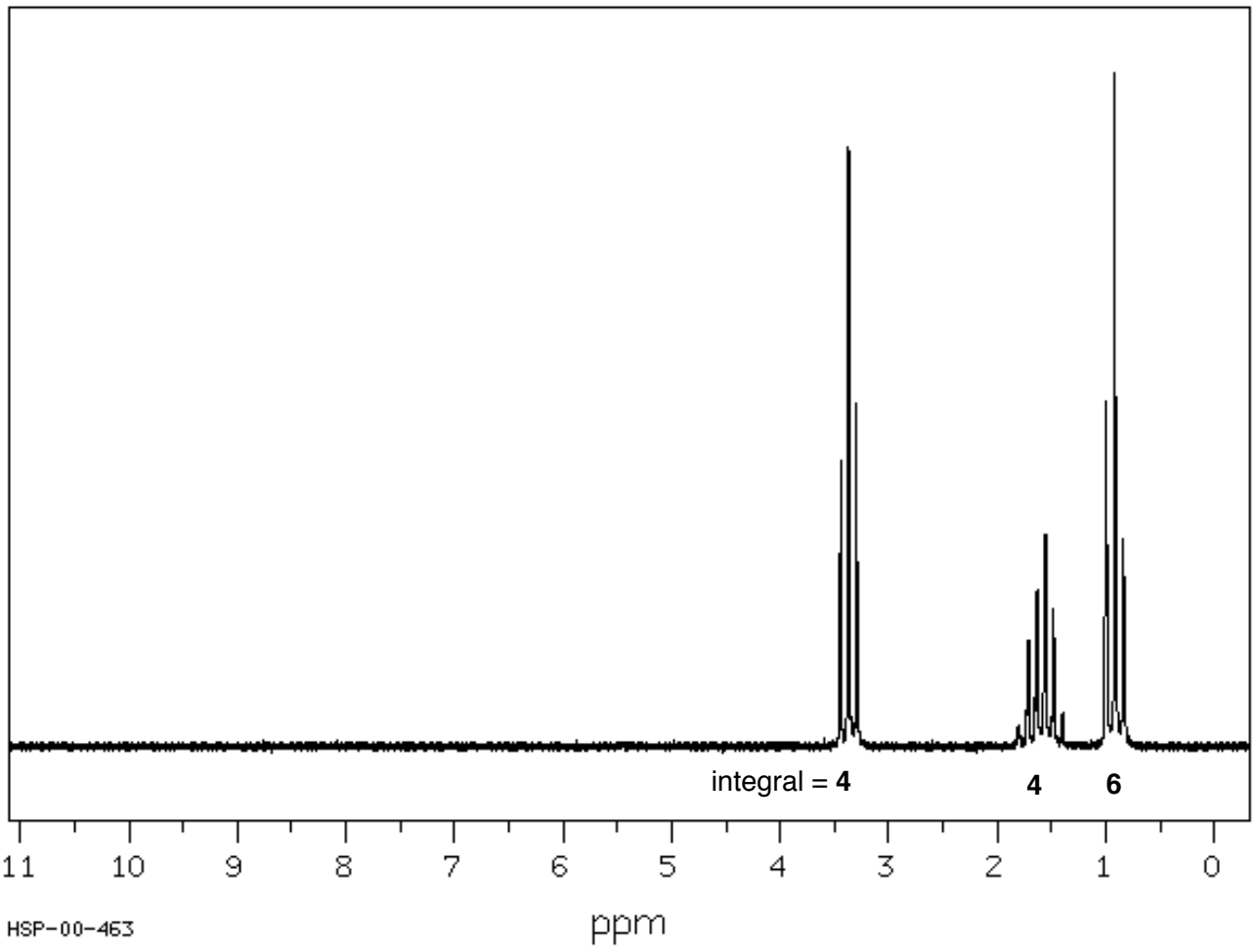
a.



b.

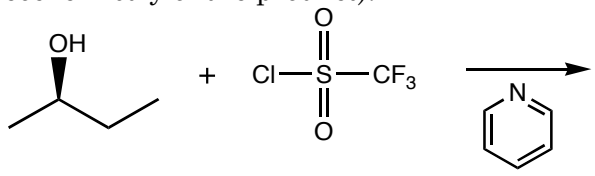


5. (10 pts.) The following is a ^1H NMR spectrum of $C_6H_{14}O$. Determine the structure of the molecule, and label the peaks.

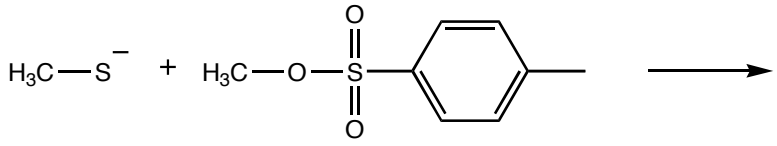


6. (4 pts. each) Identify the products of the following reactions (where appropriate, indicate the stereochemistry of the product).

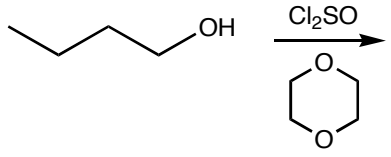
a.



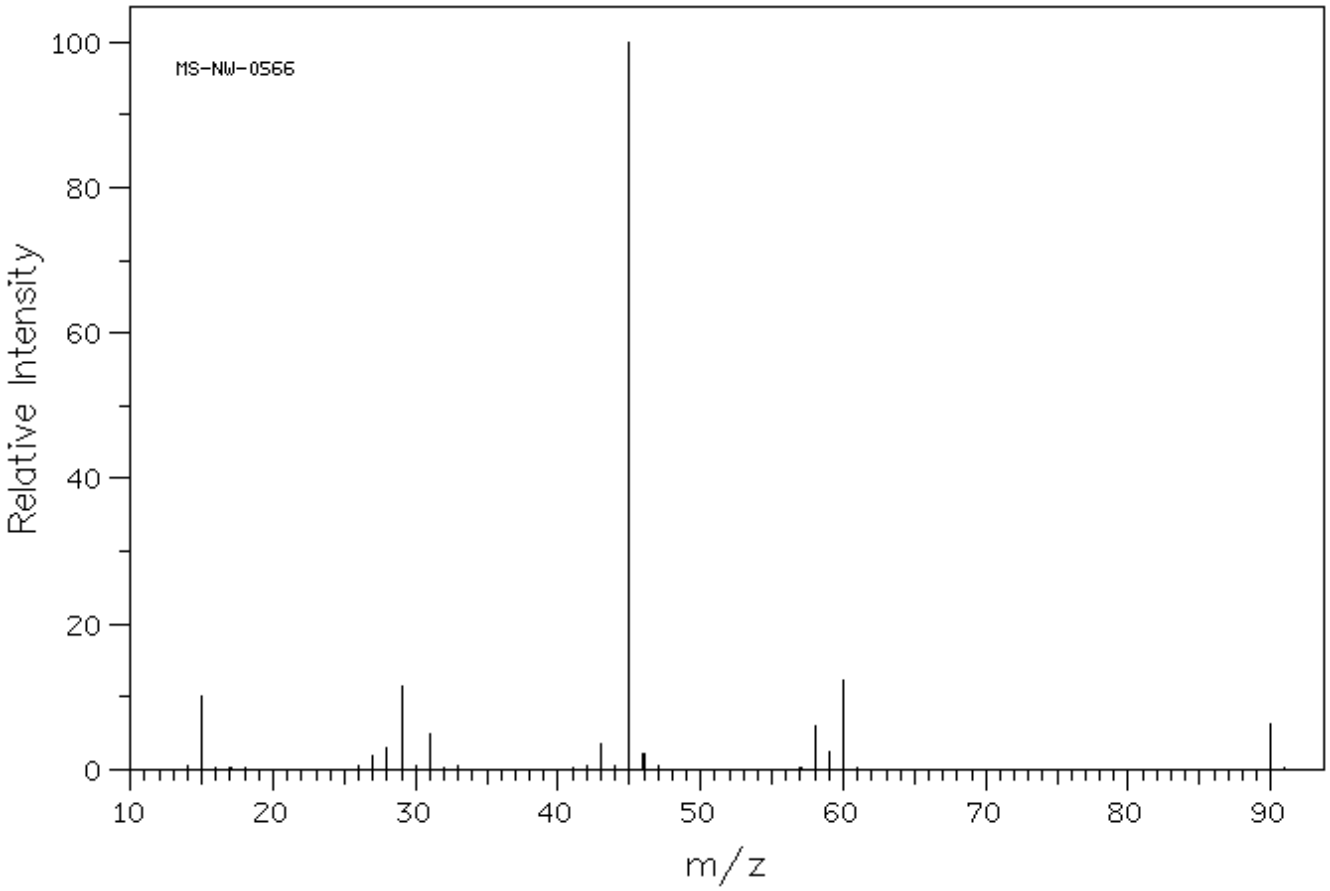
b.



c.



7. (8 pts) The mass spectrum of $CH_3OCH_2CH_2OCH_3$ is presented below.



Identify the chemical formulas of the peaks that appear at m/z equal to 90, 60, 45, and 15.