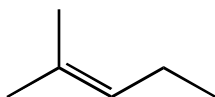


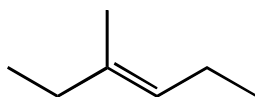
Note that this is not an all inclusive assignment. Anything that was covered in class is "fair game". For example, not a single question is asked about reaction coordinate diagrams, intermediates, or transition states. Not everything on this assignment will necessarily be on the your test.

This assignment is to give you a feeling for how the questions on your test will be asked.

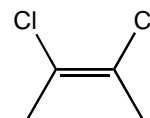
1. Provide names for the following molecules (include *Z* or *E* designation where appropriate).



a. 2-methyl-2-pentene



b. (E)-3-methyl-3-hexene



c. (Z)-2,3-dichloro-2-butene

2. Alkenes are nucleophilic, but alkanes are not. What is it about alkenes that makes them nucleophilic?

The electrons in the  $\pi$ -bond stick out away from the nuclei; thus, they can be attracted to electrophiles.

3. Which of the following molecules are nucleophilic?

a.  $\text{OH}^-$  nucleophilic

b.  $\text{Cl}^-$  nucleophilic

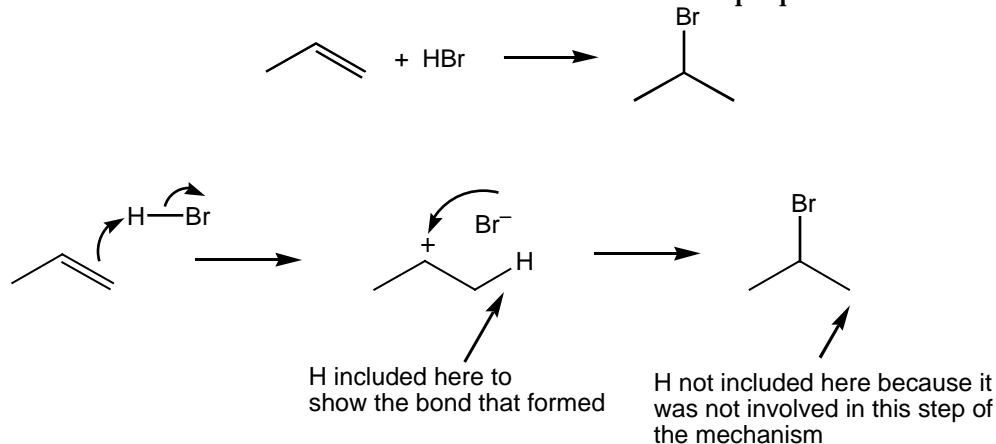
c.  $\text{BF}_3$

d.  $\text{CH}_3\text{OH}$  nucleophilic

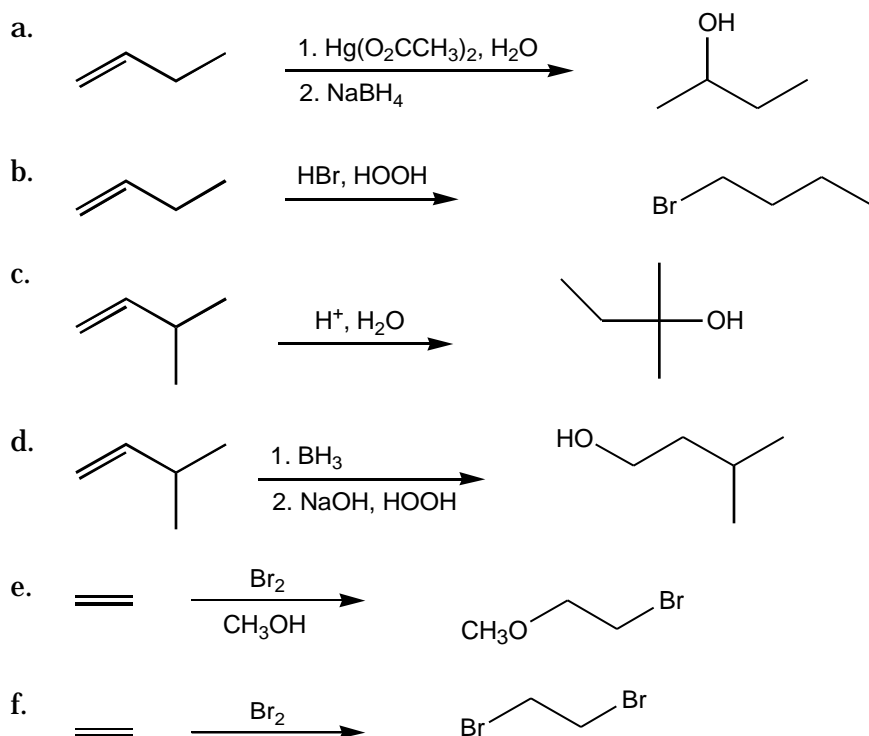
e.  $\text{Hg}(\text{O}_2\text{CCH}_3)_2$

f.  $\text{H}^+$

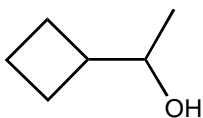
4. HBr reacts with alkenes to form bromoalkanes. In the first step of the two step reaction, a carbocation forms. Draw a mechanism for the addition of HBr to 1-propene.



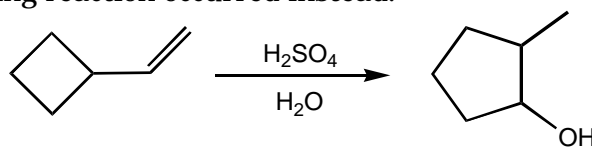
5. Predict the products of the following reactions.



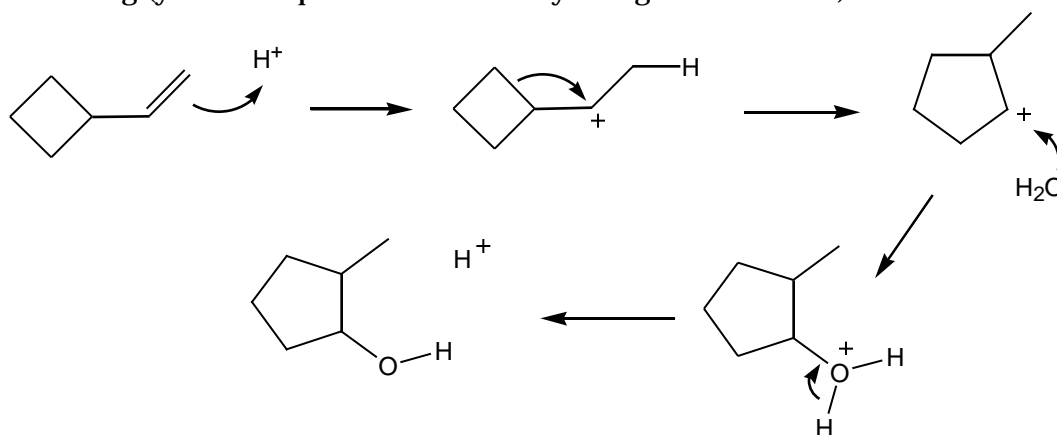
6. A chemist wants to make the following molecule.



Knowing that the addition of aqueous  $\text{H}_2\text{SO}_4$  to an alkene produces an alcohol, the chemist tried the reaction, but the following reaction occurred instead.



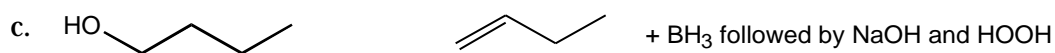
a. What went wrong (you can explain in words or by using a mechanism)?



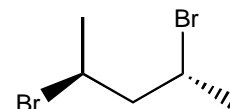
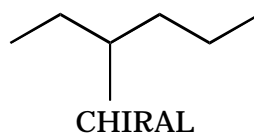
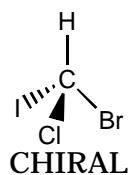
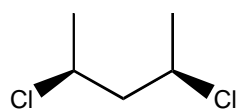
b. How can the desired product be synthesized from the starting alkene?

alkene +  $\text{Hg}(\text{O}_2\text{CCH}_3)_2$  in water followed by  $\text{NaBH}_4$  reduction

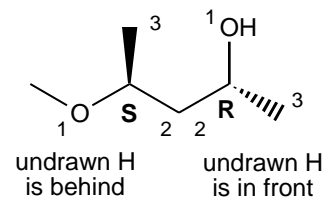
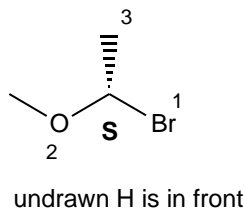
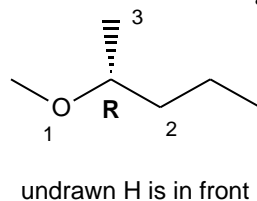
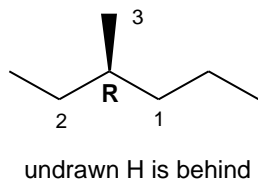
7. Describe how to make the following molecules.



8. Identify the chiral molecules.

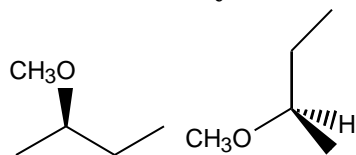


9. Determine the configuration of the following chiral centers

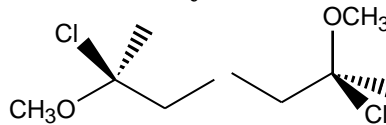


10. Use perspective drawings to draw the following molecules

a. (*R*)-2-methoxybutane



b. (*S*)-2-methoxy-2-chlorobutane



c. (*R*)-2-chloro-2-bromo-1-propanol

