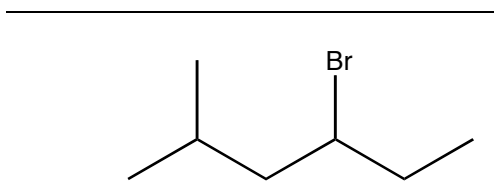
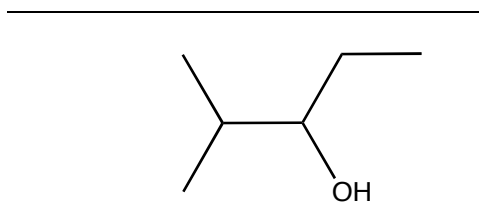


1. (6 pts. each) Provide names for the following molecules.

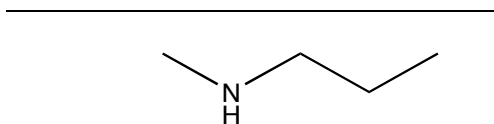
a.



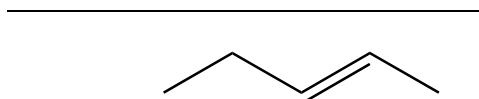
b.



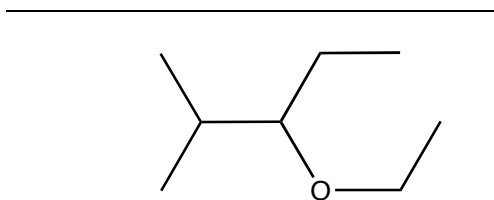
c.



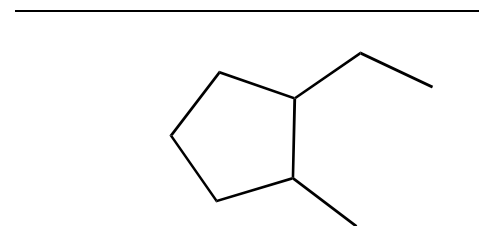
d.



e.

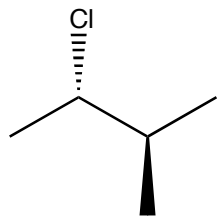


f.

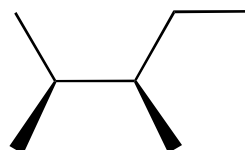


2. (4 pts. each) Draw Newman projections for the following molecules (don't change the conformations when you draw the molecule).

a.

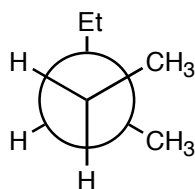


b.



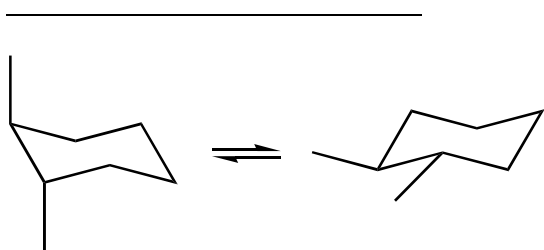
3. (6 pts.) A Newman projection of a molecule is drawn below. Draw the lowest energy rotamer.

a.

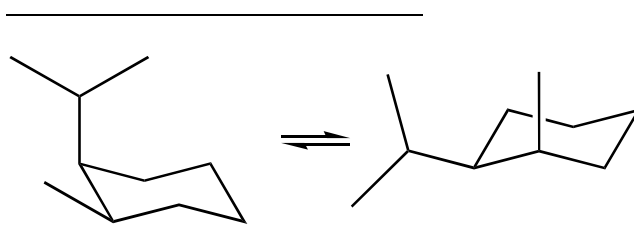


4. (6 pts. each) For the following equilibria determine whether the left or the right side of the equation will be favored?

a.



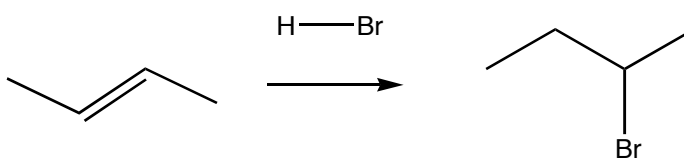
b.



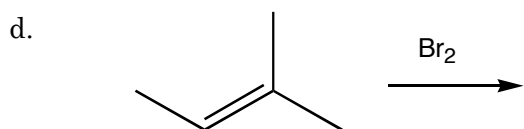
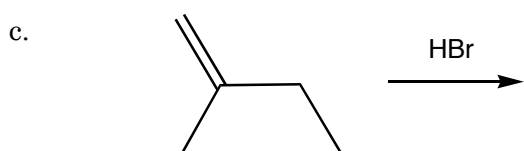
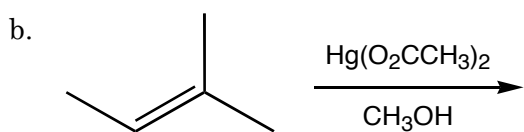
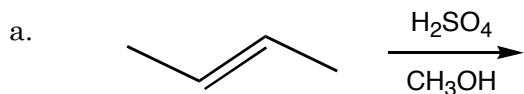
c. (4 pts.) The substituents on 4a, are they *cis* or *trans*?

d. (4 pts.) The substituents on 4b, are they *cis* or *trans*?

5. (10 pts) Draw the mechanism for the electrophilic addition of HBr to 2-butene.

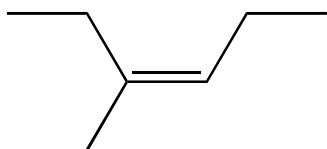


6. (6 pts. each) Predict the products for the following reactions

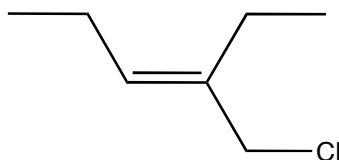


7. (4 pts. each) Indicate whether the following alkenes are *Z* or *E*.

a.

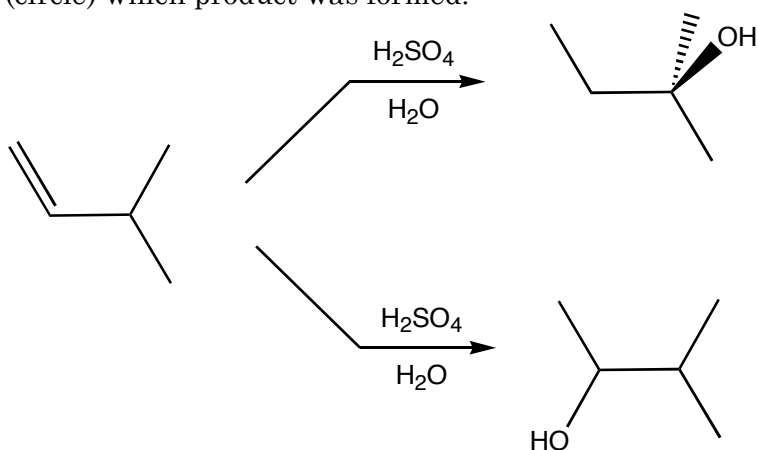


b.



8. A student attempted to make 3-methyl-2-butanol by reacting 3-methyl-1-butene with H_2SO_4 and H_2O . Unfortunately, the student made 2-methyl-2-butanol.

a. (4 pts.) Indicate (circle) which product was formed.



b. (6 pts.) What went wrong?

c. (4 pts.) What could the student have used instead to avoid the problem?

c. (10 pts.) Draw a mechanism for the reaction that went awry.