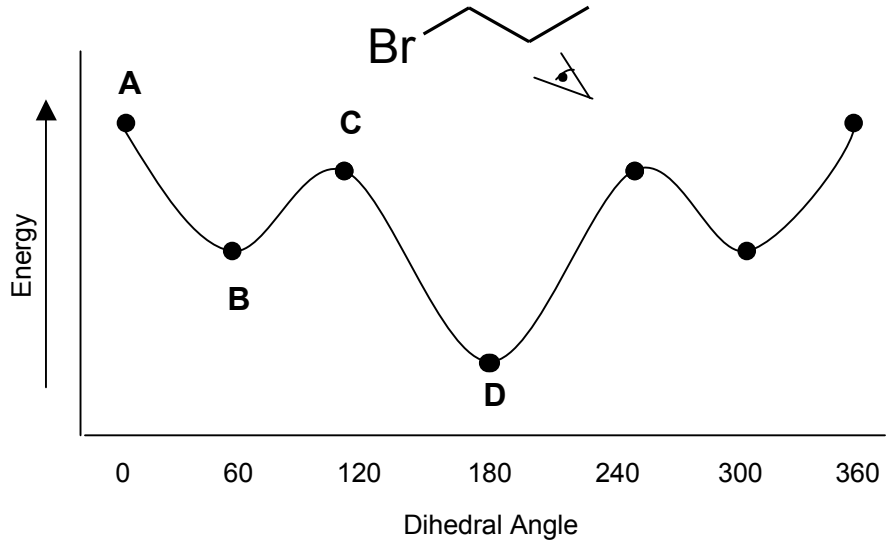
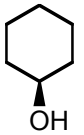
Chemistry 30A Discussion – Week 3/4: Conformation / Alkanes / Stereochemistry – DCF

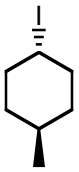
I: Conformational Analysis & Alkanes

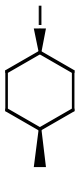
1. Draw the Newman projections (A-D) of 1-bromopropane corresponding the energy diagram below. In each case explain the relative energy of the conformation. Label syn, anti, gauche.

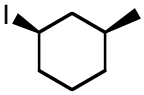


2. Draw the both chair forms for each molecule. Identify the lower energy chair of each pair and calculate the approximate ΔG.

a. 

b. 

c. 

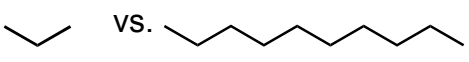
d. 

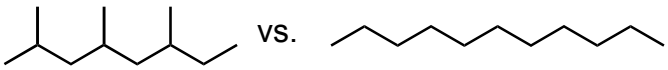
R	A value
$-CH_3$	7.5
-I	2.0

3. Draw both chair forms of *cis*-1,3-dimethylcyclohexane. Which chair is more stable? Draw newman projections of each to support your choice.

4. Draw the most stable forms for each of the following: cyclopropane, cyclobutane, cyclopentane, t-butylcyclohexane, *trans*-1-methyl-2-t-butylcyclohexane, *cis*-1-methyl-2-t-butylcyclohexane

4.5 Compare the two sets alkanes below. Which would you expect to have the highest boiling point? Why?

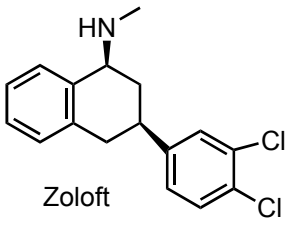




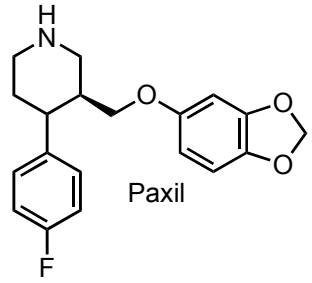
II: Setreochemistry

5. Define the following terms (in your own words, so you understand them): constitutional isomer, stereoisomer, configurational isomer, stereocenter, chirality, enantiomer, diastereomer, meso compound, racemic,

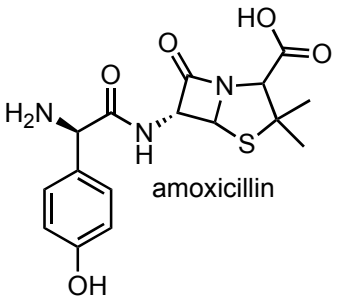
6. Assign the absolute stereochemistry of each stereocenter of the following compounds.



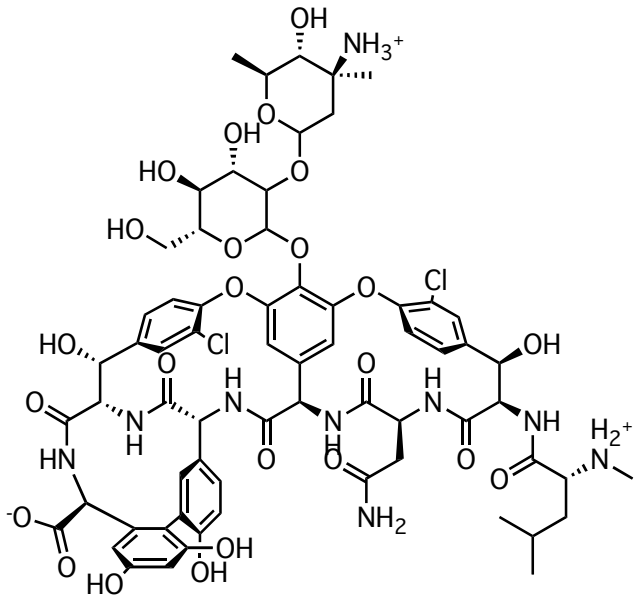
Zoloft



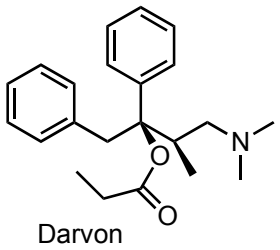
Paxil



amoxicillin

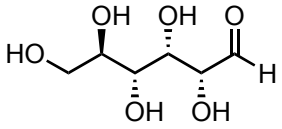


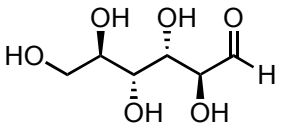
Vancomycin



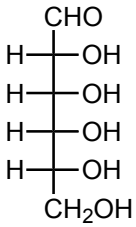
Darvon

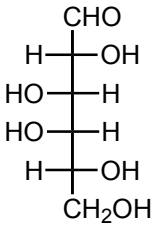
7. Redraw the following compounds as Fischer projections.





8. Redraw the following Fischer projections as line-angle structures.





9. Explain the special chemical and physical properties of enantiomers. Describe some ways to isolate single enantiomers in synthesis.