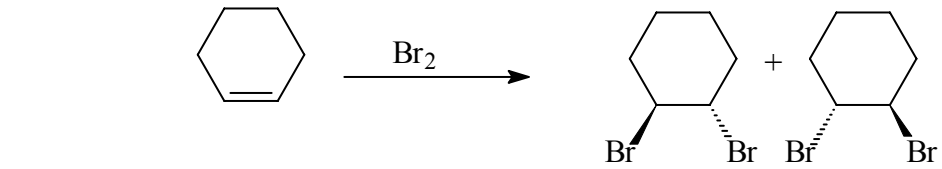
CHEM 241-601
Stereochemistry Problem Set

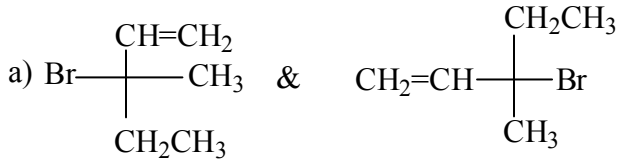
1. The bromination of cyclohexene gives the two compounds shown below. Assign *R* or *S* to each chiral center in the products. Are the two molecules the same or different?



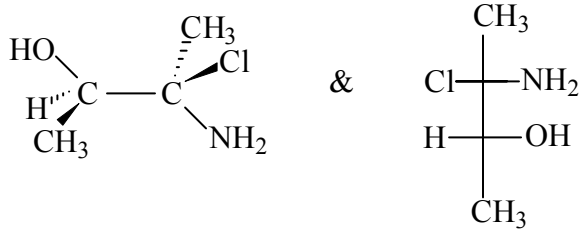
2. In class, we discussed an unusual concept inherent in *some* medicines. When someone takes an analgesic like ibuprofen, only 50% of the drug will actually act as an anti-inflammatory agent. Explain why this is the case. What does the other 50% of the drug hopefully do? Why doesn't acetaminophen (Tylenol®) have this characteristic (the entire tablet (100%) is an analgesic)?

3. Determine if the following pairs of compounds are identical, enantiomers, or diastereomers.

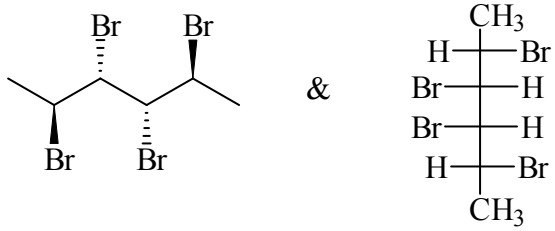
a)



b)



c)



4. Consider the molecule 2,3,4-tribromohexane.

a) Draw a Fischer projection (C-1 on top, C-4,5 on bottom) of the 2(S),3(S),4(R) stereoisomer and label as **A**.

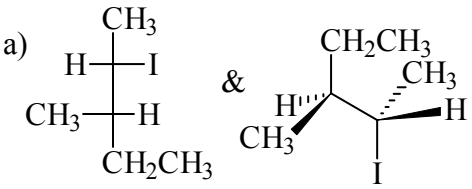
b) Draw the enantiomer of the stereoisomer you drew in a). Label as **B**.

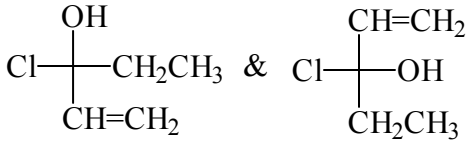
c) Draw two diastereomers of **A** that are not enantiomeric. Give the absolute configurations of each chiral center and label as **C** and **D**.

d) How many stereoisomers are there of this molecule? _____

e) Are there any optically *inactive* stereoisomers? _____

5. Determine whether the following pairs of compounds are enantiomers, diastereomers or identical. Also, assign the absolute configuration of each chiral center.

a) 

b) 

6. Consider the molecule 2,3,4-trichloropentane.

a) Draw Fischer projections of each stereoisomer and indicate the absolute configuration at carbons 2 & 4 in each structure.

b) Is carbon 3 a chiral center?

Indicate which of the stereoisomers are chiral and which are not.