

Problem Set Chapter 5

Organic Chemistry for
Life Sciences: CHM 223
Section A

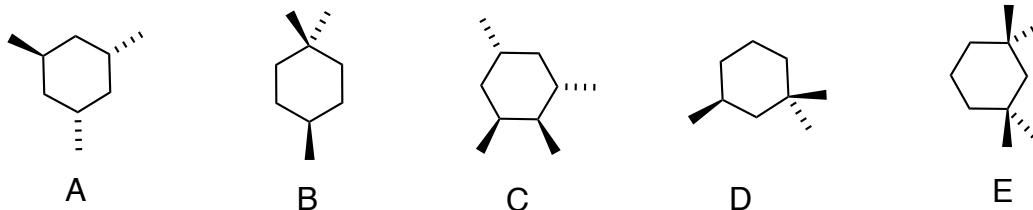
Name _____

DUE: Friday October 6th @ 8 am

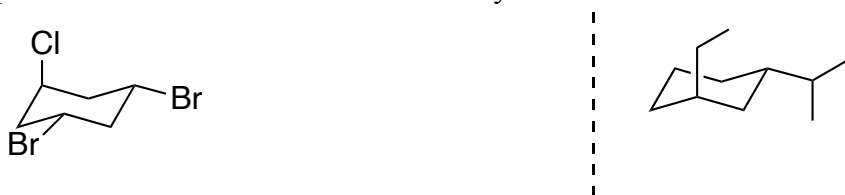
1. Assign the R or S configuration to the stereogenic carbon in each of the following compounds:



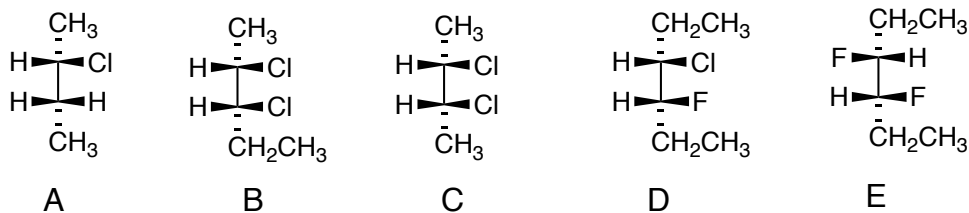
2. Label **all** stereogenic carbons in the molecules below with a *, **AND** determine which compounds are chiral.



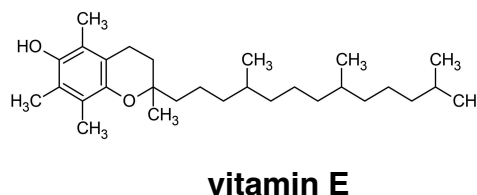
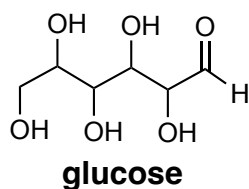
3. When a cyclohexane is drawn in a chair conformation, it might at first appear to be chiral since there is no obvious plane of symmetry. When redrawn in the planar form (as in question 2, above), however, it is much easier to determine whether a plane of symmetry exists. For the two cyclohexanes below, redraw them in their planar form and determine whether they are chiral or not:



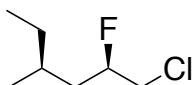
4. Which of the following compounds are meso (may be more than one)?



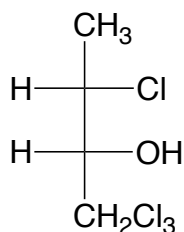
5. Label the stereogenic centers with a * and calculate the total POSSIBLE number of stereoisomers that could be drawn for the molecules below:



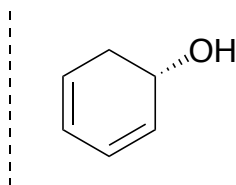
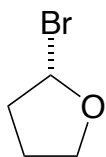
6. Provide as complete an IUPAC name as possible for the following compound (include R/S as necessary).



7. Draw the Fisher projection of the **enantiomer** and a **diastereomer** for the compound below (label each). Also, label each as chiral or achiral.



8. Assign the R or S configuration for the compounds below.



9. (S)-2-bromodecane has the following properties: boiling point, 124 °C; density, 1.051 g/ml. Which of the following statements **MUST** be true given this information (may be more than one)?

- A. (R)-2-bromodecane rotates a plane of polarized light in the levorotatory direction.
- B. (R)-2-bromodecane has a density of 1.051 g/ml
- C. (R)-2-bromodecane cannot be a meso compound
- D. A 50/50 mixture of (S)- and (R)-2-bromodecane is optically inactive

10. Jimmy insists there are 8 different stereoisomers that can be drawn for 1,2,3-trichlorocyclopropane and that 4 are chiral. Draw all of the different stereoisomers below (*be careful to not duplicate!*) and indicate which ones are chiral. Based on your finding, do you agree or disagree with Jimmy?



Jimmy