

1. (a) Draw all 6 major conformations (Newman projections) for a 360° rotation about the carbon-carbon bond in 1,2-difluoroethane.

(b) Label each conformation that you draw (eclipsed, gauche, anti, etc) and indicate which conformer will be the most stable and which will be the least stable (highest energy).

(c) A carbon-chlorine bond has a dipole moment because chlorine is more electronegative than carbon. Of all the conformations in (a) for 1,2-difluoroethane, which will have the largest dipole moment and which will have the smallest dipole moment?

2. Draw the most stable chair conformation of (1,1-dimethylethyl)cyclohexane (*tert*-butylcyclohexane).

3. Draw the two stereoisomers for 1, 4-dimethylcyclohexane (bond-line drawings) and draw the most stable chair conformation for each.

4. Draw structural formulas for and name all 5 of the isomeric cycloalkanes with the molecular formula C_5H_{10} .

5. For the following pairs of compounds, encircle the one which will have the higher boiling point and justify your choice in LESS than 20 words.

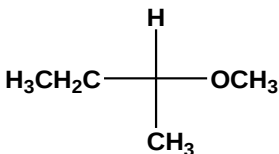
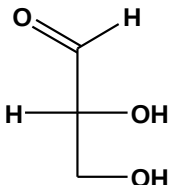
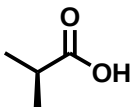
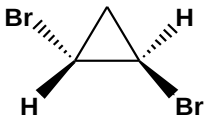
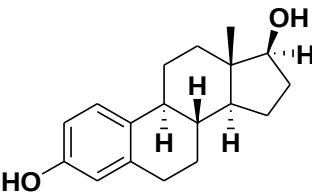
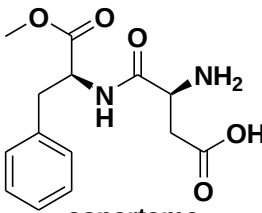
a) CH_3CH_3 vs CH_3CH_2Cl

b) butane vs 2-methylpropane

6. Draw all isomers of 1,2-dimethylcyclobutane and 1,3-dimethylcyclobutane and with the stereochemistry shown explicitly (i.e. hashed/wedged bonds or sawhorse or newman projections, etc.). Identify each as compound as chiral, achiral, or achiral/*meso*.

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7. Assign the absolute stereochemistry (*R* or *S*) to each of the following compounds at each chiral center.

 Fischer projection formula	 Fischer projection formula
	
 Oestrogen	 aspartame
