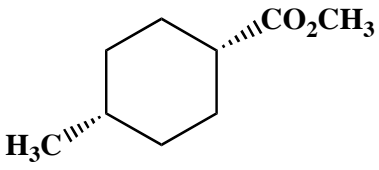
Chemistry 333 Discussion **Name: _____**

Problem Set 4

1. Draw cyclohexane in the chair conformation and show all equatorial hydrogens clearly. Draw a second picture of the chair conformation to show all axial hydrogens.

2. Draw cyclohexane in the boat conformation. Label this drawing with carefully positioned intersecting arcs to denote each interaction that causes steric strain. Then draw a Newman projection of the boat conformation and circle each eclipsing interaction separately.

3. Draw the two possible chair conformations of the following disubstituted cyclohexane. Draw carefully positioned intersecting arcs to denote all 1,3-diaxial interactions for both conformations. Use the table of 1,3-diaxial interactions at http://www.csun.edu/~hcchm007/333casc.pdf to determine the total strain energy for each chair conformation. Then circle the more stable conformation. Use the equilibrium-constant equation, $K = e^{-\Delta G^o/RT}$, to calculate the percent of each conformation at 298 K. Show your calculations. Assume that no other conformations are measurably in equilibrium with the two chair conformations. Finally, repeat the exercise for the *trans*-stereoisomer.



Please bring your molecular models to class for the discussion of this problem set.