**CHE-2060 Lecture 3 Take-home Quiz**

This take-home quiz is due in at the end of the day on Monday. You are welcome to attach any additional pages needed. ***Please email if you have any questions.***

**3.1: Alkane conformation**

1. Define the term steric hindrance.
2. What type of isomers – constitutional (aka structural), conformational (rotamers), or configurational - can be formed by:
	1. Alkanes
	2. Alkenes
	3. Alkynes
3. What is the dihedral angle between neighboring or adjacent atoms or alkyl groups in alkanes described as:
	1. Eclipsed
	2. Staggered
4. Draw Newman projections of staggered and eclipsed conformers of 1-iodopentane, looking down the axis from carbon 1 to carbon 2.
5. Draw a dash-wedge diagram of the staggered and eclipsed conformers of 1-iodopentane that you’ve created above in question 4.
6. Draw energy diagrams for the rotation of the bond from carbon 1 to carbon 2 of 1-iodopentane. Show energy as the y-axis and bond angle rotation on the x-axis.

**3.3: Ring stereoisomers: cis vs. trans**

1. Draw the line-bond structure of *trans*-1-ethyl-2-bromocyclohexane. Use the more stable chair form of cyclohexane.
	1. Now draw the *cis* isomer of the same molecule.
	2. Which is more stable, the *cis* or *trans* isomer?
	3. Now “flip” the chair. Does that change which isomer is more stable?
2. In a test tube, what needs to be added as an input to change one rotamer to the other? [To change eclipsed to staggered, or to cause chairs to flip?]