**CHE2060 Lecture 4 Example Problems**

We’ll work on some / most of these problems during class or lab to clarify concepts, and test and solidify understanding of specific points. Please print these pages and bring them to class and lab meetings.

**4.1: Physical properties of organic molecules**

1. What forces hold molecules together in a solid?

2. Why are molecules with several arenes likely to form liquid crystals?

**4.2: Types of intermolecular interactions**

3. What is unusual about the melting point of spherical molecules? Why?

4. Rank the likely boiling points of these compounds from low to high. Of course, you can use the web to discover these bps, so I’d like you to include an explanation of why the boiling points increase as they do.

a. butane

b. chlorobutane

c. butanol (CH3CH2CH2CH2OH)

d. butanoic acid (CH3CH2CH2COOH)

5. Do linear or branched molecules of the same carbon number experience greater van der Waals attraction? Why?

6. What are the essential similarities and differences between dipolar and hydrogen bonding interactions?

**4.3: Solubility**

7. You need to find a solvent that will help to create a single phase solution from hexane and formic acid solutes. Which solvent should you choose? *And why?*

a. octane

b. water

c. isopropanol

**4.4: Surfactants**

8. Why do fatty acids, surfactants, lipids and other amphipathic molecules form micelles when added to water?