

Chemistry 471/671
Introduction to Green Chemistry

Problem Set #1 (6 points)
Due Tuesday, September 13, 2011

Due to the abstract nature of this week's lecture material, we present an abstract problem set. For this week's assignment only, no answer can truly be wrong, so long as you can back up your answer with a logical argument. However, answers presented without the "work" of a logical thought process can be considered wrong. Show how you arrived at the answers you have given. Note that these sorts of open-ended questions are regular occurrences in the real world, and learning to make good assumptions is a valuable skill.

- 1) Approximately how much fuel (in gallons or liters, your choice) is consumed during the morning rush hour for an American city of approximately 1 million people? How does your answer change if we name a specific city, rather than a generalization? How does your answer change if the city isn't American?
- 2) Approximately how many liters of organic solvent waste are produced each semester during undergraduate chemistry labs at Boston's colleges and universities?
- 3) Choose ONE of the two scenarios above. Discuss the ways in which this use of resources is a poor example of Green Chemistry. Be specific: which of the 12 Principles are being violated? What might be done to remedy the situation? Consider that any changes will need to be economically as well as philosophically sound if they are to be implemented.

Reading Analysis #1 (4 points – with 2 points reserved for Discussion)
Due Tuesday, September 13, 2011

- 1) Which of the Presidential Green Chemistry Award winners do you think is the **most** likely to have an economic impact on a global scale? Which is the **least** likely? Explain your choices.
- 2) Which of the 12 Principles are being observed in Journal of Organic Chemistry paper on TPGS-750-M? Which aren't? Can you think of any ways to address those "missing" Principles? If so, why didn't the authors?