Assignment 4
Due: *In Lecture*, Wednesday, February 1

In Lab 2, you synthesized statistical copolymers from a pair of monomers. While copolymerization can give polymeric materials that possess intermediate properties between homopolymers from the component monomers, the properties you get from a copolymer are sensitive to the positioning of the monomers in the polymer. For example, *statistical* copolymers, *gradient* copolymers, *alternating* copolymers, *block* copolymers and *graft* copolymers made from the same two monomers can have very different properties. The relationship between copolymer structure and properties is a very active field of current research in polymer science and has important technological and commercial implications.

Using SciFinder Scholar, find a research paper (and not a review) that was published in *Macromolecules* in 2005 in which the authors describe the synthesis of a copolymer, and that contains at least one graph. This assignment will ask you some questions about the structure of the paper; in order to help you understand the manuscript's structure, you may want to take a look at "How to Write a Paper in the Scientific Journal Style and Format" (http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html) or The UW-Madison Writing Center Science Writer's Handbook (http://www.wisc.edu/writing/Handbook/ScienceReport.html).

Answer the following questions about the paper you found:

1. In your own words, what is the aim of this paper? What are the authors attempting to demonstrate? (If the paper is not strictly about copolymer structure, then what is it about?)

2. What type of copolymer do the authors synthesize, and what special properties do the authors anticipate/demonstrate for their copolymer? Why did they fabricate this particular copolymer structure?

3. By what method do the authors synthesize their polymer? Draw a mechanism for the *propagation* step of the authors' polymerization. (If there are multiple propagation mechanisms, draw each.)

4. Now look at the sections of the paper. The paper probably has an *Introduction,* an *Experimental*, a *Results and Discussion*, and a *Conclusion*. What do the authors say in each of these sections? (Answer this question specifically rather than generally—how did these sections support the authors' point?)

5. Pick one of the graphs in your paper, and explain how it *contributes* to the message that the authors intend. What does the graph say?

6. How did the *Figure Caption* help you understand the graph?

Turn in a copy of the paper you chose along with the answers to these questions.