Chemistry 334R

Problem Set 13

1. Draw a specific example of an addition homopolymer formed by a cationic mechanism.

2. Draw a specific example of an addition homopolymer formed by an anionic mechanism.

3. Draw a specific example of an addition homopolymer formed by a radical mechanism.

4. Draw a specific example of an addition copolymer.

5. Draw a specific example of a condensation homopolymer.

6. Draw a specific example of a condensation copolymer.

7. Polystyrene can be formed by free-radical polymerization of the monomer, styrene. Describe in detail why a sample of this polymer is not a pure compound, but is a mixture of related compounds, instead.

8. The following reaction between toluene diisocyanate and ethylene glycol forms a polyurethane. Draw the mechanism of this polymerization, using the curved-arrow notation to indicate the reorganization of electron density. Denote intermediates, lone pairs, nonzero formal charges, countercharges, and reversibility or nonreversibility. In your answer, only show the bonding of one toluene diisocyanate to two ethylene glycols. Finally, classify this polymer both in terms of its mechanism of formation and the sequence of structural units that are present.