Chem 466

Lecture #1

01/14/2014
Enrollment discussion

- engineering vs. chem vs. other
- grad. vs. undergraduate

Syllabus discussion

- contact info
- office hours and cancellations announced during lectures
- course website — important
  - lecture notes
  - hand-outs
  - exam and quiz keys
  - exams from previous years for practice
- textbook
  - 1 or 2 copies in library
- grading
  - quizzes weekly (Tues. or Thurs.)
  - exams slated in calendar
  - either quiz total or exam score dropped from final grade
- calendar
  - tentative content/material for lectures
  - firm dates for exams

Slide set discussion

- demos
  - Labeled in Flasks
  - x-linked chains
  - PET the bottle (poly bottle label, Wei, cap)
- hand-out
Polymers Examples

- Polystyrene of slide set
  - Polystyrene as one word
  - Common uses - styrofoam e.g.
   - Chain ends are important
   - Can influence properties
   - Indicate synthetic method

Repeat units
- Form the majority of the polymer
- Structural composition and dominate the properties

Synthesis
1) \( \text{C}_6\text{H}_{5}\text{Li}(\text{initiator}) \)
2) \( \text{C}_6\text{H}_{5}\text{OH} \) (terminator)

Add 'in' across for polymer

- A chain-growth polymer by addition

Demo:
PS cup with HCl vs. acetone
- poly(ethylene terephthalate) of \text{H}_2\text{O} \\
  - poly(ethylene terephthalate) is 2 words \\
  - common uses: drink bottles, etc.

\[
\begin{align*}
\text{HO-} & \quad \text{O} & \quad \text{O} & \quad \text{O} \\
\text{C} & \quad \text{C} & \quad \text{C} & \quad \text{C} \\
\text{O-} & \quad \text{O} & \quad \text{O} & \quad \text{O} \\
\text{HO}\quad & \quad \text{O} & \quad \text{O} & \quad \text{O} \\
\text{H} & \quad \text{O} & \quad \text{O} & \quad \text{O} \\
\end{align*}
\]

\[\text{retrosynthesis} \quad \Delta \quad 2n\text{H}_2\text{O}\]

\[n+1 \quad \text{HO} \quad \text{O} \quad \text{OH} + n+1 \quad \text{HO} \quad \text{O} \quad \text{OH}\]

- a step-growth condensation polymer
- a condensation by-product during polymer