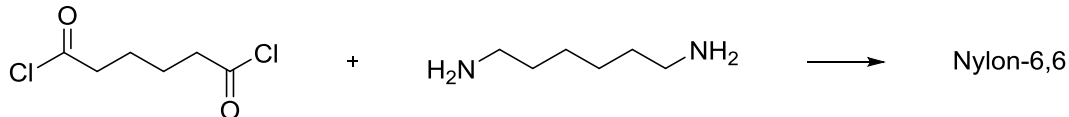


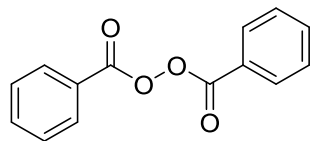
CHM2123 Problem Set #4 – The Synthesis of Organic Polymers

1. While performing the synthesis of Nylon-6,6, a student mixes adipoyl chloride and hexanediamine in dichloromethane and water. He observes that no nylon is formed. What reagent is he missing? Using a mechanism, explain why no nylon was formed.

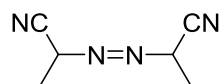


2. With the aid of structures, explain how borax is used to convert polyvinyl alcohol to Slime?
3. During the lab period, a distracted student added too much maleic anhydride in part A of the experiment. What type of polymer will she observe?
4. What is the difference between HDPE and LDPE?
5. What type of polymer is DNA? Explain how cross-linking occurs within two strands of DNA. Draw the cross-linking between adenine and thymine.
6. Starch and cellulose are two polymers of glucose. Explain the difference between them.
7. What is vulcanization?
8. What is an elastomer?
9. Give the mechanism of the termination of a growing polymer chain.
10. Give the mechanism for the initiation using:

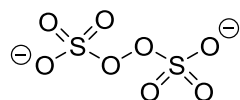
- a. Benzoyl chloride



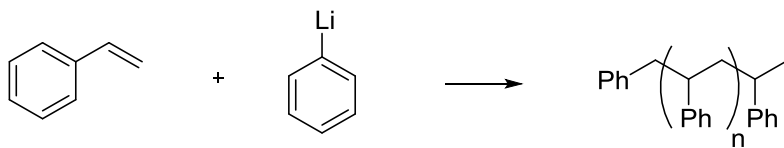
- b. AIBN



- c. Ammonium persulfate



11. Polymers can also be made via anionic chain growth. Give the mechanism for the growth of the polymer shown below (show initiation and growth of at least 1 additional monomer):



12. How would you quench the growth of a anionic polymer?

13. Give the structure of the polymer created by these two starting materials:

