

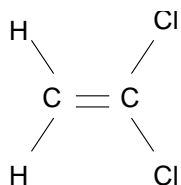
Chemistry 100
Homework Problem Set # 10
Due Monday, December 1st

1. Describe the difference between addition and condensation polymerization. (section 10.2, 10.3)

2. Classify EACH of the following properties and structural features as referring to HDPE or LDPE by placing HDPE or LDPE after each.
 - (a) higher density
 - (b) more branching
 - (c) more flexible
 - (d) more orderly stacked in the solid

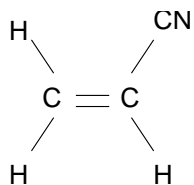
3. Describe the structures of high-density polyethylene and low-density polyethylene. How do their structures explain their respective properties?

4. The polymer Saran is an addition polymer made from the monomer below:



Draw a segment of the polymer containing at least three monomer units.

5. The polymer Orlon is an addition polymer made from the monomer below.



Draw a segment of the polymer containing at least three monomer units.

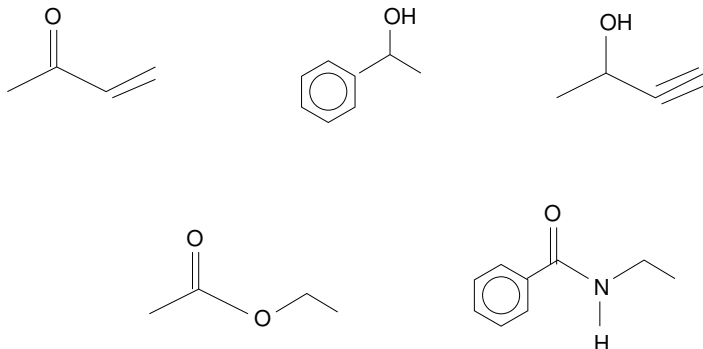
6. Waldron, Chapter 10, question 42. Using your knowledge of condensation polymerization, predict the product of the chemical reaction:



7. Describe the process of vulcanization. How does vulcanization change the properties of rubber? (section 10.4)

8. What are three of the six ways to change the properties of a polymer discussed in class?

9. Waldron, Chapter 10, question 10. Identify each organic functional group in these molecules:



10. Waldron, Chapter 10, question 9. Recycling has the potential to reduce dramatically the amount of crude oil our country uses each year. (a) How is recycling linked to the use of crude oil? (b) What happens to recyclable plastics that are thrown away as litter? (c) If recycling is becoming more and more successful, why are efforts being made to make biodegradable plastics?

11. What problems arise when plastics are (a) discarded into the environment? (b) disposed in landfills? (c) disposed of by incineration?

12. Find 10 plastic containers in your home or dorm room and look for the recycling symbol (see Waldron, page 409). Make and fill in a table in the following format. Attach your table to this assignment.

#	Product Type & Brand (if brand is known)	Recycling code (if given)	polymer	properties observed (flexibility, clarity, strength, etc)
1	Happy Cow Farms 1% Milk	1	HDPE	stiff, translucent etc.
:				
:				
10				

If you have some plastic without recycling codes, see if you can guess the type of plastic from its properties and the properties of the other items.