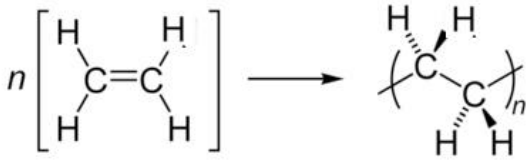
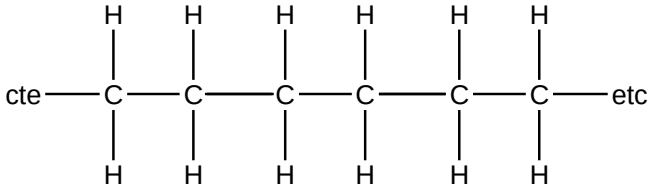
Plastics and Composites

Homework

1. A) In polyethylene, the reaction is similar to that of PVC but the Cl is replaced with H. Clarify the above and show what polyethylene looks like at the molecular level.





B) What in your house is made up of polyethylene?

Garbage bags, plastic bottles, milk jugs

2. Find 2 plastic containers in your house. Look for the recycling symbol and then complete the following table.

Recycling Code	Description of Plastic Container	Type of plastic(see recycling code legend in your notes)

3. What do all plastics have in common?

   A repeated monomer in a chain that is not easily broken down

4. What's the difference between a thermoplastic and a thermoset (thermosetting plastic)?

   Only the thermoplastic can be heated and remolded repeatedly.

5. Chemically, what do lignin and cellulose have in common with plastic?
   They are polymers: chain-like molecules
6. From a composite-perspective, what part of wood is more like plastic? Why?
   Lignin= matrix. Plastic serves as a matrix in composite materials.

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7. Carbon-fiber composites are very light and yet very hard, and if they could be made at a cheaper cost, they would be superior to steel from an energy-saving perspective. Why do you think that is?
   If you make lightweight vehicles out of these materials, it will take less energy to power them.