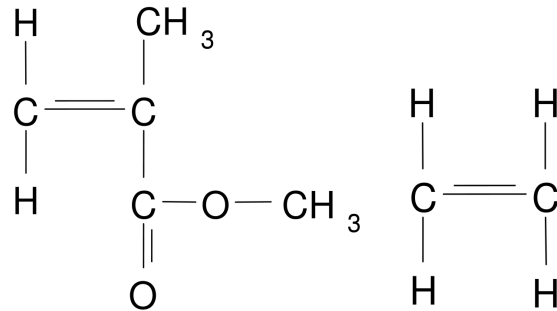


1. A monomer of methyl methacrylate (left) and a monomer of ethylene (right) are shown. (40 pts total):



- a. draw the polymer structures for poly(methyl methacrylate) and poly(ethylene).
- b. which of these polymers can crystallize more easily? Why?
- c. which of these polymers has an isomeric form? Draw one and correctly identify it as atactic, syndiotactic, or isotactic.

2. Using the distribution of molecular weights given below, compute the number average and weight average molecular weights. (40 points total)

Average Molecular Weight (g/mol)	Mole Fraction
10,000	0.1
50,000	0.3
100,000	0.5
150,000	0.1

The formulae are:

$$\bar{M}_n = \sum_i x_i \cdot M_i \quad (1)$$

$$\bar{M}_w = \sum_i w_i \cdot M_i \quad (2)$$

3. Using the data provided, estimate how many mers of ethylene are needed to synthesize a poly(ethylene) chain 1 meter in length. Assume the chain is in its zig-zag conformation. Answers having the correct order of magnitude will be accepted for full credit. (20 points total)

Bond	Length (pm)	Angle (degrees)
C-C	154	109.5
C-H	109	180
C=C	134	180