

Week 6

Reactions of Alkenes

6.1 Alkene Nomenclature and Reactions

11/2:

- Alkene nomenclature.
- Degree of unsaturation, aka hydrogen deficiency.
 - Indicate the sum of the number of rings and π bonds in a molecule simply by examining the formula.
 - Recall for hydrogens and other heteroatoms (e.g., oxygen, nitrogen, halogens, etc.).
- Reactions of alkenes:
 - Important because an understanding of reactions enables us to do syntheses.
 - There are three components in a chemical reaction: The reactants, products, and conditions.
 - We should be able to predict any one of these from the other two.
 - We should also be able to draw the reaction mechanism.
- **Reaction mechanism:** A stepwise description of what happened in the reaction.
 - This involves arrow pushing.
- Know Table 6.1 from the textbook.
- **Hydrohalogenation:** Addition of H-X across a C=C double bond.

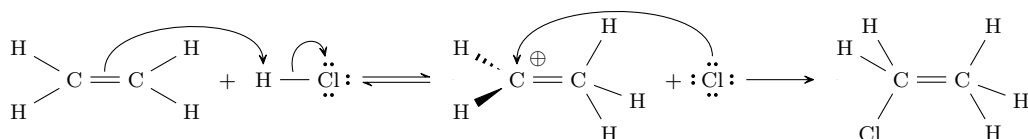


Figure 6.1: Mechanism of hydrohalogenation.

- We add the H to one of the alkene carbons and the X to the other.
- Since H-X likes electrons, it is the **electrophile**.
- If a carbocation is formed, you have an **electrophilic addition reaction**.
- For unsymmetric alkenes, we add the X to the more substituted position since a carbocation will form there during the mechanism and be stabilized by **hyperconjugation**.
 - This is Markovnikov addition.

- **Hyperconjugation:** Adjacent C–H bonding electrons donate electron density into vacant p orbitals (of C^+), thus stabilizing the carbocation.
 - Thus, alkyl groups are considered electron-donating groups because they delocalize positive charges through inductive effects.