Chapter 1

Understanding 4 Essential Steps of IUPAC Nomenclature

Key Concepts

The first 4 steps to determining the IUPAC name of a molecule are:

1. **IDENTIFY (in order):**

FUNCTIONAL GROUP	PARENT HYDROCARBON	SUBSTITUENTS
OH N = ≡	Largest Number of Continuous Carbons Incorporating any Carbon Attached to a Functional Group. If there is a tie in the number of carbons, it goes through the more branched section.	Alkyl Groups Halogens Alkoxy Groups

2. **WRITE the name of each component (in the following order):**

SUBSTITUENTS (in Alphabetical Order)	PARENT HYDROCARBON	FUNCTIONAL GROUP
ending changed to -yl ending changed to -o ending changed to -oxy		-ol -amine -ene -yne

3. **If there are identical substituents and/or functional groups, state HOW MANY of each.**

4. **Say WHERE functional groups and substituents are attached to the parent hydrocarbon. (Number the parent hydrocarbon starting from each end. Choose the numbering system that gives the lowest possible number to a carbon directly attached to a FUNCTIONAL GROUP. If there is a tie, or if the molecule doesn't have a functional group, then select the numbering system based on which one gives the lowest number possible to a parent carbon attached to a substituent.)**

What You Need to Learn, Understand, and Apply

1. **The ability to differentiate between substituents and functional groups.**
2. **The ability to locate and name the parent hydrocarbon.**

3. **The ability to incorporate the proper endings of functional groups and the correct prefixes of substituents in the overall name of the molecule.**
4. **The ability to correctly assign location numbers to functional groups and substituents.**
5. **The ability to apply the first 4 steps of IUPAC nomenclature when assigning names of alkanes, alkenes, alkynes, alkyl halides, alcohols, ethers and amines. Also, the ability to draw the structure of a molecule based on its IUPAC name.**