

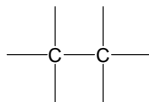
## Introduction to Organic Chemistry

## Organic Chemistry

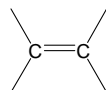
- Chemistry of Carbon
- Terminology
- Proper Structures

## Functional Groups

- **Alkane:** Contains a carbon-carbon single bond.



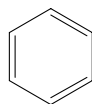
- **Alkene:** Contains a carbon-carbon double bond.



- **Alkyne:** Contains a carbon-carbon triple bond.



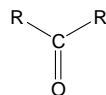
- **Aromatic:** Contains a six-membered ring, with alternating double and single bonds.



- **Alkyl Halide:** Contains an alkyl (alkane - H) and a halogen, RX.
- **Alcohol:** Contains a ROH.
- **Ether:** Contains a ROR.
- **Thiol:** Contains RSH.
- **Sulfide:** Contains a RSR.
- **Aldehyde:** Contains a H bonded to a C on one side of a C=O and a R or H bonded to a C on the other side.



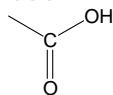
- **Ketone:** Contains 2 R groups attached to the C on either side of a C=O.



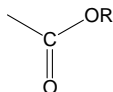
- **Acid Halide:** Contains a C=O, with an X attached to the C on one side and an R or H attached to the C on the other side.



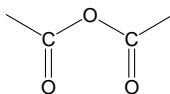
- **Carboxylic Acid:** Contains a COOH, with an R or H attached to the C of the COOH.



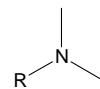
- **Ester:** Contains a COO, with an R attached to the O and a H or R attached to the C.



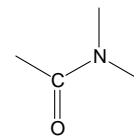
- **Anhydride:** Contains an OCOCO, with an R or H attached on either side of the O.



- **Amine:** Contains an N, with R and / or H attached to the N.



- **Amide:** Contains a N attached to the C of a C=O, with H or R on the other positions.



- **Nitrile:** Contains a carbon nitrogen triple bond.

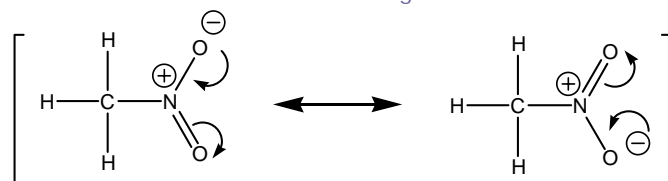


## Acids and Bases

- **Arrhenius Acid:** Dissociates to give H<sub>3</sub>O<sup>+</sup>.
- **Arrhenius Base:** Dissociates to give OH<sup>-</sup>.
- **Bronsted-Lowry Acid:** Donates an H<sup>+</sup>.
- **Bronsted-Lowry Base:** Accepts an H<sup>+</sup>.
- **Conjugate Acid:** acid that results from the Bronsted-Lowry base gaining an H<sup>+</sup>.
- **Conjugate Base:** the base that results from the Bronsted-Lowry acid losing an H<sup>+</sup>.
- **Amphoteric:** Reacts as an acid or a base.
- **Lewis Acid:** Accepts electron pairs to form new bonds.
- **Lewis Base:** Donates electron pairs to form new bonds.

## Electron Pushing

- Locate the electrons on the more electronegative atoms.
- Identify the most electronegative atom and the least electronegative atom in a bond.
- A mechanism is a step-by-step explanation of what happens in a chemical reaction.
- The flow of electrons in a mechanism is from the most electronegative atom to the least electronegative atom.
- The nucleophile donates the electrons in a mechanism.
- The electrophile accepts the electrons in a mechanism.
- Resonance structures are two or more equivalent structures for the same arrangements of atoms, the only difference is the location of the electrons.
- Delocalization are electrons that are distributed among more than two atoms that are bonded together.



## How to Study Organic Chemistry

- For the terminology, know the definition of such terms as nucleophile, electrophile, syn, anti, etc.
- Learn the functional groups and be able to recognize them quickly.
- Learn the first ten alkanes, along with the prefixes and suffixes.
- Identify the most electronegative and the least electronegative atoms.
- The flow of electrons is from negative to positive.
- Understand the concepts, do not just memorize examples.
- Find examples in the textbook or on websites to reinforce the concepts.
- Make flashcards.
- Ask for help if you don't understand something.

How to Use This Cheat Sheet: These are the keys related this topic. Try to read through it carefully twice then recite it out on a blank sheet of paper. Review it again before the exams.