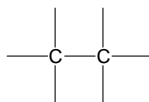


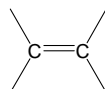
## 05: Organic Nomenclature I

## Key Chemistry Terms

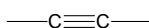
- **Alkane:** A compound that contains carbon-carbon single bonds.



- **Alkene:** A compound that contains carbon-carbon double bonds.



- **Alkyne:** A compound that contains carbon-carbon triple bonds.



- **Alkyl:** R, an alkane minus an H.
- **Halide:** X, a halogen (F, Cl, Br, I).
- **Alkyl Halide (Haloalkane):** A compound that contains an alkyl group and a halogen.

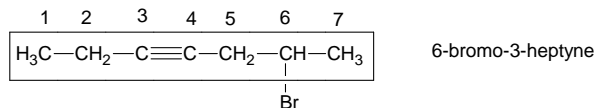
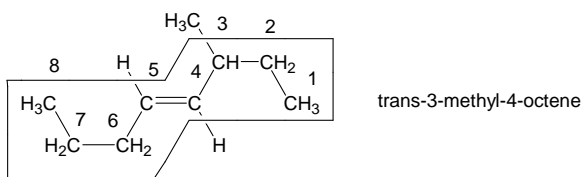
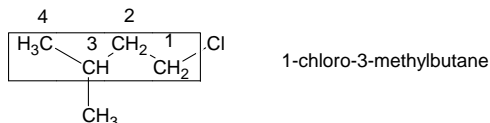


## Nomenclature Prefixes

- **Alkyl Prefixes:** 1 – Meth; 2 – Eth; 3 – Prop; 4 – But; 5 – Pent; 6 – Hex; 7 – Hept; 8 – Oct; 9 – Non; 10 – Dec .
- **Numerical Prefixes:** 1 – Mono; 2 – Di; 3 – Tri; 4 – Tetra; 5 – Penta; 6 – Hexa; 7 – Hepta; 8 – Octa; 9 – Nona; 10 – Deca.
- **Halogen Prefixes:** Fluoro, Chloro, Bromo, Iodo.

## IUPAC Nomenclature Rules for Alkanes, Alkenes, Alkynes, and Alkyl Halides

- The longest continuous carbon chain is the parent compound.
- Use “ane” for alkane, “ene” for alkene, and “yne” for alkyne.
- Circle the carbon chain to aid in identifying the parent compound.
- Number the carbon chain in alkenes and alkynes so that the multiple bonds have the lowest number, then number the substituents.
- For alkanes, number from whichever end that gives the substituents the lowest possible combination of numbers.
- Give the location of each substituent with a number.
- Use numerical prefixes if more than one identical group is present.
- Use “yl” on alkyl prefixes and “o” on halogen prefixes.
- Alphabetize the groups, ignoring all numerical prefixes.
- For alkenes, use cis if same groups are on the same side or trans if the same groups are on different sides.



## Classification of Carbons

Carbons are classified according to the number of carbons directly attached to them:

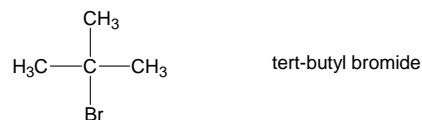
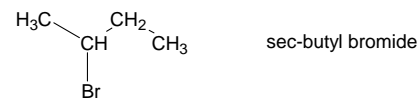
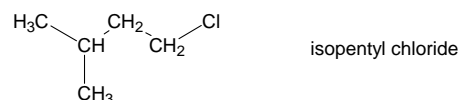
- **Zero Degree Carbon:** A carbon that is attached to no carbons.
- **Primary Carbon:** A carbon that is attached to one carbon.
- **Secondary Carbon:** A carbon that is attached to two carbons.
- **Tertiary Carbon:** A carbon that is attached to three carbons.
- **Quaternary Carbon:** A carbon that is attached to four carbons.

## Common Nomenclature Prefixes

- **n Prefix:** The structure is a straight chain, with the halogen on the end.
- **iso Prefix:** The structure contains two methyls attached to CH, with functional group on the other end.
- **sec Prefix:** The halogen is attached to secondary carbon; use only if total number of carbons is four.
- **tert Prefix:** The halogen is attached to tertiary carbon; use only if total number of carbons is four or five.
- **neo Prefix:** The halogen is attached to a carbon and that carbon is attached to tert-butyl group.

## Common Nomenclature Rules for Alkanes and Alkyl Halides

- Name as an alkyl halide.
- Use all of the carbons in the “alkyl” name.



## How to Study Nomenclature

- Learn the alkyl, numerical, and halogen prefixes before proceeding to the rules.
- Use colored pens and pencils to circle the longest continuous carbon chain.
- Number the structure.
- Follow the rules in nomenclature.
- Learn the common prefixes.
- Review the examples.
- Find other examples to practice.
- Keep up with the work—don’t let yourself fall behind.
- Ask for help when you need it!

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.