IV.1.2. acycliques unsatureted hydrocarbures (alkene and alkyne) :

a. lineare alkenes et alkynes:

The name of a linear (alkene/alkyne) consists of two parts :

PCC suffixe + (locant of double or triple bonds)

Whish :

PCC : tells how many carbon atomes

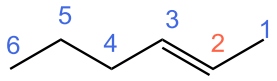
suffixe : The **ene** suffix indicates an alkene and The **yne** suffix indicates an alkyne

locant of double or triple bonds : The locant for the first carbon of the alkene aand alkyne is used in the name.

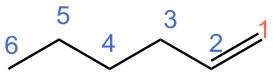
so : Naming alkenes and alkynes is just like naming alkanes :

- ✓ To start, replace the ending “ane” with “ene” (for alkenes) and “yne” (for alkynes)
- ✓ Double and triple bonds get the lowest possible number on the parent carbon chain.
- ✓ If there is a triple bond present as well, a double bond gets priority if it is in a similar position to the double bond, and the compound is referred to as an ‘enyne’

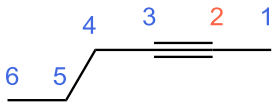
Example :



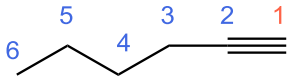
hex-2-ene
2-hexene



hex-1-ene
1-hexene



hex-2-yne
2-hexyne



hex-1-yne
1-hexyne

The location of the carbon-carbon double or triple bond can vary (number of carbon atomes > 4. Example :The 4-carbon alkene generic name is butene. Since the double bond can be located in more than one place, we have 1-butene and 2-butene:

➢ Alkenes and alkynes di, tri and polyenes and plyynes and enynes compounds :

- The term polyene simply implies the presence of several alkenes. To be more specific, a diene has two C=C, a triene has 3 C=C etc.
- The term polyyne simply implies the presence of several alkynes. To be more specific, a diyne has two C≡C, a triyne has three C≡C *etc*.
- The term enyne simply implies the presence of **both** an alkene and an alkyne.

polyenes, polyynes and enynes are named in a similar manner to alkenes, alkynes :

➢ The root name is based on the longest chain containing enes or ynes or **both ends** of the alkene and alkyne units.

➢ The chain is numbered in accord with the first point of difference rule to either the alkene or alkyne units the lowest possible locant.

➢ The locant for the lowest numbered carbon of each multiple bond is used in the name.

1 = ène 1 ≡ yne

2 = a**di**ène 2 ≡ a**di**yne

3 = a**tri**éne 3 ≡ a**tri**yne

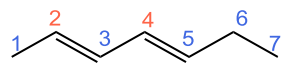
1 = et 1 ≡ **ène** + **yne** → **ènyne** (We classify ene and yne in alphabetical order)

2 = et 1 ≡ **adiènyne** 1 = et 2 ≡ **ènediyne**

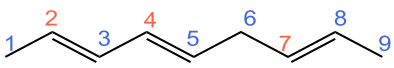
3 = et 1 ≡ **atriènyne** 1 = et 3 ≡ **ènetriyne**

Note : for numbring, If there is a choice betwine C=C and C≡C , then the C=C takes priority and is given the lowest locant.

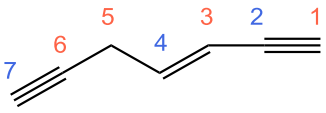
Exemple :



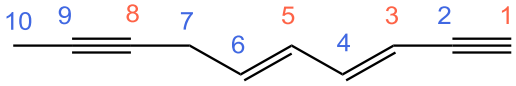
hepta-2,4-diene



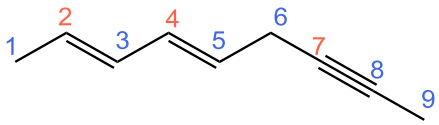
nona-2,4,7-triene



hept-3-ene-1,6-diyne



déca-3,5-diene-1,8-diyne



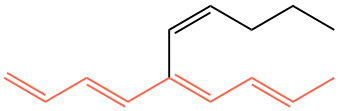
nona-2,4-triene-7-yne

branched alkenes and alkynes :

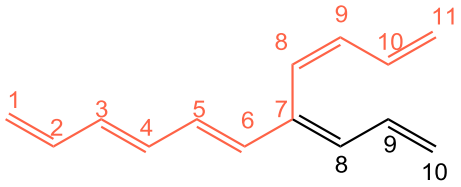
Rule-1 :

Parent carbon chain selection :

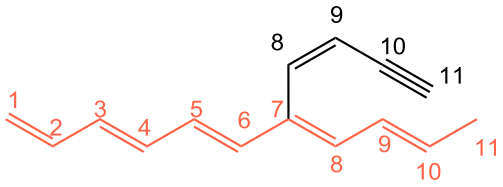
1. Select the longest carbon chain containing maximum number of multiple bonds.



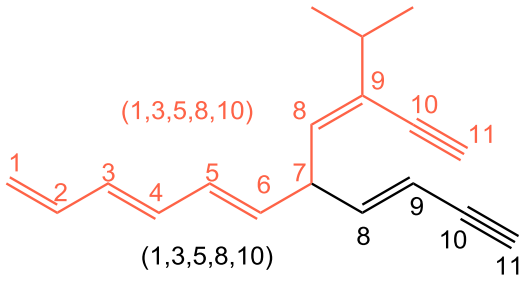
2. If two chains having same number of multiple bonds then check maximum number of carbons to select parent carbon chain.



3. If multiple bonds & carbon both are same then maximum number of double bonds



4. If the equality, same then maximum number of substituent to select parent carbon chain.

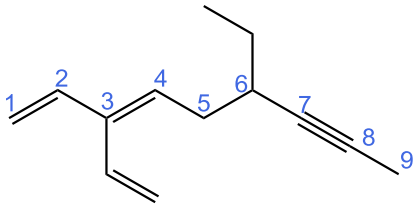


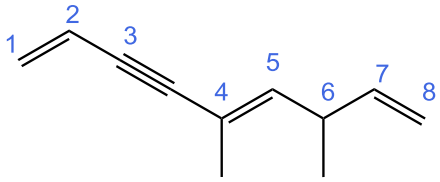
- Number of multiple bond > Number of carbon > Number of double bond > Number of substituent (priority order)

Rule-2 :

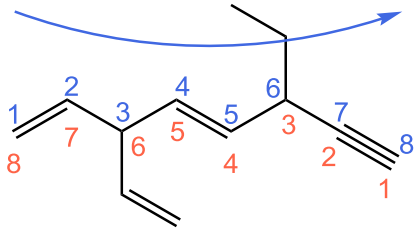
Numbering of parent carbon chain :

1. While doing numbering in alkene and alkyne minimum number should be given to multiple bond.

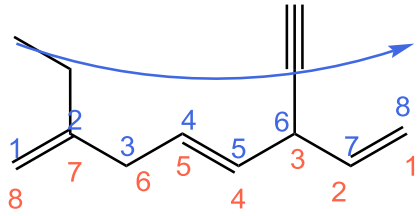




If there is a choice betwine C=C and C≡C , then the C=C takes priority and is given the lowest locant (because alphabetically ene > yne.).



1. If multiple bond getting same number from either side then give minimum number to substituent.



Note : For numbering multiple bond priority is high compare to substituent

Write the name

1. identify and number the substituents, then cite them in alphabetical order :

Naming of substituents :

The substituents may be alkyls (simple or complex see p) or unsaturated radicals (univalent or bivalent)

- Univalents univalents :

They are radicals that bind with the main chain by a simple bond (σ)

The name of a univalent unsaturated radical is obtained by replacing the final "e" of the unsaturated hydrocarbon by the suffix "yl" (alkene becom alkenyl) or "yl" (alkyne becom alkynyl), of course respecting the number of unsaturations.

Divalent radicals:

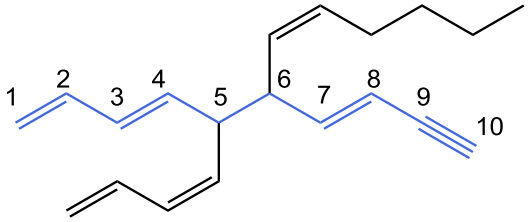
These are radicals that bind with the main chain by a double bond (π)

The name of a divalent radical is obtained by adding the suffix "idene" at the end of the name of the saturated radical "yl → ylidene" or unsaturated "enyl→ enylidene" or "ynyl → ynylidene".

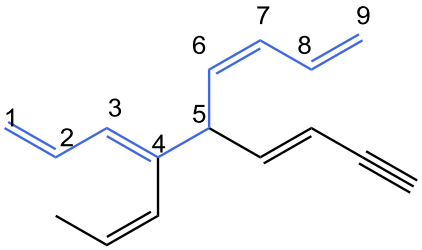
NB: The substituents are always numbered starting from the first carbon linked directly to the main chain.

If two or more similar multiple bonds are present on PCC then use di, tri, tetra etc. before 1° suffix and before this di, tri, tetra etc. 'a' should be written

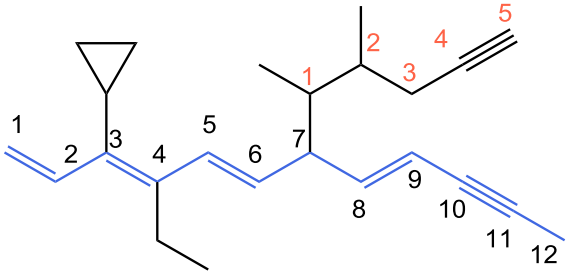
Exemples :



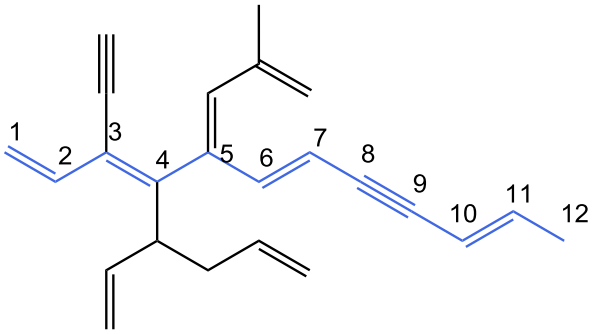
5-buta-1,3-dienyl-6-hex-1-ènyldeca-1,3,7-trien-9-yne



5-but-1-en-3-ynyl-4-prop-1-enylnone-1,3,6,8-tetraene



3-cyclopropyl-7-(1,2-dimethylpent-4-ynyl)-4-ethyldodeca-1,3,5,8-tétraen-10-yne



4-(1-ethenylbut-3-enyl)-3-ethynyl-5-(2-methylprop-2-enylidene)dodeca-