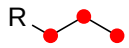
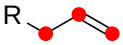
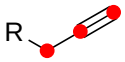
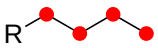
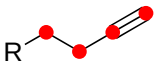
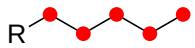
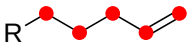
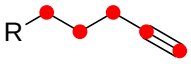
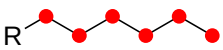
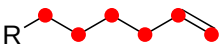
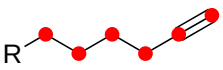
Alkynes

Table of Contents

Summary

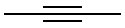
Functional group	General formula	Structure/example	Prefix (Used in side chains)	Suffix (Used in parent chain)
Alkyne	-C≡C-		-ynyl	-yne

Alkynes in side chains

	ALKANE	ALKENE	ALKYNE
1 C	 Methyl	 Methenyl	
2 C	 Ethyl	 Ethenyl	 Ethynyl
3 C	 Propyl	 Propenyl	 Propynyl
4 C	 Butyl	 Butenyl	 Butynyl
5 C	 Pentyl	 Pentenyl	 Pentynyl
6 C	 Hexyl	 Hexenyl	 Hexynyl

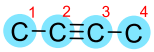
Worked Examples

But-2-yne



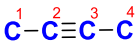
STEP 1: Identify the parent hydrocarbon chain

1.1 It should have the functional group with the highest priority[1]
1.2 It should have the maximum length



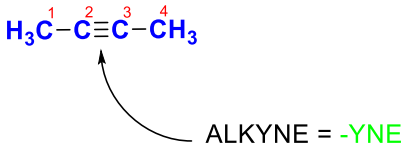
- Functional group ✔
- Longest chain ✔

STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix.



4 C = BUT

STEP 3: Identify the functional group with the highest priority and its suffix



STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix

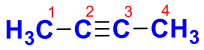
None

STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes

None

[1] The most recent IUPAC Blue Book release does not consider alkyne substituents when determining the parent chain. However, in this example, the new rules will not alter the nomenclature.

STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains



The alkyne can be considered to 'start' from carbon 2 or 3. As 2 is lower, we will use this step 7.

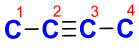
ALKYNE = -YNE

STEP 7: Numbers indicating the locant of the functional group are placed directly before the functional group portion of the name.

-2-YNE

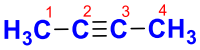
STEP 8: Write the complete name

8.1 Commas are written between numbers
8.2 Hyphens are written between numbers and letters
8.3 Successive words are combined into one word



BUT-

Step 1, 2

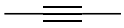


-YNE

Step 3

-2-YNE

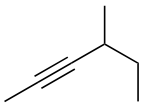
Step 6



but-2-yne

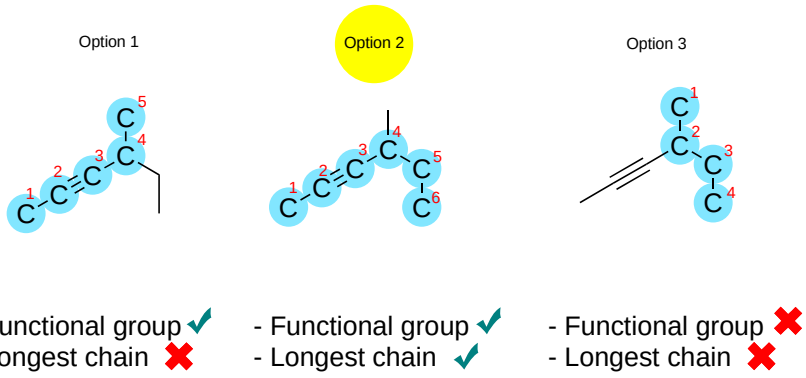
Step 8

2-methylhex-2-yne

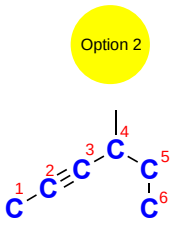


STEP 1: Identify the parent hydrocarbon chain

1.1 It should have the functional group with the highest priority[2]
1.2 It should have the maximum length

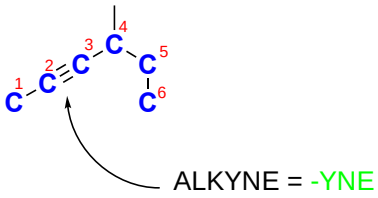


STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix.



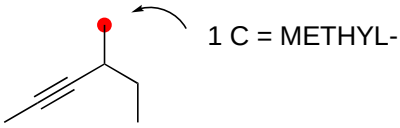
6 C = HEX

STEP 3: Identify the functional group with the highest priority and its suffix



[2] The most recent IUPAC Blue Book release does not consider alkyne substituents when determining the parent chain. However, in this example, the new rules will not alter the nomenclature.

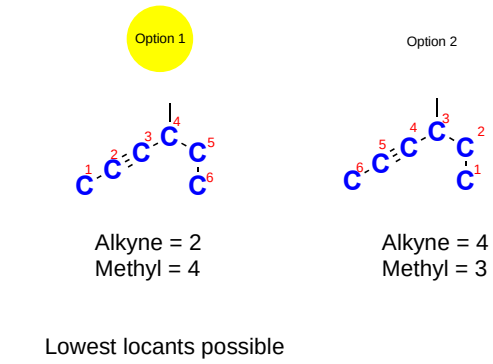
STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix



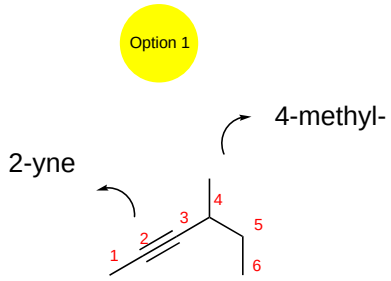
STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes

None

STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains

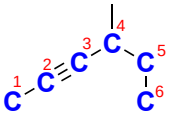


STEP 7: Numbers indicating the locant of the functional group are placed directly before the functional group portion of the name.



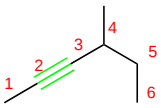
STEP 8: Write the complete name

8.1 Commas are written between numbers
8.2 Hyphens are written between numbers and letters
8.3 Successive words are combined into one word



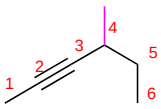
hex-

Steps 1,2



2-yne

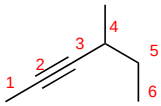
Steps 3,6,7



4-methyl

Steps 4,6,7

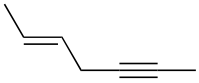
=



4-methylhex-2-yne

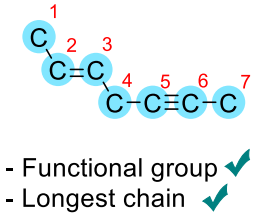
Step 8

Hept-2-en-5-yne



STEP 1: Identify the parent hydrocarbon chain

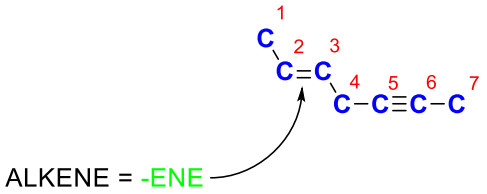
1.1 It should have the functional group with the highest priority[3]
1.2 It should have the maximum length



STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix.

7 C = HEPT-

STEP 3: Identify the functional group with the highest priority and its suffix



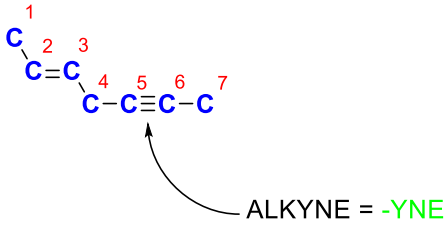
Alkenes take precedent over alkynes, so the alkene has the highest priority.

STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix

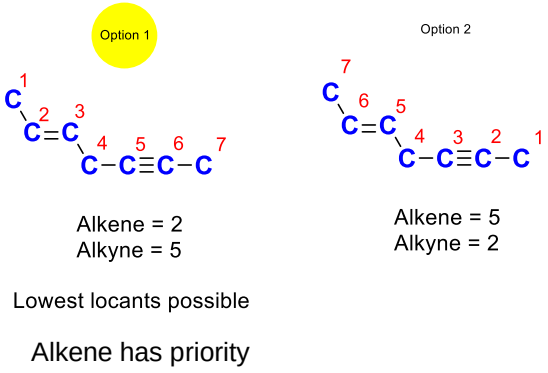
None

[3] The most recent IUPAC Blue Book release does not consider alkyne substituents when determining the parent chain. However, in this example, the new rules will not alter the nomenclature.

STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes



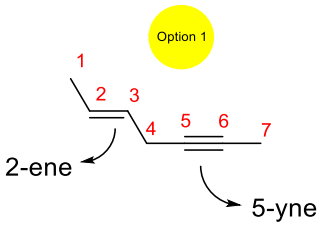
STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains



STEP 7: Numbers indicating the locant of the functional group are placed directly before the functional group portion of the name.

7.1 Names are listed alphabetically

7.2 If there is more than one of the same functional group, the prefix di- (2), tri- (3), tetra- (4) are used. These are not considered for alphabetical listing



STEP 8: Write the complete name

8.1 Commas are written between numbers
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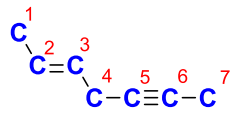
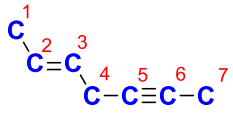


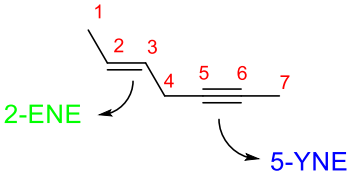
7 C = HEPT-

Step 1,2

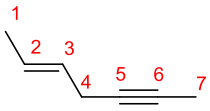


-ENE (with priority) AND -YNE

Step 3,5



Step 6,7



hept-2-en-5-yne

Step 8