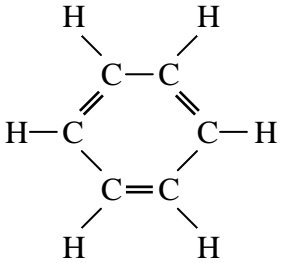



Hydrocarbons: IUPAC names

There are common names for many organic compounds. For example: methyl alcohol, acetylene, acetic acid, etc. Yet, there are an infinite number of possible organic structures. Thus, it is important to name them in a systematic way.

The purpose of IUPAC names is to provide a set of rules so that the structure of a compound can be discerned from its name, and vice-versa.

Hydrocarbons (C and H only)				
<u>Saturated</u> All single bonds Formula: C_nH_{2n+2}		<u>Unsaturated</u> At least one double or triple bond		<u>Aromatic</u> Contains a benzene ring
Prefixes for # of carbons				
1	meth-	6	hex-	
2	eth-	7	hept-	
3	prop-	8	oct-	
4	but-	9	non-	
5	pent-	10	dec-	
<ul style="list-style-type: none"> • cyclo = ring • n = normal (straight chain) – not IUPAC • iso = branched – not IUPAC 		Alkene	<ul style="list-style-type: none"> • 1 double bond $C=C$ • Formula: C_nH_{2n} 	Symbol: 
		Alkynes	<ul style="list-style-type: none"> • 1 triple bond $C\equiv C$ • Formula: C_nH_{2n-2} 	
		-dienes	<ul style="list-style-type: none"> • 2 double bonds $C=C=C$ • not necessarily in a row 	
		-trienes	<ul style="list-style-type: none"> • 3 double bonds $C=C=C=C$ • not necessarily in a row 	

Rules for naming compounds:

1. Choose the correct ending (-ane for alkanes, -ene for alkenes, -diene for dienes, -triene for trienes, -yne for alkynes)
2. Determine the longest carbon chain. Where a double or triple bond is present, choose the longest chain that includes this bond.
3. Attach a prefix that corresponds to the number of carbons in the parent chain. Add cyclo- to the prefix if it is a ring structure.
4. Assign numbers to each carbon of the parent chain. For alkenes and alkynes the first carbon of the multiple bond should have the smallest number. For alkanes the first branch (or first point of difference) should have the lowest number.
5. Determine the correct name for each branch (e.g. methyl, ethyl, propyl, isopropyl)
6. Attach the name of the branch, along with its carbon position, to the name of the parent as a prefix. Separate numbers from words with hyphens. (e.g. 3-methylhexane).
7. List branches alphabetically when more than one branch group is present. (e.g. 4-ethyl-2-methylheptane)
8. When two or more substituents are identical, use prefixes such as di-, tri-, tetra, etc. (e.g. 2,4-dimethylhexane). Note that prefixes such as di- and tri- (but not iso-) are ignored when determining alphabetical order. (e.g. 2,3,5-trimethyl-4-propylheptane)
9. When identical groups are on the same carbon, repeat the number of this carbon in the name. (e.g. 2,2-dimethylhexane)