Systematic Nomenclature (IUPAC System)

Prefix-Parent-Suffix

Parent- number of carbons

Prefix- substituents

Suffix- functional groups

Naming Alkanes

General Formula: C_nH_(2n+2)

suffix: -ane

Parent Names:

1.	CH4	Methane	CIT.
2.	СН3СН3	Ethane	CH4
3.	CH ₃ CH ₂ CH ₃		C2H6
4.	CH ₃ (CH ₂) ₂ CH ₃	Propane	C3H8
5.		Butane	C4H10
6.	CH ₃ (CH ₂) ₃ CH ₃	Pentane	C5H12
	CH3(CH2)4CH3	Hexane	C6H14
7.	CH ₃ (CH ₂) ₅ CH ₃	Heptane	C7H16
8.	CH ₃ (CH ₂) ₆ CH ₃	Octane	C8H18
9.	CH3(CH2)7CH3	Nonane	
10:	CH3(CH2)8CH3	Decane	C9H20
	= \ 270 -225	Decane	C10H22

Alkyl Substituents

R= Rest of the molecule

1.	CH ₃ -R	Methyl
2.	CH ₃ CH ₂ -R	Ethyl
3.	CH3CH2CH2-R	Propyl
4.	CH3(CH2)2CH2-R	Butyl
5.	CH3(CH2)3CH2-R	Pentyl
6.	CH3(CH2)4CH2-R	Hexyl
7.	CH3(CH2)5CH2-R	•
8.	CH3(CH2)6CH2-R	
9.	CH3(CH2)7CH2-R	· ·
10.	CH3(CH2)8CH2-R	•
8. 9.	CH3(CH2)6CH2-R CH3(CH2)7CH2-R	Heptyl Octyl Nonyl Decyl

Rules for Systematic Nomenclature of Alkanes

- 1. Find the parent chain
- a. Identify the longest continuous carbon chain as the parent chain.

$$CH_3$$
 CH_2
 CH_3
 CH_3
 CH_2
 CH_2
 CH_2
 CH_2
 CH_3
 CH_2
 CH_3
 CH_3

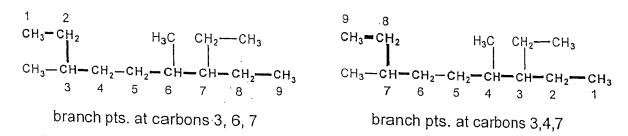
b. If more than one different chains are of equal length (number of carbons), choose the one with the greater number of branch points (substituents) as the parent.

- 2. Numbering the carbons of the parent chain
- a. Number the carbon atoms of the parent chain so that any branch points have the lowest possible number

branch pts. at carbons 3 and 4

branch pts. at carbons 4 and 5

b. If there is branching equidistant from both ends of the parent chain, number so the second branch point has the lowest number.



3. Substituents

a. Identify and number the substituents and list them in alphabetical order.

b. If there are two substituents on the same carbon, assign them the same number.

4. Write out the name

a. Write out the name as a single word:

hyphens (-) separate prefixes commas (,) separate numbers

- b. Substituents are listed in alphabetical order
- c. If two or more identical substituents are present use the prefixes:

di- for two

tri- for three

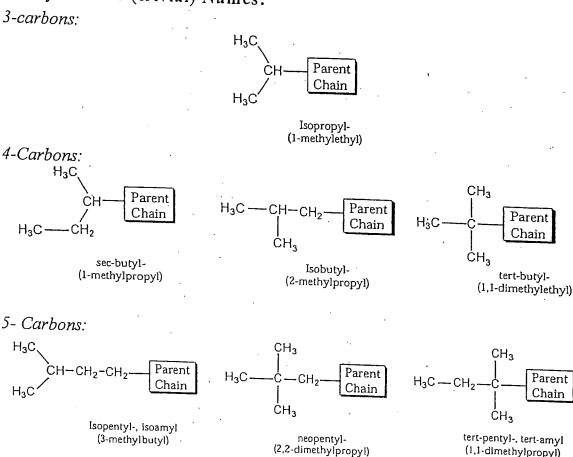
tetra- for four

note: these prefixes (di-, tri-, tetra-, etc.) are not used for alphabetizing purposes.

(1,1-dimethylpropyl)

- Complex Substituents (substituents with branching) 5.
- Named by applying the four previous rules with some modification
- Number the complex substituent separately from the parent. Begin numbering at the point of attachment to the parent chain.
- Complex substituents are set off by parenthesis.

Nonsystematic (trivial) Names:



Alphabetizing trivial names:

Iso- and neo are part of the alkyl group name and are used for alphabetizing. sec- and tert- are not included in the alphabetical order.