

			Functional Groups	
	Name ALK- <u>ANE</u>	Formula	ALK- <u>YL</u>	
1	Methane	CH ₄	CH ₃ -	methyl
2	Ethane	CH ₃ CH ₃	CH ₃ CH ₂ -	ethyl
3	Propane	CH ₃ CH ₂ CH ₃	CH ₃ CH ₂ CH ₂ -	propyl
4	Butane	CH ₃ (CH ₂) ₂ CH ₃	CH ₃ CH ₂ CH ₂ CH ₂ -	butyl
5	Pentane	CH ₃ (CH ₂) ₃ CH ₃	CH ₃ (CH ₂) ₃ CH ₂ -	pentyl
6	Hexane	CH ₃ (CH ₂) ₄ CH ₃	CH ₃ (CH ₂) ₄ CH ₂ -	hexyl
7	Heptane	CH ₃ (CH ₂) ₅ CH ₃	⋮	⋮
8	Octane	CH ₃ (CH ₂) ₆ CH ₃		
9	Nonane	CH ₃ (CH ₂) ₇ CH ₃		
10	Decane	CH ₃ (CH ₂) ₈ CH ₃		
11	Undecane	CH ₃ (CH ₂) ₉ CH ₃	CH ₃ Br	methylbromide
12	Dodecane	CH ₃ (CH ₂) ₁₀ CH ₃	CH ₃ CH ₂ I	ethyliodide
20	Eicosane	CH ₃ (CH ₂) ₁₈ CH ₃		
30	Triacontane	CH ₃ (CH ₂) ₂₈ CH ₃		
50	Pentacontane	CH ₃ (CH ₂) ₄₈ CH ₃		

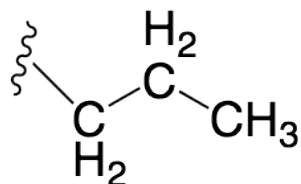
Common substituent names

Any Alkyl: “-R”

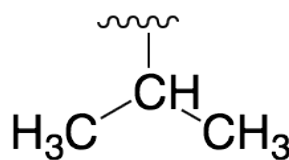
Halogens (X) : fluoro, chloro-, bromo- iodo-

special alkyl fragments:

Propyl:

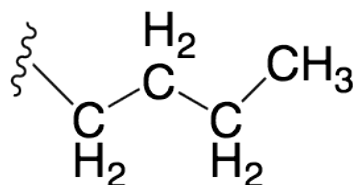


n-propyl,

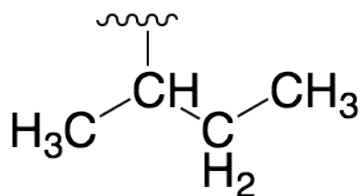


isopropyl

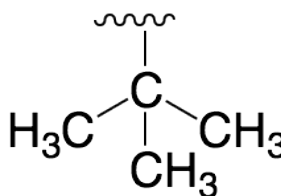
Butyl:



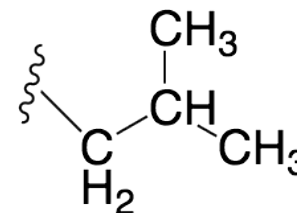
n-butyl,



sec-butyl,



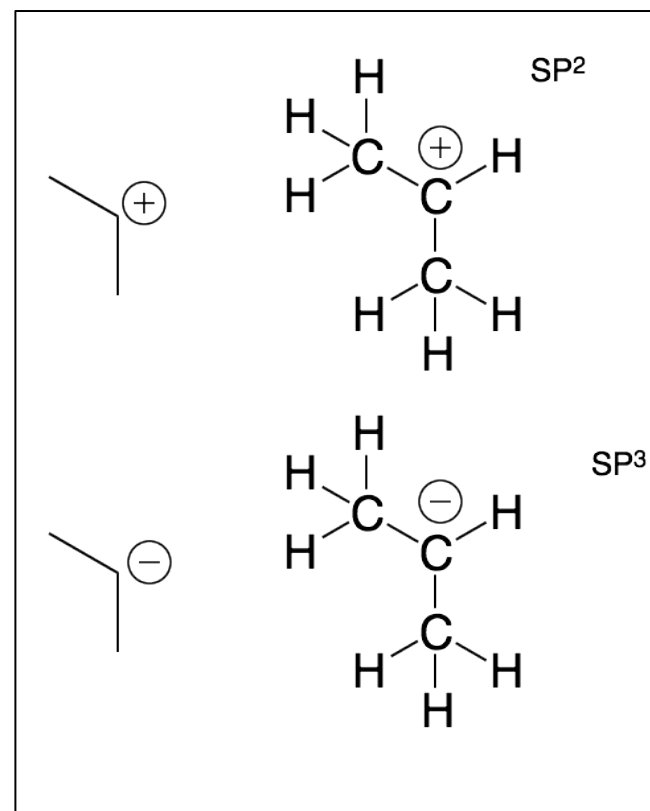
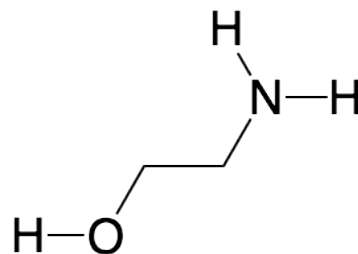
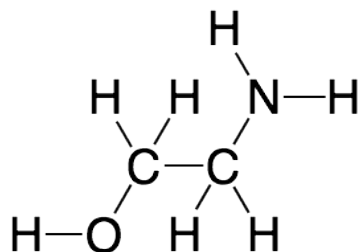
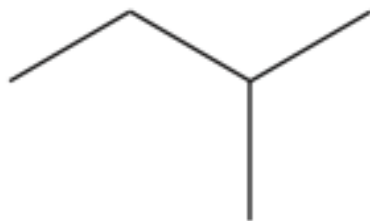
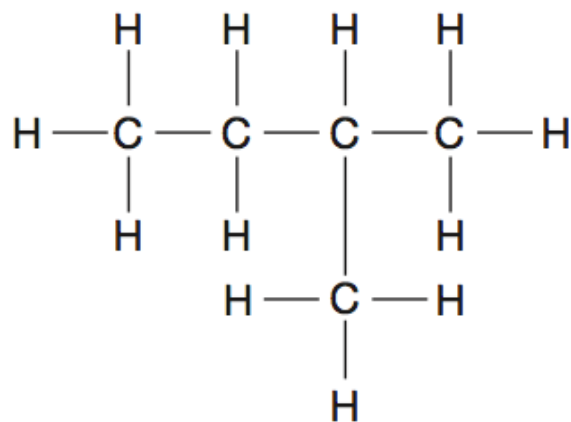
tert-butyl



isobutyl **6**

Bond-line formulas or skeletal structure:

- Carbon atoms are represented as ends or vertices of lines
- Carbon (neutral carbon) is assumed to have a valence of 4
- Hydrogens on carbon (only on carbon) are implicit.



Nomenclature of Alkanes

1. Find / name the longest continuous carbon chain.
2. Identify and name groups attached to this chain.
3. Number the chain consecutively, starting at the end nearest a substituent.
4. Designate the location of each substituent group by an appropriate number and name. (separate #'s with a "-" ex. 3-bromoheptane)
5. Assemble the name, listing groups in alphabetical order using the full name (e.g. cyclopropyl before isobutyl).
6. The prefixes di, tri, tetra etc., used to designate several groups of the same kind, are not considered when alphabetizing.

More than one longest chain of equal length:

1. If there are two or more longest chains of equal length, the one having the largest number of substituents is chosen.
2. If both ends of the root chain have equidistant substituents:
 - (i) begin numbering at the end nearest a third substituent, if one is present
 - (ii) begin numbering at the end nearest the first cited group (alphabetical order).

Alkene (C=C) nomenclature

1. Drop the “-ane” suffix of alkane and add ene (ending)
eg. propane -> propene.
2. The longest chain chosen for the root name must include both carbon atoms of the double bond.
3. The root chain must be numbered from the end nearest a double bond carbon atom. If the double bond is in the center of the chain, the nearest substituent rule is used to determine the end where numbering starts.
4. The lesser of the two numbers designating the carbons of the double bond is used as the double bond locator.
5. If more than one double bond is present the compound is named as a diene, triene or equivalent prefix indicating the number of double bonds, and each double bond is assigned a locator number. eg. 1,3-butadiene

RINGS:

6. In cycloalkenes the double bond carbons are assigned ring locations #1 and #2. Which of the two is #1 may be determined by the nearest substituent rule.

AS SUBSTITUENTS: Substituent groups containing double bonds are:

$\text{H}_2\text{C}=\text{CH}-$ Vinyl group

$\text{H}_2\text{C}=\text{CH}-\text{CH}_2-$ Allyl group